

**NUCLEAR REGULATORY COMMISSION:
REGULATORY REFORMS**

HEARING
BEFORE THE
SUBCOMMITTEE ON
CLEAN AIR, WETLANDS, PRIVATE PROPERTY AND
NUCLEAR SAFETY
OF THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
ONE HUNDRED SIXTH CONGRESS
SECOND SESSION

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MARCH, 9, 2000
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NUCLEAR REGULATORY COMMISSION: REGULATORY REFORMS

THURSDAY, MARCH 9, 2000

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON CLEAN AIR, WETLANDS, PRIVATE
PROPERTY
AND NUCLEAR SAFETY,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:03 a.m. in room 406, Senate Dirksen Building, Hon. James M. Inhofe (chairman of the subcommittee) presiding.

Present: Senators Inhofe, Voinovich, and Bennett.

OPENING STATEMENT OF HON. JAMES M. INHOFE, U.S. SENATOR FROM THE STATE OF OKLAHOMA

Senator INHOFE. The meeting will come to order.

Today's hearing continues the ongoing oversight of the Nuclear Regulatory Commission. I would like to welcome Chairman Meserve, nice to have you here. This is your first oversight hearing and I'm sure you'll enjoy it.

[Laughter.]

Senator INHOFE. Since the first hearing in July 1998, there have been many changes at the NRC. We had the relicensing program underway and reforms have taken place on the enforcement side and the NRC is moving toward more risk-based approaches.

For the first time in years, people are beginning to look at nuclear energy in a different light than they have in the past as perhaps a viable option for our energy needs in the future. It is a safe, clean, cost efficient and reliable fuel source when managed properly.

The NRC has an important mission to "ensure adequate protection of the public health and safety, the common defense and security and the environment in the use of nuclear materials in the United States." I think it is important to understand the mission of the NRC and the fact that they are charged with protecting public health and the environment. The NRC remains the foremost government agency on issues involving nuclear safety and the impact on public health and the environment.

Unfortunately, this issue was lost in the recent debate involving the nuclear waste storage facility. I want to reassure the Chairman and the Commissioners that as far as this subcommittee is concerned, you are indeed the recognized experts on this issue.

There are a number of issues that I would like to have addressed today, either in questions or in testimony. There are a total of nine:

No. 1, Is the relicensing process on schedule; will the NRC be able to handle multiple applications at once or are we going to end up with a bottleneck problem?

No. 2, I'm still interested in the NRC's 5-year strategy plan. Last February I asked the GAO and the NEI to review the plan when it was finished. Unfortunately, this seems to be the nature of any bureaucracy—you don't get it until your deadline and we didn't get it until last week, so I'm not sure how much time the GAO and the NEI have had to look it over, but we want to talk about that in some depth.

No. 3, is the NRC continuing to move toward a risk-based approach for regulations in enforcement and is it working.

No. 4, I'm interested in hearing the results on the Enforcement Pilot Program the NRC conducted this past fall.

No. 5, I'm concerned that the EPA has proposed standards for Yucca Mountain which are unworkable and did not follow the advice of the National Academy of Sciences. I'm interested in the NRC's perspective on this.

No. 6, we will have witnesses on the second panel addressing the metals recycling issue. I'd like to hear whether it is really a health and safety issue or a matter of public perception. Mr. Meserve, in that respect, I'd like to have you stay to hear the second panel so that we would have that input and maybe some debate.

No. 7, the GAO has completed their report on whether the changes at the NRC are filtering down to the rank and file employees. I'd like to hear peoples' perspective on those results. This involves changes and generally speaking, the rank-and-file don't like changes. I would like to know how that is coming.

No. 8, the subcommittee will be addressing the reauthorization of the Price Anderson Act which provides an insurance program for nuclear facilities. Are any changes to the law needed to come up with a plan that is going to offer adequate protection.

Finally, No. 9 and most importantly, is public safety being protected?

Senator Voinovich.

**OPENING STATEMENT OF HON. GEORGE V. VOINOVICH,
U.S. SENATOR FROM THE STATE OF OHIO**

Senator VOINOVICH. Thank you, Mr. Chairman.

I'm pleased to be here this morning for this hearing on the operation and program management of the Nuclear Regulatory Commission.

I went to your website; you're familiar with what it says, but it is quite a responsibility. The very nature of nuclear materials makes the job of the NRC one of utmost importance. It is up to the NRC to make sure that our Nation's nuclear facilities are running at their safest possible level. Equally important is the safeguarding of our nuclear materials from misuse. The NRC is probably one of the few agencies in the entire country where the job requirement is 100 percent perfection. Failure to maintain strict safety requirements could have a disastrous impact on millions of people.

It is also up to the NRC to make sure the United States has enough high quality nuclear material for the purpose of maintaining an effective nuclear weapons arsenal. One of our only four processors of this high quality material is the Portsmouth Gaseous Diffusion Plant in Piketon, OH. As our witnesses may be aware, I have a longstanding interest in the future of that plant.

Since 1954, at the beginning of the cold war, the Portsmouth Plant's purpose was to enrich uranium for use in nuclear weapons and propulsion systems for naval vessels. Over the years, thousands of dedicated men and women in the civilian work force at Piketon helped keep our military fully supplied and our Nation fully prepared to meet any potential threat. Their success is measured, in part, with the end of the cold war and the collapse of the Soviet Union.

As the Commissioners and the chairman are aware the U.S. Enrichment Corporation, which operates that plant, announced last month it would reduce its work force by 20 percent in the Portsmouth Gaseous Fusion Plant in Piketon, OH and its sister plant in Paducah. The NRC recertified USEC operation in both plants in January 1999, primarily based on USEC's investment grade corporate rating. However, on February 4, Standard & Poors downgraded USEC's credit rating to below investment grade level.

The agreement on post closing conduct that USEC entered with the Department of Treasury outlined significant events which would allow USEC to close down one of its facilities. Because of their current downgrade, is NRC reevaluating its finding of "inimicality"? That's one thing.

Under the USEC Privatization Act, the NRC is authorized to review whether USEC's license would be inimical to the common defense and security of the United States or the maintenance of a reliable and economical source of enrichment services. To put it in a nutshell, just how important is that facility to our country's preparedness, both civilian and militarily? I would very much like to know what NRC thinks about it.

Another issue I'm concerned about is the long-term storage of high-level nuclear wastes. I have talked with the chairman about this on several occasions. Without a long-term solution to this problem, the Perry and Davis-Besse Nuclear Plants in northeast Ohio will reach maximum capacity in 2007 and 2017 respectively. If a permanent storage solution is not reached, it could jeopardize the viability of one or both of these plants. This is an important issue to Ohioans since approximately 12 percent of the electricity generated in Ohio comes from them.

The American people have contributed—and I think this is really important—some \$15 billion to design and construct a permitted home for high-level nuclear waste. Just over \$6 billion of that has already been spent. Since 1977 when the Davis-Besse Nuclear Plant was built, Ohioans have paid more than \$287 million into this fund, \$22 million just this last year. It is unconscionable for the Federal Government to continue to impose this tax without using these funds to finish constructing the permanent site.

Last month, like 63 of my colleagues, I voted in favor of S. 1287, the Nuclear Waste Policy Amendments Act, to get the Federal Government off the dime. The point is, all this money has been coming

in, part of it has been used, but the rest of it has gone into the General Fund of the United States and is spent for something else. The question is, when, if ever, is it going to be built and is it fair to continue to collect this money that goes into the General Fund?

I've said to the people that have been paying this, the utilities and others who passed the cost on to their customers, when it finally comes time to be built, where is the money going to come from to build it. So I think all of us really are concerned about this. I think as a Nation, we have to stop playing politics and get on with it.

One final item I'd like to bring up with the NRC is our Nation's lack of a coherent, cohesive energy policy. This is obviously an issue that will need to be addressed particularly in light of recent increases in prices for home heating oil and gasoline. I don't think we have any energy policy.

We talk about what source of energy are we going to use in this country. Recently, Mr. Chairman, there was a meeting in Cleveland of some folks that were concerned about moving nuclear wastes through the city. My initial reaction was, you don't have to worry about that occurring because before they build that plant, I'll be in the ground, most of us will.

The other aspect of it that was of interest to me is they were opposed to nuclear energy. They are opposed to nuclear energy, they are opposed to fossil fuel and when asked the question, what energy source, they said solar.

Just think in terms of our Nation, we ought to start talking about these sources of energy that we have. Is nuclear power a viable source and if it is, we ought to make that clear and talk about its environmental benefits and get into this dialog. It just seems too often that the only people we hear from are the ones who are against everything. We don't hear enough from the people who really have all of the information, get them out and talk about the realities. In this particular case, we'd like to hear from you. Where do you stand on nuclear energy? Is it a viable source of energy for this country in the future? Should it be expanded?

We know for sure that one of the problems with it has been over the years that we still don't know what we're going to do with our waste.

Mr. Chairman, I appreciate the opportunity to be here this morning.

Senator INHOFE. Thank you, Senator Voinovich. You bring up a real good point because one of the reasons I'm going to have to leave for just a few minutes during the course of this committee hearing is we have Secretary Richardson in the Senate Armed Services Committee. I can remember last year when we were developing our authorization bill, they talked in the President's budget about the money that was going to go into defense. I looked at the line and it was fuel savings, all this money they were going to save from fuel.

I said at that time, it's not going to be a fuel savings. At that time, I think it was \$10 a barrel. That it was going to go up because we have allowed ourselves, with a lack of energy policy in this country and I blame the Republican Presidents and Democrat Presidents alike for not having one. I really believe in the next Ad-

ministration, we should just insist that we have one, have a cornerstone of that policy as to the percentage of dependency on foreign oil that we would have and we wouldn't get ourselves in the position we are.

We're in the position right now because we have allowed our domestic industry to atrophy, to be run out and then artificially manipulated down low enough so they are gone and now they are bringing it back up again. All the time in our Administration, we have our Secretary of Energy running around talking about how we can artificially get other people to do things they don't want to do. So we're going to have to face that.

When you talk about nuclear energy, I see a difference out there now from 10 years ago when people were really hysterical about the use of nuclear energy. Now it has a good safety program, it's clean, it's efficient. You look at other countries in which 80 or 90 percent of their energy is nuclear energy. I think we may have to be looking very carefully at this in the near future.

We have our first panel, which is Senator Jeff Sessions who is not here yet. I do want to accommodate him because he and I are on both committees working right now.

Why don't we do this. Mr. Meserve if you and our four Commissioners would come to the table, we can have opening statements and then after our opening statements, I might ask if Senator Sessions is here if you would allow him to just sit down and make a few statements and you folks come back.

Let's start with the opening statement. Chairman Meserve, again, I am looking forward to working with you in the capacity that you hold now. I welcome you to your first committee hearing.

Why don't we use the stop, change, go lights here and try to hold your opening statement to about 5 minutes. Your entire statement will be made a part of the record. Without objection, I will enter Senator Bob Graham's statement as a part of the record.

[The prepared statement of Senator Graham follows:]

STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR FROM THE STATE OF FLORIDA

Mr. Chairman, the U.S. Nuclear Regulatory Commission (NRC) plays a vital role in shaping our Nations electric energy production technology mix. Its mission of regulating the licensing and operation of commercial nuclear power reactors as well as the industrial use of nuclear materials and the transport, storage, and disposal of nuclear materials and waste is critical in our efforts to operate safe and efficient nuclear power plant facilities in the U.S. Nuclear power plants currently generate approximately 20 percent of the nation's electric energy. Our experience with nuclear power generation since our first commercial nuclear reactors went on line in the early 1960's shows that nuclear power electric generation in this country is an efficient, safe and clean source of electric energy. Western Europe and Japan share this view. France generates approximately 79 percent of its electricity from nuclear power; Belgium, 60 percent; Sweden, 42 percent; Switzerland, 39 percent; Spain, 37 percent; Japan, 34 percent and the United Kingdom, 21 percent.

Today the world is focused on reducing greenhouse gas emissions from coal, oil and gas fired power plants, and other fossil fuel fired boilers and equipment in response to concerns about global warming. Nuclear power plants produce virtually no greenhouse gas emissions. Therefore, the continued use of nuclear power as a substantial component of our Nations electric generation mix along with other major electric energy generating sources is a prudent course for the Nation to follow. However, no new nuclear power plants have been ordered in the U.S. since the late 1970's. Additionally, no new nuclear plants have commenced operation since the early 1990's. It is possible therefore that we may experience a situation in the not too distant future where a significant number of our current 103 commercial nuclear powered electric generating plants will have reached the end of their useful life with

no new nuclear replacement plants coming on line. It is estimated that in a period of less than 15 years about one third of our nuclear plants may be retired. If this estimate is correct, coal, oil, or gas fired electric generating units are the most likely types of generating facilities to make up the bulk of this replacement generation capacity. Without nuclear power we will be increasing, not decreasing our greenhouse gas emissions. Concerns over global warming and our experience with the safe and efficient operation of our nuclear plants demand that we find a way to ensure an appropriate level of nuclear power generation in our Nation's future electric energy technology mix.

I want to commend the NRC on its work in regulating the nuclear power industry in the U.S. and ask that it continue its ongoing efforts to ensure that the relicensing of nuclear powered generating plants is done as efficiently and rapidly as possible while remaining consistent with applicable laws, regulations and NRC requirements.

Thank you, Mr. Chairman.

Senator INHOFE. All of you will have any length of statement you want. We'd like to ask the four distinguished Commissioners to try to withhold their response to Mr. Meserve's opening statement to 2 or 3 minutes.

Mr. Meserve, welcome.

STATEMENT OF COMMISSIONER RICHARD MESERVE, CHAIRMAN, NUCLEAR REGULATORY COMMISSION; ACCOMPANIED BY COMMISSIONER NILS DIAZ, COMMISSIONER JEFFREY S. MERRIFIELD, COMMISSIONER EDWARD MCGAFFIGAN, JR., AND COMMISSIONER GRETA JOY DICUS

Mr. MESERVE. Mr. Chairman, Senator Voinovich, it is a pleasure to appear before you today with my fellow Commissioners to discuss the Nuclear Regulatory Commission's accomplishments, the challenges before us, our budget submittal and our legislative program.

Let me first introduce my fellow Commissioners: Greta Joy Dicus, Nils J. Diaz, Edward McGaffigan, Jr. and Jeffrey S. Merrifield who join me here. All of us appreciate the interest of this subcommittee in our work.

I last appeared before the Environment and Public Works Committee for my confirmation hearing. I told the committee at that time that in my view, the NRC was generally on the right track but needed to maintain momentum in its many initiatives. My experience over the past 4 months has confirmed this view.

Let me turn first to our accomplishments. I will highlight just a few of the major areas that I know are of concern to this subcommittee. I understand that you have a continuing interest in the status of license renewal and you have a question you raised this morning.

It should be noted that we have met or exceeded every milestone in our review of the Calvert Cliffs and the Oconee license renewal applications. The Calvert Cliffs license renewal is currently pending before the full Commission. The staff has recommended, based on its review of the safety and environmental issues, that the Commission approve the license renewal application. The Commission intends to reach a decision on this matter in April which is within 24 months after the application was received. The Oconee license renewal is similarly on track for Commission decision by July.

Although we have processed these first renewal applications expeditiously, we have a major effort underway to look at the generic

lessons learned from the license renewal process and to make improvements for future applicants.

We also know that you were very interested in our ability to process license transfers expeditiously. I believe the NRC has an exemplary record in dealing with the complex licensing transfer cases that are coming before us. We were among the first regulators to analyze and act on the transfers of the Pilgrim, Three Mile Island Unit I and Clinton licenses. There are several other complex licensing transfer cases before us that arise from the restructuring of the industry. These cases sometimes require a significant expenditure of energy but we will make continuing efforts to assure timely resolution of these matters.

We are also proud of the new reactor oversight process which is another issue on which you raised a question. We plan to use that process to inspect, assess and enforce regulations at nuclear reactors. Last year, we launched a pilot program involving 13 reactors at 9 sites and we learned a great deal from that effort.

The results of the pilot program were recently presented to the Commission with a staff recommendation that we extend the new approach to the oversight of all of our operating reactors. The new approach has been endorsed by a broad spectrum of stakeholders and the initial implementation is to begin at all power plants in April 2000.

We recognize, however, that this is a work in progress and we will have to make continuous adjustments, including training of and interaction with our staff.

I also want to highlight our nuclear materials program for you. We have a very large number of materials-related initiatives underway. As with our reactor program, we are working and making our nuclear materials regulation more risk informed and flexible. For example, we are in the final steps of totally revising our regulations covering the medical use of byproduct material using risk insights together with other factors to establish requirements that better focus licensee and regulatory attention on issues commensurate with their importance to health and safety.

We continue to prepare for a possible Department of Energy application for a high level waste repository at Yucca Mountain. In this endeavor, we proposed implementing regulations that we believe will serve to protect public health, safety and the environment. We recently provided our comments to DOE on its viability assessment, draft environmental impact statement and draft siting guidelines.

We are also continuing our efforts in decommissioning various sites around the country, licensing of independent spent fuel storage facility installations, certification of dry casks, and issues associated with the transportation of spent fuel and radioactive material.

Almost all of our initiatives, whether in the reactor, materials or waste programs raise difficult issues on which our stakeholders have widely differing views. In recent years, the Commission has broadened the scope and depth of our interaction with all stakeholders to the benefit of all.

Let me turn now to our budget. To stay the course on the various initiatives we have underway, we obviously need resources to do

the job. Our Commission has proposed a fiscal year 2001 budget of \$488.1 million. This budget request represents approximately a 3.9 percent increase or about \$18 million over the fiscal year 2000 budget, but it is still the second lowest budget in the history of the agency in real terms.

The number of employees at the agency continues to decline and our budget reflects almost a 20 percent reduction in staff since fiscal year 1993.

The \$18 million increase over our fiscal year 2000 budget is primarily for the pay raise that the President has authorized for Federal employees. Two charts reflecting a summary of our budget since fiscal year 1993 are attached to my written testimony and are displayed here on the easels.

There is one feature of our budget submission that I know is of great interest to the subcommittee. As you know, the Commission has for years acknowledged that there is a legitimate fairness concern about the fees that are charged to our licensees. NRC licensees should not be charged fees for activities that are important to the agency's mission but which do not directly benefit them. Such activities constitute about 10 percent of our budget.

To address this concern, OMB has approved a graduated reduction of the percentage of our budget that must come from user fees. As you know, this is an approach that originated with this subcommittee last year.

I would like to conclude very briefly by touching on our legislative program. S. 1627, as reported by the committee, included many of the provisions that we recommended to the committee last year. We deeply appreciate your support for these programs.

There are a few additional provisions that we would respectfully request you to consider: clarification of our authority to deal with non-licensees who retain control over decommissioning funds; elimination of the provisions dealing with foreign ownership and removing and reviewing any ambiguity as to our authority to conduct informal hearings. These provisions are described in our full statement submitted for the record.

Finally, I would note that the Commission introduced a provision in last year's request to clarify the status of NRC licensees who decommission their sites pursuant to our license termination rules. Our rule was promulgated using a public process. The rule is consistent with international standards and is based on sound, scientific research. The rule ensures adequate protection of groundwater.

The provision which we suggest for your consideration would clarify that licensees who cleanup to our standard are not subject to CERCLA except in the rare event in which we or an Agreement State invite the EPA into the decommissioning to take advantage of CERCLA remedies. We are seeking to negotiate a Memorandum of Understanding with EPA on this point but if we fail, legislation would be the cleanest way to resolve the issue.

I have tried to present some of our pressing issues and accomplishments and have requested your support for our budget and for our legislative initiatives. We stand ready to make further changes to improve our regulatory programs and we look forward to your support in our efforts to reach that goal.

Thank you.

Senator INHOFE. Thank you, Mr. Meserve.

If any of the Commissioners would like to react—don't feel compelled to do so, but if you would like to?

Mr. McGaffigan.

Mr. MCGAFFIGAN. Mr. Chairman, we normally go in a seniority order but I have no remarks. I support the Chairman's testimony and look forward to questions.

Senator INHOFE. Ms. Dicus.

Ms. DICUS. Again, I think you're going to hear ditto, ditto, that the testimony we have presented, both the written testimony as well as the Chairman's oral testimony, is a consensus testimony that we all contributed to and we all agree with.

The other point that I'd like to bring up, just to make you aware, is that I have the pleasure of serving as the Commission's representative to the National Association of Rate Utility Commissioners which are the public utility commissions of your States, the rate setting body.

They met just this week and I testified before them on Monday and talked to them about Yucca Mountain issues from the NRC's perspective together with license renewal issues. I simply want to make you aware of two resolutions that NARUC has passed in the past year.

The first was entitled, "Resolution Regarding the Nuclear Regulatory Commission's Efforts to Improve the Regulatory Process." They support us in that regard and continue to encourage us to refine and revise our regulatory processes.

The second was entitled, "Resolution on Proposed Radiation Protection Standards for Yucca Mountain, Nevada," which encourages the EPA to adopt the NRC's proposed radiological standards for licensing Yucca Mountain.

I did want to make you aware, if you were not, of those two resolutions. I appreciate the opportunity to be here to testify before you today.

Thank you.

Senator INHOFE. Thank you, Ms. Dicus.

Mr. Diaz.

Mr. DIAZ. Mr. Chairman, I do appreciate the opportunity to testify with my colleagues today.

I also wish to express my full support for the testimony presented by Chairman Meserve on behalf of the Commission. I believe that it is now time to consolidate our multiple initiatives over the last 3 years and I believe that we are working our way toward that end.

I have a practitioner's comment on the broad area of risk informed regulation, an area that I believe should be properly defined as focusing attention and resources on what is more important to safety. Whether we use it for new reactor oversight, or for licensing, risk informed regulation is more an encompassing method than a probabalistic analysis.

Risk informed regulation is supported, whatever we're doing with it, by a strong network of regulations, information flow, of deterministic results, regulatory and licensing experiences, and proven

practices, enhanced, when appropriate, by probabilistic risk analysis. In this case, the whole is stronger than any of the parts.

Regarding the major changes occurring in the industry, especially utility consolidation and mergers, I believe that addressing now the issues being brought forth by these changes in the industry will prepare us well for the immediate future.

Thank you, sir.

Senator INHOFE. Thank you, Mr. Diaz.

Mr. Merrifield.

Mr. MERRIFIELD. Thank you, Mr. Chairman.

I would also support the remarks of our Chairman, Mr. Meserve. I believe they do reflect the unified position of our Commission.

A couple of things I would point out, you mentioned in one of your questions you wanted to ask us about the GAO report as it relates to the reviews of our staff. I think that it is a helpful report. Its survey pointed out that we do have to do enhancements to training, interacting and communicating with our staff. I think the Commission is committed to doing that.

Our staff has a questioning attitude. As we move forward with a new inspection and oversight process, it is natural that they would question that as well and make sure that we have the highest level of accountability for our inspection and oversight program. So as it moves along, as they become more comfortable with that program, I think we will enhance our confidence, not only in ourselves, but our staff that we have an appropriate program.

As part of that, we do want to enhance our training. One of the moves the Commission has recently made is an action to close our Technical Training Center, a small, 26-member training body that was located in Chattanooga, TN in 1980 for the purposes of conducting reactor simulator training for our staff. That facility was originally located there because of its proximity to TVA simulators that we utilized.

The Commission has subsequently purchased four simulators. We believe now that it is more appropriate for those simulators and that staff to be located near our 1,800 member staff in Rockville. That is an action that is not supported by the Tennessee delegation. We would ask and seek the support of this committee to ensure that we have the ability to enhance our training and the ability to have the highest level of health and safety among our staff.

The last point, you asked about how we are reacting relative to enhancing our Nation's energy security. I would point out we have, as of last month, approved the last of three designs that were submitted to us—the AP-600 design of Westinghouse for a new PWR reactor; we had previously signed off on the GE advanced boiling water reactor; and the Combustion Engineering System 80 Plus.

So the Commission has acted as a whole in approving three new advanced nuclear reactor designs. Those are on the shelf and waiting for an order by a utility and a request for us to judge the individual license. So we have acted in that regard.

Thank you.

Senator INHOFE. Thank you, Mr. Merrifield.

I'm going to inject a couple of questions I want to make sure we get in before something happens here. Senator Voinovich does have

to go chair another committee. I'll turn it over to you after that, Senator Voinovich, for the questions you have, then we will go back to the regular order.

The first question we had at the last hearing we had is probably appropriate for this hearing too, Mr. Meserve. You mentioned that you're meeting every milestone. Specifically, are you on track for finishing each license renewal application within the 36 months?

Mr. MESERVE. Yes, we are. We will be acting on the Calvert Cliffs application by April which means we will have completed that in 24 months.

Senator INHOFE. It sounds like you're a little ahead of that schedule then?

Mr. MESERVE. Similarly with the Oconee application, we are on track to complete action by July which would similarly have us in well under the 30-month period. I believe that is also about 24 months.

Senator INHOFE. Will you be able to keep up that pace? I'm thinking about the time when you might have 10 applications at one time. Will a bottleneck occur?

Mr. MESERVE. We have been trying to work with the nuclear industry to try to work out arrangements so that we can basically develop a queue of license renewal applications so that we don't have a whole series of them that have to be processed at one time. We've asked the industry to basically let us know 5 years in advance of the filing so that we can plan to be able to accommodate the applications that come in.

Senator INHOFE. How does the concept of giving credit for an existing program come into effect when you're looking at this?

Mr. MESERVE. We examine a limited set of issues in the licensing renewal process, with a particular focus on those issues that are associated with the extension of the life of the reactor, so we are very concerned about aging issues and making sure that the plant can continue to operate safely for a more extended period.

The focus of the relicensing activity is to make sure there are aging issues which have been addressed, there are maintenance programs that are appropriate in place to be able to handle the extended period, if there are analyses that were time limited in the original application, to make sure those are examined to make sure they are appropriate to allow continued operation.

We have tried to focus the activity in relicensing on the issues that bear directly on the decision we are making, whether the extension of the license is appropriate and will provide adequate protection of health and safety.

Senator INHOFE. Mr. Meserve, on the second panel, Mr. Adelman, who has already submitted his testimony, refers to the fact that "The NRDC is opposed to the NRC proposed rule on the issue of metals recycling." I didn't know you had already proposed a rule.

Mr. MESERVE. We have not.

Senator INHOFE. Then what is he referring to?

Mr. MESERVE. We have engaged in an interaction with the public on whether we should proceed with the development of a clearance rule, which is what we call the matter referred to by Mr. Adelman. In that process, we published an issues paper in the Federal Reg-

ister from which we sought comments. We have engaged in four meetings in various parts of the country in order to get public reaction as to whether we should proceed with a rule in this area and if we do so, what its content should be.

Staff is preparing an evaluation of all that information and will be submitting it to the Commission so that we can make a decision later this spring as to whether to proceed with the rulemaking in this area.

Senator INHOFE. So right now the staff is gathering the information together so that you will then be able to come make a determination even if you're going to have a rule, not just necessarily what the rule is going to be?

Mr. MESERVE. That's correct.

Senator INHOFE. We will ask Mr. Adelman that question.

Senator Voinovich, I know you have to leave. Why don't you go ahead and take all the time you need.

Senator VOINOVICH. I have actually two questions. The first deals with my statement I made and that is that nuclear energy accounts for practically 20 percent of our Nation's electrical use. Of this, USEC supplies 75 percent of the enriched uranium for our domestic needs, with the other 25 percent supplied from foreign enrichers. USEC also serves as the executive agent for the United States and the Russian Highly Enriched Uranium Program.

Of USEC's share of the enriched uranium market, approximately half of the material the corporation sells is from the Russian HEU agreement. Therefore, one-half of our Nation's supply of enriched uranium is from foreign sources.

What are the Commission's thoughts on the current reliance on foreign produced fuel for our nuclear energy needs? Basically, if a decision should be made to shut down USEC, we're not going to have any facility to enrich uranium. The question is what is your reaction to that?

Mr. MESERVE. We are obligated by the Congress in examining the certification of the USEC facilities to make an assessment as to whether the issuance of the certificate and the operation of the facility is sufficient to maintain a reliable and economical domestic source of enrichment services. I believe that reflects the Congress' judgment about the importance of our having domestic capability to provide enrichment services which obviously not only serve as an ingredient to producing fuel for nuclear power plants but also have defense purposes.

I understand and the Commission would understand that the Congress has asked us to look at the viability of the USEC operations in order to assure that we have a domestic capability to provide enrichment services.

Senator VOINOVICH. So the answer is that in the event that you'd have to pull the plug on USEC for some reason or other, we still need to have a domestic source of enriched uranium to take care of our domestic and military needs?

Mr. MESERVE. That's my understanding of why Congress wanted us to look at that. It is a kind of review we don't undertake in the nuclear power plant area. My understanding would be that Congress has asked us to examine this issue specifically because of the importance of maintaining a domestic capability.

Senator VOINOVICH. I think it fits in with the other problem we're having right now and that is in terms of domestic oil supply. We kind of just ignored that and we're more reliant today than ever before on foreign oil, not only from a cost point of view but also now from a national security point of view if something would happen, particularly some of the people we're getting oil from aren't necessarily our best friends.

The last thing has to do with your budget. Do you know what percentage of your budget right now is going for training?

Mr. MESERVE. I don't know the precise number. I'd be happy to submit that for the record. We do have a 26-person training facility, as Commissioner Merrifield indicated, in Chattanooga. That's all we have in Chattanooga, the training facility. We have wanted to bring those people to our headquarters in order to integrate the training that's now undertaken at Chattanooga with the training that also takes place at headquarters.

We view this, as Commissioner Merrifield indicated, as an enormously important activity at a time when there is very significant change underway at the Nuclear Regulatory Commission. We have a need to make sure that our staff fully appreciates the new directions that we're taking. We think having that facility where the bulk of our employees are is the way to assure that the training is adequate.

It also allows an interaction between the trainers and our technical staff at headquarters to make sure that there is a close linkage of the new directions in regulation with the training activities. That is going to be facilitated if we can have these operations collocated.

Senator VOINOVICH. I'd be interested in comparisons in terms of the money you're spending on training. The hearing I'm going to be chairing in a half hour or so is on the human capital in the next century. One of the things I have observed, looking at the budgets of various Federal agencies, is that over the years, they have really cut back on training at a time when training is more important than ever before. So I'd be interested in those numbers.

Mr. MESERVE. I'd be happy to provide the figures. We share your view that training, for a technical agency like ours with a wide range of responsibilities at a time when we're undergoing a lot of change, is an essential ingredient for our staff. We need to have an effective training system and we're dedicated to trying to develop that. The NRC plans to spend about \$10.3 million—more than 2 percent of its fiscal year 2001 budget request—for training. Note that this estimate does not include the cost of the NRC staff's time (salaries) for those who are attending training.

The NRC's fiscal year 2001 budget request is \$488.1 million.

Senator INHOFE. I think perhaps the five of you and Mr. Meserve, your background, would equip you best to answer the question. On the next panel they are going to be talking about metals recycling, the level of radiation that would be found in materials.

I'd like to ask if you could explain what that level would be and how much of a public health threat that poses?

Mr. MESERVE. We haven't undertaken development of a rule, so there's no basic number that's on the table that we have introduced as a proposed rule.

The objective that we would undertake, if we were to proceed with a rule, is to select a number where there was complete assurance that the public health and safety would be protected in any reasonable use of the material.

The numbers, for example, that people have talked about as being an appropriate level for such limit is something on the order of 1 mr, a unit of radiation. By way of background, let me say that we all live in a world in which we are all exposed to radiation.

Senator INHOFE. I was going to say that. I keep hearing people talk about zero and that doesn't exist, the granite in the buildings here.

Mr. MESERVE. But we all are exposed on average to something on the order of 300 mr, just by what nature provides us. If you happen to live in a place like Denver, you're exposed to higher levels, probably 40 or 50 mr higher as a result of the fact that the rock there has higher uranium content naturally and you're at higher elevations. You have more exposure to cosmic rays.

The variability in natural background is much, much larger than 1 mr. In fact, the exposure in the United States, I understand, that just comes from nature is in the order of magnitude of 100 mr or so at the low range to as high as 1,000 mr.

The number that people have been talking about as a possibility for a clearance rule is 1 mr, which is way below the variability in the natural background.

Senator VOINOVICH. Mr. Chairman, I'd just like to make one comment just to put things in perspective.

I visited an outfit in Ashtabula, OH, RMI, who extruded these rods for nuclear reactors and they are decommissioning the plant. Their cutting that place up into little pieces. I asked the people running the plant, how risky is this material and what are you doing with it. They said, we're packaging it up and sending it out to Nevada to go into a dump out there.

I looked at this and said how much radiation would I pick up from that if I had it around me? They said, you could have it on your front porch and you'd get less radiation from that than you would from flying from Washington out to Denver.

The reason I'm mentioning this is that there are some people out there that think there is some kind of laxness in getting rid of some of this stuff and from my perspective, I thought they were going way overboard in terms of trying to make sure none of this metal was going to get back into the supply out in the marketplace.

My reaction would be that anyone that raises the issue about some of this stuff, plutonium, uranium, is out there somewhere, I don't give it that much credence, especially after seeing what they're doing with the material. Every piece of this place is being chopped up and they're sending it out there.

Mr. MESERVE. May I comment, Mr. Chairman, on that?

Senator INHOFE. Yes, of course.

Mr. MESERVE. The dose one would get in a cross country flight is about 5 mr so the clearance approach that people have viewed as a possibility is much less than that.

I think there is another important element of this problem. We are not dealing just with materials that might be released from a site to go into commerce and could be recycled in consumer products. The clearance rule would deal with any material that would be leaving a licensed site. The question would be, are the levels low enough that they can be handled the way non-radioactive materials would be handled.

One of the consequences of the approach that we're talking about would be allowing materials which pose no health or safety risk to leave the site and to be disposed of in the normal way. So if you have contaminated dirt, for example, or contaminated materials that have very low levels of contamination associated with them, so low that they don't pose a health and safety risk—you would be allowed to dispose of them without using the expensive and valuable space in radioactive waste disposal facilities.

We've been trying to handle these issues as they've arisen on a case by case basis. We've thought about having an approach that would be a standardized approach, that would be a clear rule everyone would understand.

Mr. DIAZ. I just want to say that the undertaking for this analysis that we're doing is just a clear expression of the concern the Commission has for radiological protection. It is not to actually ignore it. On the contrary, it's to bring it to the forefront and deal with it in the best manner that we can to protect public health and safety.

Senator INHOFE. And at the same time, do it with sound science and honesty where the people know and are not going to be scared by something that doesn't exist.

I'd like now to ask Senator Bennett, who has to leave at 10 o'clock, to go ahead and take whatever time he'd like.

Senator BENNETT. Thank you very much, Mr. Chairman.

I'd say to the Senator from Ohio I think they're shipping it to Utah, not Nevada.

Mr. Chairman, I want to congratulate you on your initiative and leadership in holding these hearings. I understand the process began about 18 months ago and I think it's the proper, appropriate activity on the part of the committee because it gives the agency someone to report to, a benchmark to work toward.

I remember President Eisenhower used to say that areas that did not get inspected regularly tended to deteriorate. I'm not suggesting, Mr. Meserve, that your agency in any way was deteriorating but I do think the inspection the Chairman has initiated is something we benefit from and ultimately you too.

I have an issue that I've raised with Chairman Meserve in the form of a letter. I think perhaps as an indication of the value of these hearings, I got an answer to that letter last night.

[Laughter.]

Senator BENNETT. So I am in a position to thank him for that and tell him how grateful I am.

Senator INHOFE. And we received our 5-year plan last week.

Mr. MESERVE. I apologize to both of you.

Senator BENNETT. I understand that you'd prefer to have me raise the issue regarding FSRAP and its 1978, pre-1978, post-1978

issue at the full committee hearings proposed in April, so I will not pursue that in any detail today.

I do want to thank Chairman Meserve for his letter that did respond to some of the questions I raised. We will follow up at the full committee hearing. Our goal is exactly the same as the one the Chairman has outlined, sound science, an intelligent way to protect health and safety, moving away from arbitrary lines that get drawn that maybe don't have any scientific validity.

Not being a lawyer, and I recognize Senator Sessions is one of the premiere lawyers in this body, sometimes I get a little frustrated by the artificial nature of arbitrary decisions that come down with respect to the law. That's why I want to pursue this 1978 date because I don't think it has any validity in science. I think it is a fairly arbitrary situation.

I do thank the Chairman for his response and this Chairman for keeping the opportunity alive for this kind of exchange and this Chairman for his response on the issue. I look forward to a more complete discussion of it in the full committee hearings.

That is really all I think I need to take the committee's time for this morning.

Senator INHOFE. Any response to the comments by Senator Bennett?

Mr. MESERVE. We would welcome the opportunity to discuss the issue with you.

Senator INHOFE. We're embarking upon the reauthorization of the Price Anderson Act. Is there anything we should particularly be looking at right now or be aware of as we start into this process?

Mr. MESERVE. The Commission submitted a report on the reauthorization of Price Anderson in 1998 which urged its reauthorization and included some relatively minor recommendations for its reauthorization. The Commission still stands behind that report.

For example, there was a suggestion that the annual retrospective premium, which is one of the layers of basic insurance provided through the Price Anderson Act, might be raised from \$10 to \$20 million. In short, there are relatively minor changes that the Commission has proposed.

Senator INHOFE. We're going to go to our first panel that was on our schedule but I feel we have kind of shorted some of the Commissioners. If there are any of the four Commissioners who have something they feel should be expressed to this panel, this would be the opportunity to do that.

Mr. MCGAFFIGAN. Mr. Chairman, I might just pick up on one point that Senator Bennett made about the artificial nature of some of what we do.

One of the big artificial distinctions—and you mentioned it as well, Mr. Chairman—is the distinction between the material that we deal with, Atomic Energy Act material, and the rest of radioactive material. Some day, and I don't think today's the day, looking at these two sets of material comprehensively would be a good thing because we regulate Atomic Energy Act material, EPA has the rest and really can set generally applicable regulations that apply to us as well.

The suggestion I'm making is that accelerator produced material, naturally occurring material, technologically enhanced naturally occurring material, all of that is treated quite differently.

I come to this business from the Armed Services Committee 3½ years ago and there is no greater frustration than all of the ways we have parsed radioactive material over the last 50 years. The lawyers have done it, Senator Bennett, not the scientists.

Senator INHOFE. Thank you, Mr. McGaffigan.

I want to mention also that I know you have been renominated by the President for another term. We're looking forward to getting you confirmed as quickly as possible.

Mr. MCGAFFIGAN. Thank you, sir.

Senator SESSIONS. Mr. Chairman, could I just say for this panel, I remember you called the first NRC oversight hearing where I was a member of this committee and my interest was captured for this subject. I felt the NRC had really stagnated, that it was time for us to reevaluate it, and we had no prospect of bringing any new nuclear power plants on-line at all. I wondered if they were expected just to disappear because they will all be gone before long.

I thought the employment level at the NRC may have been appropriate back when we were building nuclear plants but all the nuclear plants today are mature and have been regulated for quite a number of years, and no new ones are under construction. I felt it was time to really shake up things a bit.

I thought, pleasantly, that maybe the Board also was coming to the same conclusions and that your leadership affirmed them and gave them some impetus to follow through with some changes. I believe some positive steps have been made.

I think there is more that perhaps can be done. I think if this were a division of United States of America, Inc., they probably would want a little more downsizing, a little more reorganization, a little leaner and more effective regulation than we have today but you're moving in the right direction. I do think that is a positive step. I just wanted to share that.

Senator INHOFE. Thank you, Senator Sessions. I appreciate that.

Any other comments? Yes, Ms. Dicus?

Ms. DICUS. If I could, please, I'd like to follow Commissioner McGaffigan's comments. Something that I frequently say in speeches that I give around the Nation and internationally. We do have a mishmash of radiation standards in this country across the Federal family and in some cases, across the States. It is confusing to the public, it's confusing to the Federal agencies, and I keep wishing and hoping that there is a point in time that we can standardize our radiation protection standards and that we can settle on a particular standard that we all adhere to. So I continue to push for that level.

The Chairman was talking about how flying across the country is 5 mr and where is the proper standard we should have for protection of the public health and safety? What is the proper thing to do if we decide to go forth with a clearance rule? I would like to see some standardization of our standards.

Senator SESSIONS. When you consider risk, does anybody ever consider the risks of alternatives to nuclear energy, such as the increased health costs related to coal-fired plants and higher levels

of pollution? How about risks to coal miners, or risks related to truck wrecks, train wrecks and all those things that come from relying on fossil fuels? Life is a constant balancing act between risks and benefits, between profits and losses. Sometimes we seem to judge nuclear energy too harshly in terms of risk and environmental damage. It's environmentally friendly and has demonstrated that it is the lowest risk energy source by far.

I would like to think that we could develop some policies that would get us off this path to the end of nuclear power in America which is where we are headed unless something changes.

Senator INHOFE. Senator Sessions, in our opening statement, I addressed that same thing. People don't consider the alternatives and in terms of safety, cleanliness, availability cost, it's something we need to look at.

Any other comments?

Mr. DIAZ. Just an exclamation point to what my fellow Commissioner is said. Radiological protection is the bottom line of what we do. We try to do it well, and we'd like to do it better. We urge your support for the Commission initiatives.

Senator INHOFE. Thank you, Mr. Diaz.

Mr. Merrifield.

Mr. MERRIFIELD. As a follow up to the issue of the clearance rule that the Chairman talked about, the issue of science and sound science ultimately is a bottom line for us. We don't look at this in a vacuum, however. We can't deal with simply what is going on in the United States. Our European counterparts, for example, the EU, is going to a 1 m standard, so there are materials that will enter into commerce that we're going to have to grapple with maybe coming from Europe that may have level of material, and are we, in a uniform sense with international trading issues, going to grapple with that.

The other issue that we have to deal with is stakeholder concerns. There is obviously and has been for a long time, a great deal of concern on the part of a lot of American people about anything radioactive. So as part of our whole stakeholder process, we want to get those comments in, we want to understand what the public has to say about that so we can include that view in the direction in which we go.

I don't want to leave the impression that we've gone off one way and are just going to deal with the science. We also want to make sure we have an understanding of stakeholder's concerns, whether that's the general public or whether that's companies, and get their views in there as well.

Senator INHOFE. Thank you, Mr. Merrifield.

We will, at this time, excuse this panel. Mr. Meserve, do you mind staying and participating in the second panel.

Before introducing the first panel for a presentation which you may make up here if you like instead of going to the table, that we do miss you on this committee. I'd like to have you reconsider and come back.

Senator VOINOVICH. Even though you are a lawyer.

Senator INHOFE. One lawyer is not so bad.

We will recognize Senator Sessions at this time.

**STATEMENT OF HON. JEFF SESSIONS, U.S. SENATOR
FROM THE STATE OF ALABAMA**

Senator SESSIONS. It was a wonderful experience for me to serve on this committee. I enjoyed every minute. I enjoyed the issues and I believe we should act with a sense of urgency in regard to energy in America. We are seeing an extraordinary rise in prices of gasoline and fuel oil. It indicates to me that we are not thinking very clearly about our energy policy.

Energy costs and pollution are fundamental factors that ought to be evaluated as part of establishing an energy policy. Nuclear power clearly plays a critical role in our energy supply. It provides over 20 percent of our electric power; it's one of the cleanest and safest ways to produce power. While the United States experienced a boom of new nuclear power plants in the 1960's and 1970's, the last plant was licensed in 1974. Many of those plants are reaching the end of their life span today.

During the 2 years I served on this committee, I learned a great deal about our efforts to combat air pollution. The committee focused on the need to meet our Nation's air quality and energy needs.

Under the Kyoto greenhouse gas agreement, which the Senate refused to consider but the Vice President asked us to ratify, we were to commit to a goal of reaching by 2012 emission levels equal to 7 percent below 1990 levels.

What has happened since 1990 is our greenhouse gas emissions have increased 8 percent. In effect, between now and 2012, if we were to meet the Kyoto accord standards, we would have to reduce emissions by over 15 percent below today's emission level.

To further compound the problem, the Energy Information Agency projects that our demands for energy will increase by 30 percent between now and 2012.

There has also been a very hostile approach by this Administration to the production of natural gas. The Vice President has said he believes in no offshore drilling or additional in the Rockies where the great reserves of natural gas are. Natural gas, next to nuclear energy, is by far the cleanest burning fuel that we have.

Natural gas-fired electric plants are the cleanest form of non-nuclear electricity production. Many utilities are going to natural gas, but if we shut off our supply in the Gulf, if we continue to block our drilling abilities in the Rocky Mountain States and shut off the Alaska reserves, then we're going to be faced with a serious energy supply dilemma, even before trying to meet Kyoto's goals.

Energy involves cost, pollution and resources. I sincerely believe we may be entering a crisis period today. I think it is insanity for us to believe that we can meet our energy demands without nuclear power. I don't believe I'm alone in this position. Members of the Administration—even though the policies of this Administration have not been favorable to nuclear energy. In fact, I believe they have been hostile to nuclear energy. Many of its members have agreed with me.

In 1998 Under Secretary of State Stuart Eisenstadt remarked:

I believe very firmly that nuclear has to be a significant part of our energy future and a large part of the western world if we're going to meet emission reduction tar-

gets. Those who think we can accomplish these goals without a significant nuclear industry are simply mistaken.

I agree.

In March 1999, the U.S. Ambassador to the International Nuclear Association, John Rich, at the North Atlantic Assembly made his speech. I happened to be there and heard it. He made a clear analysis of all our choices facing us and said, "Nuclear power provided the only opportunity for us to meet energy demands and pollution clean air demands." He concluded, "The reality is that of all energy forms capable of meeting the world's expanding needs, nuclear power yields the least and most easily managed waste." That is so obvious as to be without dispute.

The idea that a great nation can't take nuclear waste and deliver it out to a desert in Nevada and plant it underground where it is no threat to anybody is really remarkable to me. It presents no threat to anyone. It's just been irrational to me to see the debate that has taken place on the floor of the Senate about people who would oppose the safe disposal of nuclear waste and find one excuse after another to not do what we plainly ought to do. It is stunning to me.

In 1993, Pulitzer Prize winner Richard Rhodes wrote in his book "Nuclear Renewal" that:

Electricity from nuclear fission continues to be the most comprehensive source of energy available to meet growing U.S. demand, the cleanest and safest of all major sources.

Many of the problems which have hindered development and increased use of nuclear power in the United States have not risen from safety concerns or inherent problems with the use of technology, but from excessive regulations and high economic risk associated with licensing and bringing a new plant on line.

In addition, plunging fossil fuel prices in the late 1970's and afterwards made nuclear power less economically feasible. At times there seems to have been an irrational hostility toward nuclear power. Some of that resulted from actions in Congress and otherwise, forcing the NRC to put excessive regulations on our nuclear industry to the point of micromanagement.

As I said earlier, I do believe we are moving away from that and I believe we can do better. In the long run, nuclear energy must remain a significant part of our energy mix. Between 1973 and 1997, nuclear generation avoided the emission into the atmosphere of 82.2 million tons of sulfur dioxide and more than 37 million tons of nitrogen which would have been released by fossil fuel plants producing the same amount of electricity.

In 1997 alone, emissions of sulfur dioxide would have been about 5 million tons higher and emissions of nitrogen oxides 2.4 million tons higher had the electricity been generated by fossil fuel rather than nuclear. As testimony before this committee has shown, the impact of these emissions would have had significant adverse effect on both environment and human health.

Some believe that nuclear power is dangerous and presents unacceptable risks. France obviously does not believe that. Today, 60 percent of their power is nuclear power and it is growing around the world.

To put the idea of risk in context, a physicist, Dr. Bernard Cohen conducted a detailed study in 1990 entitled, "The Nuclear Energy Option." It carefully examined the risk associated with nuclear power. He basis his analysis on two studies, "The Reactor Safety Study" done by the NRC in 1975 and a study conducted by the Union of Concerned Scientists which I think is less scientifically based but is a study worthy of examination.

Dr. Cohen states,

According to The Reactor Safety Study the risk of reactor accidents in the United States would reduce each American's life expectancy by .12 of 1 day or 18 minutes.

I don't know how these scientist can calculate these things but they made a serious effort at doing this.

The Union of Concerned Scientists, who have been hostile to nuclear power, say it would "reduce life by 1.5 days." What does that mean? It goes on to say:

Since our loss of life expectancy of being killed by any type of accident is now 400 days, the risk of using nuclear power would increase that number by .003 of 1 percent."

He goes on to conclude:

According to the best estimate of established scientists, having a large nuclear power program in the United States would give the same risk to average Americans as a regular smoker indulging in one extra cigarette every 15 years, as an overweight person increasing his or her body weight by .12 of 1 ounce and is less risky than switching from a mid-size to a small car.

Clearly the risks associated with nuclear power are manageable and far less risky than many other forms of conventional electricity generation—coal, natural gases pipelines, oil wells—those things we know how to do with great skill but still they have more risk historically than nuclear power.

With NRC's renewed focus on minimizing the risk of nuclear power generation, it is possible to make generation of nuclear power even safer. I do appreciate what you are doing. I do appreciate your commitment to real safety and real risk and not just micromanagement.

Although high costs currently prevent new plants from being brought on line, we do have virtually complete plants across the Nation which we might economically be able to bring on line. One plant in my State, the Belafonte Nuclear Plant in Scottsboro, is over 85 percent complete. When you go in it, it looks like you could turn a switch and it would run. Even though this plant has the ability to significantly reduce air pollution, fear of NRC regulations adds to the already high economic risk and contributes to their decision not to step forward at this time.

I know and believe the NRC would do its best to analyze that plant effectively. I just have to say when those people are sitting down at TVA, the Tennessee Valley Authority, and deciding whether to bring it on, they are concerned that they could get in the midst of it and have \$1 billion or more added because of unnecessary regulation.

I'd just like to take a moment to recognize a particular nuclear power plant in my State which I think exemplifies the way to safely operate a nuclear facility. Last week, TVA's Browns Ferry nuclear plant set a record for operating a boiling water reactor for 500 consecutive days without a single shutdown. This is a significant

achievement and one for which the plant employees, the NRC and the entire U.S. nuclear industry should be proud.

I've also seen the statistics and I think members of the Board would agree that every plant in America seems to be operating better now. All plants are having much better safety records, they're working out the bugs, they have staffs trained to the level at which they need to be and we are operating at much safer levels than before and operating with much fewer shutdowns.

I believe this Commission has made a significant improvement in carrying out its regulatory responsibilities since our first oversight hearings in July 1998 and February 1999. Moving regulatory focus away from micromanagement and toward risk informed and performance-based regulations appears to have helped both operators and regulators to focus their efforts on safety.

I am hopeful the NRC will continue its reforms and continue to ensure the safety of our nuclear power program while at the same time striving to eliminate unnecessary costs and to see what we can do to get this industry back on its feet again to expand and construct new plants.

Mr. Chairman, during one of our previous hearings, you correctly pointed out that the NRC could shutdown the nuclear program in the United States, it had that capacity. If that happened, we'd lose 20 percent of our electricity. The potential health and environmental impacts of such a scenario would be staggering.

Thank you for giving me the chance to come back to this committee, to talk about an issue about which I care deeply. Thank you for your leadership in heightening our awareness of the need to do a better job of managing our nuclear power industry.

We don't want to kill it off, we don't want to be the only nation in the world that does not have any prospect of building a new nuclear power plant. We cannot sit idly by while plant after plant's life span ends and they have to be closed. To do so would be both irresponsible and tragic.

Thank you again.

Senator INHOFE. Thank you, Senator Sessions. Again, I repeat, I miss you on this committee.

You started off talking about some of the things in the Kyoto Treaty and just for your information, I would like to have had you on this committee when we had a hearing earlier this year talking about the fact that, "Yes, we would like to have the Administration submit that for ratification so we know what would happen if it comes to the Senate." Instead, we were trying to analyze the number of things, executive orders and everything else where they are actually trying to implement this thing without authority and circumventing us. So, we miss you on the committee.

Senator SESSIONS. I would just say thank you for those comments and would point that when you shut off lands for oil and gas production, when you clamp down on nuclear power and you enhance substantially clean air regulations without providing a source of energy, then you're going to have what we're having today, an extraordinary increase in the cost of energy.

We don't have a good policy now as a nation and we, as a Congress, are going to have to participate in helping to establish one.

Senator INHOFE. Are you suggesting that the most advanced industrial nation in the history of civilization can't run on windmills?

Senator SESSIONS. That is exactly right. In fact, President Clinton's appointee, Ambassador Rich, talked about those issues quite directly and honestly. He said at this time there is no way these alternative sources of energy can come close to meeting our needs. He pointed out that the world needs electricity. In areas of the world where electricity is readily available, life span is almost twice what it is when not available.

You care about environment and human life. Production of power improves the quality of life, and increased the longevity of life and the health of the world we care about. We need to figure out ways to increase our energy and not cut back on it.

Senator INHOFE. Thank you, Senator Sessions.

I'd ask now that our second panel come to the table. The panel consists of Mr. Ralph Beedle, vice president and chief nuclear officer, NEI; Ms. Gary Jones, Associate Director of Energy, Resources and Science Issues, U.S. GAO; Mr. David Adelman, Project Attorney, Nuclear Program, National Resources Defense Council; and Mr. William Kennedy, Health Physics Society. We had asked the chairman of the NRC also to join us at this table, not for opening remarks but just for responses if called upon.

We will start with Mr. Ralph Beedle.

**STATEMENT OF RALPH BEEDLE, VICE PRESIDENT AND CHIEF
NUCLEAR OFFICER, NUCLEAR ENERGY INSTITUTE**

Mr. BEEDLE. Good morning, Mr. Chairman. Thank you very much and we appreciate the opportunity to be here this morning.

I am the senior vice president and chief nuclear officer of the Nuclear Energy Institute. The Institute represents the nuclear industry on public policy issues, including Federal regulations that apply to the Nation's 103 operating nuclear plants which produce nearly 20 percent of this Nation's electricity.

I want to thank you, Chairman Inhofe, for your continued leadership and the subcommittee for its continued oversight of the regulatory process for the commercial nuclear industry. This is particularly important at this time as Congress and policymakers are beginning to once again recognize the important role that nuclear energy plays in meeting our Nation's electricity demand, as well as our goal of improving our air quality.

Nuclear energy is our Nation's second largest source of electricity and accounts for two-thirds of all emission-free electricity produced in the United States. It is and has been for the last three decades a significant, yet silent partner in Clean Air Act compliance.

In 1999, the nuclear energy industry enjoyed a record year of safety and production. Last year, our plants operated a record efficiency of almost 87 percent, a 9 percent increase over 1998. This increase represents enough electricity to serve about 5 million households.

I'm also pleased to report that our nuclear plants have been operating with excellent safety levels. The industry's commitment to safety is evident in performance indicators compiled by both the NRC and the industry.

This report by the World Association of Nuclear Operators released this month summarizes the record safety performance of the nuclear plants in the United States. It is attached to my written testimony and reports that we are setting record levels of safety for our workers as well as the American public.

The industry's outstanding safety record has set the stage for the NRC's transition to a new nuclear power plant oversight process. This process will focus the attention of the industry and the Commission's inspectors on those areas of the plant that are most important to safety. NEI supports this process and urges the Congress to support it as well.

I would like to make just a few comments regarding the recent GAO report. Although that report included some findings that are of concern to each of us, it is important that the subcommittee take note of one important conclusion. That is by a 2 to 1 margin, the NRC staff believes that a transition to a regulatory process that incorporates risk insights will improve nuclear plant safety.

I can tell you that from my experience as the Chief Nuclear Officer at a large utility that there is skepticism within the staff whenever you embark on a major transition. Although some of the staff concerns were addressed in the pilot program, I'm convinced the GAO report provides two clues to the NRC in their planning and in their training that would enhance their ability to make changes.

There is still a need for better long range strategic planning and more training by the agency as it makes this significant transition to a new oversight process. The NRC needs to improve in both of these areas so that the agency staff will be fully prepared for the planned changes.

NEI has previously testified before this committee about the need for the NRC to adopt a comprehensive, 5-year strategic plan. The NRC just last week released a draft of the 5-year strategic plan for public comment. Earlier this week, NRC released the five-five planning information document which incorporates resource projections based on goals and strategies.

In estimating workload and identifying planning assumptions, this new planning document provides an improvement and points toward a more functional long-range planning document.

We remain concerned about two budgeting issues. First, the NRC continues to unfairly bill 100 percent of its operating costs to licensees. Through this subcommittee's effort and leadership, we hope to receive some relief starting next year. I'm pleased that the NRC is supporting this long-term solution to this problem as well.

Second, most of the NRC user fees are collected as a generic assessment levied against all licensees. This creates, in effect, a miscellaneous category to describe nearly 80 percent of the NRC's budget. The lack of transparency in the fee structure does not provide the NRC, the Congress, the industry or the American public with budget information necessary to examine that process.

The industry strongly encourages this subcommittee and the Congress to continue its oversight and to support the NRC's regulatory reform and the transition to safe focused regulatory oversight. This new oversight process is promising and we look forward to industrywide application of the program this April.

I would appreciate the opportunity to return before this committee and tell you about the progress the industry is making when the 107th Congress convenes next year.

Thank you, Mr. Chairman. This concludes my remarks.

Senator INHOFE. Thank you, Mr. Beedle.

Ms. Jones.

STATEMENT OF MS. GARY L. JONES, ASSOCIATE DIRECTOR OF ENERGY, RESOURCES, AND SCIENCE ISSUES, GENERAL ACCOUNTING OFFICE

Ms. JONES. Thank you, Mr. Chairman. We are pleased to be here today to discuss the results of our survey of NRC staff on the move to a risk-informed regulatory approach, the status of NRC's efforts to develop a strategy to implement this approach, and the disagreement between NRC and EPA over radiation standards.

First, let me address the results of our survey. It was intended to take the pulse of NRC staff on issues related to moving to risk-informed regulation at a particular point in time. The survey was conducted in August and September of last year and 68 percent of the almost 1,600 staff we surveyed responded.

Our survey results show that the vast majority of NRC staff feel personally responsible for the quality of their work and believe their work contributes to protecting public health and safety. They also generally believe that NRC management is supportive of their public health and safety efforts.

With respect to NRC's efforts to change its regulatory approach, however, the staff expressed mixed views. A large number of NRC staff do not believe that management is receptive of leading the change process or involving them in the changes being made. Almost half the staff that responded to the survey said a risk-informed, regulatory approach could be effective but only about a quarter believe that NRC staff have bought into the process.

In addition, many staff expressed concern about the new risk-informed oversight process to assess the overall performance of nuclear power plants. For example, 60 percent of the staff that responded to the questions about the oversight process agree or strongly agree that the process would reduce safety margins at nuclear power plants.

More recently, NRC surveyed 94 regional office staff at the conclusion of the pilot for the new oversight process. The survey results showed that NRC staff expressed very favorable views about the training that NRC has provided about the new oversight process and the communications with the public.

NRC's results also showed that the staff was not optimistic about some specific elements of the new process. For example, 70 percent of NRC staff who expressed an opinion do not believe the process would identify declining safety performance. In addition, about the same percent do not believe that performance indicators would adequately alert NRC to declining safety performance.

I'd like to briefly discuss the status of NRC's development of a comprehensive strategy for moving to risk-informed regulation. NRC staff expect to provide the Commission with a draft strategy, which they are calling an implementation plan, on March 10, 2000.

In January, NRC staff provided the Commission an outline of the proposed plan. The outline mentions many of the issues that we raised in previous reports and testimony—the need for goals, objectives, performance measures, milestones, training of staff, and using this document as a management and communication tool.

Finally, let me say a few words about the disagreement between NRC and EPA over acceptable radiation levels for nuclear facilities. This disagreement could increase the cost to decommission a nuclear power plant and to develop a proposed repository for the plant's high-level wastes at Yucca Mountain.

Although EPA has authority to establish a standard for residual radiation at nuclear power plants, it has not done so. Utilities are using a standard developed by NRC that EPA believes is not restrictive enough. Utilities are concerned that they may ultimately have to use a more restrictive EPA standard, which would increase their decommissioning costs.

EPA has proposed a radiation standard to protect public health and safety at Yucca Mountain. However, NRC, NEI, the National Academy of Sciences and others have raised concerns about the proposed standard.

In 1994, we recommended that NRC and EPA work out their differences. While we understand a Memorandum of Understanding is under development right now, 6 years later, a stalemate seems to exist.

Thank you and we'd be happy to respond to questions.

Senator INHOFE. Thank you, Ms. Jones.

Mr. Adelman.

STATEMENT OF DAVID ADELMAN, PROJECT ATTORNEY, NUCLEAR PROGRAMS, NATIONAL RESOURCE DEFENSE COUNCIL

Mr. ADELMAN. First, I want to thank the Chairman and members of the subcommittee for giving me the opportunity to testify today.

I want to start by saying that I've generally been dismayed by the kind of debate that has surrounded the issue of setting a *de minimis* radiation standard, particularly that more often than not, it becomes so polarized that little meaningful discussion occurs at all.

I believe the DOE and NRC officials bear particular responsibility for this dynamic because of their inability or unwillingness to do more than assert the correctness of their position, without first attempting to explain the basis for it in a meaningful way to the public.

In my testimony my hope is to identify some of the sources of the public's concern more specifically. That is, to try incrementally to move beyond this stalemate toward a broader discussion that will promote a fuller understanding of the issues and the bases for public concern.

The NRC, and particularly the DOE, have a long history of poor relations with the public and failing to safely control radioactively contaminated materials. The NRC, for example, was caught flat-footed when it was brought to its attention that the contractor conducting the technical analysis for its proposed rule SAIC had a di-

rect conflict of interest, namely that it was working concurrently for BNFL, the major DOE contractor responsible for recycling radioactively contaminated metals at Oak Ridge.

For its part, the DOE has avoided the open public engagement recommended by a 1996 National Academy of Sciences study that the DOE sponsored when it chose to proceed with the massive Oak Ridge radioactive metals recycling project without complying with NEPA or providing adequate public notice.

There are also numerous examples of DOE releasing radioactive materials improperly. The recent reports of improper releases and dumping of radioactive materials at Paducah is just the most recent example.

In short, if the NRC and DOE cannot manage such materials in a purported highly regulated environment, what confidence can the public possibly have that they can release contaminated materials safely for use in consumer products.

The implementation problems of a standard are equally serious. The public is skeptical about the NRC's ability to reasonably evaluate the human health impacts associated with a *de minimis* standard. Examples of specific issues are, aggregate effects of multiple exposures to different contaminated materials; synergistic effects with other carcinogens; and assessing the long-term impacts of radionuclides that remain hazardous for literally thousands of years.

The public is also profoundly concerned about the capacity of DOE and NRC licensees to release materials safely and in compliance with whatever standard may be set. The reasons for this include: the difficulties involved in surveying complex equipment for contamination and questions about whether proper instrumentation is available and will be used. None of these issues has been adequately addressed to the satisfaction of the public.

The most basic question the public is asking is why materials contaminated with nuclear wastes need to be recycled in the first place. What is the underlying policy? This is particularly relevant given the low value of steel which makes up the vast bulk of metals that could be recycled. Not even the economics appear to support recycling such materials. Moreover, such a standard, when applied to recycling, establishes a dangerous precedent of turning recycling into a form of hazardous waste disposal which is achieved by diluting contaminants in bulk commercial products. At a basic intuitive level, this just seems like bad public policy.

Neither the NRC nor DOE has provided a clear understandable explanation for why such a standard is necessary or why in particular recycling of contaminated materials makes sense. Lacking public confidence, facing serious public concerns about practical real-world problems, and failing to address basic public policy issues coherently, it is no wonder that the NRC and DOE have run into such strong public opposition.

These concerns must be addressed before proceeding with the rule or indeed, proceeding with any further releases of contaminated materials.

Thank you.

Senator INHOFE. Thank you, Mr. Adelman.

Mr. Kennedy.

**STATEMENT OF WILLIAM KENNEDY, HEALTH
PHYSICS SOCIETY**

Mr. KENNEDY. Thank you, Mr. Chairman and members of the subcommittee for having me here today to present to you information from the Health Physics Society.

I am a member of the Board of Directors of the Health Physics Society which is an independent, nonprofit, scientific organization of professionals who specialize in radiation safety. I am pleased to testify today on the efforts of the Society and the American National Standards Institute to develop a formal, consensus standard on the release of contaminated materials, including metals, and to comment on the proposed current NRC rulemaking effort in this area.

I am past chairman of an ANSI writing group to develop national consensus standards on clearance for the release of materials from radiological controls. The standard is known as ANSI N1312 and it was published in January of this year.

I also serve as a consultant to the International Atomic Energy Agency, the IAEA which is an agency of the United Nations to help them develop technical criteria for clearance that can be applied to international commerce.

The Health Physics Society includes over 6,000 members who are engaged in the practice of radiation safety. As a non-profit, scientific organization, we are not affiliated with any governmental, industrial or private entity and therefore, we are in a unique position to provide informative, scientific positions that are independent of both government and industry.

In summary on this issue, the Health Physics Society recommends that first, uniform standard dose criteria for clearance for release of radioactively contaminated materials are necessary and important and it is an important part of protecting public health and the environment from unnecessary radiation exposures.

Second, radiation protection regulations should be based on consensus standards, including those issued by ANSI and the Health Physics Society.

Third, the primary dose criterion should be related to screening levels that can be used to establish radiation survey programs that will ensure that the dose levels will be met.

Fourth, the ANSI standard N1312 should be adopted by U.S. Federal agencies for application to the clearance or release of these materials.

Mr. Chairman, the Health Physics Society believes that the establishment of strict dose standards and guidelines for clearance will ensure that potentially harmful sources are controlled while conserving our natural resources. We strongly support the continuing effort of the NRC in this area to explore the rulemaking and we encourage the NRC to adopt the criteria outlined in the ANSI standard.

The development and use of release criteria is not unique to radiation and radioactive materials. For example, the Food and Drug Administration sets levels for pesticides and other materials in foods. The Environmental Protection Agency sets contamination levels in water, air and in soil during the cleanup of land contaminated with hazardous materials.

The purpose of the ANSI standard is to provide guidance for protecting the public and the environment from radiation exposure by specifying a primary dose criteria of 1 mr per year which is consistent with the recommendations of the IAEA and with international commerce. The 1 mr per year number is a very small fraction as we have heard of the doses that Americans receive from natural background sources.

For example, Americans receive about 300 mr per year from background, including the radon in their homes and 1 mr is only about .3 percent of the natural background dose that Americans receive. For perspective, I'll receive about five times that dose traveling round trip to appear before this subcommittee by airplane.

The current proposed NRC rulemaking is focused on the recycle of contaminated metals and fears that consumer products will become contaminated to unacceptable levels. Recycling cleared metals would not mean the dilution of highly contaminated metal and other metals into commerce. Rather, it would mean the careful sorting of these metals using standard criteria such that no metals above the restrictive 1 mr per year clearance criteria could find their way into commerce. The credibility of the U.S. radiation protection framework is at stake here since other countries have already adopted uniform criteria and we have not.

Industry standards such as ANSI N1312 can play an important role in the regulatory process. The OMB issued revisions to Circular A-119 which requires Federal agencies to use voluntary industry standards developed by the private sector whenever possible. The purpose of this requirement is to eliminate excessive costs by the Government to develop its own standards. Thus, the ANSI standard could play a significant and key role in development of Federal regulations and policy regarding clearance.

In closing, the Health Physics Society believes that it is important that clearance criteria for low levels of radiation in materials be established to increase the protection of the public, the environment and health and to ensure that potentially harmful sources are controlled while conserving our natural resources.

We strongly support the continuation of the NRC rulemaking in this area and we encourage the NRC to adopt the criteria outlined in the ANSI standard N1312. Thank you.

Senator INHOFE. Thank you, Mr. Kennedy.

At our last hearing or the hearing before last, we said we would like to have the 5-year plan and then have the reaction from both the GAO and the NEI to that plan. I was a little critical a minute ago, Mr. Meserve, that the plan didn't get here a little earlier. On the other hand, I want to thank you for getting all your testimony in on time. I wish the EPA would take a lesson from you on that.

Mr. Beedle and Ms. Jones, you've had a chance to look at this and I'd like to have you briefly address it and get into any detail you'd like as far as that 5-year plan. Is it adequate? Your comments about it.

Mr. BEEDLE. Our preliminary look at the 5-year strategic plan that was issued last week resulted in the same kind of conclusion we had previously with regard to the details and fidelity of that plan. We think that the resource information that was provided by

the Commission to you in a letter dated March 7 provides far more valuable information in looking at long range planning.

As I indicated, we have just had a short time to review that. We would look at both the strategic plan and that information document as a composite and I think it is headed in the right direction. I think we are looking at that as an excellent start to a longer range strategic plan that would be meaningful for the staff.

Senator INHOFE. Ms. Jones.

Ms. JONES. Two points, Mr. Chairman. One is in terms of the 5-year strategic plan. NRC has made some changes that have been positive. It reduced the number of strategic areas from seven to four and they focused those four areas on outcomes. Its performance looking at outcomes will be easier to track; that is, whether or not it is meeting its goals in those areas.

The second point I'd like to make is our point in testimony a year ago before you was NRC needed a focused strategy to implement risk-informed regulation. In my testimony this morning, I mentioned it was coming out with that implementation plan in the next couple of days. The outline we have seen of that looks very positive. It mentions all the kinds of elements that we were expecting to see, so we look forward to seeing that as well.

Senator INHOFE. Mr. Meserve, do you have any comments about their partly embracing, partly criticizing the plan?

Mr. MESERVE. Let me just apologize at the outset for the delay in our sending the material to you this week. The letter Mr. Beedle referred to of the 7th had attached to it the document that was intended to be responsive to your request for a 5-year plan. He has indicated that document includes the kind of information he thinks should be in the plan.

The reason there is confusion about it is that we had developed very aggressive efforts to prepare a strategic plan which were required to prepare by the Government Performance and Results Act, that sets out the agency's broad goals and objectives and various metrics for assessing them.

The material we submitted to you this week was intended to take that same information and then relate it to resource information over a 5-year period. We are hopeful that would be helpful to you in responding to the request you made that we provide you with information.

Let me say though that this is a very difficult undertaking. If you had asked us to prepare a 5-year plan 3 years ago as to what we would be doing today, we would have no doubt predicted that we would have a large part of resources devoted to decommissioning nuclear plants, and preparing for the decommissioning of nuclear plants.

As a result of changes in the industry, and I hope as a result of changes that have been undertaken by the Nuclear Regulatory Commission, there are now a substantial number of our operating plants that can continue operation and are intending to file licenses for license renewal and life extension. As many as 80 percent of the plants, we understand informally, may come forward and seek life extension.

In light of that, it is extraordinarily difficult for us to provide reliable estimates on into the future because our workload is largely governed by the events that are external to us.

Senator INHOFE. Thank you, Mr. Meserve.

Mr. Beedle, I'm interested in the new reactor regulations that are being implemented by the NRC. Now that we have completed the pilot program, would you comment on how the new performance indicators used by the NRC for reactor regulation reflect the safety margins at our nuclear plants?

Mr. BEEDLE. The new oversight process indeed gives some focus on the performance indicators and I'll comment on that in just a moment. I would point out that the oversight process is more than just a performance indicator. It's a performance indicator followed by an inspection process, an enforcement process and a significant determination process that all boil up into a more effective way on the part of the NRC to provide oversight for the facilities.

With regard to the performance indicators themselves, there are 18 performance indicators that are used by the agency to gauge the safety level of the plant and I think those indicators which are available on the NRC's website clearly demonstrate the tremendous margin of safety that exists at these facilities. I think the levels of thresholds that have been established by the Commission are aggressive, reflect the excellent performance in safety and production that the industry has achieved and I think they go a long way to providing both the NRC, the industry and the public a detailed look at each one of our facilities and how well they operate.

Mr. Adelman, in your testimony you say you are opposed to a rule which I understand has not been proposed. So what are you talking about and are you prejudging?

Mr. ADELMAN. Actually, I think the public's concern was that the NRC was potentially prejudging.

Senator INHOFE. The what was concerned?

Mr. ADELMAN. The public's concern is that the NRC was potentially prejudging its rule. The memo that was sent to the NRC staff from the Commission presented the issue as almost a foregone conclusion that a *de minimis* standard would be set. One concern of the public was that all the various alternatives be fully considered before a final rule is determined.

Senator INHOFE. I don't want to sound overly critical but I keep hearing you say what the public is saying. I don't hear the public saying this. Tell me who you're speaking for when you say the public? Is this polling data, do you get it from newspapers? Who is the public?

Mr. ADELMAN. There was a poll undertaken by an industry group in December that assessed different types of recycling scenarios. In that poll the range of opposition to recycling was about 60 to 70 percent. So at least initial polling data indicates there is public opposition.

NRDC is also a large environmental organization. We have more than 400,000 members spread throughout the country and there are a number of other large environmental groups that have similar concerns.

Senator INHOFE. In your comments opposing the development of a national standard, I want to get into this thing about a standard.

You are opposed to or you don't believe that a 1 mrem range is a standard that should be set. Do you oppose a 1 mrem standard?

Mr. ADELMAN. I think that NRDC's position is that we don't oppose the standard in principle. In other words, our belief is that given adequate data and analysis, in principle a standard could be set. Our concern is the credibility of DOE and NRC and the long legacy of mismanagement of, in particular, DOE facilities.

Senator INHOFE. I guess I'll put it a different way. You heard Senator Voinovich talk about the cutting up of the plant and you would oppose that recycling of that, correct, or is it the method by which it would be recycled?

Mr. ADELMAN. I think again the central issue here is, given the problems that have continually been raised about, in particular, DOE's but even other facilities' management of radioactively contaminated materials, whatever standard you set, the public needs to be convinced that standard can be adhered to and that there aren't going to be unanticipated risks associated with recycling such materials.

If you look at instances like Paducah, KY that recently came up this past summer, we find time and again that the DOE, in particular—which is going to be responsible for recycling the large bulk of material if this should go forward—hasn't been able to and continues not to be able to adequately manage these materials. If they can't manage it in a highly regulated environment, how can the public have any confidence that they can release it for use in commercial products?

Senator INHOFE. I'm going to ask if Mr. Meserve has any response to that statement?

Mr. MESERVE. I would like to make a few points. The main theme Mr. Adelman has raised is that the NRC has not allowed a meaningful public debate on the issue as to whether there should be a standard.

In fact, the debate that we're having today and the discussion that has arisen on this issue is precisely because the NRC has tried to obtain the views of the public on whether to have a rule, what the content of a rule should be, and what the issues are. The purpose of our publication of the issues paper and of our public meetings that we have had all over the country has been exactly for the purpose of engaging the public before we proposed a rule to make sure that we understood the issues that are of concern.

Senator INHOFE. I'm going to interrupt you at this point, Mr. Meserve. I have a number of questions I want to ask this panel I am going to be forced to ask on the record because the Armed Services Committee I just found out is about to wind up and we have Secretary Richardson up there and I have a very critical line of questioning for Secretary Richardson.

I am going to have to conclude this but I appreciate both panels and the time that you have spent. I want you to know that you will be receiving a lot of questions that we will be asking you to respond to on the record.

We will adjourn this meeting. Thank you very much.

[Whereupon, at 10:48 a.m., the subcommittee was adjourned, to reconvene at the call of the chair.]

[Additional statements submitted for the record follow:]

STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE
STATE OF CONNECTICUT

Good morning and thank you, Mr. Chairman, for holding this oversight hearing on the Nuclear Regulatory Commission.

Nuclear energy is a critical component of our power supply in Connecticut and New England, and I have long been a supporter of continued research and development of nuclear energy. Because it does not produce emissions of nitrogen oxides, sulfur dioxide, carbon dioxide and other air pollutants, nuclear power should be a key component of our nation's ability to meet its energy needs while also ensuring clean air for the public.

However, nuclear energy is not without risks, and for that reason I also support a strong role for the Nuclear Regulatory Commission in overseeing and managing our nation's nuclear plants. Both Congress and the public must have confidence in the NRC's ability to ensure that our nuclear facilities are operated with the highest safety standards. A strong NRC has been particularly important for oversight of the Millstone Units in Connecticut, where the NRC investigated federal safety regulation violations that occurred in 1995. Over the next year, the Millstone Units will be auctioned to a new owner under Connecticut's energy deregulation legislation. Again, NRC oversight will be critical for maintaining strong standards of safety and management as this transition occurs.

Last April, in response to a request from Senator Biden and me, GAO issued a report entitled "Strategy Needed to Regulate Safety Using Risk Information." The report identified some of the challenges that the NRC and the nuclear power industry could experience in a competitive environment, and issues that the NRC must address in its efforts to implement a risk-informed approach to plant safety and enforcement of oversight programs.

Now, over a year later, the NRC has gained more experience with risk-informed safety management. A pilot program at 13 reactors will now be extended to all plants, including Millstone. Overall, I am hopeful that this new framework will help the agency prioritize the safety concerns that pose the greatest risk. I am also supportive of NRC's intention to increase transparency by posting report cards for every plant on the Internet. Timely sharing of information with the public can only help enhance the effectiveness of the NRC. It also can serve a verification role to correct any mistakes that might have been since performance evaluations are based on a plant's self-reporting.

Today I am interested in hearing from witnesses about what progress NRC has made in addressing some of the questions raised in the GAO report. For example, how will NRC monitor the safety of our nuclear plants in a deregulated environment? How is NRC managing the transition from traditional to risk-informed regulatory paradigms? What steps is the NRC taking to improve its base of information on the plant conditions and modifications to ensure that adequate information is in place to effectively monitor plant safety?

Finally, I'd like to touch on the issue of NRC's regulatory review and rulemaking proceedings that could provide for the release of radioactively contaminated solid materials for use in consumer products. As has been evident in several news stories about this issue, the public is very concerned about the potential for radioactively contaminated materials to be introduced into the metals stream. Once included, treated metals will not be identifiable in particular products, and there is a real concern on the part of recyclers and scrap metal dealers that even if the material is deemed to be safe under state or federal regulation, consumers may not be satisfied and will not want to purchase the product. It is absolutely essential that the NRC do a better job of providing an open, clear forum to proceed with this rulemaking. I recently joined several other Senators on this committee in writing to you to raise concerns about how the NRC is addressing this important issue. I hope that you can provide a response here today.

I look forward to hearing from the witnesses, and thank all of you for participating in this hearing today.

STATEMENT OF HON. BARBARA BOXER, U.S. SENATOR FROM THE STATE OF
CALIFORNIA

Thank you for holding this oversight hearing, Mr. Chairman.

I would like to welcome NRC Chairman Richard Meserve and the other Commissioners to the committee today. I would also like to welcome Dr. David Adelman from the Natural Resources Defense Council and the other witnesses that are here today to discuss the NRC's radioactive recycling proposal.

I have two very serious issues that I would like to raise.

The first issue involves the NRC's 1998 decision not to require the Army Corps of Engineers to dispose of low level radioactive waste at NRC licensed facilities. The second issue involves the NRC's recent proposal to permit radioactively contaminated materials to be released into the environment without restriction.

Two recent cases in California involving these issues show how the decisions the NRC makes on these matters can have a very direct and potentially harmful impact on the lives of our citizens and our environment.

The first case involves the Army Corps of Engineers disposal of 2,200 tons radioactive waste in a California dump not licensed to dispose of such waste. The dump sits above aquifers that supply water to the Central Valley of California.

When I learned of the Corps action, I immediately demanded that they remove the waste from the site, and dispose of it properly at a NRC licensed facility.

The Corps responded to me that they are under no legal obligation to dispose of this radioactive waste at a NRC licensed low level radioactive waste facility. The Corps justified this position by relying upon a 1998 legal opinion supplied by the NRC.

In that hairsplitting NRC opinion, the NRC told the Corps that it would only require the Corps to send low level radioactive waste to a NRC licensed facility if the waste was generated after 1978.

According to the NRC, the *exact same* type of waste did not have to be disposed of at a NRC licensed facility, however, if it was generated *before* 1978.

Since the waste the Corps improperly dumped in California was generated before 1978, the Corps says it has no obligation to dispose of it in a safe, NRC licensed facility.

Although the NRC reads the relevant law as justifying this interpretation, judicial opinions don't support it. I would like to understand better how the NRC justifies this interpretation. Also, I understand that citizens have petitioned the NRC to reverse its interpretation. I would like to hear about the NRC's plans to consider that petition.

I will shortly introduce legislation to require that this radioactive waste—regardless of when it was generated—be properly disposed of in a NRC licensed facility. It will also require the Corps to remove the 2,200 tons of radioactive waste it improperly dumped in California, and to properly dispose of it at a NRC licensed facility.

The second case I would like to address involves the Department of Energy cleanup of a nuclear research and weapons production facility called Rocketdyne located in Ventura County, California.

As part of the cleanup, the DOE approved the release radioactively contaminated building debris for disposal at standard municipal landfills. Shockingly, DOE also released trailers from the site and sent them to a school to be used as children's classrooms.

Although the trailers were on a site that is heavily contaminated with radioactive materials, DOE didn't even test the trailers for radioactive contamination before sending them out to be used as classrooms.

When I learned of this incident, I demanded that DOE retrieve the trailers from the school and locate the building debris. I also discovered, however, that there are effectively no federal legal restrictions on releases of this kind.

While the fact that we have no legal restrictions against this practice is bad, the NRC's proposed radioactive recycling proposal is far worse.

That proposal could fill this legal void with a standard which would explicitly allow such releases to occur in the future. It could, for example, allow trailers from radioactively contaminated sites to be used as children's classrooms, as almost occurred in the Rocketdyne case.

For this and other reasons I, along with Sens. Baucus, Lautenberg, Lieberman, Moynihan and Reid, recently sent the NRC a letter urging it not to proceed with a rulemaking which would provide for these releases. In the letter, we pointed out that the NRC proposal appears to be inconsistent with its mission to protect public health and safety.

We also pointed out that the NRC proposal is nearly identical to the agency's "below regulatory concern" policies of 1986 and 1990. As you know, in the Energy Policy Act of 1992, Congress specifically directed NRC not to implement those policies.

I would like to hear the NRC's rationale for pursuing this discredited policy. I would also like the NRC to discuss any studies which show that this policy would be protective of public health and the environment.

I look forward to hearing the NRC's position on these and other issues today.

Thank you.

STATEMENT OF HON. PETE V. DOMENICI, U.S. SENATOR FROM THE STATE OF NEW MEXICO

Mr. Chairman, I thank you for allowing me to submit my comments for the Record at today's hearing on the Nuclear Regulatory Commission (NRC). The critical issue of regulatory oversight of our nuclear energy sector is of tremendous importance to me and a vital factor in providing for our nation's energy security.

Earlier this year I introduced legislation (S. 2016) to assist the NRC in its efforts to achieve greater efficiencies and eliminate outdated restrictions within our nuclear energy sector. Several provisions from S. 2016 have been included in S. 1627, but several very important ones were not.

More specifically, my legislation, eliminated anachronistic provisions that preclude any foreign ownership of power and research reactors located in the United States. These provisions are a significant obstacle to foreign investment or participation in the U.S. nuclear power industry and its restructuring. No valid reasons exist to prohibit investors from countries such as the United Kingdom from participating in the ownership of nuclear plants in this country. The provisions in current law that protect U.S. security interests are unchanged by my legislation. The NRC strongly endorses removing these restrictions.

Furthermore, a clarification of the NRC's authority to conduct informal hearings in specific licensing actions is critical. My legislation provides that the Commission *should not use* formal *adjudicatory procedures* in cases of amendments or transfers of existing operating licenses. As Chairman Meserve points out in his testimony today, informal proceedings are often an appropriate way to involve the public—*not* cut them out of the process.

Last, I believe it is imperative to give the NRC the authority to establish such requirements it deems necessary to ensure that non-licensees fully comply with their obligations to provide funding for nuclear plant decommissioning. This includes jurisdiction over non-licensees, i.e., those who have transferred their license but retain responsibility for decommissioning. Although the NRC believes it has this authority, I strongly believe we should clarify this issue.

Mr. Chairman, I am sure everyone is aware of my strong commitment to nuclear energy. This conviction is well-founded; the recent spike in oil prices shows that we must get our nuclear energy sector back on track.

Ensuring diversity and reliability in our nation's future energy portfolio is a critical national security concern. I want to ensure nuclear is part of that portfolio. In order to ensure nuclear's presence in the future, we must pay careful attention to changes in the regulatory environment now. The NRC is a major component of that regulatory framework.

I congratulate the NRC on all of their recent progress in implementing a risk-informed approach to their oversight responsibilities. I applaud their progress in expediting the relicensing process, and their work to create a more objective, risk-relevant inspections regime. All of these represent needed and valuable improvements.

I believe it is now Congress' task to assist the NRC in its efforts by eliminating outdated restrictions and ensuring the statute is appropriate based on current conditions within the energy industry.

Mr. Chairman, I thank you again for the work this committee is doing on this important issue.

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
Washington, DC, March 2, 2000.

Dr. RICHARD MESERVE, *Chairman,*
U.S. Nuclear Regulatory Commission,
Washington, DC.

DEAR CHAIRMAN MESERVE: We are writing to express our serious concerns with Nuclear Regulatory Commission (NRC) regulatory actions which could provide for the release of radioactively contaminated materials for use in consumer products and for other uses. We believe these actions suffer from several flaws. First, they appear to lack sufficient justification and support on the record. Even if such flaws can be corrected, other NRC actions may undermine the objectivity of the process. Second, and more importantly, we believe that such actions may be inconsistent with the Atomic Energy Act and the NRC's mission to protect public health and safety.

As you know, on June 30, 1999, the NRC released an issue paper seeking public input into the question of whether it should broaden its current case-by-case approach which permits the release of radioactive materials for use as consumer products and for other purposes.

Under sections 84 and 161 of the Atomic Energy Act, the NRC has the general responsibility to protect the health and safety of the public from unreasonable risks posed by byproduct and other radioactive materials. Despite the statutory requirement, the major impetus for the NRC to consider a radioactive release rule appears to be improving the consistency of its radioactive release regulations among air, water and solid media.

To our knowledge, NRC has not determined that the actions it is considering to increase the amount of radioactive material in commerce will not constitute an unreasonable risk to the health and safety of the public. Moreover, to our knowledge there have been no NRC economic analyses of the potential negative impact the proposal or regulatory changes could have on the metals recycling and related industries. Finally, NRC has not adequately explained why the consistency of regulatory treatment among differing media justifies the increased amount of radioactive materials in commerce that would result.

We would also note that in considering the Energy Policy Act of 1992, Congress specifically rejected the development of a "below regulatory concern" standard.

In addition to our concern about whether there exists an adequate basis for changing the current system, several other actions undertaken by NRC suggest that the Commission may have already decided to move forward with changing the current case-by-case approach, regardless of the outcome of the public comment and review of the June 1999 proposal.

For instance, a June 30, 1998, NRC memorandum from L. Joseph Callan to NRC staff directs the staff to focus the rulemaking on "the codified clearance levels above background for unrestricted use that are adequately protective of public health and safety." This direction suggests that NRC may not seriously evaluate the option of not moving forward with a rulemaking. Rather, it seems to indicate that the process is designed to justify further deregulation of nuclear materials rather than objectively analyze whether such a change is warranted.

This concern is underscored by the selection of Science Applications International Corporation (SAIC) to perform the technical analyses that would form the foundation for a rulemaking on this subject. SAIC handles regulatory compliance issues for businesses that have a direct interest in the deregulation of radioactive materials, thereby raising a question of its objectivity on this subject.

In addition, we understand that the NRC has given its tacit approval of a plan to release approximately 6,000 tons of radioactively contaminated materials for recycling at the Department of Energy's (DOE) K-25 facilities on the Oak Ridge Reservation. To our knowledge, this is the largest proposed release of its kind in history. Allowing such a plan to move forward in advance of resolving the issues raised in the NRC proposal raises serious questions concerning whether those issues can be resolved in an impartial manner.

We believe that until the concerns we have raised are addressed, and Congress is further consulted, the Commission should not proceed with any action that could result in increasing the amount of radioactive materials released into commerce.

We also would appreciate receiving information on the volume of contaminated materials that have been released into commerce since 1992, separated by licensee, the associated radioactivity, and where the materials went.

Thank you for your attention and consideration. Please inform us as soon as possible how the Commission intends to proceed in this matter.

Sincerely,

MAX BAUCUS,
BARBARA BOXER,
FRANK R. LAUTENBERG,
HARRY REID,
JOSEPH LIEBERMAN,
DANIEL MOYNIHAN.

STATEMENT OF HON. JEFF SESSIONS, U.S. SENATOR FROM THE STATE OF ALABAMA

Mr. Chairman, thank you for inviting me back to the Environment and Public Works committee to testify at today's Nuclear Regulatory Commission oversight hearing. I appreciate your continued leadership on this important issue. Nuclear power plays a critical role in the United States energy supply. Providing over 20

percent of the electric power in this country, nuclear energy is one of the cleanest and safest ways we have to produce power.

During the two years I served on the this subcommittee—under your leadership, Mr. Chairman—I learned a great deal about our national efforts to combat air pollution while at the same time trying to meet our nation's increasing energy needs. The experience has led me to conclude that it is insanity to believe that we can meet our energy and environmental needs without the use of nuclear power.

Fortunately, I am not alone in this conviction. Members of the Administration and notable nuclear experts seem to agree:

In October 1998, Undersecretary of State, Stuart Eizenstat, remarked:

I believe very firmly that nuclear has to be a significant part of our energy future and a large part of the Western world if we're going to meet . . . emissions reduction targets. Those who think we can accomplish these goals without a significant nuclear industry are simply mistaken.

Then in March, 1999, John Ritch, U.S. Ambassador to the North Atlantic Assembly remarked:

The reality is that, of all energy forms capable of meeting the world's expanding needs, nuclear power yields the least and most easily managed waste. (Amb. John Ritch)

In 1993, Pulitzer Prize winner Richard Rhodes wrote in his book, *Nuclear Renewal*:

Electricity from nuclear fission continues to be the most comprehensive source of energy available to meet growing U.S. demand—the cleanest and safest of major sources.

Many of the problems which have hindered the development and increased use of nuclear power in the United States has not arisen from safety risks or inherent problems with the use of the technology, but from burdensome regulations and high economic risks associated with licensing and bringing a new plant on-line. In addition, plunging fossil fuel prices following the 1970's made nuclear power less economically feasible.

At times, there seems to have been an irrational hostility towards nuclear power reflected by excessive NRC regulations and Administration policy which has focused not on safety, but rather on the micro-management of nuclear plant operation. The cumulative affect of these developments has forced would be nuclear plant owners to pursue other, less environmentally friendly, electricity generation sources.

In the long run, however, nuclear energy must remain a significant part of our energy mix.

Between 1973 and 1997, nuclear generation avoided the emission of 82.2 million tons of sulfur dioxide and more than 37 million tons of nitrogen which would have been released by fossil fuel plants producing the same amount of electricity.

In 1997 alone, emissions of sulfur dioxide would have been about five million tons higher and emissions of nitrogen oxides 2.4 million tons higher had fossil generation replaced nuclear.

As testimony before this committee has shown, the impact of these offset emissions could have had a significant adverse effect on both the environment and human health.

Some believe that nuclear power is dangerous and presents unacceptable risks. To put the idea of risk in context, physicist Dr. Bernard Cohen conducted a detailed study in 1990 titled *The Nuclear Energy Option* which carefully examined the risks associated with the use of nuclear power.

Dr. Cohen bases his analysis on two studies, the *Reactor Safety Study* issued by the NRC in 1975 and a study conducted by the *Union of Concerned Scientists* published in 1977.

Dr. Cohen states:

According to the *Reactor Safety Study* . . . the risk of reactor accidents in the U.S. would reduce each American's life expectancy by .12 day or 18 minutes, whereas the *Union of Concerned Scientists* estimate is 1.5 days. Since our 'Loss of Life Expectancy' of being killed by any type of accident is now 400 days, the risk would be increased by .003 (three one hundredths of one percent) . . .

Dr. Cohen goes on to conclude:

According to the best estimate of Establishment scientists, having a large nuclear power program in the United States would give the same risk to the average American as a regular smoker indulging in one extra cigarette every 15 years, as an overweight person increasing his or her body weight by .012 once . . . and is less risky than switching from midsize to small cars.

Clearly, the risks associated with nuclear power are manageable and far less risky than many other forms of conventional electricity generation. With the NRC's renewed focus on minimizing the risks of nuclear power generation, it is possible to make nuclear power generation even safer.

Although high costs currently prevent new plants from being brought on-line, we do have virtually complete plants across the nation which might be economically feasible to complete in the near future. One plant in my own state of Alabama—the Bellefonte nuclear power plant in Scottsboro—is over 85 percent complete. Even though this plant has the ability to significantly reduce air pollution, fear of NRC regulations adds to an already high economic risk. I am hopeful the continuation of reforms underway at the NRC will improve the feasibility of eventually bringing Bellefonte and other partially complete plants on-line.

I would like to take a moment to recognize the employees of a particular nuclear power plant who exemplify the way to safely operate a nuclear power plant. Last week, TVA's Browns Ferry Nuclear plant in Alabama set a record for operating a boiling water reactor for 500 consecutive days without a single shut down.

This is a significant achievement and one for which the plant employees, the NRC and the entire U.S. nuclear industry should be proud.

The Nuclear Regulatory Commission has made significant improvements in carrying out its regulatory responsibilities since this committee's first oversight hearings held in July of 1998 and February 1999. Moving regulatory focus away from micro-management and towards risk informed and performance based regulations appears to have helped both operators and regulators to focus their efforts on safety. I am hopeful the NRC will continue its reforms and continue to ensure the safety of our nuclear power program while at the same time striving to eliminate and avoid unnecessary regulations and procedures.

Mr. Chairman, during one of previous NRC oversight hearings, you correctly pointed out that the NRC could shut down the nuclear program in the United States. If that happened, over 20 percent of this nation's total electricity would have to be replaced by fossil fuel plants. The potential health and environmental impacts of such a scenario are staggering.

Mr. Chairman, thank you for affording me the opportunity to testify today. Under your leadership and continued oversight, the NRC has improved the carrying out of its regulatory responsibilities. As a result, the future of nuclear power in the United States is looking brighter.

I am hopeful the NRC will continue these needed reforms. The future of our nation's energy supply depends on it.

STATEMENT OF RICHARD A. MESERVE, CHAIRMAN, U.S. NUCLEAR REGULATORY COMMISSION

Mr. Chairman and members of the subcommittee: It is a pleasure to appear before you today with my fellow Commissioners to discuss the Nuclear Regulatory Commission's accomplishments, the challenges before us, our budget submittal, and our legislative program. Let me first introduce my fellow Commissioners, Greta Joy Dicus, Nils J. Diaz, Edward McGaffigan, Jr., and Jeffrey S. Merrifield. All of us appreciate the interest of this subcommittee and the series of hearings that you have held over the past two years.

I last appeared before the Environment and Public Works Committee for my confirmation hearing. I told the committee at that time that, in my view, the NRC was generally on the right track. My experience over the past four months has confirmed that view. During the 105th Congress the Commission began sending a monthly report on our activities to this subcommittee and other Congressional oversight and appropriations committees. We believe that these monthly reports depict an agency that is successfully managing a host of important initiatives. Our testimony today will briefly summarize some of the accomplishments that we have described in greater detail in our reports.

We also believe that our programs have benefited from Congressional scrutiny and from the scrutiny of other outside stakeholders, both in industry and in the public interest community. I would like to make specific note of the report issued by the Center for Strategic and International Studies (CSIS) since the Commission last met with you. The ranking minority member of this subcommittee, Senator Graham, was one of the Congressional participants in that study. This was an excellent study that told us that the NRC was on the right track, but that the agency had much more to do. We agree.

ACCOMPLISHMENTS

Let me highlight just a few of the major areas that I know are of concern to this subcommittee. Mr. Chairman, I understand that you have a continuing interest in the status of license renewal applications. It should be noted that we have met or exceeded every milestone in our review of the Calvert Cliffs and Oconee licensee renewal applications. The Calvert Cliffs license renewal is currently pending before the full Commission. The staff has recommended, based on its review of the safety and environmental issues, that the Commission approve the license renewal application. The Commission was briefed by the staff on its recommendation on March 3. In addition, the Advisory Committee on Reactor Safeguards has advised us to approve the license based on its independent review of the safety issues. I should note that the U.S. Court of Appeals for the District of Columbia heard oral argument on March 2, 2000, on an appeal by the National Whistleblower Center of the Commission decision to deny the Center an adjudicatory hearing in this case. Unless the Court orders otherwise, the Commission intends to reach a decision on the Calvert Cliffs renewal by April, within 24 months after the application was received. The Oconee license renewal is similarly on track for a Commission decision by this July. Although we have processed these first renewal applications expeditiously, we have a major effort underway to look at the generic lessons learned from license renewal and to make improvements in our process for future applicants. We now have a large number of future applicants who are queuing up to renew their reactor licenses—a reflection, we believe, of our success in responsibly handling these first applications.

We also know that you are very interested in our ability to process license transfers expeditiously. I believe the NRC has an exemplary record in dealing with the complex license transfer cases that are coming before us. We were among the first regulators to analyze and act on the transfer of the Pilgrim operating license to Entergy Corporation from Boston Edison. We were among the first to approve the Three Mile Island Unit 1 transfer from GPU to Amergen, and we promptly acted on the Clinton transfer from Illinois Power to Amergen. There are several other complex licensing transfer cases before us that arise from the restructuring of the industry. These cases sometimes require a significant expenditure of energy by our staff, but we will make continuing efforts to assure timely resolution of those matters.

We are also very proud of the new reactor oversight process, the process that we plan to use to inspect, assess and enforce regulations at nuclear reactors. Last year we launched a pilot program that involved 13 reactors at nine sites, and we learned a great deal from that effort. The results of the pilot program were recently presented to the Commission with a staff recommendation that we extend the new approach to the oversight of all our operating nuclear reactors. The revised oversight process focuses inspection efforts on those aspects that present the greatest risk. Moreover, performance indicators covering a range of areas will be available to the public, which should better enable the public to understand our assessment of the plants. The new approach also uses a significance determination process to classify inspection findings, thereby better allowing the NRC and the licensee to focus attention on the most important safety matters identified by the inspection. The new approach has been endorsed by a broad spectrum of stakeholders, and, as I indicated, the NRC intends to extend the new process to the entire industry. The initial implementation is to begin at all nuclear power plants in April 2000. We recognize, however, that this is a work in progress and we will have to make continuous adjustments.

As the January GAO report to this subcommittee recommended, we are communicating with our own staff about the new oversight process and about our risk-informed regulatory initiatives more broadly. Intensive discussion of how staff concerns with the new oversight process are to be resolved and intensive training on the new oversight process are now underway. We believe that the new reactor oversight approach is a significant improvement over our previous regulatory oversight process, and the Commission is committed to making these regulatory revisions work.

I also want to highlight our nuclear materials program for you. We have a very large number of materials-related initiatives underway. As with our reactor program, we are working on making our nuclear materials regulation more risk-informed and flexible. For example, we are in the final steps of totally revising our regulations governing the medical use of byproduct material using risk insights, together with other factors, to establish requirements that better focus licensee and regulatory attention on issues commensurate with their importance to health and safety. We are also revising our regulations governing the licensing of fuel cycle fa-

cilities to introduce the use of an integrated safety assessment, thereby incorporating risk insights into the regulation of these facilities. We are also working with the international community to learn about problems associated with facilities and materials programs abroad, most recently illustrated by events in Japan and Thailand.

We continue to prepare for a possible Department of Energy application for a high-level waste repository at Yucca Mountain and, in this endeavor, we have proposed implementing regulations that we believe will serve to protect public health, safety and the environment. We have recently provided our comments to DOE on its Viability Assessment, Draft Environmental Impact Statement, and Draft Siting Guidelines for Yucca Mountain.

We are implementing by rule a new registration program for the control of generally-licensed devices that have the potential to expose members of the public if such devices are disposed of improperly. Additionally, we are working with other Federal agencies and States to address protection of public health and safety from sources found in the public domain without a responsible owner, often referred to as "orphan sources". Our interest in orphan sources also extends internationally, and the NRC has been assisting the International Atomic Energy Agency (IAEA) with its program of identifying and securing orphan sources in member countries. Finally, we have engaged many different stakeholders in considering the need for a rulemaking to establish criteria for the release of certain types of slightly contaminated solid material, the so-called "clearance rule".

We are also continuing our efforts in decommissioning various sites around the country, licensing of Independent Spent Fuel Storage Facility Installations, certification of dry casks, and issues associated with the transportation of spent fuel and radioactive material.

STAKEHOLDER INVOLVEMENT

Almost all of our initiatives, whether in the reactor or materials or waste programs, raise difficult issues on which our stakeholders have widely differing views. In recent years, the Commission has broadened the scope and the depth of our interaction with all stakeholders, whether from industry or public interest groups, whether from the Congress or the States. The Commission has sought stakeholder involvement at both staff and Commission levels in redesigning the oversight process for reactors, in re-writing our rules on use of radioactive materials in medicine, in revising our rules on fuel cycle facilities, and in establishing the decommissioning requirements for the West Valley Demonstration Project.

In the case of the reactor oversight process that I mentioned earlier, we formed a formal advisory committee on which representatives from our various stakeholder groups met with NRC's staff. That body has helped us to shape the new oversight process and has helped bring a very broad constituency of support for the new oversight process.

In the case of the West Valley Demonstration Project, the Commission interacted personally with members of the public at a Commission meeting in January 1999. Input received from that meeting was considered when the Commission prepared a draft West Valley decommissioning criteria policy statement which was published in the Federal Register in December 1999. We anticipate a final policy statement by the end of this year.

Thus, we have sought to increase our interaction with the public at all levels. I hasten to add that we do not expect everyone to agree with all of our decisions. But we do believe that our decisions are best when they are made with as much transparency as possible. We no doubt can further enhance stakeholder interaction, but I can tell you that we are all deeply committed to improving the scope and the depth of stakeholder interaction. By doing so we hope to build public confidence in the Commission and its decisions.

BUDGET AND PROPOSED LEGISLATION

To stay the course on the various initiatives that we have underway, we obviously need resources to do our job. The Commission has proposed a Fiscal Year 2001 budget of \$488.1 million. This budget request represents approximately a 3.9 percent (\$18 million) increase over the Fiscal Year 2000 budget, but it is still the second lowest budget in the history of the agency in real terms. The number of employees at the agency continues to decline and our budget reflects almost a 20 percent reduction in staff since Fiscal Year 1993. The \$18 million increase over our Fiscal Year 2000 budget is primarily for the pay raise that the President has authorized for Federal employees. Two charts reflecting a summary of our budget since Fiscal Year 1993 are attached to this testimony.

This budget requires us to be very careful in judging priorities so that we can provide adequate resources in important areas, such as license renewal and license transfers and the needed preparations for a potential DOE application for the Yucca Mountain repository. Given the range of initiatives, we are stretched thin.

The NRC has recently submitted a proposed bill for authorization of appropriations for Fiscal Year 2001. We respectfully request the committee's support for our budget request in any managers' amendment to S. 1627, the authorization bill which your committee reported last November. S. 1627 currently includes authorization at the requested level for our Fiscal Year 2000 budget.

There is one feature of our budget submission that I know is of great interest to the subcommittee. As you know, the Commission has for years acknowledged that there is a legitimate fairness concern about the fees that are charged to our licensees. NRC licensees should not be charged fees for activities that are important to the Agency's mission but which do not directly benefit them. Such activities constitute about 10 percent of our budget. To address this concern, OMB has approved a graduated reduction of the percentage of our budget that must come from user fees. In Fiscal Year 2001, 98 percent of our budget, excluding funds from the Nuclear Waste Fund, will be recovered from user fees. This percentage will decrease at a rate of 2 percent per year to 90 percent in Fiscal Year 2005. We know we have your support for this approach because this committee has a very similar approach in S. 1627.

I would like to conclude by touching briefly on our legislative program. S. 1627, as reported by the committee, included many of the provisions that we recommended to the committee last year. We deeply appreciate your support for those provisions. There are a few additional provisions that we would respectfully request you to consider.

First, I would like to mention a provision that is an outgrowth of the CSIS report that Senator Graham helped prepare. It would clarify that the NRC has the necessary authority to deal with non-licensees who retain control over decommissioning funds. This relates to an issue that arises in connection with various license transfers. We believe we have authority over non-licensees who retain control over decommissioning funds, but the CSIS report recommended that this authority be made crystal clear. We agree that legislation would be helpful to avoid disputes over the issue and we support a provision to clarify the point.

Last year we suggested that the foreign ownership and control provisions in the Atomic Energy Act with regard to nuclear reactors were no longer necessary. These provisions are not needed because the law will still retain clear language barring a license to any person if, in the Commission's opinion, the issuance of a license to such person would be inimical to the common defense and security or to public health and safety. We are confident, Mr. Chairman, that no inappropriate foreign entity, such as a State that supports terrorism or a State that is a proliferation threat, would ever pass muster under the revised statute, even if the prohibition on foreign ownership and control were to be lifted.

Another provision involves Senator Domenici's proposed clarification of our authority under Section 189a. of the Atomic Energy Act to conduct informal hearings rather than formal trial-type hearings. We very much support public involvement in our licensing process, but we often find that informal hearings are the appropriate way to engage the public. For example, we are using informal hearings in license transfer cases under a rule that we promulgated in 1998. We firmly believe that we have the flexibility to determine whether to use formalized trial-type procedures or other, less formal hearing procedures and are considering revisions to our administrative hearing process. Nevertheless, this is another area in which the CSIS report recommends that our statute be clarified. Clarification could eliminate needless disputes over our authority to fashion appropriate hearing procedures, and we would support Congressional clarification on this matter.

There is also a provision in our Fiscal Year 2001 authorization bill that will allow us to provide grants to Agreement States who need to oversee "formerly licensed sites"; and to ensure that these sites are adequately decontaminated. Formerly licensed sites are sites for which the licenses were terminated, in many cases by the Atomic Energy Commission prior to NRC's creation, and which were never issued Agreement States licenses. Some Agreement States that have formerly licensed sites within their borders have argued that these sites remain the responsibility of the Federal government. Some States have expressed a willingness to take responsibility for site decontamination, but they have requested Federal funding. We believe that it would be efficient, fair, and in the interest of protecting health and safety for the Federal government to bear the costs of decontaminating these sites, but legislative authorization is required for that program. I believe our initiative has

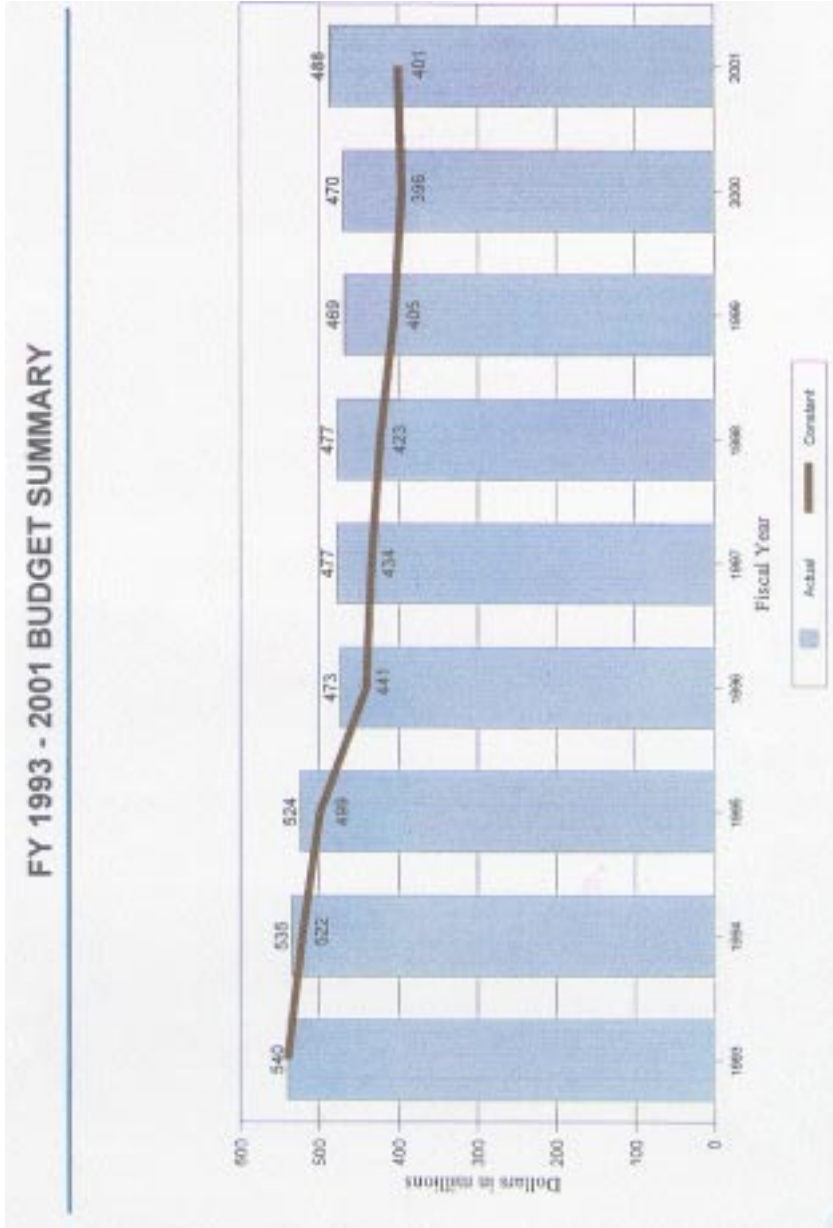
strong support in the States. We estimate the total cost of this proposal for fiscal year 2001 would be \$1.4 million.

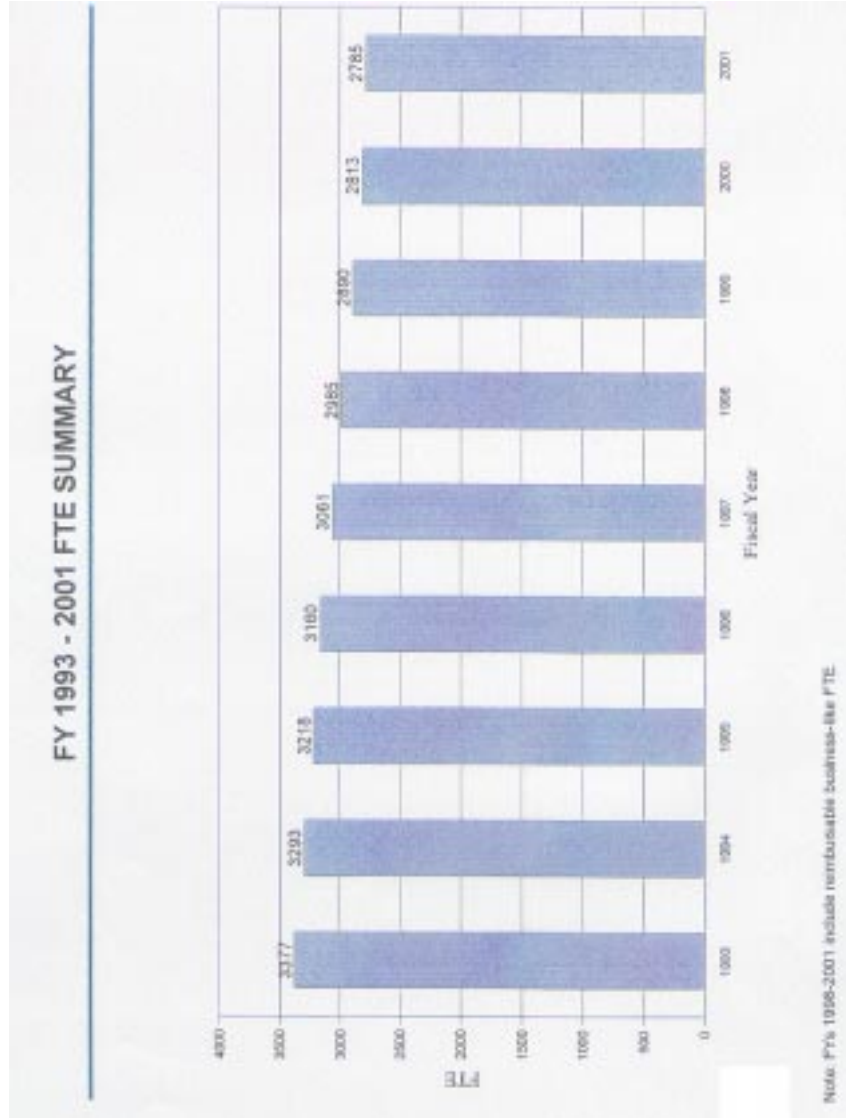
Finally, Mr. Chairman, I would note that the Commission included a provision in last year's request to clarify the status of NRC's licensees who decommission their sites pursuant to our license termination rule or who terminate Agreement State licenses pursuant to an Agreement State's version of our license termination rule. This is a matter on which we and the Environmental Protection Agency (EPA) have had a long disagreement. In 1997, after many years of effort, the Commission promulgated a license termination rule which set what we believe to be a protective standard for public health and safety and the environment—namely, a standard establishing an annual dose limit of 25 mrem for all pathways to the public. The EPA has issued guidance to its Regions to the effect that our rule is not sufficiently protective. We strongly disagree with EPA's assertion. Our rule was promulgated using a public process, the rule is consistent with international standards, and is based on sound scientific research. The rule ensures adequate protection of groundwater. The provision which we suggest for your consideration would clarify that licensees who clean up to our standard are not subject to CERCLA except in the rare event in which we or the Agreement State invite the EPA into the decommissioning to take advantage of CERCLA remedies. The Appropriations Committees have asked us to try and solve this issue through a Memorandum of Understanding (MOU) with EPA and we are now seeking to negotiate such an MOU. But if we fail, legislation would be the cleanest way to resolve this issue.

CONCLUSION

Mr. Chairman, I have tried to present some of our pressing issues and accomplishments, and have requested your support for our budget and for our legislative programs. Let me conclude by once again thanking you for your interest in our activities. We will best be able to continue to make progress with continued interest and oversight on your part, and with your help on budget matters and on legislative initiatives. We stand ready to continue to make further changes to improve our regulatory programs, and we look forward to your support in our efforts to reach that goal.

Thank you Mr. Chairman. We would be pleased to answer any questions you may have.





RESPONSES BY RICHARD MESERVE TO ADDITIONAL QUESTIONS FROM SENATOR INHOFE

Question 1. DOE's failure to begin picking up spent fuel in 1998 means utilities will rely increasingly on dry cask storage to keep operating their plants. How has the Commission prepared to meet the increasing needs for numbers of certified casks and casks that are certified for the types of fuel being discharged? What efforts does the Commission have to streamline the process for amending the cask certificates of compliance?

Response. Because the time of availability of a geologic repository remains uncertain, the NRC staff has undertaken several initiatives to respond to utilities' interim spent fuel storage needs, including giving high priority to the review of dual-purpose cask systems that accommodate the need for both spent fuel storage and transportation. We have certified 12 generic, spent fuel storage cask designs and anticipate

certifying 2 additional designs by the end of fiscal year 2001. Of these 14 spent fuel storage designs, 7 will be dual-purpose casks. So far, 13 reactor sites are utilizing dry cask storage technology and 18 additional reactor sites plan to implement dry cask storage in the near future.

To streamline and make the technical review process more predictable and stable, the NRC staff has developed a business-like review process that consists of: (1) assigning dedicated NRC review teams to each application, (2) establishing strict schedules for each application, (3) having no more than two rounds of written questions and answers, with a goal of no rounds of questions, (4) requiring applicants to respond completely to written questions within 60–90 days, and having NRC staff determine the acceptability of written responses within two weeks of applicant response, and (5) if more than two rounds of questions are needed, suspending further NRC review on the application until completion of certification of application's sufficiency by the respective utility owners group.

These review process guidelines have helped ensure that storage and transport portions of well-prepared applications are reviewed and approved within 13 months of the start of the review, an improvement of about one year over previous review time estimates. The staff anticipates that the rulemaking certification process will add an additional 11 months, for an overall approval schedule of approximately two years.

The NRC staff is working to further improve the review and regulatory process. For example, the NRC staff is working with industry to develop implementing guidance for the recently revised 10 CFR 72.48, which will be effective mid fiscal year 2001. This revised regulation will allow certificate holders (cask vendors) to make minor, non-safety significant changes to their cask design without obtaining prior NRC approval (i.e., amending the certificate). The NRC continues to work with industry and other external stakeholders on regulatory and technical issues of mutual concern, such as shipping and storing high burn-up fuel, the use of burn-up credit, and certificate of compliance and license renewal.

In summary, while the staff has already approved multiple spent fuel storage cask design options, we continue to work with industry to improve the regulatory process and provide safe on-site and off-site storage options.

Question 2. Dual regulation of decommissioning by NRC and EPA continues to undermine public confidence at these sites and subjects the licensees to uncertainty regarding the outcome of their efforts and added unnecessary expenses to respond to two federal agencies on day to day compliance issues. What action has the Commission taken to work with EPA to avoid dual regulation at these sites? Has the Commission considered specific legislative remedies to address any impasses?

Response. In report language to H.R. 2684, August 1999, it was stated that EPA should continue its policy of deferring to NRC for cleanup of NRC licensed sites. Both agencies were requested to report by May 1, 2000, on development of a Memorandum of Understanding (MOU) that would clarify EPA's involvement at NRC sites, when requested by NRC. The Commission responded to Congressional oversight committees, including this subcommittee, on May 1, 2000, on the status of the development of such an MOU and stated that it reserved any conclusion as to whether an MOU will be achievable. The NRC will keep the subcommittee informed about the status of the MOU.

Limited progress has been made on developing an MOU. Mr. Timothy Fields, EPA Office of Solid Waste and Emergency Response sent a February 17, 2000, letter to Dr. William Travers, NRC Executive Director for Operations indicating that Mr. Larry Reed would serve as the EPA point of contact for development of the MOU. This letter enclosed a memorandum providing EPA guidance that is intended to clarify EPA's role under the Comprehensive Environmental Response, Compensation, and Liability Act at facilities previously or currently licensed by NRC. These materials provided by Mr. Fields suggested to NRC that the differences in each agency's policy may not be resolvable without legislation.

On February 23, 2000, NRC sent a letter to EPA Administrator Browner that enclosed a draft MOU between EPA and NRC on the decommissioning and decontamination of NRC-licensed sites, consistent with the House Report language. The proposed draft MOU included provisions that the NRC would provide notice to the EPA of those cases in which the NRC's all-pathways residual radiation dose may exceed EPA's preferred all-pathways limit of 15 mrem/year and of those cases in which NRC requests EPA consultation. These proposals would provide finality, avoiding potential dual regulation for NRC-licensed sites by relying on the NRC's decision on license termination. Because the MOU is the subject of on-going negotiations between the two agencies, the draft MOU was not made public.

On March 14, 2000, NRC responded to Mr. Fields' February 17, 2000, letter. The NRC letter requested initiation of a process that would lead to finalizing an MOU to eliminate dual regulation at decommissioning sites consistent with NRC and EPA requirements.

On March 22, 2000, Mr. Fields, EPA, responded to the NRC letter indicating EPA was optimistic about the development of a workable MOU that would address the sites in a protective manner without dual regulation.

Subsequently, each agency's representative for development of the MOU met on March 27, 2000, and April 24, 2000, to discuss each agency's policies and processes related to site decommissioning and to discuss options for development of an MOU. At the April 24, 2000 meeting, both agencies exchanged ideas concerning language for an MOU. Each agency agreed to meet again on May 23, 2000, which will provide an additional opportunity to discuss options for development of an MOU. NRC staff have also been meeting with EPA Office of Radiation and Indoor Air (ORIA) and EPA Region I to develop a protocol that addresses site-specific cases.

In the past, the NRC has offered legislative language which would amend the Comprehensive Environmental Response, Compensation, and Liability Act to address the Commission's concerns with dual regulation. In 1997, H.R. 3000 contained language in this regard that was acceptable to the Commission. If current efforts to create an acceptable MOU between the two agencies fail, the Commission would support a legislative solution.

Question 3. Under current law the EPA is to propose the Nuclear Storage standards and then the NRC is to operate the storage facility. Are EPA's proposed standards workable? Will you be able to follow the standards and operate a storage facility?

Response. The NRC understands this question to ask whether the EPA's proposed standards for disposal of high-level waste (HLW) at Yucca Mountain, Nevada pose licensing difficulties such that the NRC would not be able to make its licensing finding on a Department of Energy (DOE) proposal for constructing and operating a HLW repository at Yucca Mountain. The NRC has provided formal comments to the EPA on the proposed standards (see enclosed letter Travers to Page dated November 2, 1999) which provide detailed comments on what NRC considers to be fundamental flaws in the proposed rule. Many of the requirements in the proposed rule, if included in the final rule, may add significant cost and burden to the license application process. They would also significantly increase the complexity of the NRC's licensing process without a commensurate, if any, increase in the protection of public health and safety and the environment.

The NRC considers the inclusion of separate ground-water protection requirements in the proposed standard inappropriate because these requirements would result in non-uniform risk levels and would far exceed what is needed for protection of public health and safety.

The NRC considers the imposition of a 15 mrem per year individual dose limit from all pathways in the proposed standard inappropriate because this dose limit, in contrast to the NRC's proposed limit of 25 mrem/year, will unnecessarily increase the conservatism of the dose assessment without a commensurate benefit to the protection of public health and safety.

NOVEMBER 2, 1999.

Mr. STEPHEN D. PAGE, *Director,*
Office of Radiation and Indoor Air,
U.S. Environmental Protection Agency,
Washington, DC.

DEAR MR. PAGE: This letter provides the comments of the U.S. Nuclear Regulatory Commission (NRC) staff on the Notice of Proposed Rulemaking, "Environmental Radiation Protection Standards for Yucca Mountain, Nevada" (64 FR 46976) at proposed 40 CFR Part 197. As the Agency responsible for licensing a possible repository at Yucca Mountain, Nevada, the NRC is concerned that the standards exhibit a sound scientific and technical basis and that the need for the standards adopted be fully justified on health and safety grounds. The NRC staff disagrees with the need for, and health and safety basis of, some of the requirements in the proposed standards. In addition, the NRC staff is concerned that EPA has not provided any analysis of the costs and benefits of its approach to regulating radioactive waste disposed at Yucca Mountain. The staff's objections to the proposed standards are given below and in the enclosure to this letter.

1. *The NRC staff objects to the inclusion of separate ground-water protection requirements for the proposed repository at Yucca Mountain because these require-*

ments would result in non-uniform risk levels, they misapply the Maximum Contaminant Levels for radionuclides, and they far exceed what is needed for protection of public health and safety.

Although Maximum Contaminant Levels (MCLs) may have been considered reasonable standards during their development in 1975, current understanding of the risk posed to individual organs by radiation exposure demonstrates that the MCLs for individual radionuclides provide a level of protection that varies significantly. For example, consider the annual risk of developing a fatal cancer from drinking water that contains Neptunium-237 (Np-237) and Iodine-129 (I-129) at their respective MCL. The risk of developing a fatal cancer from ingestion of Np-237 at its MCL is 30 chances in 1,000,000 (3×10^{-5}), while the risk from ingestion of I-129 at its MCL is 0.07 chance in 1,000,000 (7×10^{-8}). More than a four-hundred fold difference exists between the risk levels prescribed for these two radionuclides. Therefore, this simple comparison shows an application of MCLs that results in non-uniform risk levels which are likely to lead to greater confusion about the level of risk which is acceptable and attainable, rather than confidence that the health and safety of the public are being protected. It is our understanding that there are no EPA efforts currently underway to modify the MCLs to ensure a uniform risk level.

The EPA does not demonstrate a need for such an overly conservative, separate groundwater limit to protect public health and safety. The all-pathway dose limit, by definition, ensures that risks from all radionuclides and all exposure pathways, including the groundwater pathway, are acceptable and protective. All radionuclides and all exposure pathways will have to be acceptably evaluated at Yucca Mountain, and will have to meet an individual protection standard that is fully protective of public health and safety and the environment. Therefore, the proposed standard should not contain separate ground-water protection requirements because they are unnecessary for protection of public health and safety and because they lead to inconsistent and unreconcilable results as described above, which we believe will cause confusion and diminish rather than enhance public confidence that adequately protective limits have been established.

Certain MCLs maintain a risk level so small that the individual, all-pathway dose limit is meaningless. EPA has proposed an annual, individual dose limit of 0.15 mSv (15 mrem) which is equivalent to an annual risk of developing a fatal cancer of 9 chances in 1,000,000 (9×10^{-6}).¹ The MCL for I-129 (annual risk of 0.07 chance in 1,000,000) is more than 100 times below the risk of the individual dose limit. Consequently, the groundwater protection criteria become the de facto standards instead of the individual protection limit called for by the Energy Policy Act of 1992 (EnPA—Public Law 102-486).

The EPA's current proposal is a continuation of EPA's practice of using the MCLs without appropriate justification. Specifically, EPA would have NRC require that groundwater in the vicinity of Yucca Mountain meet EPA's MCL, originally established to implement the Safe Drinking Water Act (SDWA). The MCLs were based on an analysis of treating contaminated water in public drinking water systems subject to the SDWA and not on an analysis of technology and costs of remediating groundwater at actual sites. In this rule, EPA proposes to apply the same MCLs to groundwater supplies before treatment rather than "at the tap" after treatment. Therefore, in the absence of an appropriate and comprehensive cost-benefit analysis, EPA should not require the expenditure of potentially significant amounts of taxpayer money to prevent potential contamination of groundwater that may require treatment prior to use anyway. Instead, EPA's standards should permit a decision to spend much smaller sums for water treatment in the event that such contamination should occur. Finally, EPA's application of MCLs at DOE's Waste Isolation Pilot Plant (WIPP) site in New Mexico should not be considered a precedent for the Yucca Mountain site since the WIPP site is located in a salt formation and lacks potable groundwater making the application of MCLs irrelevant.

Furthermore, the NRC staff is troubled by the discussion of ground-water protection that suggests additional options that are not representative of ground-water conditions at Yucca Mountain and further increase the conservatism in applying these unnecessary separate requirements. The preamble to the standard requests comment on alternative dilution volumes that are extremely small (e.g., 10 and 120 acre-feet). These dilution volumes are not reflective of the resource to be protected (the EPA states the representative volumetric flow is 4000 acre-ft/year for the sub-basin in which the proposed repository is located). The standard also requests comment on alternative locations for determining compliance (e.g., 5 kilometers) that

¹This value was calculated by EPA's use of NCRP Report No. 126 risk value of 6×10^{-2} health effects per Sievert (SV) [6×10^{-4} health effects per rem] and the NAS recommendations for an annual risk limit.

are similarly not reflective of the resource. As explained in connection with the compliance location for the individual protection (e.g., 20 kilometers), cautious and reasonable assumptions for lifestyles and the practicality of obtaining water provide no basis for identifying the 5 kilometer location for protection of ground water.

Is there a better approach? Yes. An individual, all-pathway dose limit of 0.25 mSv (25 mrem) total effective dose equivalent (TEDE) properly accounts for the radiation sensitivity of individual organs, and ensures the risks from all radionuclides and all exposure pathways are acceptable and protective.

2. *The NRC staff objects to those portions of the proposed standard that address technical matters of compliance determination and implementation—matters which Congress has assigned to the NRC, not to the EPA.*

In the proposed rule, there are many requirements where the EPA has inappropriately assumed the Commission's responsibility. For example, the EPA introduces a new term, "reasonable expectation," in place of the Commission's term, "reasonable assurance." Confidence that the U.S. Department of Energy (DOE) has or has not demonstrated compliance with the EPA's standards is the essence of NRC's licensing process, and is the Commission's responsibility. The NRC has effectively used "reasonable assurance" in licensing a variety of atomic energy activities. The reasonable assurance standard is derived from the finding the Commission is required to make under the Atomic Energy Act that the licensed activity provides "adequate protection" to the health and safety of the public; the standard has been approved by the Supreme Court. *Power Reactor Development Co. v. Electrical Union*, 367 U.S. 396, 407 (1961). This standard, in addition to being commonly used and accepted in the Commission's licensing activities, allows the flexibility necessary for the Commission to make judgmental distinctions with respect to quantitative data which may have large uncertainties. The NRC staff has incorporated this concept of reasonable assurance in its development of implementing regulations for Yucca Mountain (Proposed 10 CFR Part 63).

A second example is the EPA's requirement that the dose should be calculated to the "reasonably maximally exposed individual" (RMEI). The RMEI is the EPA's proposal of a technical criterion for determining whether the standard will achieve its purpose of protecting the individuals most likely to receive doses from any releases from the repository. The RMEI is untested in NRC's licensing process, and involves a matter of implementation within the NRC's statutory responsibilities. The NRC staff, consistent with the National Academy of Science (NAS) recommendations and international practice, intends to use the "average member of the critical group" approach to determine the population that should be the focus in implementation of the individual protection standard. The EPA should conform to the recommendations of the NAS and international practice by adopting the use of the "average member of the critical group." [Comments on other examples of the EPA's intrusion into implementation matters are provided in the Enclosure to this letter.]

3. *The NRC staff objects to the imposition of a 0.15 mSv (15 mrem) per year individual dose limit from all pathways, because this lower dose limit will unnecessarily increase the conservatism of the dose assessment.*

An annual all-pathways individual dose limit of 0.25 mSv (25 mrem) is fully protective of public health and safety and is a suitable standard for a potential repository at Yucca Mountain. The 0.25 mSv/year (25 mrem/year) limit represents a small fraction of the national and international public dose limit of 1 mSv/year (100 mrem/year) and provides a level of radiation protection that is consistent with our and EPA's regulations for related activities (e.g., low-level, high-level, and transuranic waste management, storage, and disposal; spent fuel storage and disposal). Although the EPA rule proposes a lower limit of 0.15 mSv (15 mrem), and the difference between 0.15 and 0.25 mSv (15 and 25 mrem) is small, the lower value is not necessary for protection of public health and safety and would provide little, if any, reduction in health risk when compared with 0.25 mSv (25 mrem). It is also important to consider that the average American receives approximately 3 mSv/yr (300 mrem/yr) from natural background radiation. In addition to the lack of public health and safety benefit, there are regulatory concerns associated with lowering the dose limit to 0.15 mSv (15 mrem). Specifically, as the dose limit becomes smaller, limitations in the DOE's models used for estimating performance, and the associated uncertainties in supporting analyses, become more pronounced. Further, a 0.15 mSv (15 mrem) dose limit is likely to cause unnecessary confusion for the public and cause the NRC to expend resources without a commensurate increase in public health and safety.

In addition to the above objections to provisions proposed in 40 CFR Part 197, the NRC staff also provides responses to the EPA's solicitation for input on specific questions annotated in Section IV of the "Supplementary Information" text. These responses are provided in the enclosure to this letter.

In summary, the NRC staff believes there are fundamental flaws in the proposed rule which EPA should reconsider before finalizing the rule. Moreover, many of the requirements in the proposed rule will, if included in the final rule, add significant cost and burden to the DOE license application process and significantly increase the complexity of the NRC's licensing process without a commensurate, if any, increase in the protection of public health and safety and the environment. The NRC staff will attend the EPA-sponsored public meetings on the proposed Yucca Mountain Standard and may provide further comments, if warranted.

Sincerely,

WILLIAM D. TRAVERS,
Executive Director for Operations.

COMMENTS ON PROPOSED U.S. ENVIRONMENTAL PROTECTION AGENCY STANDARDS
FOR YUCCA MOUNTAIN (40 CFR PART 197)

UNWARRANTED SPECIFICATION OF IMPLEMENTATION CRITERIA

The U.S. Nuclear Regulatory Commission (NRC) staff objects to those portions of the proposed standard that address technical matters of compliance determination and implementation—matters assigned to NRC's jurisdiction and responsibility. The NRC staff offers the following comments on specific portions of the standard that prescribe implementation and/or solicit comment on implementation:

(A) Use of Reasonable Expectation

The U.S. Environmental Protection Agency (EPA) proposes to “establish minimum requirements for implementation” by requiring the NRC to use reasonable expectation as a basis for determining compliance. The NRC staff objects to the EPA's intrusion into an area of implementation related to making a license determination. The NRC has the sole licensing responsibility to determine compliance of the U.S. Department of Energy's (DOE's) license application with pertinent regulations and standards. The EPA has no authority to define how the NRC should make its licensing decision and should remove language that presumes to prescribe matters of NRC implementation.

Furthermore, the EPA incorrectly portrays how the NRC makes its licensing decisions. The EPA wrongly asserts that use of “reasonable assurance” as a basis for judging compliance would force the NRC to focus on extreme values (i.e., “tails of distributions”) for representing the performance of a Yucca Mountain repository. This is not correct for the proposed repository at Yucca Mountain. Over the last several years, the Commission has clearly articulated how performance analyses are to be conducted to assist the NRC's goal of protecting health and safety. The Commission's Final Policy Statement on the “Use of Probabilistic Risk Assessment Methods in Nuclear Regulatory Activities” (FRN Volume 60, Number 158, August 16, 1995) stated that use of probabilistic risk assessment (PRA), which includes performance assessment for waste management systems, should: (1) reduce unnecessary conservatism; and (2) be as realistic as practicable when supporting regulatory decisions. In particular, the NRC's proposed implementing regulation for disposal of high-level waste at Yucca Mountain (10 CFR Part 63) propounds a comparison of the average or mean dose with the individual dose limit to determine compliance. The NRC's draft Branch Technical Position on Performance Assessment for Low-Level Waste Disposal Facilities (FRN May 29, 1997, Volume 62, Number 103) also uses an average dose as the basis for comparison with the dose limit. The NRC has made it clear that it does *not* focus on extreme values but rather is evaluating expected doses. The EPA should remove language that incorrectly portrays the NRC's use of reasonable assurance.

(B) Specification of the Reasonably Maximally Exposed Individual (RMEI)

The EPA proposes that the RMEI be used for making dose estimates and also prescribes the approach to be used for determining the diet, and specifies the water intake volume of the RMEI. The EPA should not require use of the RMEI, but instead endorse use of the more widely-accepted critical group (CG) concept, consistent with the National Academy of Sciences (NAS) recommendations (see also the NRC staff response to the EPA's question #3). Specification of attributes or characteristics of the RMEI or how these attributes or characteristics are to be determined should not be prescribed in the standards, but left to the NRC's implementing regulation (see also NRC staff responses to EPA's questions #4, 5, and 6).

(C) Specification of the Stylized Calculation for Human Intrusion

Prescription of the stylized calculation for evaluating human intrusion should not be part of the EPA standards. Specification of the stylized calculation more appropriately belongs in the NRC's implementing regulations (see also the NRC staff response to the EPA's question #10). Additionally, the standards include an alternative for evaluating human intrusion beyond 10,000 years in the event an intrusion is not likely in the initial 10,000 years. The EPA should prescribe only the standard that is to be met and should not stipulate implementation details for what constitutes compliance with the standard.

(D) Request for Comment on Inclusion of Assurance Requirements

It is unnecessary for the EPA to establish additional qualitative "assurance requirements" to "add confidence that the Yucca Mountain disposal system will achieve the level of protection proposed in the quantitative standards." The degree of confidence that the NRC must have, in assessing whether the DOE's compliance demonstration satisfies applicable requirements, including the EPA disposal standards, is inherently an implementation matter for the NRC licensing requirements and licensing process to determine. Further NRC staff response to this specific request is provided later in this document.

(E) Request for Comment on Inclusion of Requirements for Use of Expert Opinion

It is unnecessary for the EPA to set guidelines for the use of expert opinion in its standards for Yucca Mountain. The NRC's licensing requirements and licensing process will govern the DOE's use of expert opinion in the development of its licensing case for a repository at Yucca Mountain. Further NRC staff response to this specific request is provided later in this document.

The NRC requests that those portions of the proposed standards that address the foregoing technical matters of compliance determination and implementation be removed or, at a minimum, that they acknowledge that the NRC, as the implementing authority, is not bound by implementation details that are contained in the standards. Additionally, the section entitled, "Who Will Be Regulated by These Standards?" should: (1) properly define the EPA role in standard development; (2) accurately describe the NRC's authority to establish technical requirements that are consistent with the EPA standards; and (3) acknowledge the time constraints established by the U.S. Congress that require the NRC to promulgate its rule within one year after the EPA issues its final standards.

RESPONSES TO SPECIFIC QUESTIONS FOR COMMENT IN THE PROPOSED STANDARDS

Question 1. The NAS recommended that we base the individual-protection standard upon risk. Consistent with this recommendation and the statutory language of the Energy Policy Act of 1992, we are proposing a standard in terms of annual committed effective dose equivalent (CEDE) incurred by individuals. Is our rationale for this aspect of our proposal reasonable?

Response. Yes. The individual-protection standard should be specified in terms of an annual CEDE limit. The use of an "effective" dose limit correctly accounts for the variation in risk levels associated with different organs. Not using an effective dose provides widely varying degrees of protection depending on the organ and radionuclides used in the exposure scenario.

Question 2. We are proposing an annual limit of 150 Sv [equivalent to 0.15 mSv (15 mrem)] CEDE to protect the reasonably, maximally exposed individual (RMEI) and the general public from releases from waste disposed of in the Yucca Mountain disposal system. Is our proposed standard reasonable to protect both individuals and the general public?

Response. No. An annual all-pathways individual dose limit of 0.25 mSv (25 mrem) is fully protective of public health and safety and is a more appropriate standard for a potential repository at Yucca Mountain. The 0.25 mSv/yr (25 mrem/yr) limit represents a small fraction of the national and international public dose limit of 1.0 mSv (100 mrem/yr) and provides a level of radiation protection that is consistent with our and EPA's regulations for related activities (e.g., low-level, high-level, and transuranic waste management, storage, and disposal; spent fuel storage and disposal). Although the EPA rule proposes a lower limit of 0.15 mSv (15 mrem), and the difference between 0.15 and 0.25 mSv (15 and 25 mrem) is small, the lower value is not necessary for protection of public health and safety and would provide little, if any, reduction in health risk when compared to 0.25 mSv (25 mrem). It is also important to consider that the average American receives approximately 3 mSv/year (300 mrem/yr) from natural background radiation. In addition to the lack of public health and safety benefit, there are regulatory concerns associated with low-

ering the dose limit to 0.15 mSv (15 mrem). Specifically, as the dose limit becomes smaller, limitations in the DOE's models used for estimating performance, and the associated uncertainties in supporting analyses, become more pronounced. Further, a 0.15 mSv (15 mrem) dose limit is likely to cause unnecessary confusion for the public and cause the NRC to expend resources without a commensurate increase in public health and safety.

A single, all-pathway standard is protective of both individuals and the general public health when the standard is applied to a CG (i.e., those individuals in the population expected to receive the highest dose equivalent using cautious but reasonable assumptions). An annual limit of 0.25 mSv (25 mrem) applied to the average member of the CG is protective of individuals in the CG. The general public is comprised of the individuals within the CG group as well as all other individuals residing in the Yucca Mountain area who are not part of the CG (e.g., the DOE has considered individuals living within 80 km (50 miles) of the Yucca Mountain site for evaluating population doses in the Draft Environmental Impact Statement). Individuals within the CG will have estimated doses higher (i.e., at least 3–5 times higher) than individuals outside the CG. The dose limit is protective of individuals in the CG and is also protective of individuals outside the CG for whom doses will be lower.

Question 3. To define who should be protected by the proposed individual-standard, we are proposing to use a RMEI as the representative of the rural-residential CG. Is our approach reasonable? Would it be more useful to have the DOE calculate the average dose occurring within the rural-residential CG rather than the RMEI dose?

Response. The NRC staff endorses the NAS recommendation for use of the average member of the CG as a basis for comparison with the risk limit.

The NRC staff disagrees with the EPA's use of "a RMEI as the representative of the rural-residential CG" because: (1) it unnecessarily confuses the CG concept, recommended by the NAS, by advancing a second, less widely-used, concept (i.e., RMEI); (2) the CG concept has been accepted both internationally and nationally and thus has meaning to a wider audience than the RMEI; and (3) specification of a particular group (i.e., rural-residential RMEI) is a matter of implementation to be determined in the NRC's implementing regulation. NRC routinely employs the CG approach in its licensing actions and for other regulatory applications (e.g., as part of our LLW and Decommissioning programs). We are also aware of documented applications of the CG approach by state regulatory authorities and by regulatory authorities in the United Kingdom, Sweden, Switzerland, and Canada. The EPA should replace the "RMEI" with the "average member of the CG" and remove any reference to the particular characteristics of the CG.

Question 4. Is it reasonable to use the RMEI parameter values based upon characteristics of the population currently located in proximity to Yucca Mountain? Should we promulgate specific parameter values in addition to specifying the exposure scenarios?

Response. The NRC staff agrees with the NAS recommendation that specification of the CG is to be based on cautious but reasonable assumptions. In doing so, it is appropriate to use present day knowledge of the habits and characteristics of the local population in the vicinity of Yucca Mountain to inform the specification of the CG.

That being said, however, the NRC staff objects to specification of parameters of the exposure scenario because they are matters of implementation that are to be determined in the NRC's implementing regulation. Additionally, detailed specification of exposure parameters at this time unnecessarily pre-judges ongoing efforts by the DOE to collect information in the Yucca Mountain vicinity relevant to exposure scenarios.

Question 5. Is it reasonable to consider, select, and hold constant today's known and assumed attributes of the biosphere for use in projecting radiation-related effects upon the public of releases from the Yucca Mountain disposal system?

Response. Yes. As explained in the NRC's proposed 10 CFR Part 63, it is appropriate to hold constant today's known and assumed attributes of the biosphere. Specification of assumed attributes of the biosphere is a matter of implementation that should be accomplished in the NRC's implementing regulations.

The NAS recognized the difficulties in forecasting the characteristics of future society, especially those influencing exposure, and recommended specification of exposure scenario assumptions. The NAS indicated the purpose for making the exposure scenario assumptions was to provide a framework for evaluation of repository performance and not to identify or predict possible futures.

Question 6. In determining the location of the RMEI, we considered three geographic subareas and their associated characteristics. Are there other reasonable methods or factors which we could use to change the conclusion we reached regarding the location of the RMEI? For example, should we require an assumption that for thousands of years into the future people will live only in the same locations that people do today? Please include the rationale for your suggestions.

Response. The NAS recommended that cautious and reasonable assumptions be used in defining an assumed exposure scenario, including the compliance location. The EPA should not go beyond considerations that are cautious and reasonable. Specification of additional assumptions for determining the compliance location are unnecessary. The NRC staff recognizes that the EPA has a need to discuss who is being protected by their standard. However, specification of the exposure scenario is a matter of implementation, and specification of the compliance location should be determined in the NRC's implementing regulation.

Question 7. The NAS suggested using a negligible incremental risk level to dismiss from consideration extremely low, incremental levels of dose to individuals when considering protection of the general public. For somewhat different reasons, we are proposing to rely upon the individual-protection standard to address protection of the general population. Is this approach reasonable in the case of Yucca Mountain? If not, what is an alternative, implementable method to address collective dose and the protection of the general population?

Response. Yes, it is reasonable to rely on an all-pathway, individual protection standard. We agree with the NAS that "a health-based individual standard will provide a reasonable standard for protection of the general public" (p. 65 of NAS report). By definition, it will ensure that every member of the general public will not receive more than the individual dose limit and is therefore protected. Additional regulatory criteria limiting collective dose are unnecessary for the protection of public health and safety and should not be included in the final EPA standards for Yucca Mountain.

Question 8. Is our rationale for the period of compliance reasonable in light of the NAS recommendations?

Response. Yes. A 10,000-year compliance period is reasonable for the reasons identified in the NRC's proposed criteria at 10 CFR Part 63. The fact that it is feasible to calculate performance of the engineered and geologic barriers making up the repository system, for periods much longer than 10,000 years, does not mean that it is possible to make realistic or meaningful projections of human exposure and risk, attributable to releases from the repository over comparable time frames. NAS acknowledged that projecting the behavior of human society over long periods is beyond the limits of scientific analysis and recommended that "cautious, but reasonable" assumptions, based upon current knowledge, be made with regard to the selection of biosphere and CG parameters for Yucca Mountain. Determining just how far into the future current knowledge can no longer support "reasonable" assumptions about pathways affecting human exposure is clearly a subjective, policy judgment. The NRC staff believes that, for periods approaching 1,000,000 years, as suggested by NAS, during which significant climatic and even human evolution would almost certainly occur, it is all but impossible to make useful and informed assumptions about human behaviors and exposure pathways. The NAS explicitly acknowledged that selection of a time period over which compliance should be evaluated necessarily involves both technical and policy considerations (p. 56 of NAS report). We believe sound reasons—technical, policy, and practical—support the designation of a 10,000-year compliance period for evaluating compliance with an all-pathway, individual protection standard.

Question 9. Does our requirement that the DOE and the NRC determine compliance with §197.20, based upon the mean of the distribution of the highest doses resulting from the performance assessment, adequately address uncertainties associated with performance assessments?

Response. Although the NRC staff agrees with the use of the mean of the distribution, we object to the EPA prescription of a specific statistical parameter that the NRC must use to evaluate compliance with the standard. Specification of approaches for determining compliance, given the uncertainties associated with performance assessment, is strictly a matter of implementation that is properly addressed in the NRC's regulation.

Question 10. Is the single-borehole scenario a reasonable approach to judge the resilience of the Yucca Mountain disposal system following human intrusion? Are there other reasonable scenarios which we should consider, for example, using the probability of drilling through a waste package based upon the area of the package

versus the area of the repository footprint or drilling through an emplacement drift but not through a waste package? Why would your suggested scenario(s) be a better measure of the resilience of the Yucca Mountain disposal system than the proposed scenario?

Response. Specification of a calculation for the NRC to use to evaluate the consequences of human intrusion on repository performance is a matter of implementation to be determined by the NRC. The NRC has proposed implementing regulations at 10 CFR Part 63, that include a proposal for evaluating the consequences of an assumed intrusion scenario, on which we have received significant comment. We will fully consider these comments prior to finalizing the rule. The EPA should eliminate the separate provisions for evaluating human intrusion by deleting §§ 197.25 and 197.26.

Question 11. Is it reasonable to expect that the risks to future generations be no greater than the risks judged acceptable today?

Response. Yes. The NRC staff agrees with the basic principle that individuals in the future should be afforded a level of protection from actions taken today that is comparable to that found acceptable for the current generation. The primary objective of geologic disposal of high-level radioactive wastes is the protection of current and future generations from the radiological hazards posed by the wastes produced by the current generation. The NRC has long supported the national strategy to pursue deep geologic disposal in the belief that the current generation's responsibilities to provide comparable protection to future generations are better fulfilled by pursuit of long-term disposal than by indefinite reliance on temporary storage strategies. That being said, however, the NRC acknowledges that permanent, complete isolation is unlikely to be achieved by any repository at any site, including Yucca Mountain, and that some fraction of the waste inventory can be expected to migrate to the biosphere, giving rise to potential exposures thousands, or even hundreds of thousands of years in the future. Doses and risks to individuals over these very long time frames can only be estimated, and the reliability of such estimates diminishes, the further into the future they are calculated. Because doses and risks cannot be forecast with any certainty into the indefinite future and must instead rely on cautious, but reasonable assumptions, as noted by the NAS, it is only appropriate to use such estimates to evaluate whether a proposed repository system is adequate, over a compliance period within which those assumptions continue to be reasonable. For the reasons cited or referenced in the response to Question 8, the NRC staff believes 10,000 years is an appropriate compliance period.

Question 12. What approach is appropriate for modeling the groundwater flow system down-gradient from Yucca Mountain at the scale (many kilometers to tens of kilometers) necessary for dose assessments, given the inherent limitations of characterizing the area? Is it reasonable to assume that there will be some degree of mixing with uncontaminated groundwater along the radionuclides travel paths from the repository?

Response. Determination of the appropriate model for groundwater flow will be an important part of the NRC's review of a possible DOE license application. It is inappropriate for the EPA to prescribe any degree of belief in potential modeling approaches that could be part of the DOE's license application.

Question 13. Which approach for protecting ground water in the vicinity of Yucca Mountain is the most reasonable? Is there another approach which would be preferable and reasonably implementable? If so, please explain the approach, why it is preferable, and how it could be implemented.

Response. Although Maximum Contaminant Levels (MCLs) may have been considered reasonable standards during their development in 1975, current understanding of the risk posed to individual organs by radiation exposure demonstrates that the MCLs for individual radionuclides provide a level of protection that varies significantly. For example, consider the annual risk of developing a fatal cancer² from drinking water that contains Neptunium-237 (Np-237) and Iodine-129 (I-129) at their respective MCL. The risk of developing a fatal cancer from ingestion of Np-237 at its MCL is 30 chances in 1,000,000 (3×10^{-5}),³ while the risk from ingestion of I-129 at its MCL is 0.07 chance in 1,000,000 (7×10^{-8}).⁴ More than a four-hundred fold difference exists between the risk levels prescribed for these two radionuclides. Therefore, this simple comparison shows an application of MCLs that re-

²The annual risk of developing a fatal cancer is 60 chances in 1,000,000 (6×10^{-5}) per mSv of exposure.

³Based on a concentration of 15 picocuries per liter.

⁴Based on a 0.04 mSv (4 mrem) exposure to the thyroid.

sults in non-uniform risk levels which are likely to lead to greater confusion about the level of risk which is acceptable and attainable, rather than confidence that the health and safety of the public are being protected.

Certain MCLs maintain a risk level so small that the individual, all-pathway dose limit is meaningless. EPA has proposed an annual, individual dose limit of 0.15 mSv (15 mrem) which is equivalent to an annual risk of developing a fatal cancer of 9 chances in 1,000,000 (9×10^{-6}). The MCL for I-129 (annual risk of 0.07 chance in 1,000,000) is more than 100 times below the risk of the individual dose limit. Consequently, the ground-water protection criteria become the *de facto* standards instead of the individual protection limit called for by the EnPA.

The EPA's current proposal is a continuation of EPA's practice of using the MCLs without appropriate justification. Specifically, EPA would have NRC require that groundwater in the vicinity of Yucca Mountain meet EPA's MCL, originally established to implement the Safe Drinking Water Act (SDWA). The MCLs were based on an analysis of treating contaminated water in public drinking water systems subject to the SDWA and not on an analysis of technology and costs of remediating groundwater at actual sites. In this rule, EPA proposes to apply the same MCLs to groundwater supplies before treatment rather than "at the tap" after treatment. Therefore, in the absence of an appropriate and comprehensive cost-benefit analysis, EPA should not require the expenditure of potentially significant amounts of taxpayer money to prevent potential contamination of groundwater that may require treatment prior to use anyway. Instead, EPA's standards should permit a decision to spend much smaller sums for water treatment in the event that such contamination should occur. Finally, EPA's application of MCLs at DOE's Waste Isolation Pilot Plant (WIPP) site in New Mexico should not be considered a precedent for the Yucca Mountain site since the WIPP site is located in a salt formation and lacks potable groundwater making the application of MCLs irrelevant.

The EPA does not demonstrate a need for such overly conservative, separate ground-water limit to protect public health and safety. The all-pathway dose limit, by definition, ensures that risks from all radionuclides and all exposure pathways, including the groundwater pathway, are acceptable and protective. All radionuclides and all exposure pathways will have to be acceptably evaluated at Yucca Mountain, and will have to meet an individual protection standard that is fully protective of public health and safety and the environment. Therefore, the proposed standard should not contain separate ground-water protection requirements because they are unnecessary for protection of public health and safety and because they lead to inconsistent and unreconcilable results as described above, which we believe will cause confusion and diminish rather than enhance public confidence that adequately protective limits have been established.

Furthermore, the NRC staff is troubled by the discussion of ground-water protection that suggests additional options that are not representative of ground-water conditions at Yucca Mountain and further increase the conservatism in applying these unnecessary separate requirements. The preamble to the standard requests comment on alternative dilution volumes that are extremely small (e.g. 10 and 120 acre-feet). These dilution volumes are not reflective of the resource to be protected (the EPA states the representative volumetric flow is 4000 acre-ft/year for the sub-basin in which the proposed repository is located). The standard also requests comment on alternative locations for determining compliance (e.g., 5 kilometers) that are similarly not reflective of the resource. As explained in connection with the compliance location for the individual protection (e.g., 20 kilometers), cautious and reasonable assumptions for lifestyles and the practicality of obtaining water provide no basis for identifying the 5 kilometer location for protection of ground water.

Is there a better approach? Yes. An individual, all-pathway dose limit of 0.25 mSv (25 mrem) total effective dose equivalent (TEDE) properly accounts for the radiation sensitivity of individual organs, and ensures the risks from all radionuclides and all exposure pathways are acceptable and protective.

Question 14. Is the 10,000-year compliance period for protecting the RMEI and groundwater reasonable or should we extend the period to the time of peak dose? If we extend it, how could the NRC reasonably implement the standards while recognizing the nature of the uncertainties involved in projecting the performance of the disposal system over potentially extremely long periods?

Response. Yes, 10,000 years is a reasonable time period for evaluating compliance with an all-pathway individual protection standard for the reasons stated in the answer to Question 8 (above). For reasons stated in response to Question 3, we disagree with the EPA's use of the RMEI construct. For reasons given at Question 13, inclusion of separate groundwater protection criteria is unnecessary regardless of the compliance period applied.

Question 15. As noted by the NAS, some countries have individual-protection limits higher than we have proposed. In addition, other Federal authorities have suggested individual-dose limits with no separate protection of groundwater. Therefore, we request comment upon the use of an annual CEDE of 0.25 mSv (25 mrem) with no separate groundwater protection, including the consistency of such a limit with our groundwater protection policy.

Response. The NRC staff believes that the application of a single, all-pathway standard is fully protective of public health and safety, and obviates the need for separate, single pathway limits. The purpose of a post-closure performance objective for a repository at Yucca Mountain is to ensure that members of the public will not receive doses, from all possible sources, exclusive of background radiation, in excess of 1 milliSievert (mSv) or 100 millirem (mrem) per year. 1 mSv (100 mrem) per year is the public dose limit established by the Commission at 10 CFR Part 20 and is the radiation protection basis upon which the Commission licenses all operating nuclear facilities. A limit of 0.25 mSv (25 mrem) to the TEDE, received in a year by the average member of the CG would limit the dose received from all possible pathways to the CG at Yucca Mountain, including direct exposure, drinking of contaminated water, eating food that was irrigated with contaminated groundwater or grown in contaminated soil, exposure to airborne releases, etc. The Commission established the 0.25 mSv (25 mrem) annual dose limit as the overall safety objective for both decommissioning of nuclear facilities (at 10 CFR Part 20.1402) and for low-level radioactive waste disposal facilities (at 10 CFR Part 61.41). It is within the range of international constraints that allocate doses from high-level waste disposal to between 0.1 and 0.3 mSv (10 and 30 mrem) per year, and is sufficiently below the public dose limit that no members of the public near Yucca Mountain would be expected to receive doses from all sources, excluding background radiation, in excess of 1 mSv (100 mrem) per year.

We believe that recent Congressional direction and NAS guidance, provided pursuant to that direction, are germane to the setting of acceptable risk levels for radionuclides received through the ground-water pathway—the primary pathway of concern at Yucca Mountain. The 1996 Amendments to the Safe Drinking Water Act directed the EPA to withdraw drinking water standards proposed for radon in 1991, that would have established an acceptable risk level for radon (a naturally-occurring isotope, not generally regulated by the NRC) comparable to current MCLs for other radionuclides. The same amendments called for the EPA to arrange for the NAS to conduct an individual risk assessment for radon in drinking water. Based on the results of that assessment, the EPA was further directed to develop an alternative MCL that would represent a risk comparable to that incurred from naturally-occurring radon in outdoor air. By our calculations, such an alternative MCL for a single radionuclide would correspond to an annual risk of 3.8×10^{-5} or more than twice that arising from exposure to an all-pathway, all-nuclide limit of 0.25 mSv (25 mrem) for Yucca Mountain. In view of this, and for the reason cited above and in the NRC's notice of proposed rulemaking for Part 63, we continue to believe that an all-pathway limit of 0.25 mSv (25 mrem) per year is an appropriate level of protection for a repository, a level that is consistent with national and international radiation protection practice.

Question 16. We are proposing to require, in the individual-protection standard, that the DOE must project the disposal system's performance after 10,000 years. Are the specified uses of the projections appropriate and adequate?

Response. We agree that the NRC should not be required to use the results of the DOE's analyses of repository performance after 10,000 years. However, should the DOE elect to use results of these calculations to further support its safety case, to demonstrate the capability of individual barriers, or to justify uncertainty estimates for data supporting its compliance demonstration, the Commission should not be constrained from considering such information. For this reason we object to the wording on p. 46993, that states that ". . . NRC is not to use the additional analysis in determining compliance with proposed § 197.20." We recommend that the EPA modify this statement to read ". . . NRC is not *required* to use the additional analysis in determining compliance with proposed § 197.20."

RESPONSES TO FURTHER REQUESTS FOR COMMENT IN THE PROPOSED STANDARD

Question (p. 46997). Is it appropriate for the EPA to set guidelines for the use of expert opinion in this standard and, if so, what should those guidelines be?

Response. It is inappropriate for the EPA to set guidelines for the use of expert opinion in its standards for Yucca Mountain. The NRC's licensing requirements and licensing process will govern the DOE's use of expert opinion in the development of its licensing case for a repository at Yucca Mountain. Furthermore, the NRC has

already issued guidance on this matter (see Kotra, J.P. et al., NUREG-1563, "Branch Technical Position on the Use of Expert Elicitation in the High-Level Radioactive Waste Program," 1996).

Question (p. 46998). Is it appropriate for the EPA to establish assurance requirements . . . and, if so, what should those requirements be?

Response. It is inappropriate for the EPA to establish additional qualitative "assurance requirements" to "add confidence that the Yucca Mountain disposal system will achieve the level of protection proposed in the quantitative standards." The degree of confidence that the NRC must have, in assessing whether DOE's compliance demonstration satisfies the EPA disposal standards, is inherently an implementation matter for the NRC licensing requirements and licensing process to determine. As a practical matter, the NRC has already included criteria, in its proposed Part 63 regulations, that address the issues cited by the EPA as potential "assurance requirements." Two of these are matters explicitly assigned to the NRC by statute [i.e. Section 121(b)(1)(B) of the Nuclear Waste Policy Act specifies that the NRC criteria "shall provide for the use of a system of multiple barriers in the design of the repository and shall include such restrictions on the retrievability of the solidified high-level radioactive waste and spent fuel emplaced in the repository as the Commission deems appropriate (emphasis added)].

Question 4. It is my understanding that the EPA did not follow the recommendations of the National Academy of Sciences in drafting their proposed standards. What is NRC's view on this issue?

Response. NRC believes the EPA's proposal for specifying separate requirements for protection of ground water does not follow the recommendations of the NAS. Regarding the protection of ground water, the NAS stated "[w]e make no such recommendation, and have based our recommendations on those requirements necessary to limit risks to individuals" (page 121, Technical Bases for Yucca Mountain Standards, NAS, 1995). In its comments on the EPA proposed standard, the NAS Board of Radioactive Waste Management (BRWM) contends that EPA ". . . must make more cogent scientific arguments to justify the need for this standard." John Ahearne, current Chair of the BRWM, was recently quoted as saying that "it was not scientifically logical to add in the groundwater standard." Additionally, EPA's proposed requirements for protection of ground water through maximum contaminant levels (MCLs) that result in non-uniform risk levels for individual radionuclides (see November 2, 1999 letter to Stephen D. Page, enclosed with the answer to question 3) is contrary to the NAS' recommendation for a health-based risk value. For example, the specific MCL for iodine-129 equates to an individual dose of approximately 0.2 mrem/year, not 4 mrem/year as the rule suggests.

Question 5. I understand that the NRC has had conversations with Carol Browner on this issue. Where does the NRC and the Administration currently stand on the issue?

Response. After the publication of the National Academy of Sciences (NAS) recommendations for high-level waste (HLW) disposal at Yucca Mountain in 1995, the NRC and the EPA met at various staff and management levels and with other government agencies (e.g., Office of Management and Budget, Office of Science and Technology Policy) to discuss appropriate standards for HLW disposal at Yucca Mountain. NRC continues to have concern regarding the EPA's proposal to establish separate limits for the ground-water pathway (e.g., MCLs) and for individual protection (e.g., 15 mrem) because these funds could increase costs and complicate licensing without providing a commensurate increase in public health and safety.

In a November 2, 1999 letter to EPA (see enclosure to Question 3), the NRC provided comments on the Notice of Proposed Rulemaking, "Environmental Radiation Protection Standards for Yucca Mountain, Nevada" (64 FR 46976). NRC concerns regarding HLW standards include: (1) needless application of a separate ground-water protection standard, (2) use of outdated 1959 dosimetry (ICRP 2) for determination of concentration limits for application of the groundwater protection standard, (3) an overly stringent performance standard of 15 mrem (NRC considers the range of 25 to 30 mrem protective of public health and safety), and (4) inappropriate EPA constraints on implementation of the standard, thereby intruding on NRC jurisdiction.

Question 6. The NRC just completed a pilot program to test the agency's transition to a new oversight process for power reactors. What were the principal lessons learned from the pilot program on the new regulatory oversight process? When does the Commission plan to implement the process on an industry-wide basis?

Response. The full results from the 6-month pilot program of the NRC's revised reactor oversight process are reported in Commission Paper SECY-00-0049, "Re-

sults of the Revised Reactor Oversight Process Pilot Program," dated February 24, 2000.

The principal conclusion from the pilot program was that the revised reactor oversight process was an improvement over the existing processes. The revised process met its objectives of (1) improving the objectivity of the oversight process, (2) improving the scrutability of the oversight so NRC actions have a clear tie to licensee performance, and (3) risk-informing the oversight process to focus NRC and licensee resources on performance having the greatest impact on plant safety.

Based on lessons learned from the pilot program, changes were made to the revised oversight process. Changes included (1) deletion of the containment performance indicator, (2) changes to the thresholds on some performance indicators, (3) addition of guidance to address cross-cutting issues (e.g., personnel errors in the human performance area) in assessment letters if the items are tied to safety issues, and (4) development of plant specific Significant Determination Process (SDP) Phase 2 worksheets.

The pilot program also identified additional areas for improvement to the oversight process, including the potential need for additional performance indicators, the need for better definition of some of the existing performance indicators, and potential refinements in the inspection process. The exact nature of these changes require additional data and observations from a larger population of facilities than the nine pilot program plants. The staff will report to the Commission on these potential enhancements following the first year of implementation.

The Commission approved initial implementation of the revised reactor oversight process on an industry-wide basis beginning April 2, 2000.

Question 7. The recent GAO survey concluded that the NRC staff has not fully accepted the changes associated with the new oversight process. What steps does the Commission plan to take in order to achieve broader acceptance and more uniform support from the staff?

Response. The GAO survey was performed during the time the program was being implemented at the nine nuclear plant sites selected for the pilot program. At that time, working knowledge of the new oversight process was limited to the relatively small number of inspectors and other staff support personnel involved with the pilot plants. Thus, many of those who responded to the GAO survey were not fully informed about the program. Moreover, the survey responses reflected experiences during the early stages of the pilot program.

Since the initial GAO survey, training on the new oversight process was conducted in all of the regions. During the first year of implementation, efforts to reach out to the staff will continue using a variety of methods, including large group briefings, small group discussions, newsletters, and the revised reactor oversight process web site. In addition, the staff intends to monitor the implementation of the new oversight process closely, solicit feedback from internal and external stakeholders, and make changes as appropriate. The Commission believes that as inspectors gain more experience with the program, staff confidence and acceptance will increase.

Question 8. The NRC has developed an initiative to transition to more risk-informed and, when appropriate, performance based regulatory approaches. What management oversight is the commission exercising to ensure coordination of and timely and effective issue resolution between the Office of Research's and Nuclear Reactor Regulation's efforts to risk inform NRC regulations?

Response. The Commission and NRC senior management are actively involved in oversight of the agency's risk-informed activities. This has included periodic public Commission meetings on progress and issues, as well as providing direction on specific issues brought before the Commission.

The NRC staff is now developing a risk-informed regulation implementation plan that will document staff plans and progress in risk-informed activities. This document is to be updated semi-annually and will be the subject of a public meeting after each update. In addition, the agency's Executive Director for Operations has established a Risk-Informed Regulation Steering Committee consisting of high level representatives from each of the NRC program offices and a regional representative. The committee is chaired by the Director of NRC's Office of Nuclear Regulatory Research and includes the Director of Nuclear Reactor Regulation. It is the function of this committee to ensure good coordination among the offices to set priorities, and to resolve issues that cannot be resolved at a lower level. This committee also meets periodically with a counterpart industry committee (organized by Nuclear Energy Institute) to coordinate and discuss items of mutual interest.

Question 9. In the past, the NRC has been subjected to significant criticism for the length of time it has taken to render decisions in licensing actions. Although

it appears that the NRC has made considerable progress in, for example, license renewal, does the NRC expect to streamline its hearing procedures generally? Please provide a schedule for completion of all changes the NRC will implement to ensure that its licensing process is as efficient as possible.

Response. The staff has been successful in addressing concerns raised regarding timeliness in processing licensing actions. This was due, in part, to efforts undertaken by the NRC informing the Licensing Action Task Force in the Summer of 1998. The staff has also received comment from a counterpart organization, sponsored by NEI. The Task Force facilitated key changes to processes and procedures that established a much more predictable review process in reviewing and approving licensing action requests. The Task continues in its efforts to improve the process and obtain input from stakeholders to improve the NRC's efficiency in processing licensing action requests. To ensure the continued success of this effort, the two groups continue to meet on a bi-monthly basis.

In 1998, the regulated industry highlighted its concerns that the licensing action inventory had grown considerably and a significant number of licensing actions were taking an inordinate amount of time to review and approve. The staff also became aware of the industry concern that technical reviews were inconsistent and questions were being sent to licensees that had little or no regulatory basis. Beginning in October 1998, the Commission established three key performance metrics related to the number of licensing actions to be completed, average age of the licensing inventory and number of licensing actions in the inventory. These have been incorporated in the NRC's Performance Plan. Our progress in meeting the goals is routinely provided as part of our monthly report to Congress on the status of NRC licensing and regulatory actions.

The performance on NRR's processing licensing actions report card for fiscal year 1999 was very positive. At the end of fiscal year 1999 the staff had surpassed the established goals. Specifically, the staff issued 1727 licensing actions, while the goal for fiscal year 1999 was 1650. No licensing actions were greater than 2 years old and the inventory had been reduced to 857 open licensing actions.

The NRC also has an exemplary record in dealing with the complex license transfer cases that are coming before us. We were among the first regulators to analyze and act on the transfer of the Pilgrim operating license to Entergy Corporation from Boston Edison. We were among the first to take action on the Three Mile Island Unit 1 transfer from GPU to Amergen, and we promptly acted on the Clinton transfer from Illinois Power to Amergen. There are several other complex license transfer cases before us that arise from the restructuring of the industry. These cases sometimes require a significant expenditure of energy by our staff, but we will make continuing efforts to assure timely resolution of those matters.

Finally, regarding your question about streamlining our hearing procedures, it is important to note that on an annual basis less than one percent of NRC licensing actions involve a request for a hearing. Even so, the Commission is currently considering a draft proposed rule which would make improvements to hearing processes in 10 CFR Part 2. The proposed rule under consideration by the Commission would expand the use of informal hearing procedures. Following Commission review and the completion of any changes to the proposed rule which the Commission deems to be necessary or desirable, the proposed rule will be published in the Federal Register for a 60-day public comment period. After the close of the public comment period, the Commission anticipates that it would take 4 to 7 months to consider the public comments, make any necessary changes to the proposed rule, prepare responses to the public comments, provide for Commission deliberation and voting on the final rule, and publish the final rule in the Federal Register.

Question 10a. Recently, the NRC Office of Inspector General completed a study evaluating the NRC's assessment of fees under the Independent Offices Appropriation Act of 1952 (IOAA) and the Omnibus Reconciliation Act of 1990 (OBRA-90). The IG's report concluded that there were several significant deficiencies in the NRC's methodology for determining its fees. Specifically, the IG's evaluation determined (1) by using the percent change methodology over an extended period of time without first conducting an annual rebaselining analysis, the NRC's Part 171 annual fees are being divorced from the cost of service; (2) the methodology used to determine the NRC's hourly rate charged licensees inappropriately excludes some generic costs and includes others, and inconsistently uses budget data rather than direct costs; and (3) there is inadequate management oversight, including providing incomplete public information during the rulemaking comment period. The response to the IG's report by the NRC's General Counsel and CFO indicate disagreement with several parts of the IG's recommendations.

What actions will the NRC take to ensure that rebaselining is performed on a more frequent periodic basis?

Response. Prior to fiscal year 1999, Commission policy required that annual fees be rebaselined every five years, or earlier if there was a substantial change in the total NRC budget or in the magnitude of the budget allocated to a class of licensees. In fiscal year 1999, based on experience gained as a result of applying the criteria for rebaselining over the previous four years, the Commission implemented a revised policy requiring that future annual fees should be rebaselined every three years, or earlier if warranted, and that in any event, the Commission will not use the percent change method for more than two years in a row. The Commission's decision on the appropriate method for establishing annual fees (i.e., rebaselining vs. percentage change) is made each year after considering all relevant factors.

Question 10b. If the NRC is not going to develop rebaselining thresholds, what are the other criteria used to evaluate the need to conduct rebaselining?

Response. Establishing quantifiable threshold changes as the basis for rebaselining does not address all of the factors the Commission needs to consider when establishing fees each year. For example, substantial changes in individual licensees' annual fee amounts may result from many things other than a discrete change (e.g., changes in the budget or in the amount of the budget allocated to a class of licensees), such as reduced Independent Offices Appropriation Act fee collections from a class of licensees or a decreasing number of licensees in a particular class/category. Therefore, in fiscal year 1999 the Commission adopted a policy of rebaselining every three years or earlier, if warranted, as stated in the response to Question 10(A).

Question 10c. Without rebaselining, how can the NRC justify the now more distant relationship between NRC fees and actual costs?

Response. The NRC did rebaseline for fiscal year 1999 fees, so the relationship between fees and costs is closer now, not more distant. Furthermore, the Commission decided in 1999 that it would rebaseline every three years, at a minimum, and earlier if warranted. The Commission also believes that its annual charges meet the statutory criteria that they be fairly and equitably allocated among licensees and, to the maximum extent practicable, have a reasonable relationship to the cost of providing regulatory services. To address licensee concerns about fee stability and predictability, the Commission adopted the policy of adjusting the annual fees by the percentage change in the total NRC budget, with adjustments for the number of licenses and other adjustments to meet the statutory requirement to recover approximately 100 percent of the budget through fees. This percent change method is used only if there has not been a substantial change in the total NRC budget or the magnitude of the budget allocated to a specific class of licensees, in which case the annual fees will be rebaselined.

Question 11a. The IG recommended that the NRC evaluate the hourly rate calculation methodology. Yet the response by the NRC's General Counsel and CFO indicate that the NRC will undertake an examination of the existing approach to determine if improvements can be made "in a cost effective manner." This answer seems to ignore the IG's point that the NRC's fee development process must comply with the full cost recovery principles contained in Independent Offices Appropriation Act (IOAA) and OMB Circular A-25.

What action will the Commission take to address the IG's point?

Response. The Commission continues to believe that its fee schedules are in full compliance with the requirements of the Independent Offices Appropriation Act (IOAA) and OMB Circular A-25. The NRC's methodology for calculating the fees it assesses under IOAA was upheld by the Court in *Mississippi Power & Light Co. v. NRC* [601 F. 2d 223 (5th Cir. 1979)]. Nonetheless, the NRC's Office of the Chief Financial Officer (OCFO) examined the contract costs excluded from the current hourly rate calculations and provided the study results to the NRC's IG on March 6, 2000. The study concludes that there is no basis for including these costs in the hourly rate. In addition, the OCFO contracted with a professional accounting firm to review the current methodology for calculating the hourly rates and to recommend alternative methods. The accounting firm's report is currently being evaluated by the NRC; however, it concludes that the NRC's current methods are recognized and acceptable means of assigning costs and provides a consistent, defensible, and economically feasible means for determining fees.

Question 11b. Why does the NRC seem unwilling to develop specific definitions for generic costs, which would ensure that such costs are treated consistently in fee calculations?

Response. A specific definition is lacking not because the Commission is unwilling to develop it, but because it simply is not possible to do so under the statutory framework that governs the Commission's fee assessment program. Under the Independent Offices Appropriations Act (IOAA), the NRC may assess Part 170 fees only for specific services provided to identifiable beneficiaries (31 U.S.C. §9701). These services include primarily licensing and inspection, but also could include rule-making and research that are performed for a single identifiable beneficiary, such as research performed to enable the staff to review a particular license application. But costs of generic activities that cannot be attributed to a single identifiable beneficiary, such as rulemaking or research that benefits all pressurized water reactors, cannot be recovered pursuant to the IOAA (*Florida Power & Light v. NRC*, 846 F.2d 765 (D.C. Cir. 1988), cert. denied, 490 U.S. 1045 (1989)); *Mississippi Power & Light v. NRC*, 601 F. 2d 223 (5th Cir. 1979), cert. denied, 444 U.S. 1102 (1980)). Under the Omnibus Budget Reconciliation Act of 1990, as amended, the NRC must recover in fees approximately 100% of its budget authority, minus sums appropriated to the NRC from the Nuclear Waste Fund. Thus, the costs of all activities not recovered through IOAA fees are "generic costs" or other costs that must be recovered through the assessment of Part 171 annual fees. The category of generic costs is therefore "defined" mainly through a process of elimination of costs that are to be recovered under the IOAA. The category necessarily defeats attempts at specific definition because it encompasses a broad range of activities.

Nonetheless, the lack of a specific definition of "generic costs" does not result in inconsistent treatment of similar costs. To the contrary, the statutory constraints outlined above leave the agency little latitude as to how to treat specific or generic costs.

Question 11c. What is the agency's justification for formulating hourly rates by using data developed for budget preparation and not traceable to billable activities, rather than actual data from the previous year's billings?

Response. The NRC's hourly rates are established to recover the cost of maintaining a professional employee, such as salaries and benefits and overhead, and to recover general and administrative costs, such as heat, lighting, and supplies. These budgeted costs are incurred whether a professional employee is performing work that is billable under Independent Offices Appropriations Act (IOAA) (fees for services) or work that is recovered through annual fees. The time spent by a professional employee in performing work that is subject to IOAA fees is traced to the billable activities and billed, at the professional hourly rate, to the recipient of the service. Any direct contract support costs incurred in providing the service are also traced and billed directly to the recipient. Because the hourly rate is not intended to be used only for work that is billable under IOAA, we believe it is more appropriate to use budget data than to base the hourly rate calculations on historical IOAA-type billing data. The professional accounting firm's report, which is currently being evaluated by the NRC, concludes that the NRC's current methods are recognized and acceptable means of assigning costs and provide a consistent, defensible, and economically feasible means of developing fees.

Question 11d. The IG report is critical of the NRC's lack of written procedures for preparing the annual fee rule. What action will the Commission take to direct the NRC staff to develop such procedures?

Response. The NRC is currently compiling its annual fee rule process in the form of a standard operating office procedure, which is scheduled for completion by September 30, 2000.

Questions 12 and 13. The NRC continues to collect approximately 80% of the total fees for generic activities. Approximately only 20% of NRC fees are allocated for discrete services. In the past, the NRC has justified the low percentage of its fees being allocated to specific services based on (1) NRC inability to recover costs for providing specific services to most federal agencies and for infrastructural services rendered to Agreement States; (2) exemption of nonprofit educational institutions from fees; and (3) a reduction in fees for small businesses.

What steps has the NRC taken to increase the percentage of fees allocated to discrete services so that the benefits derived from NRC activities are more visible to the regulated community?

Response. The items listed in number 12 represent a small portion of the annual fees that are collected for other than discrete services. The principal component of the annual fees are costs for generic activities (such as direct program costs for rule-making, research, and maintenance of an incident response center). These costs are not recoverable pursuant to the Independent Offices Appropriations Act (IOAA) through fees assessed for discrete services to applicants and licensees.

In the fiscal year 1998 and 1999 Final Fee Rules, the NRC instituted a series of changes to increase cost recovery under IOAA for discrete services provided to identifiable beneficiaries. For example, major changes include full cost recovery for resident inspectors and project managers (excluding time spent on generic type activities, leave time, etc.), and assessing fees for incident investigations, certain performance assessments and evaluations, and reviews of reports and other submittals, such as responses to Confirmatory Action Letters. The NRC has on several occasions solicited public comment on the cost recovery method for other discrete activities, such as contested hearings and escalated enforcement actions. Those commenting on this issue presented arguments both for and against assessing fees for these activities. The NRC concluded there were legal and policy concerns with assessing charges of this nature. Therefore, based on these considerations, the Commission decided to continue recovering costs for these types of activities through annual fees.

Although the NRC has taken steps to increase cost recovery for discrete services, the percentage of costs recovered through fees for services (IOAA fees) has been reduced by recent Commission policy changes made for the convenience of licensees and the NRC. To streamline the cost recovery process and ease burdens on the regulated community, the annual fees assessed to materials users now include the costs of inspections, license renewals, and license amendments. The costs of these activities were previously recovered through fees for services assessed to specific licensees. While this decision decreases the percentage of fees for discrete services, the NRC has received very positive feedback from the materials licensees concerning this change. In their view, the revised approach provides greater fee stability and reduces their administrative burden.

Question 14. What steps has the NRC taken to account for discrete and general services and link them with fees paid?

Response. Costs for discrete services provided to identifiable beneficiaries are billed to the applicants and licensees under Independent Offices Appropriations Act (IOAA), unless exempted by law or Commission policy. Exceptions to this policy are inspections, license renewals, and license amendment costs for materials users, which are included in the materials users' annual fees as a streamlining and cost-saving measure. Legislation is currently pending which would permit NRC to assess IOAA fees to Federal Agencies, who are currently exempted by law from these fees. In addition, Commission policy exempts non-profit educational institutions and certain activities, such as contested hearings, responses to allegations and escalated enforcement actions, from IOAA fees. These costs are recovered through annual fees. The NRC is unable under existing law to charge IOAA fees for generic activities; therefore the costs of these activities are also recovered through annual fees.

Question 15. When does the NRC expect to provide users with a line item budget analysis of discrete services and general fees?

Response. The NRC believes it provides sufficient information concerning its proposed fee schedules each year to allow effective evaluation and constructive comment by the public. For example, each proposed fee rule provides detailed explanations of the budgeted costs for the various classes of licensees being assessed fees. In addition, the NRC work papers pertinent to the development of the fees are placed in the NRC's Public Document Room on the first day of the public comment period. These work papers provide additional information concerning the development and calculation of fees, including NRC's fiscal year budgeted resources at the activity and subactivity level for the agency's major programs. The NRC staff is also available to meet with interested parties in person, respond to written inquires, or respond to telephonic inquiries to explain its fee schedules.

The NRC believes that sufficient information is currently provided to licensees or applicants on which to base payment of invoices. The NRC has addressed this issue previously in a similar response to the American Mining Congress (60 FR 20918, April 28, 1995). The NRC's invoices for full-cost licensing actions and inspections currently contain information detailing the type of service for which the costs are being billed, the date or date range the service was performed, the number of professional staff-hours expended in providing the service, the hourly rate, and the contractual costs incurred. The NRC will provide available data concerning the bill upon a request of the licensee or applicant. Additionally, if requested, the NRC program staff will provide a best estimate of the hours required to complete a specific licensing action, thereby enabling licensees to estimate the costs.

Question 16. The NRC appears to have taken steps to remedy the situation where licensees pay for agency services that do not benefit licensees. Why has the NRC chosen to increase its general revenue request without earmarking these funds for services that do not benefit licensees (e.g., international activities)? Given that the

basis is a percentage reduction, how does this percentage relate to actual expenses for these activities?

Response. The NRC believes that adjusting the percentage of the budget to be recovered from fees is an efficient and effective means to address the fairness and equity concerns associated with fees. We do emphasize that any funds provided from the general fund would be used to reduce or eliminate inequities in our fee schedules.

We have not sought to earmark specific funds for specific items for two reasons. First, not all of the costs in question are specifically budgeted activities. For example, the small entity subsidy is not a budgeted item but rather is the amount that will not be recovered from those licensees who pay reduced annual fees based on their status as small entities. Second, identification of specific items may imply that the NRC has two separate budgets with different importance and priorities. This is not the case. NRC's budget is used for those activities needed to carry-out our mission and meet our performance goals, independent of how they are funded.

Historically, on the order of 10 percent of our budget has been for those activities associated with fairness and equity concerns. For example, in fiscal year 1999, the surcharge amount assessed to licensees for these activities was \$55.2 million, or approximately 11.7 percent of the total NRC fiscal year 1999 budget.

Question 17. The NRC has recently issued several enforcement actions for violations of the employee protection provisions of 10 C.F.R. §50.7, on the basis that adverse employment actions were motivated, at least "in part," by the employee's engagement in protected activity. In one of these actions, as a corollary to the "in part" standard, the NRC ruled that a licensee retaliated against an employee who has engaged in protected activity because the licensee could not prove that its decisions were "based solely on" legitimate business considerations. In another case the NRC found a violation because the adverse action was "related to" protected activity. The NRC's legal theory, initially captured in the Millstone Independent Review Team (MIRT) report and later directly established in Enforcement Guidance Memorandum (EGM) 99-007, appears to derive from discrimination law other than that arising under Section 211 of the Energy Reorganization Act. Under the criteria for a violation of 10 C.F.R. 50.7 set out in the MIRT and the EGM, the only nexus that must be established between the protected activity and adverse action is whether the adverse action was taken "at least in part" because of protected activity. While this requires a finding of some retaliatory intent, it does not allow the licensee to demonstrate—consistent with 10 C.F.R. § 50.7(d)—that legitimate considerations dictated the actual employment action taken. The NRC's current standard and approach has never been presented to the Commission in open session, nor has it been discussed with stakeholders. Please explain the basis for the change in the legal standard and evidentiary threshold now being applied in enforcement actions based upon alleged violations of 10 C.F.R. 50.7.

Response. The Commission has not changed the standards which it applies to employment discrimination cases arising under 10 C.F.R. §50.7. Although the MIRT report made a number of recommendations regarding the procedures used to arrive at enforcement decisions, it otherwise made no recommendations for substantive changes to what have been the underlying legal standards applied in cases arising under section 50.7. The Executive Director for Operations noted that consistent application of the overall approach applied in such cases in his June 14, 1999 response to MIRT.

Moreover, while it is true that there are some differences in the standards applied by the Commission under section 50.7 and by DOL under Section 211 of the Energy Reorganization Act, those differences are dictated by the nature of the agencies' respective interests in and roles with respect to the alleged discrimination. As you know, Section 211 (formerly section 210) was enacted to provide individuals who believed they had been subjected to discrimination for raising safety issues with a forum in which they could obtain a personal remedy, for example, compensation or reinstatement. Thus, in applying Section 211, DOL properly considers, in determining the appropriate remedy, whether the individual has actually suffered some adverse action that would not have resulted absent the individual's raising the concern. If a licensee can prove that it would have taken the same action irrespective of the protected activity, then the individual has not been harmed and no personal remedy is warranted for the employee.

On the other hand, the Commission's interest in promulgating section 50.7 was to ensure a work environment where individuals feel free to raise safety concerns without fear that their doing so will be used against them. Given its nexus to the Commission's health and safety responsibilities, section 50.7 (and its analogues elsewhere in the Commission's regulations) were promulgated under the authority of

section 161 of the Atomic Energy Act with the description of protected activity modeled on section 211 of the Energy Reorganization Act. If the staff can prove that an individual's engaging in protected activity was a factor on which an adverse action was based, then a violation of 50.7 would be established. From the Commission's perspective, the reliance on illegitimate grounds for taking an adverse action has a harmful effect on the work environment that may warrant enforcement action, even if the licensee could show that it would have taken the same action irrespective of the protected activity. It is important to emphasize the point that the staff would bear the burden of proof in any hearing requested by a licensee to contest an enforcement action. Thus, the staff would have the burden to prove by a preponderance of the evidence that one of the reasons for the adverse action taken by the licensee was that the individual engaged in protected activity. This is entirely consistent with section 50.7(d) which is designed to ensure that an individual cannot insulate himself from adverse action by raising a safety concern. As long as the licensee does not consider the protected activity, it is free to take any appropriate action it desires without interference from the Commission.

Question 18. Given that Section 50.7(d) specifically allows employment actions involving protected employees if those actions are "dictated by nonprohibited considerations," please explain the basis for citing violations of 10 C.F.R. 50.7 regardless of whether the licensee demonstrates that legitimate reasons for adverse employment action existed.

Response. As indicated in the answer to Question 17, section 50.7(d) applies to situations where the licensee takes an action which does not take into account that the individual engaged in protected activity. It is designed to ensure that an individual cannot immunize himself from adverse action by raising safety concerns. As long as the licensee bases its decision solely on reasons other than the employee's protected activity, it is free to take any action it desires without Commission interference.

Question 19. Does the Commission believe it is appropriate, as a matter of policy, for the NRC to summarily reject evidence that there was no retaliatory intent in a Section 50.7 case?

Response. The staff does not summarily reject any evidence in reaching its decision on whether to proceed with an enforcement action. Moreover, as noted in answering Question 17, the Commission staff would bear the burden of proof in any enforcement hearing.

Question 20. Does NRC staff believe it is legally supportable to determine that there was retaliatory intent in the face of evidence of nonprohibited considerations supporting an employment decision?

Response. Yes. As previously stated, the issue is not whether there is also a nonprohibited reason for the action taken but rather whether a prohibited reason was a factor in taking the action at issue.

Question 21. Does the Commission believe it is sound public policy to require a licensee in a Section 50.7 case to have to show the absence of bad faith at all levels of its organization, i.e., that its actions were based "solely" on nonprohibited concerns?

Response. As explained above, licensees do not have to show or prove anything in a section 50.7 case. Rather it is the Commission staff which bears the burden of proving that an action was taken, at least in part, for prohibited reasons.

Question 22. As a matter of policy, does the Commission support permitting licensees to take appropriate action to ensure the competence and quality of their work force by assigning, counseling, and as necessary, disciplining employees who do not contribute to a safe environment, notwithstanding the fact such employees may have engaged in protected activity. Please explain the basis for the answer provided.

Response. Yes, and that is precisely the reason that section 50.7(d) was promulgated. A licensee may take action to assure the competence and quality of its work force so long as participation in protected activity is not a consideration in taking the action.

Question 23. A likely consequence of the NRC's new approach to Section 50.7 cases necessarily will be that management will be reluctant to make adverse employment decisions, set standards or assure accountability, even where those decisions are warranted or would further enhance safe operations. Management may be unwilling to assess performance if this assessment is "related to" protected activity, even if the performance issues go to the essence of an employee's safety-related duties.

Response. In order to assure that a safety conscious work environment exists at licensed nuclear facilities, 10 CFR 50.7 states that discrimination against employees for engaging in protected activities is prohibited.

However, 10 CFR 50.7 (d) states that "Actions taken by an employer, or others, which adversely affect an employee may be predicated upon non-discriminatory grounds. The prohibition applies when the adverse action occurs because the employee has engaged in protected activities. An employee's engagement in protected activities does not automatically render him or her immune from discharge or discipline for legitimate reason or from adverse action dictated by non-prohibited considerations."

As noted in the response to Question 17, standards being utilized by the NRC in Section 50.7 cases are not new and the percentage of allegations being substantiated by the staff has not changed. Management's ability to set standards, assume accountability and assess performance are not adversely impacted by the NRC's enforcement of employee protection regulations (10 CFR 50.7). For many years the NRC has consistently held that adverse action taken against an employee, at least in part because of protected activities, is a violation of 10 CFR 50.7. However, as stated, 10 CFR 50.7 (d) recognizes that, if an adverse action were taken for legitimate reasons apart from the protected activity, there is not a violation of 10 CFR 50.7. It is incumbent upon the licensee to base the adverse action solely on legitimate business reasons and not on the protected activities. Including protected activities in the licensee's reasoning for why an adverse action was taken leads the staff to conclude that the action was taken, in part, because of the protected activity and was a violation of 10 CFR 50.7. Including a protected activity in the reasoning for why an adverse action was taken clearly sends the message to other employees that engaging in protected activities may be used as part of the basis for taking action against them. This would create an environment where employees fear retaliation if they engage in protected activities. Therefore, a discharge or other disciplinary action must be dictated by the non-prohibited considerations.

Licensee management faces no different challenge under Section 50.7 than it does under the many other employment discrimination statutes which are potentially applicable to every employment decision which it must make.

Question 24. Please explain whether and, if so, why the Commission believes the new approach to Section 50.7 cases is in the public interest, given that its impact is to effectively paralyze licensees because of fear that protected activity may later be discerned by the NRC to have played "a part" in any given employment decision.

Response. The NRC inspection program has limited resources and uses a sampling approach, focused on the most safety significant aspects of the facilities. As a result, the NRC has traditionally also relied on the openness of licensee employees to identify safety significant issues. The NRC's approach to discrimination against employees for raising safety concerns is aimed at maintaining an environment in which employees feel free to raise such concerns, thereby enhancing the overall ability of the agency to ensure the continued safe operation of the nuclear facilities.

As stated previously, there is no new approach to section 50.7 cases. For many years the NRC has consistently held that an adverse action taken against an employee, at least in part, because of protected activities is a violation of 10 CFR 50.7. The percentage of substantiated allegations has not increased. (The NRC substantiates and takes action in approximately 10 percent of the discrimination complaints identified.) The focus of the NRC regulations in this area is to ensure that a safety conscious work environment exists in which employees feel free to raise safety issues without fear of reprisal or adverse employment action being taken against them. The Commission believes that it is in the public interest for employees at nuclear power plants to feel free to raise nuclear safety issues without fear of reprisal.

10 CFR 50.7(d) provides that licensees may take employment action against employees for legitimate reasons dictated by non-prohibited considerations. Provided that licensee actions were based on these non-prohibited considerations and not the protected activities, licensees should feel confident that protected activity will not later be perceived by the NRC to have played "a part" in any given employment decision. Moreover, the application of the standards does not turn on what the NRC "discerned" but rather what the NRC staff can prove by a preponderance of the evidence in front of a neutral third party.

Question 25. Does the Commission believe that an inference of retaliatory intent can be made from only a manager's knowledge that an employee has engaged in protected activity? If so, please explain the Commission's legal and policy justification for this position.

Response. No. Mere knowledge that an employee had engaged in protected activity would not be sufficient to establish retaliatory intent as is clear from a reading

of section 50.7(d). In order to establish a violation, the staff has to prove by a preponderance of the evidence that, the employment action was based, at least in part, on the fact that the employee had engaged in protected activity.

Question 26. Given that the Department of Labor administers Section 211, the NRC's 50.7 regulations are, at least in part, designed to implement Section 211, and the NRC has little or no particular expertise in the area of labor relations and/or employment disputes, will the Commission reconsider the NRC's role in investigating individual allegations or retaliation? Please explain the basis for the answer provided.

Response. The Commission has no plans to reconsider the NRC's role in investigating individual allegations of retaliation. The Department of Labor considers whether or not the individual has actually suffered some adverse action that would not have resulted absent the individual's engagement in protected activity and whether it can provide a remedy for the individual. The Commission's interest in promulgating Section 50.7 was to ensure a work environment in which individuals feel free to raise safety concerns without fear that their doing so will be used against them. The NRC has a long history of investigating alleged discrimination cases to ensure a safety conscious work environment exists at licensee facilities such that employees feel free to raise safety concerns. The freedom of employees to raise concerns is an important part of the NRC's various oversight programs, which highlights the importance of the Commission's policy on employee protection.

The Atomic Energy Act (AEA) provides the Commission with authority to investigate cases in which discrimination may have resulted from an individual raising concerns, and to take appropriate enforcement action against licensees for such discrimination. In 1977, the staff became aware of a concern by a construction worker that he had been fired because he raised a safety issue with an NRC inspector. The worker was employed by a contractor to a utility holding a construction permit for a reactor facility. The staff took the position that it had legal authority under the AEA to investigate the allegation and take enforcement action if the allegation was substantiated. The utility refused to permit the investigation. The issue was reviewed by both the Licensing and Appeal Boards. Both Boards held that the AEA provided the Commission with authority to take action where a licensee or its contractor discriminated against an employee for raising a safety issue. The Appeal Board explained that labor disputes could "engender radiation hazards to the public of the kind that the AEA was designed to guard against."¹

Although the AEA provides the Commission with authority to take proscriptive action against a licensee for discriminating against employees who raise safety concerns, it does not provide authority to order a direct, personal remedy to the employee. Consequently, on November 6, 1978, Congress enacted Section 210 of the Energy Reorganization Act (ERA), giving the Department of Labor the authority to order a direct, personal remedy to the employee. Senator Hart, urging his colleagues to accept Section 210, emphasized that "while new Section 210 of the Energy Reorganization Act of 1978 provides the Department of Labor with new authority to investigate an alleged act of discrimination in this context and to afford a remedy should the allegation prove true, it is not intended to in any way abridge the Commission's current authority to investigate an alleged discrimination and take appropriate action against a licensee-employer, such as a civil penalty, license suspension or license revocation. Further, the pendency of a proceeding before the Department of Labor pursuant to new section 210 need not delay any action by the Commission to carry out the purposes of the Atomic Energy Act of 1954."² (Section 210 was changed to section 211 in the Energy Policy Act of 1992, Public Law 102-486.)

The Office of Investigations has conducted investigations into numerous allegations of discrimination. For example, over a 3 year period (1997, 1998, and 1999), the Office of Investigations completed review of 277 discrimination-related cases. Based on the long history of NRC investigations and the significant number of investigations conducted per year, the NRC has significant expertise in the area of nuclear employee protection. In fact, the NRC was involved in nuclear employee protection prior to the Department of Labor's involvement resulting from the 1978 addition of Section 210. In addition, most of the attorneys who provide legal advice in connection with these cases have many years experience in employment discrimination law. The Commission plans to continue to investigate allegations of discrimination, as has been the policy for more than 20 years.

¹ Union Electric Company (Callaway Plant, Units 1 and 2), ALAB-527, 9 NRC 126, 133-39 (1979).

² 124 Cong. Rec. S15318 (daily ed. September 18, 1978), remarks of Senator Hart.

Question 27. Has the NRC formally determined that, as a matter of policy, the NRC staff, and particularly Office of General Counsel staff, should serve in a prosecutorial role in predecisional enforcement conferences? Please explain the basis for the answer provided.

Response. The purpose of the predecisional enforcement conference is to obtain information that will assist the NRC in determining the appropriate enforcement action. This is often accomplished through an interactive dialogue between the NRC and the licensee. The intent is not to prosecute the case, but to develop an understanding of the facts.

During the conference, the licensee, contractor, or other person potentially subject to enforcement action is given an opportunity to provide information related to the purpose of the conference. Specifically, the licensee, contractor, or other person is encouraged to present their understanding of the facts and circumstances surrounding the apparent violation and whether they agree with the facts. The staff routinely asks follow-up questions to further its understanding of the facts. An explanation of the corrective actions (if any) that were taken following identification of the potential violation is also requested.

For a case in which an NRC Office of Investigations (OI) report finds that discrimination as defined under 10 CFR 50.7 (or under similar provisions in Parts 30, 40, 60, 70, or 72) has occurred, the employee or former employee who was the subject of the alleged discrimination is normally provided an opportunity to participate in the conference with the licensee/employer. This participation is normally in the form of a statement and comment on the licensee's presentation, followed in turn by an opportunity for the licensee to respond to the employee's presentation. The purpose of the employee's participation is to provide information to the NRC to assist it in its enforcement deliberations.

A conference is the last step in the fact-finding process, and is conducted prior to any NRC enforcement action or NRC adjudicatory hearing on the enforcement action.

Question 28. Please provide examples of other federal agencies with responsibility to protect health and safety that have enacted enforcement-based regulations (like Section 50.7) to address "chilling effect." Please specifically identify the regulations implemented by the named agencies for this purpose.

Response. Section 50.7 does not directly address "chilling effect"; rather, it prohibits discrimination. If not corrected, discriminatory actions can then lead to a degraded safety conscious work environment, or a "chilled environment." We are unaware of provisions implemented by other agencies similar to section 50.7.

In 1993, an NRC task force contacted a number of federal departments and agencies and discussed their policies concerning employee protection. Although a number of statutes were identified that related to employee protection, the statutes provided, like section 211, a remedy for the aggrieved employee through the Department of Labor.

Recently, the staff recognized a need to contact other federal agencies again and review their rules, procedures, and practices. The staff recognizes that both the Department of Energy and the Federal Aviation Administration have recently strengthened their programs through legislation and rulemaking. However, an initial search of certain of the previously contacted agencies' web sites indicated little of substance has changed since 1993. The staff intends to discuss these and other agency programs with appropriate officials to identify similarities.

Note: It is the NRC's understanding, although not verified through the identified agencies, that the Department of Transportation's rule on employee protection for commercial motor vehicle safety (49 USC 31105) does not contain provisions for taking enforcement actions as specifically described in 10 CFR 50.7(c). Additionally, on March 10, 2000, the Department of Energy's rule on employee protection, 10 CFR 708, "DOE Contractor Employee Protection Program," became effective; however, 10 CFR 708 appears to address an individual remedy through DOE investigations and hearings similar to DOL's role rather than an enforcement policy to prevent or minimize a "chilling effect."

Question 29. The Office of Enforcement issues Enforcement Guidance Memorandum to apprise NRC staff and licensees about various enforcement issues, including interpretations of various provisions of the Enforcement Policy, etc. What process exists for ensuring that EGMs and other agency documents do not establish new or change existing Commission policy?

Response. Enforcement Guidance Memoranda (EGMs) are staff documents providing guidance to the staff on how to administer the enforcement program (including administrative process issues) and how to implement the Enforcement Policy. By definition, EGMs cannot change Commission policy. If there is an inconsistency be-

tween the Commission's Enforcement Policy and an EGM, the Enforcement Policy—as a policy statement—takes precedence over staff procedures. In an effort to ensure that EGMs do not inadvertently revise existing policy, draft EGMs are subject to extensive internal review prior to issuance. Because EGMs are not intended to establish new or change existing Commission policy, they do not require prior review by the Commission but in certain cases, EGMs are reviewed by the Commission before being issued.

At the time that EGMs are made public, they are included on the Office of Enforcement's (OE's) website. Although public comments are not currently solicited prior to issuance of EGMs, interested parties may always provide comments for OE's consideration. If warranted, the EGM may be revised after public comment. OE is initiating the practice of stakeholder review prior to EGM implementation when time permits.

Question 30. Often research efforts are of an anticipatory nature with a general, rather than clear nexus as to how or to whom a benefit might accrue. Consequently, research funds are often subject to significant scrutiny and criticism as to the value and cost of the activity. In the fiscal year 1993 NRC budget authorization, the NRC research budget allocation was not included as a "fairness and equity" item for the public good. Instead, the research budget has been funded from user fees rather than being appropriated. Would you be in favor of modifying the NRC fee structure such that those elements of the research budget not related directly to licensee regulation be exempt from recovery via user fees?

Response. The NRC research budget was not included as a "fairness and equity" concern in the fiscal year 1993 NRC study because the research activities did not meet the criteria that were used for identifying such concerns. The activities that were included in the study were not directly related to the licensees who paid the fees or provided support to both NRC and non-NRC licensees. The costs of NRC research activities are directly related to the class of licensees who pay the fees.

NRC's regulatory research program is designed to resolve identified and potential safety issues and to provide technical information and tools that reduce uncertainties in knowledge and therefore enable the NRC to make more realistic decisions. Accordingly, the research program is directly related to licensee regulation, resulting in improved protection of public health and safety and often avoiding unnecessary burdens on licensees.

NRC research activities are predominantly confirmatory—that is, they address specific needs and issues arising out of operating experience, plant aging, the decommissioning of licensed facilities, and licensee initiatives. This type of research is initiated by a specific request by the Office of Nuclear Reactor Regulation or the Office of Nuclear Material Safety and Safeguards. Anticipatory research areas are identified by the Office of Nuclear Regulatory Research, in consultation with other offices, to address issues that the staff judges may become important in the future. Historically, anticipatory research conducted by the NRC represents a small percentage of the regulatory research program, but even that research has had significant benefits in maintaining safety, enhancing regulatory effectiveness, and reducing unnecessary regulatory burden. For example, extensive research to assess the safety significance of plant aging formed the technical foundation for both the development of the regulatory framework and ongoing decisions on license renewal, which is allowing licensees to extend the operating life of their facilities in appropriate cases. Further, development of Probabilistic Risk Assessment (PRA) methods not only created the groundwork for conducting risk assessments and for the current efforts to risk-inform our regulations, but also has supported decisions on a number of regulatory issues. Research to better understand fission product release, transport and deposition during core melt accidents has resulted in a fundamental revision to regulatory requirements (i.e., source term), allowing licensees to eliminate unnecessary burdens while maintaining adequate protection.

NRC may be the sole agency which collects the fees to fund its research activities from classes of licensees. The critical issue for the Commission is the availability of adequate research resources to carry out its safety regulatory mission both in the short and long term. If the Congress believes that funding a portion of research activities from general funds instead of fees is appropriate, the Commission is prepared to work with Congress to that end.

ADDITIONAL COMMENTS FROM COMMISSIONER MCGAFFIGAN ON QUESTION 30.

I support moving our research program, both anticipatory and confirmatory research, off of the fee base and into a general fund appropriation. I firmly support a strong NRC research program. I believe that our research program benefits both the public and licensees. It leads to sounder, independent regulatory decision-mak-

ing. It often permits changes in our rules that reduce unnecessary regulatory burdens on the industry. Occasionally, it requires us to add new rules to protect public health and safety.

Unfortunately, some, but by no means all, in industry myopically focus on the occasions where NRC research leads to new requirements and miss the far more numerous instances when our research program validates the opportunities for introducing new technologies or for eliminating excess conservatism in the NRC's largely deterministic, prescriptive regulatory framework. This framework was put in place decades ago when we knew far less and regulators appropriately erred on the side of conservatism. Dr. John Ahearne, a former NRC Chairman and Chair of the group which wrote the CSIS report, has termed this industry view as terribly shortsighted. He has stated that he believes Congress made a mistake in requiring that the research budget be paid for entirely by licensee fees in the Omnibus Budget Reconciliation Act of 1990. I agree.

The concern of many at NRC is that if Congress makes this change, the research budget might be more likely to be reduced in the annual Congressional appropriations process. They fear that we could end up with an imbalanced program where the program offices would have to shelve activities dependent on research results. They believe that if the research program continues to reside in the fee base, and Congress reduces our budget, we will retain the flexibility to allocate an appropriate share of the cuts to research and the program and support offices.

I respect that concern. However, the fact is that our research program in the current fee-based framework has been eroded year by year. Since 1993 the real reduction in the NRC research budget has been about 50%, compared to an overall agency reduction of about 27%. Every year the Nuclear Energy Institute questions our research program in their annual comments on our fee rule. The 1998 Tim Martin report suggested NRC needed no research program at all (in which case we would lose our ability for independent analysis and be forced to become an inflexible regulator locked into the past.) Our nuclear regulatory research budget is now smaller than those of France and Japan, and we become ever more dependent on leveraging the larger research programs abroad to deal with issues of interest to the industry such as higher burnups for fuel. Thus, retaining the research budget in the fee base has hardly been a model for success.

I am willing to accept the possibility of greater scrutiny in the Congressional budget process for our research program under a general fund appropriation. I believe that such scrutiny, far from leading to budget cuts, could lead to budget increases. Congress has traditionally been very supportive of the research budgets of other agencies because Congress understands the benefits of sound research programs. There is a compelling case for our research budget even from a narrow industry perspective. Perhaps that case will be clearer to all if the nuclear industry ceases to be the sole industry which must pay for the research program of its regulator.

Question 31. The Center for Strategic and International Studies published a review of the regulatory process for nuclear power reactors. A number of recommendations were identified on 13 issues related to NRC operational practices and regulation. How are you using these recommendations to improve the performance of the agency? How have these recommendations been incorporated in the NRC's Strategic Plan?

Response. As you noted, the CSIS report made recommendations in 13 areas related to NRC's regulation of nuclear power reactors. The report acknowledged that ". . . many of the recommendations and conclusions made here were arrived at independently by the NRC and are already under consideration or in place." Thus, although we believe our Strategic Plan is largely consistent with the CSIS recommendations, it is difficult to identify specific changes to NRC's Strategic Plan as a result of the recommendations.

The agency has taken action to improve gency performance in the areas addressed in the CSIS report. For example, in the areas identified in the report as "implementation issues," the inspection, assessment and enforcement processes have been fundamentally redesigned since the issuance of the report. Initial implementation of the Revised Reactor Oversight Process (RROP) at all operating reactors commenced on April 2, 2000. This new process responds to the CSIS recommendations in these areas. Similar progress has been made on the four "emerging issues" identified in the CSIS report. For license renewal, the Commission is seeking to build on the success of the first two application reviews and to regularize the renewal process by finalizing its generic aging lessons learned (GALL) report and its standard review plan for license renewal while working with NEI on the standard format and content for an application. On license transfers, the Commission has anticipated the

large volume of applications as a result of industry restructurings, and has put in place a framework of guidance to speed the staff review. Similar progress is being made in the emerging issues mix of decommissioning and risk-informed regulation.

Finally, with regard to the CSIS issues dealing with NRC processes, the Commission has made substantial improvement to the license amendment process, and is considering changes to its hearing process (as discussed in more detail in our answer to question 9). We are discussing improvements to the 10 CFR 2.206 petition process and will hold a public commission meeting on proposed staff changes later in May. We believe that our rulemaking process continues to deserve the high marks given to it by the CSIS report. However, as noted in our October 22, 1999 letter to the committee, after careful review the Commission decided, contrary to the majority CSIS recommendation, that averted onsite costs should be included in backfit analyses pursuant to the NRC's backfit rule.

Question 32a. The process for NRC review and approval of the initial two license renewal applications, submitted by Baltimore Gas & Electric Co. and Duke Power Co., appears to be on schedule. It is anticipated that many license renewal applications will be submitted in the near future. Please respond to the following questions about what lessons have been learned from the experience with the first two license renewal applications and how these lessons are being applied to improve the efficiency of the process in the future:

Are there any new technical issues that came to light as a result of the two reviews?

Response. No new technical issues (types or effects of aging) have been encountered. However, both license renewal applicants have identified the need for additional programs to manage aging at the plants for the extended period of operation. As we continue to review different reactor designs, we will remain vigilant to ensure the identification of any new technical issues.

Question 32b. What has been learned about the level of resources needed for a license renewal application review?

Response. The experience gained from the review of the first two license renewal applications is expected to result in improvements in the efficiency and effectiveness of the license renewal process.

The NRC and the industry have also identified generic issues associated with implementation of the license renewal rule that relate primarily to clarification of the regulatory requirements and to simplification of the review process. These issues are being resolved in parallel with the license renewal applications to improve the implementation guidance being issued by the NRC.

For subsequent license renewal application reviews conducted in fiscal year 2000 and fiscal year 2001, the NRC will concentrate on process improvements to define the review scope more closely and to define future resource needs.

Question 32c. How is the agency planning to shift staffing and budget resources to handle the increased workload in this area in the coming years?

Response. Licensees have formally informed the NRC of plans to submit 12 additional renewal applications through fiscal year 2003. The NRC is budgeting resources to review these publicly announced license renewal submittals and also allow for some consideration of unannounced licensee renewal applications. Current budget estimates anticipate that the NRC will receive 4 renewal applications in fiscal year 2001, 4 in fiscal year 2002, and 8 in fiscal year 2003.

The staff recognizes the potential resource impacts of the unexpected receipt of a large number of renewal applications and has encouraged the licensees to inform the NRC of their plans for license renewal. The NRC will use its Planning, Budgeting and Performance Management process to update the budget in the event of emergent work, including license renewal applications of which we were not previously aware. The NRC expects efficiency gains in future reviews as experience is gained and implementation guidance is improved.

Question 32d. Has the Commission reached any conclusions about the adequacy of existing regulations for the extended term of operation?

Response. During the review of the first license renewal applications and the development of implementation guidance, the NRC did not identify any existing regulations that are not adequate for the extended term of operation. In fiscal year 2001, after completing development of the implementation guidance and gaining more experience with application reviews, the staff intends to evaluate the existing regulations pertaining to license renewal to determine if any changes should be considered.

The NRC is also addressing the issue of the extent of credit given for existing programs to manage aging effects. The implementation guidance being developed will

catalog aging effects that are adequately managed by existing programs and identify those programs that need to be augmented. This guidance will provide the basis for crediting existing programs and focus future staff reviews on augmented programs for license renewal. As discussed in the response to Question 32 (F), the implementation guidance is scheduled to be issued in draft form for public comment in August 2000.

Question 32e. In comparison to the 30 to 36 month targets set for review of the initial applications, what is the agency's current target for reviewing subsequent applications?

Response. Review of a license renewal application is planned to take 30 months or less following receipt of the application. For the first two applications, no hearing was conducted and the NRC was able to issue the renewed licenses for Calvert Cliffs in 23.5 months. The Commission similarly expects to decide on the Oconee application in less than 24 months. The NRC will continue to monitor experience and seek efficiencies where possible to improve on future schedules.

We anticipate the future reviews will require less resources per application than the initial reviews because of lessons learned from the initial applications. These resource savings will be available to support the increased number of license renewal applications that are under concurrent review.

Question 32f. What is the NRC's schedule for finalizing the Standard Review Plan for license renewal applications?

Response. The NRC's "Standard Review Plan for the Review of License Renewal Applications for Nuclear Power Plants" and the associated Regulatory Guide, "Standard Format and Content for Applications to Renew Nuclear Power Plant Operating Licenses," have been available in draft form since 1997. Revisions that incorporate experience from the first two renewal reviews are scheduled to be issued in draft form for public comment in August 2000 and in final form in April 2001. Also planned to be issued on the same schedule is the NRC's "Generic Aging Lessons Learned Report" that is referenced in the standard review plan, and an industry guideline, NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54—the License Renewal Rule," that would be endorsed by a regulatory guide.

Question 33a. Please respond to the following questions relating to how the Commission is planning to improve the efficiency of its regulatory process for safeguards and security at nuclear power plants, especially with regard to taking advantage of lessons-learned from the regulatory process improvements being made in other areas of plant operations:

How is the agency planning to carry over the lessons-learned to the area of safeguards and security?

Response. The Commission has directed the staff to: (1) conduct a comprehensive review of the regulatory requirements for safeguards and security at nuclear power facilities, and (2) proceed with necessary rulemaking. The primary goal of these initiatives, which has been discussed with stakeholders, is to achieve more efficient, effective safeguards and security requirements and to improve regulatory processes in this area, including incorporation of lessons learned from process improvements to the reactor oversight process. The staff is scheduled to provide a proposed rule to the Commission in May 2001, and a final rule to the Commission in July 2002, with publication of the final rule in late 2002. The status of staff activities in this area will be provided to Congress in our monthly report.

Question 33b. What changes are being planned in regulations to improve the focus on aspects of safeguards and security most directly linked to safety?

Response. The Commission has approved the staff's approach to re-evaluate the power reactor physical protection regulations and the proposed definition of radiological sabotage by providing performance criteria as the basis for physical protection regulations. Based on discussions with stakeholders in a series of public meetings, the staff developed a draft set of physical protection performance criteria in terms of public protection that are consistent with criteria used in other areas of nuclear power plant regulation. These performance criteria will provide the risk-informed basis for the comprehensive review of 10 CFR 73.55 and associated power reactor physical protection requirements, including requirements to exercise protective strategies.

These performance criteria will be based on a concept of ensuring that a plant retains the capability to shutdown the reactor safely and assure long-term heat removal in the face of a malevolent act consistent with the design basis threat. The staff is developing a proposed revision of 10 CFR 73.55 with requirements to protect the plant against such a malevolent act by protecting critical safety functions.

Question 33c. What are the agency's plans for assessing and adjusting the level of staff and contracted resources in this area?

Response. The staff has recently re-evaluated the level of NRC staff and contractor resources needed in the safeguards and security area as part of the development of the revised reactor oversight process. Inspection resources in the reactor physical security area were left essentially constant in the revised reactor oversight process, compared to the previous inspection program. The staff plans to re-evaluate resource requirements for the revised reactor oversight process, including the safeguards and security area, after the first year of its implementation. In addition, the staff will re-evaluate the resources necessary in the safeguards and security area following implementation of an acceptable industry program of exercises and drills, and again following a review and revision of the reactor physical security regulations.

Question 34. The committee understands that the nuclear industry has developed a self-assessment program for security. What changes to inspection programs can be made to take advantage of this industry program for more effective oversight?

Response. In the development of the revised reactor oversight process, the staff anticipated the future implementation of the industry's self-assessment program and some changes to the inspection program have already been made. The risk-informed baseline inspection component of the revised reactor oversight process includes inspections that will provide oversight of the self-assessment program once it is in place. It is noted that the self-assessment program is currently limited to exercises of protective strategies. NRC staff oversight also includes inspections of licensees' overall security and safeguards programs, including security access authorization, access control, and security plan changes.

Question 35. Questions have been raised regarding the subject of working hours and fatigue at nuclear power plants. What evidence do we have that fatigue, in fact, is contributing to operational problems within our nuclear facilities?

Response. In 1999, the NRC conducted a preliminary review of NRC inspection findings and plant operational experience related to working hours and worker fatigue at nuclear power plants. Findings from this review were summarized in a letter dated May 18, 1999, from former Chairman Shirley Ann Jackson to the Honorable Edward J. Markey. This letter stated that the NRC had attributed few events at nuclear power plants to personnel fatigue. However, it also noted that the number of events for which fatigue has been a contributing factor cannot be reported with certainty given the difficulty of making such determinations.

The staff is reviewing the Commission's Policy on Factors Causing Fatigue of Operating Personnel at Nuclear Reactors. During its review, the staff will consider: (1) the substantial scientific literature documenting the effects of fatigue on human performance; (2) the recognition that approximately 50 percent of the events reported annually to the NRC involve human performance issues; and (3) existing NRC fitness-for-duty requirements.

In addition, in February of this year the staff met with stakeholders for the purpose of better understanding issues and concerns associated with this policy and to facilitate the policy re-assessment process. The staff is currently evaluating the information gained through this stakeholder meeting, inspection findings concerning the working hours of personnel performing safety-related duties, instances of personnel found inattentive to duty, and concerns raised to the NRC regarding licensee practices and policies for ensuring that personnel who perform safety-related duties are not assigned to work while impaired by fatigue. The staff is also reviewing a petition for rulemaking (PRM-26-2) which proposes to address the subject of worker fatigue at nuclear power plants and is evaluating the information gained through the public comments on this petition. The staff anticipates that the policy reassessment process and review of PRM-26-2 will provide greater insights concerning the relationship between worker fatigue and plant operational safety and will establish a basis for appropriate NRC action on this matter.

Question 36. The committee is aware that the House Appropriations Subcommittee on VA-HUD and Independent Agencies has encouraged the NRC and Environmental Protection Agency to enter into a memorandum of understanding (MOU), "in the interest of ensuring that sites do not face dual regulation." The NRC and EPA have been directed to report to the House subcommittee by May 1, 2000, on the status of the development of such an MOU. Can you please share with us what progress has been made in reaching an MOU?

Response. Please refer to our response to your Question 2.

Question 37a. In August of 1998, the NRC pursuant to a statutory requirement submitted a report to Congress on the Price-Anderson nuclear insurance and liabil-

ity statute. [The Price Anderson Act—Cross the Bridge to the Next Century: A Report to Congress.] In the report, the NRC recommends that the Price-Anderson Act be renewed with only a few modest changes because the Act “provides a valuable public benefit by establishing a system for the prompt and equitable settlement of public liability claims resulting from a nuclear accident.”

I assume the NRC still stands by this report and supports extension of the Price-Anderson Act with few changes?

Response. The assumption is correct. The Commission still stands by its report and supports extension of the Price-Anderson Act for 10 years with few changes.

Question 37b. Does the Commission agree that the Price-Anderson insurance system worked at Three Mile Island by providing prompt compensation to the public?

Response. Yes. The Price-Anderson Act worked as intended for the public by providing prompt compensation in the following ways. The insurance pools responded rapidly to the TMI accident by establishing an office within 24 hours to pay claims for the living expenses of families with pregnant women or pre-school age children who had evacuated the five-mile area, at the Governor's suggestion. Families affected by the advisory were advanced funds for their immediate out-of-pocket expenses for food, lodging, transportation and emergency medical care. The financial loss caused by the interruption of business and loss of wages was compensated later.

Soon after the TMI accident, numerous lawsuits were filed in State and Federal courts in Pennsylvania, alleging various injuries and property damages. These suits were consolidated into one suit before the Federal District Court in Harrisburg. A Settlement Agreement was signed in these cases within two and a half years after the accident occurred. Pursuant to the agreement the insurers paid \$20 million into a Court managed fund for economic harm to businesses and individuals within 25 miles of TMI, and \$5 million for the establishment of a Public Health Fund. Additional sums have been paid out for indemnity and expenses in investigating and defending claims.

However, additional personal injury claims were later filed mainly in 1986—1987 and consolidated in the Pennsylvania Federal District Court. That consolidated litigation in the Middle District of Pennsylvania has not yet terminated. In that respect, it would be difficult to conclude that there was prompt resolution. Nonetheless, it is important to note several factors which contributed to the extended time period.

1. There were between two and three thousand personal injury claims involved.
2. The Three Mile Island incident was not determined to be an extraordinary nuclear occurrence. Thus, special provisions of the Act designed to expedite proceedings were not called into play.
3. This was the first significant litigation affected by the 1988 amendment's jurisdictional provisions. Thus, some novel issues were presented which caused delays that would not be expected to be repeated. There were, for example, difficult issues related to state laws on time bars to litigation that were affected by the new jurisdictional and choice of law provisions as applied retroactively to claims allegedly resulting from the 1979 incident.
4. Summary judgment was granted in favor of the defendants and was thereafter appealed, resulting in a partial remand. It is that partial remand that is ongoing.

Question 37c. I understand that the unique Price-Anderson system of a pre-paid insurance and retrospective premiums results in almost \$10 billion in financial protection for the public in the event of a nuclear accident.

Response. Your understanding is correct with respect to any nuclear accident at a commercial power reactor or Department of Energy facility, as well as during the transport of nuclear fuel to or from such reactors and facilities.

With respect to nonpower commercial reactors and reactors operated by educational institutions, the maximum amount of indemnity available for paying public liability claims is \$500 million to be paid by the U.S. government under agreements of indemnification. For those required by the Commission to have commercial insurance, an additional layer of funds could increase the total available for compensating public liability claims and paying expenses to \$560 million. Requirements for insurance are statutorily waived for educational institutions, and the government's liability under its indemnification agreements begins after the first \$250,000 of payments for public liability.

Question 37d. Would this level of insurance protection exist but for the Price-Anderson law?

Response. Without the Price-Anderson Act, the only insurance protection would be from commercial insurers or voluntary industry insurance pools. Commercial insurance of \$200 million is currently available. Under current Price-Anderson Act provisions, each power reactor licensed to operate at the time of the nuclear accident

would be required to contribute, if needed, \$83.9 million (assessed in payments not to exceed \$10 million annually) to a retrospective premium utility pool. That sum would compensate injury to the person or property of members of the public who were harmed. We have no basis to determine what level of insurance would be available without Price-Anderson.

Without an extension of Price-Anderson there would also be no limitation of the liability for any reactor whose operator had not executed an indemnity agreement before the termination of the Act. The ability to compensate claims related to reactors not so indemnified would be limited to the assets of the parties against whom there would be a judgment of liability.

RESPONSES BY RICHARD A. MESERVE TO ADDITIONAL QUESTIONS FROM SENATOR SMITH

Question 1. You have stated that the "protection of the environment" is one of your agency's strategic goals. EPA has indicated that NRC radiation standards for decommissioning are not adequately protective. Some have even questioned the NRC's qualifications to develop radiation standards. Others charge that it is the EPA that is unreasonable in its standards. Some charge that what makes matters even more confusing to the licensees, is the EPA's inappropriate application of radionuclide Maximum Contaminant Level (MCL) drinking water standards to ground water. It is claimed that for some radionuclides the MCLs would produce exposures as low as 0.02 mrem/yr, some 200 times lower than the 4 mrem/yr EPA water standard. Please explain the NRC's concerns with EPA's approach and why the application of the EPA's MCLs for radionuclides to groundwater is inappropriate. Please fully describe the implications of the EPA actions and pronouncements for your licensees and the regulatory environment. Also discuss, in some detail, the basis and health significance of the EPA's concerns regarding the NRC's regulatory decisions in decommissioning.

Response. The NRC has a fundamental disagreement with the EPA approach. The NRC believes that individual protection criteria, which take into account all pathways, are sufficiently protective of the groundwater pathway, and represent a more uniform and comprehensive approach to protecting the public health and safety. The NRC is aware that differences in NRC's standards (i.e., an individual dose of 25 mrem/yr from all pathways) and EPA's standards (i.e., an individual dose limit of 15 mrem/yr from all pathways and separate requirements for the protection of ground water) might suggest that there are resulting differences in the level of protection. However, the level of protection provided by either standard, when viewed in light of current epidemiology, is comparable. For example, EPA has determined that the NRC dose limit results in a cancer incidence (not fatality) risk of 5×10^{-4} and that the EPA dose limit results in a cancer incidence (not fatality) risk of 3×10^{-4} . Although EPA concludes that the NRC standard is not acceptable, the mathematical difference in the cancer risk between the two standards is so small that the epidemiology would not distinguish between them. Moreover, although there is little difference in the level of protection provided, analytical and decommissioning costs will certainly increase significantly under the EPA approach.

The NRC all-pathways annual individual dose limit of 25 mrem is fully protective of public health and safety and is a suitable standard for radiation protection. The 25 mrem/yr limit represents a fraction of the national and international public dose limit of 100 mrem/yr. The International Commission on Radiological Protection (ICRP) and the National Council on Radiation Protection and Measurement (NCRP) use an approach similar to NRC's in setting an acceptable risk level. ICRP and NCRP are organizations which are chartered, and internationally recognized, for the development of basic radiation protection standards throughout the world and in the U.S. Their findings are contained in ICRP Publication 60 and in NCRP Report No. 116, respectively. Based on a review of health and societal issues, both documents (while acknowledging the difficulty of setting standards for an "acceptable" public dose limit) arrive at 100 mrem/yr from all sources as a level that can be said to be acceptable. Generally, a principle of apportioning this total dose limit is used to constrain specific sources of exposure. ICRP emphasizes that these partitions of the individual dose standard for individual activities such as waste disposal are not dose limits but rather are constraints, above which doses would not necessarily be considered unacceptable unless the dose exceeded 100 mrem/yr. ICRP recommends a constraint value in the range of 30 mrem/yr. In addition, none of the national and international recommendations for radiation protection calls for a separate standard for groundwater as required by EPA. The drinking water pathway is included in the all-pathways approach and there is no reason to single it out for a lower dose limit.

Not only does EPA have a separate ground water limit of 4 mrem/yr, EPA implements this ground water limit by establishing maximum concentration limits (MCLs) for various radionuclides. EPA's application of the MCLs for decommissioning activities is inappropriate for several reasons. First, EPA originally derived these limits to protect consumers from harmful contaminants in drinking water from public drinking water supplies. If the drinking water contamination level was too high, the tap could be closed and the water further treated to meet these standards. However, without a technical justification or cost benefit analysis, EPA is attempting to apply MCLs to protect ground water. The MCLs were not designed as a ground water protection standard and are inappropriately being applied in this area.

Second, MCLs, as they exist today, result in non-uniform risk protection levels for the various radionuclides. The EPA's MCLs may have appeared to be reasonable standards when they were developed in the mid-seventies. In view of what is known today, however, about risk posed to individual organs by radiation exposure, the MCLs for individual radionuclides provide levels of protection that vary significantly (risk values vary more than 10,000 fold). In effect, the MCLs for radionuclides with exposures much below 4 mrem/year (to as low as 0.02 mrem/yr) become the effective standard for the site as they establish very limiting conditions for acceptability which could result in resource expenditures without additional protection to public health and safety. The NRC strongly objects to the application of MCLs that result in non-uniform risk levels because such practices (1) contribute to greater confusion about the level of risk that is acceptable and attainable and (2) undermine confidence that the health and safety of the public are being protected. There is no sound scientific or technical basis for the arbitrary range of protection afforded by EPA's MCLs.

Finally, the inappropriate application of MCLs to decommissioning not only provides no additional benefit to public health and safety, but also adds complexity and additional cost to any demonstration of compliance with the regulations.

Question 2. You are developing an MOU with the EPA to resolve the confusion associated with EPA's activities regarding decommissioning of nuclear facilities. What progress have you made so far? Is the EPA's Office for Air and Radiation the lead for this activity? Please explain the role of that Office and the Office of Water in this effort.

Response. In report language to H.R. 2684, August 1999, it was stated that EPA should continue its policy of deferring to NRC for cleanup of NRC licensed sites. Both agencies were requested to report by May 1, 2000, on development of a Memorandum of Understanding (MOU) that would clarify EPA's involvement at NRC sites, when requested by NRC. The Commission responded to Congressional oversight committees, including this committee, on May 1, 2000, on the status of the development of such an MOU and stated that it reserved any conclusion as to whether an MOU will be achievable. The NRC will keep the committee informed about the status of the MOU.

Limited progress has been made on developing an MOU. Mr. Timothy Fields, EPA Office of Solid Waste and Emergency Response sent a February 17, 2000, letter to Dr. William Travers, NRC Executive Director for Operations indicating that Mr. Larry Reed would serve as the EPA point of contact for development of the MOU. This letter enclosed a memorandum providing EPA guidance that is intended to clarify EPA's role under the Comprehensive Environmental Response, Compensation, and Liability Act at facilities previously or currently licensed by NRC. These materials provided by Mr. Fields suggested to NRC that the differences in each agency's policy may not be resolvable without legislation.

On February 23, 2000, NRC sent a letter to EPA Administrator Browner, that enclosed a draft MOU between EPA and NRC on the decommissioning and decontamination of NRC-licensed sites, consistent with the House Report language. The proposed draft MOU included provisions that the NRC would provide notice to the EPA of those cases in which the NRC's all-pathways residual radiation dose may exceed EPA's preferred all-pathways limit of 15 mrem/year and of those cases in which NRC requests EPA consultation. These proposals would provide finality, avoiding potential dual regulation for NRC-licensed sites by relying on the NRC's decision on license termination. Because the MOU is the subject of on-going negotiations between the two agencies, the draft MOU was not made public.

On March 14, 2000, NRC responded to Mr. Fields' February 17, 2000, letter. The NRC letter requested initiation of a process that would lead to finalizing an MOU to eliminate dual regulation at decommissioning sites consistent with NRC and EPA requirements.

On March 22, 2000, Mr. Fields, EPA, responded to the NRC letter indicating EPA was optimistic about the development of a workable MOU that would address the sites in a protective manner without dual regulation.

Subsequently, each agency's representative for development of the MOU met on March 27, 2000, and April 24, 2000, to discuss each agency's policies and processes related to site decommissioning and to discuss options for development of an MOU. At the April 24, 2000 meeting, both agencies exchanged ideas concerning language for an MOU. Each agency agreed to meet again on May 23, 2000, which will provide an additional opportunity to discuss options for development of an MOU. NRC staff have also been meeting with EPA Office of Radiation and Indoor Air (ORIA) and EPA Region I to develop a protocol that addresses site-specific cases.

In the past, the NRC has offered legislative language which would amend the Comprehensive Environmental Response, Compensation, and Liability Act to address the Commission's concerns with dual regulation. In 1997, H.R. 3000 contained language in this regard that was acceptable to the Commission. If current efforts to create an acceptable MOU between the two agencies fail, the Commission would support a legislative solution.

Question 3. Please explain the rationale for the Commission's decision to move the Technical Training Center from Chattanooga to Maryland. Also please provide a cost-benefit analysis for this decision including the initial capital cost required for this effort.

Response. In February 2000, the Commission reached a unanimous decision to relocate the NRC Technical Training Center (TTC) from its existing location in Chattanooga, Tennessee, to a location near the NRC headquarters buildings in Rockville, Maryland. The Commission considers it important to establish a more robust technical training program in headquarters, where approximately 1,900 of the approximately 2,800 NRC staff members are located. Relocating the TTC staff and functions, along with the four full scope reactor training simulators which model the operational reactor vendor designs in the U.S., would enable the NRC to enhance the level of training for headquarters personnel who currently do not take full advantage of the TTC facilities because of concerns about the associated travel involved. The Commission also believes that the rapidly changing regulatory environment and the emergence of new technologies require that the TTC staff work more closely with NRC Headquarters managers and technical experts to increase awareness of current agency activities and perspectives in order to integrate these perspectives more fully into ongoing training courses.

Prior to Commission consideration of alternatives, the NRC contracted with a private firm, Grant Thornton LLP, to perform an independent estimate of the costs of relocating the TTC and personnel to a location near NRC headquarters in Rockville to estimate the costs for maintaining and operating the TTC in Rockville versus Chattanooga, and to prepare a break even analysis that identified the amount of time it would take the NRC to recoup the relocation costs. The conclusions from the independent cost study were that the costs to establish the TTC in Rockville would be between \$3.9 million and \$4.2 million depending on the number of simulators being moved, that only a small percentage of the cost of establishing the TTC in Rockville could be recovered, and that there were no break even points for any of the scenarios considered by the cost study within the 10-year life cycle. Subsequent to the completion of the independent cost study, additional scenarios not identical to those depicted in the Grant Thornton LLP final cost study report were considered and evaluated using the same assumptions and methodology as used for the independent cost study. In reviewing and studying the results, the Commission determined that over a 10-year period there would be neither significant increased costs nor significant savings as a result of relocating the TTC. The one-time costs to implement the Commission's decision to relocate the TTC with all four reactor simulators to the NRC headquarters area, as announced on February 24, 2000, were estimated at \$4.5 million.

On February 24, 2000, Senator Fred Thompson, Chairman, United States Senate Committee on Governmental Affairs, requested that the General Accounting Office (GAO) perform an analysis of the costs and benefits associated with the Commission's decision to relocate the TTC from Chattanooga to Rockville. On March 16, 2000, the Commission decided to delay implementing the decision to relocate the TTC until the GAO has had an opportunity to conduct an independent study of the issue. The Commission directed the NRC staff not to take any action to carry out the Commission's previous direction to move the TTC to headquarters until the GAO issued its report and the Commission has had an opportunity to review its recommendations. This GAO audit began in April 2000; it is our understanding that the GAO report may be issued in 5-6 months.

Question 4. In case there are delays in the finalization of the high level waste repository, how prepared is the NRC to ensure that there is enough storage capacity, and, specifically, is the spent fuel cask certification process adequately addressing the needs of the industry?

Response. Because the time of availability of a geologic repository remains uncertain, the NRC staff has undertaken several initiatives to respond to utilities' interim spent fuel storage needs, including giving high priority to the review of dual-purpose cask systems that accommodate the need for both spent fuel storage and transportation. We have certified 12 generic, spent fuel storage cask designs and anticipate certifying 2 additional designs by the end of fiscal year 2001. Of these 14 spent fuel storage designs, 7 will be dual-purpose casks. So far, 13 reactor sites are utilizing dry cask storage technology and 18 additional reactor sites plan to implement dry cask storage in the near future.

The NRC is also working with industry on spent fuel storage options at away-from-reactor sites which would store spent fuel from multiple reactor sites. The Private Fuel Storage, Limited Liability Corporation, a private consortium of eight utilities, submitted an application in 1997 for an ISFSI on a site leased from the Skull Valley Band of Goshute Indians in Utah. This application is currently under review and subject to hearing before an Atomic Safety and Licensing Board. Also, in late fiscal year 2001 we anticipate receiving an application from the Owl Creek Energy Project for a privately-owned, ISFSI to be located in Fremont County, Wyoming.

NRC staff has made changes to streamline and make the technical review process more predictable and stable. These review process changes ensure that storage and transport portions of well-prepared applications are reviewed and approved within 13 months of the start of the review, an improvement of about 1 year over previous review time estimates. The rulemaking certification process will add an additional 11 months, for an overall approval schedule of approximately 2 years.

The NRC staff is working to further improve and streamline the review and regulatory process. For example, the NRC staff is working with industry to develop implementing guidance for the recently revised 10 CFR 72.48, which will be effective mid fiscal year 2001. This revised regulation will allow certificate holders (cask vendors) to make minor, non-safety significant changes to their cask design without obtaining prior NRC approval, (i.e., amending the certificate). The NRC continues to work with industry on regulatory and technical issues of mutual concern, such as shipping and storing high burn-up fuel, the use of burn-up credit, and certificate of compliance and license renewal.

NRC maintains cognizance of the status of power reactors and their capability to store spent fuel. The NRC will continue to maintain awareness of any potential delays in the Department of Energy's waste disposal program.

In summary, while the staff has already approved multiple spent fuel storage cask design options, we continue to work with stakeholders to improve the regulatory process and provide increased on-site and off-site storage options.

Question 5a. The NRC has made serious strides to change its regulatory thinking, i.e., the move towards a risk-informed approach. This approach will identify some activities that may require more attention and resources and some that should be dropped because of their low risk.

What are those activities that would require more resources and what are those that are candidates for elimination?

Response. The NRC, through its current programs and planned initiatives, is implementing a risk-informed approach to its full range of regulatory activities: rule-making, licensing, inspection, enforcement, performance assessment, and event response. Our experience has shown that each activity contains a mix of risk-significant and non-risk significant issues. The risk-informed approach does not provide a basis for dropping any of these activities. However, within each activity, the risk-informed approach allows the agency to concentrate its resources, and the resources of licensees, on those issues which have the greatest risk-significance. For example, under the new reactor oversight process, each NRC inspection finding will be evaluated using a significance determination process (SDP). Only those findings which can be shown to have a significant effect on public risk, or those such as discrimination or intentional violation, will result in follow up action by our Regional Offices. This new approach will ensure that risk-significant issues receive the appropriate level of attention.

A second example relates to the NRC response to operational events. When a potentially significant operational event occurs at a reactor in the United States, the NRC conducts an inspection to determine the proper agency response. These inspections may involve various size teams of NRC staff. The newly implemented agency practice is to evaluate the risk-significance of the event, and use that assessment

as a major input to the decision regarding what level of follow up inspection is conducted.

Our approach to risk-informing 10 CFR Part 50, through evaluation of the special treatment requirements for systems, structures, and components, will likely result in reduction in regulatory oversight for those areas that only contribute marginally to controlling plant risk. For other areas, this approach may identify the need for additional regulatory treatment. This effort is currently in progress, and it is not possible to state definitively which areas will fall into the high- and low-risk categories.

In summary, the risk-informed approach will provide the basis for concentrating agency resources on those regulatory issues which have potential significance to public risk, while placing less emphasis on those issues which have only marginal impact on risk. We expect that the overall effect of these changes will be an increase in the efficiency of our regulatory program. However, it will not, in and of itself, result in the elimination of any major regulatory activities.

The results of a risk-informed evaluation of agency activities also provides input to the overall Planning, Budgeting and Performance Management (PBPM) process. In the context of that process, resources are prioritized according to the contribution of activities to meeting the agencies four performance goals (maintain safety, increase public confidence; increase effectiveness, efficiency, and realism; reduce unnecessary regulatory burden). Other things being equal, activities that have a low-risk significance would be assigned lower priority and thus be allocated less resources.

Question 5b. Also, please explain the more significant concerns expressed by our stakeholders if the agency becomes more performance-based and less prescriptive.

Response. The NRC has had the benefit of interacting with a wide variety of stakeholders on the subject of performance-based regulation. In addition to correspondence on published material, the interaction has occurred at two public workshops which were conducted as facilitated discussions.

Many participants at the meetings were advocates for performance-based approaches. It appears that application of the performance-based approach, which emphasizes results and objective criteria, does not itself cause much concern. However, some concerns have been noted regarding the NRC's initiatives to develop and apply performance-based approaches. The concerns may be characterized as "implementation issues" and "trust issues." Moreover, the foundations for deterministic and prescriptive regulatory requirements in technical fields are easier to communicate than performance, risk-based requirements, and hence appear to raise fewer concerns.

The implementation issues appear to arise from past NRC practices that are seen as inconsistent and incoherent. For example, some stakeholders have expressed concern that the regulatory approaches followed by the regions and headquarters staff have not always been consistent with each other. Some have also stated that documents which describe regulatory improvement efforts present positions with merit, but the actions taken by NRC based on those positions seem to be at odds with the expectations developed from the documents. Stakeholders who feel this way seem to believe that performance-based approaches to regulation will increase flexibility and hence the likelihood that staff's actions will differ from the documented intent of the regulatory requirement.

The trust issues appear to arise from a perception that industry representatives have inordinate influence on NRC decisions. For example, a concern has been raised that the NRC may accept performance data reported by licensees without subjecting such data to rigorous scrutiny. Some appear to perceive too much industry influence in setting the performance standards as well.

The NRC is paying close attention to such concerns as we develop and implement performance-based regulatory approaches. Public involvement is being emphasized to a much greater extent and a wider range of stakeholders are being sought to provide public input. Basic policies and principles which have been articulated by the Commission will be explicitly used as the foundation on which regulatory practice will be conducted. Every attempt is being made to maintain an alignment between our principles and our practices.

In addition, our staff has displayed a questioning attitude with respect to changes in oversight programs (inspection, assessment, enforcement). We encourage this type of attitude in our licensees, and view it as healthy for the staff as well. We are continuing to reach out to our staff and solicit feedback, and will make changes as appropriate. As the new reactor oversight process is implemented and improved, and inspectors become more familiar with it, we believe confidence and acceptance will increase.

STATEMENT OF RALPH BEEDLE, SENIOR VICE PRESIDENT AND CHIEF NUCLEAR
OFFICER, NUCLEAR ENERGY INSTITUTE

INTRODUCTORY COMMENTS

Chairman Inhofe, Ranking Member Graham and distinguished members of the subcommittee, I am Ralph Beedle, senior vice president and chief nuclear officer at the Nuclear Energy Institute, the Washington, D.C. policy organization for the nuclear industry. I am pleased to testify regarding the performance of the commercial nuclear industry and the industry's safety regulator, the Nuclear Regulatory Commission.

The Nuclear Energy Institute (NEI) establishes industry policy positions on various issues affecting the nuclear energy industry, including federal regulations that help ensure the safety of the 103 operating commercial nuclear power plants in 32 states. NEI represents 275 companies, including every U.S. utility licensed to operate a commercial nuclear reactor, their suppliers, fuel fabrication facilities, architectural and engineering firms, labor unions and law firms, radiopharmaceutical companies, research laboratories, universities and international nuclear organizations.

The United States has the largest commercial nuclear power industry in the world, with more than 2,200 reactor years of operating experience. More than 100 nuclear power plants continue to safely and reliably produce nearly 20 percent of America's electricity. Over the past decade alone, improvements in nuclear plant operating efficiency have effectively added the equivalent of twelve 1,000-megawatt plants to the national electric grid. The U.S. nuclear industry also is the global leader in the development of advanced nuclear power plant technology. The foundation for this leadership role is the extensive use of nuclear power in this country and the industry's outstanding safety and performance records.

Nuclear power provides our nation with tremendous environmental benefits. Without nuclear energy, the United States could not meet air quality standards established by the Clean Air Act or international commitments to reduce greenhouse gases, including carbon dioxide. Nuclear power plants are the nation's largest emission-free source of electricity, and they produce power at a competitive price—with production costs that are only a fraction of a cent higher than coal-fired electricity and substantially cheaper than natural gas, solar or wind power.

Within Congress, and indeed across the United States, there is a growing awareness that nuclear power is a proven, dependable technology and a vital part of our nation's electricity generating system. Nuclear energy will become even more essential if our nation is to meet the multi-faceted demands of economic expansion, environmental stewardship and population growth in the 21st Century.

NUCLEAR ENERGY: SAFE AND RELIABLE

The U.S. electricity industry is rapidly changing, and America's nuclear industry embraces the challenges and the opportunities of the new competitive marketplace. Most U.S. utilities with nuclear energy are well positioned for competition.

The performance of U.S. nuclear plants has in each of the last two years reached record high levels. In a restructured electricity market that eliminates the rate base, a fully depreciated nuclear plant will demonstrate enormous economic potential. Recognizing nuclear energy's success and its importance both to economic growth and environmental protection, we ask the subcommittee to maintain its oversight of the Nuclear Regulatory Commission. Today's outstanding nuclear power plant performance and safety must be maintained for the long term. The NRC's transition to a nuclear plant oversight process that focuses on safety is an important component for the future nuclear energy industry.

Attached to this testimony is the 1999 list of the World Association of Nuclear Operators' (WANO) performance indicators for nuclear reactors.

The nuclear industry's continued commitment to safe nuclear plant operation must be accompanied by the NRC's commitment to fulfill its mission as an effective and credible regulator. Both are essential to maintain public trust and confidence in nuclear energy. In addition, Congress must continue strong oversight over the NRC and support the regulatory changes being made by the NRC.

RELICENSING AND LICENSE TRANSFERS

Nuclear power plants are valuable and highly marketable facilities, with some plants being sold by those companies choosing to leave the electricity generation business. In addition, the owners of the vast majority of nuclear power plants are expected to extending the operating licenses for an additional 20 years. The market demand for nuclear power is evident in the purchase of Three Mile Island 1 and Clinton nuclear power stations by AmerGen Energy Co., and the purchase of the

Pilgrim nuclear power plant by Entergy Operations Inc. Future power plant sales and anticipated consolidations in the industry will require the NRC to transfer operating licenses in a timely manner.

The NRC has recognized the importance of swift action in these transactions, and the agency should be commended for its attention to improving the license transfer process. The commission should continue to ensure timely reviews and disciplined licensing board proceedings related to license transfers and amendments.

Baltimore Gas & Electric Co., Duke Power Co., Entergy and Southern Nuclear Operating Co. have filed applications with the NRC to extend operations at eight nuclear reactors for additional 20-year periods. Electric companies have announced they will file applications with the NRC to extend the plant licenses at 22 other reactors during the next four years. License renewals and transfers will become more frequent as electric utilities reposition themselves in a competitive electricity market.

A competitive market requires efficient, standardized and timely license renewal and license transfer processes. Because the economic viability of a license transfer proposal can be impacted by a commission review, such processes are essential to enable nuclear operating companies to make timely and effective business decisions. An expeditious relicensing process best serves the public interest.

The NRC is expected to meet the original 30- to 36-month target for completing the initial two license renewal applications, submitted by Baltimore Gas & Electric Co. and Duke Power Co. In fact, those applications are being completed ahead of schedule.

Using the experience of the first two reviews to refine the process, future relicensing efforts should continue to be streamlined. The NRC's performance on license renewal applications is an example of the agency working in an efficient manner to accomplish an important objective. A true test of the NRC will be the agency management's ability to shift staffing and budget resources to review a larger number of nuclear plant licensing extension applications expected in the coming years. It is essential that the NRC incorporate efficiencies that have been learned during the first two license renewal applications into future license renewal applications.

NRC REGULATORY REFORM

A credible and effective regulator is vitally important to the nuclear power industry. The new oversight process better focuses resources on those aspects of plant operation most directly linked to safety. The new system will continue the baseline inspection program for all plants. Those plants that do not meet the highest level of performance, as measured by 19 key plant performance indicators, will receive increased inspection and oversight.

In moving to this new system, the NRC is replacing an oversight process rooted in subjective plant performance ratings with a safety-focused assessment process that uses objective measures of key plant performance.

This new safety-focused regulatory oversight process retains the baseline NRC inspection program at nuclear power plants. NRC inspectors will continue to work at each nuclear power plant, monitoring operations on a daily basis. In addition, the nuclear energy industry, both through the plant owners and the Institute of Nuclear Power Operations (INPO), continually performs on site plant evaluations and self-assessments.

By focusing its resources on safety-related issues, the NRC can carry out its mission most effectively. As NRC Commissioner Nils Diaz testified in July 1998, the need to change the NRC's regulatory approach "is not an indictment of the past, but a requirement of the future." Like the industry it regulates, the NRC must adapt to a changing environment.

Mr. Chairman, I would like to emphasize the importance of this subcommittee's support and oversight of the NRC in recent years. Congressional oversight hearings have been instrumental in encouraging the NRC commissioners and staff to move forward on many long-standing issues, such as implementing the safety-focused, performance-based approach for assessing nuclear power plant operations using objective plant performance measures. Positive change is underway at the NRC—change for which you and the commission both deserve credit.

Continued congressional oversight, coupled with periodic NRC public meetings among all stakeholders, is producing the desired regulatory change at the agency. There is general consensus among the NRC and its stakeholders that nuclear safety will be enhanced by a more objective prioritization of resources based on quantifiable safety significance to plant operations. Building on this consensus for change, the industry strongly urges this subcommittee and Congress to continue its support and oversight of the NRC as it moves to a new regulatory system. Congressional

oversight can help keep the agency focused on the essential public policy concern—maintaining a high level of public safety. In that light, I would appreciate the opportunity to return and tell you about the nuclear energy industry's progress soon after the 107th Congress convenes next year.

PILOT PLANT EXPERIENCE

After a year long development phase, the NRC tested the new oversight process at 13 reactors in seven states during June–November 1999. The new oversight process used 19 indicators to gauge plant performance in three areas: plant safety, radiation safety and security. Performance for each indicator was measured during the course of the pilot program and placed in one of four color-coded bands. The color-coded indicators of plant performance will be posted quarterly on the NRC's website—along with key findings from quarterly plant inspections. Preliminary data from performance indicators for all 103 reactors show that 98 percent of all indicators are at the highest level of safety.

The pilot program served its primary purpose by testing the performance indicators and ensuring that participants understand how to calculate and report data in each area to the agency. The industry and the agency evaluated the new processes during the pilot program, and modifications have been made to the program in preparation for an anticipated industrywide rollout in spring 2000. The evaluation and modification period should continue through the end of the initial year of implementation at all plants.

NEI believes that the new oversight process, coupled with the industry's commitment to safety, will achieve the following goals:

- ensure that nuclear power plants continue operating safely
- improve NRC efficiency by focusing resources on those areas most important to safety
- reduce unnecessary regulatory burden on licensees
- improve public access to information on the safe operation of nuclear power plants.

GAO REAFFIRMS NEED FOR NRC TRAINING AND STRATEGIC PLANNING

The nuclear industry shares the concerns of this subcommittee regarding the results of the recently released General Accounting Office survey of the attitudes of NRC employees. The study reports that some NRC employees are skeptical of the shift toward safety-focused regulations and a new assessment process. In reviewing those conclusions, however, this subcommittee should not lose sight of an important finding: The GAO study showed that the NRC staff—by a 2-to-1 margin—believes that the transition to a regulatory process that incorporate risk insights will *improve* nuclear plant safety.

Despite staff skepticism, the GAO study also confirms that change is beginning to take hold at the agency. Employee concerns voiced in that study are typical of any large organization in transition. The GAO conducted its survey in August and September of last year, but since that time the NRC has completed its pilot program and conducted internal and external evaluations of the program that involved staff in each NRC region.

In its assessment of NRC staff attitudes, the GAO concluded that there is a need for long-range planning and training by the agency as it makes this significant transition to a new oversight process. Planning and training are essential to improve NRC employee understanding and acceptance of the new oversight process. The GAO concluded that reform efforts were being hindered by the lack of a detailed NRC strategic plan with quantifiable goals and objectives. The industry also believes that the lack of adequate training for NRC employees and the failure to implement a long-term strategic plan could be impediments to the effective and efficient implementation of the new oversight process.

Given this recent release of the NRC's strategic plan, the industry has had time for only a preliminary review of the plan, but we believe that the NRC's strategic plan as drafted is not sufficient to guide the agency during this period of significant change. The industry agrees with the GAO that the NRC must implement a more comprehensive strategic plan to assist the agency's transition to a new regulatory framework. Many of the concerns voiced by NRC staff to the GAO may stem from a lack of effective communication between the commission and staff regarding the new regulatory oversight process. Making the NRC long-range strategic plan more detailed should be a major step in the agency's earning the support of those staff who are reluctant to embrace change. We suggest that the NRC's strategic plan be revised to specifically include the following principles:

- a safety-focused regulatory framework that incorporates risk insights;

- a more efficient and accountable regulator;
- an integrated NRC strategy for achieving the objectives of regulatory reform;
- a specific timetable and milestones to ensure the NRC's long-range plan is implemented on schedule; and
- staff resources and a fully accountable budget that supports fundamental NRC reform.

This multi-year plan also should include an annual planning process that establishes a meaningful set of NRC objectives with measurable results. The long-range strategic plan should integrate the principles of regulatory reform outlined in this testimony, with measurable goals and objectives to demonstrate progress to achieve reform of the regulatory system. It also should recognize improved plant safety and performance and account for new demands on the regulatory process, such as license renewal and transfer procedures, resulting from the transition to a competitive electricity market.

The commission must examine what appropriate levels of staffing and budget are required for future years. The NRC should optimize its resources, including an examination of its organizational structure, to conform to the new regulatory oversight process. The commission also should allocate resources in a manner that ensures adequate staff support.

NRC SHOULD SEEK LEGISLATIVE CHANGES

The nuclear industry also believes that several legislative proposals regarding the NRC deserve the support of this committee. NEI supports each of the legislative proposals forwarded last year by the NRC to Congress. Amending the Atomic Energy Act with respect to foreign ownership, eliminating antitrust reviews at the NRC and providing for flexibility in the hearing process are particularly important.

NEI appreciates the efforts of this subcommittee and the full Environment and Public Works Committee in passing S. 1627 and forwarding it to the Senate for consideration. Although we were disappointed that several of the provisions recommended by the NRC were not included in the bill, the industry will continue to work with each of you to solve problems with those provisions so that they may become law.

In addition to the legislative changes recommended by the NRC, NEI urges the subcommittee to consider amending the Atomic Energy Act to allow the NRC more flexibility in the way that it is organized. Current law requires that the NRC organization include certain divisions. Those restrictions should be removed from the statute, and the commissioners should be allowed to organize the agency in a manner that is most effective and efficient and that reflects the changing regulatory environment.

NUCLEAR INDUSTRY USER FEE ADJUSTMENT

Current law requires the NRC to collect approximately 100 percent of its budget through licensee user fees. Most of those fees are collected as a generic assessment equally levied against all licensees, creating, in effect, a "miscellaneous" category to describe nearly 80 percent of the NRC's budget. This practice is contrary to sound and accountable budgeting. By collecting the vast majority of its budget from a general user fee assessment, the NRC has failed to provide Congress and the industry with the budget data and information necessary for a thorough and complete evaluation.

In testimony last year before this subcommittee, NEI urged Congress to ensure that the NRC adheres fully to the requirements of the Omnibus Budget and Reconciliation Act of 1990 and submit legislation, if necessary, to modify the NRC fee structure so that licensees are assessed fees only for those NRC programs related directly to licensee regulation. Unrelated agency expenditures, such as international activities and regulatory support to agreement states or other federal agencies, should be excluded from nuclear plant licensee user fees. Instead, NEI recommended that those costs be included in a specific line item in the NRC's budget, subject to the authorization and appropriations process. Finally, the industry urged Congress to reexamine the agency's ability to collect user fees annually until the commission completes its regulatory reform initiatives.

As directed by this subcommittee in 1999, the agency is making commendable progress to remedy the problem of user fees supporting NRC activities unrelated to licensee activities. While these non-licensee related NRC activities may be beneficial, they do not directly relate to the regulation of agency licensees. The commission's budget for FY2001 proposes that the NRC collect approximately 98 percent of its budget from user fees levied on licensees, excluding funding from the federal Nuclear Waste Fund. Each fiscal year from 2001 through 2005, the proportion of

the NRC budget derived from user fees will decrease by 2 percent. By 2005, user fees should represent 90 percent of the NRC budget base rather than the entire budget. While this is an important first step by the NRC, the most equitable outcome would be an immediate reduction in the user fee by the entire \$50 million being spent on unrelated activities.

DUAL REGULATION

Since the agency's formation in 1975, the NRC has been effective in developing and implementing radiation safety standards to protect public health and safety. Due to duplicative and overlapping regulatory authority, the Environmental Protection Agency (EPA) has become involved in the NRC's regulatory process, most notably in the decommissioning and remediation of NRC-licensed sites. For example, the EPA has challenged the NRC regulatory program in written comments and public meetings, and it has threatened to overturn NRC regulatory decisions by listing decommissioned sites on the National Priorities List (NPL) under Superfund authority. Such dual regulation diverts licensee resources, increases costs and reduces the effectiveness of regulation by the federal government without measurably improving public health and safety. It also undermines public trust and confidence in federal regulation of nuclear technology.

Mr. Chairman, Congress cannot afford to let the federal government waste public and private resources on overlapping regulatory activities that do not improve public health and safety. This subcommittee has jurisdiction over both agencies, and the industry encourages you to eliminate dual regulation of NRC-licensed facilities and to reaffirm the NRC as the sole and proper authority for assuring radiation safety at those facilities.

RADIATION STANDARDS

Protection of public health and safety is the industry's priority, and this concept extends to the practice of sorting solid material that can be removed from nuclear power plant and other facilities that use nuclear technologies without safety consequences. These materials are slightly radioactive, but significantly less so than low-level radioactive waste or used nuclear fuel, both of which must be disposed at facilities licensed by the federal government. The NRC has established safe standards for the control of liquids and gases at these facilities, but no consistent federal standard has been established for the removal of solid materials. Good public policy demands consistency in the application of government regulations for all materials.

In the interests of good public policy, the NRC is considering a rulemaking to set standards for the removal of safe solid materials and equipment to and from nuclear facilities. Materials above the NRC safe release standard would continue to be fully regulated with regard to safe handling, transportation and disposal. No high-level radioactive waste or used nuclear fuel would qualify for safe uncontrolled release under this type of standard. NEI commends this NRC initiative and encourages the agency to move expeditiously through formal rulemaking to establish a safe standard for removal of solid materials.

The international community has established guidance for the removal of solid materials through the International Atomic Energy Agency (IAEA). Member states of the European Community must have clearance regulations in place by May of this year. On Aug. 31, 1999, the American National Standards Institute approved ANSI/HPS N13.12, "Surface and Volume Radioactivity Standards for Clearance," which the NRC could endorse. It is time for this nation to establish a standard for the clearance of safe materials from nuclear facilities, and the NRC is the appropriate federal agency to do so.

SUMMARY OF KEY POINTS

- In 1999, the nuclear power industry had a record year for safety and electricity production. In fact, there has been a steady improvement in nuclear power plant safety, as demonstrated both by NRC and industry plant performance indicators. Through November of last year, the average capacity factor for all 103 reactors was 86.8 percent—a 9.2 percent increase over 1998.
- This outstanding safety record has set the stage for the NRC's transition to a new nuclear power plant oversight process. This process will focus attention on those areas of the plant most important to ensuring safety, as indicated by a regular NRC inspection program based on 19 plant performance indicators. Continued congressional oversight of the NRC and support for this new process by this subcommittee is important to continue a successful transition to safety-focused oversight.

- As the General Accounting Office's study of the NRC's new oversight process reveals, change is beginning to take hold at the agency. However, there is some skepticism of the new process among NRC staff, as one might expect during this kind of transition by a large organization. GAO recommends that the NRC implement additional training and planning to educate the agency workforce on this new oversight process. The industry agrees with GAO. There is a need for employee training and long-range strategic planning by the agency to ensure that NRC employees understand the new oversight process and that adequate resources are available for initial implementation at all nuclear power plants.

- NEI has recommended, in previous testimony before this subcommittee, that the NRC adopt a comprehensive five-year strategic plan. Given the release of the NRC's draft strategic plan just last week, the industry has had time for only a preliminary review of the plan. However, the industry believes that the NRC's strategic plan as drafted is not sufficient to guide the agency during this period of significant change. The NRC's strategic plan should recognize improved industry safety and performance and account for new demands on the regulatory process, such as license transfer and renewal procedures. The agency should optimize its resources, including an examination of its organizational structure, to allocate resources in a manner that ensure adequate staff to set the foundation for broad regulatory reform.

- The NRC should also incorporate sound budgeting practices into its strategic planning. Under the current user fee system, most of the fees are collected as a generic assessment equally levied against all licensees. This creates, in effect, a "miscellaneous" category to describe nearly 80 percent of its budget. This system also fails to provide Congress and the industry with the budget information necessary for a thorough and complete evaluation of its effectiveness and efficiency.

The industry strongly encourages this subcommittee and the Congress to continue its oversight of this agency as it moves to a safety-focused regulatory oversight program. NEI appreciates this opportunity to submit testimony, and recommends that this subcommittee holds a hearing early in the 107th Congress to examine the industrywide implementation of the new regulatory oversight process.

STATEMENT OF MS. GARY L. JONES, ASSOCIATE DIRECTOR, ENERGY, RESOURCES, AND SCIENCE ISSUES, RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE

Mr. Chairman and members of the subcommittee: We are pleased to be here today to discuss the Nuclear Regulatory Commission's (NRC) move from its regulatory approach which was largely developed without the benefit of quantitative estimates of risk, to an approach—termed risk-informed regulation—that considers relative risk in conjunction with engineering analyses and operating experience.¹ Our testimony addresses (1) the views of NRC staff (based on our survey that was reported to you in January) on the quality of the work NRC performs,² NRC's management of and the staff's involvement in changes occurring in the agency, and the move to a risk-informed regulatory approach; and (2) the status of NRC's efforts to develop a comprehensive strategy to implement a risk-informed regulatory approach.

In addition, you asked us to provide information based on past reports on the disagreement between NRC and the Environmental Protection Agency (EPA) on radiation standards.³ EPA is responsible for setting radiation limits outside the boundaries of nuclear facilities and for establishing residual radiation standards for the amount of radioactivity that can safely remain at a nuclear power plant site and still not pose a threat to public health and safety and the environment. In addition, the Energy Policy Act of 1992 directed EPA to develop environmental protection standards for the Department of Energy's (DOE) proposed high-level nuclear waste repository at Yucca Mountain, Nevada.

In summary, we found the following:

¹ NRC differentiates between "risk-informed" and "risk-based" regulation, noting that the latter approach relies solely on the numerical results of risk assessments. NRC does not endorse a risk-based approach.

² To obtain a diversity of views, we surveyed 1,581 NRC staff; 1,076, or 68 percent, responded. See: *Nuclear Regulation: NRC Staff Have Not Fully Accepted Planned Changes* (GAO/RCED-00-29, Jan. 19, 2000).

³ *Nuclear Regulation: Better Oversight Needed to Ensure Accumulation of Funds to Decommission Nuclear Power Plants* (GAO/RCED-99-75, May 3, 1999) and *Nuclear Health and Safety Consensus on Acceptable Radiation Risk to the Public Is Lacking* (GAO/RCED-94-190, Sept. 19, 1994).

- Although our survey results showed that the vast majority of NRC staff feel their work contributes to protecting public health and safety, their views on NRC's efforts to change its regulatory approach were less favorable. For example, less than one-quarter of the staff believe that senior management is receptive to suggestions for change made by the staff. While almost half of the staff who responded to the survey said that the change to risk-informed regulation has had a positive effect on nuclear safety, only about one-fourth believe that NRC staff have "bought in to" the process. Relatedly, many staff expressed concern about a central element of risk-informed regulation—the new risk-informed process for assessing the performance of nuclear power plants. Sixty percent of the staff who responded to questions about this oversight process believe that it will reduce the margins of safety at nuclear power plants. Our findings are similar to the results of an NRC survey, which found that 70 percent of its staff who expressed an opinion do not believe that the new oversight process will allow for the identification of declining safety performance. Based on the results of the NRC survey and input from stakeholders, NRC has made some changes to the new oversight process in anticipation of its implementation in April 2000.

- NRC staff expect to provide the Commission with a draft comprehensive strategy, which NRC is calling an Implementation Plan, for moving to a risk-informed regulatory approach in March 2000. NRC will then seek public comments on the plan, and it may then take another year to put it in place. The outline of the draft implementation plan that was provided to the Commission in January 2000 touched on the elements we recommended be included in a strategy for moving to a risk-informed regulatory approach in our March 1999 report.

- Disagreement between NRC and EPA over appropriate standards for regulating radiation levels at nuclear facilities could impact the costs to decommission nuclear power plants (dismantle them and dispose of their wastes) and develop a proposed repository for the plants' high-level waste at Yucca Mountain, Nevada. Although EPA has authority to establish a standard for residual radiation at nuclear power plants that have been decommissioned, it has not done so. Utilities are using a standard developed by NRC that EPA believes is not restrictive enough. Utilities are concerned that they may ultimately have to use a more restrictive EPA standard, which would increase their decommissioning costs. EPA has proposed a radiation standard to protect public health and safety at the proposed nuclear waste repository, as it was required to do in 1992. However, NRC, the Nuclear Energy Institute (NEI), a board of the National Academy of Sciences, and others have raised concerns.⁴ The Academy, for example, stated that the proposed standard may have a negligible impact on the protection of the public and could complicate the licensing of the facility.

BACKGROUND

NRC has been incorporating risk into the regulatory process for many years and, in August 1995, it issued a policy statement that advocated certain changes in the development and implementation of its regulations for commercial nuclear plants through a risk-informed approach. Under such an approach, NRC and the utilities would give more emphasis to those structures, systems, and components deemed more significant to safety. To respond to past criticisms about the lack of a consistent, objective, and transparent method to assess the overall performance of nuclear power plants, in January 1999, NRC proposed a new risk-informed oversight process. Within the new oversight process, NRC developed a new inspection program, developed performance indicators, and established clearly defined, objective thresholds for making decisions about a plant's performance. NRC tested the new oversight process at 13 plants between May and November 1999 and expects to implement it industrywide in April 2000.

NRC has also been examining various approaches to consider risk for other regulatory activities. This includes overseeing facilities that produce fuel for nuclear power plants; entities that use nuclear materials in medical, academic, and industrial applications (materials licensees); and DOE's proposed high-level nuclear waste repository in Yucca Mountain, Nevada.

⁴NEI includes members from all utilities licensed to operate commercial nuclear plants in the United States, as well as nuclear plant designers, major architectural/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry. NEI establishes unified policy for the nuclear industry on such matters as generic operational and technical issues.

STAFF SAY THEY ARE COMMITTED TO SAFETY BUT ARE CONCERNED ABOUT THEIR
LIMITED INVOLVEMENT IN CHANGES AT THE AGENCY

Although our survey showed that the vast majority of NRC staff feel their work contributes to protecting public health and safety, their views on NRC's efforts to change its regulatory approach were less favorable. In particular, the staff had concerns about management and their involvement in change, the move to risk-informed regulation, and the new nuclear power plant oversight process.

Staff Are Concerned About Management of and Their Involvement in Change

Our survey results suggest that senior management may not be providing the leadership necessary to facilitate change and that staff believe they have not been involved in many of NRC's recent initiatives.⁵ As might be expected, the survey results for some questions showed statistically significant differences between the views of management and staff with management's views being significantly more positive.⁶ For example, 46 percent of the NRC managers who responded agree or strongly agree that senior management is receptive to suggestions for change, compared with 23 percent of the staff who agree or strongly agree. Similarly, 34 percent of the NRC managers agree or strongly agree that senior management solicits ideas and opinions from staff before making changes that affect their work compared with 17 percent of the staff.

The results of our survey are consistent with those of a survey conducted in the latter part of 1998 by NRC's Office of Inspector General on the agency's safety culture and climate. The Inspector General noted that the issue of management trust was of particular concern to NRC staff. The results of the Inspector General's survey showed that NRC staff did not believe that higher management levels trusted their judgment and that 53 percent of the staff did not believe that the management style at NRC encourages them to give their best. More recently, the Inspector General reported that the large number of staff who work within the offices of the Chairman and the Commissioners can be viewed as a lack of reliance on and trust of the agency's staff by senior management.⁷ In addition, in October 1999, Arthur Andersen and Company reported that leaders across NRC work more as a group of individuals than as a team.

NRC Staff Have Mixed Views on Risk-Informed Regulation

Our survey results also showed that staff had mixed views about NRC's move to risk-informed regulation. Although 48 percent believe that risk-informed regulation has had a positive effect on nuclear safety, about 20 percent believe it has had a mostly negative effect. In addition, only 27 percent of the staff agree or strongly agree that the new risk-informed approach has been accepted by NRC staff. NRC managers said that these data are not surprising. They said that staff will be skeptical about moving to a risk-informed approach until they see how the approach is implemented.

NRC Staff Are Skeptical About the New Oversight Process

Of the NRC staff who answered questions about a central aspect of risk-informed regulation—the development and implementation of the process for overseeing safety at nuclear power plants—⁸ our survey results show that:

- 75 percent agree or strongly agree that utilities and industry groups had too much input/influence in developing the process,
- 60 percent agree or strongly agree that the process will reduce safety margins, and
- 86 percent agree or strongly agree that as time passes, subjectivity will creep into the process.

According to NRC managers, the agency has recognized these potential problems, has monitored them during the pilot project at 13 plants, and will consider them as it develops the final oversight process. NRC also said that the survey results reflect the staff's knowledge and views at a particular point in time; but as the new

⁵ For the purpose of the survey, senior management referred to managers at the Deputy Office Director/Deputy Regional Administrator level and above, including the Chairman, Commissioners, and Executive Council, and mid-level management refers to section chiefs, team leaders, assistant branch chiefs, branch chiefs, and deputy and division directors.

⁶ The percentage of management agreeing with the statement is significantly different from the percentage of staff at $p < .05$. This means that 95 times out of 100, a difference this large would not occur by chance.

⁷ *Special Evaluation of the Role and Structure of the NRC's Commission* (OIG/99E-09, Dec. 23, 1999).

⁸ About 33 percent of the NRC staff who responded to the survey neither agreed nor disagreed, did not know or had no basis to judge, or provided no answer to the questions.

process continues to develop and more staff receive training, the agency expects an increase in the staff's level of knowledge and confidence about the new oversight process.

We agree with NRC that our survey results reflect the staff's knowledge and views at a particular point in time. More recently, however, NRC surveyed 94 regional office staff, including inspectors and others who participated in the new oversight process pilot project, which ended in November 1999. NRC found that less than half agree or strongly agree that the new oversight process provides adequate assurance that plants are being operated safely and about half agree or strongly agree that the new inspection program will appropriately identify risk-significant issues. NRC also found that:

- 36 percent agree or strongly agree that the new process provides sufficient regulatory attention to licensees with performance problems,
- 31 percent agree or strongly agree that the new inspection report format adequately communicates relevant information to the licensee and public, and
- 19 percent agree or strongly agree that the new process allows for the identification of declining performance before safety margins are significantly reduced.

In addition to the issues NRC identified through the pilot project, NEI, utility and state officials, and representatives of public interest groups identified 27 issues they believed should be resolved before NRC implements the new process in April 2000. The issues, identified during a recent workshop on the oversight process, included the need for guidance for NRC staff and the industry on the enforcement actions that NRC would take when utilities report inaccurate plant performance data and inspection issues that cut across all aspects of plant operations (like human performance). The need for performance indicators for the security of nuclear power plants were also identified. The workshop participants identified another 22 issues that NRC should resolve during or after the first year of implementing the new process.

Despite these unresolved issues, NRC staff, NEI officials, and other stakeholders, such as the Union of Concerned Scientists, believe that the new oversight process provides a more objective and clear approach that is fundamentally more sound and will produce better overall results than NRC's prior process to assess overall plant performance. However, during the pilot project at 13 plants, NRC found that about 99 percent—or nearly all—of the performance indicators were acceptable and only three inspection findings were not. Two members of NRC's Advisory Committee on Reactor Safeguards, reacting to this information, believe that the performance indicators are not sensitive enough to identify degrading plant performance.⁹ In addition, 70 percent of the NRC staff who provided opinions to an agency survey indicated that the new process will not allow for the identification of declining safety performance. When taken together, the question arises: How good is a process that tells NRC, the utility, and the public that overall plant performance is acceptable but cannot tell NRC when performance starts to decline? This overall question was raised by some members of the Advisory Committee on Reactor Safeguards at a recent meeting with NRC staff. In responding to the Advisory Committee, NRC staff said that the oversight process is not "set in stone"; and will continue to evolve during its initial implementation. NRC staff expect to evaluate the process by June 2001 and provide the Commission with recommendations to improve it.

NRC Is Developing a Strategy to Implement a Risk-Informed Regulatory Approach

NRC agreed with the recommendation in our March 1999 report on risk-informed regulation that it should develop a comprehensive strategy to implement a risk-informed regulatory approach. The staff expect to have a draft strategy for the Commission's consideration by March 10, 2000. However, NRC will not finalize the strategy until it obtains and addresses public comments on it, which could take another year. NRC staff did provide the Commission with a memorandum on January 13, 2000, describing their proposal for the development of a comprehensive risk-informed strategy. The outline mentions many of the issues that we raised in previous reports and testimony—it discusses the need for goals, objectives, performance measures, timelines, and training for staff. NRC staff and other stakeholders, including NEI and the Union of Concerned Scientists, will meet with the Commission at the end of this month to provide their views on the draft strategy.

⁹The Advisory Committee on Reactor Safeguards is a statutory committee established to advise the Commission on safety aspects of proposed and existing nuclear facilities, as well as to perform other duties as the Commission may request.

NRC and EPA Disagree on Radiation Standards

NRC and EPA disagree on the level of residual radiation that can safely remain at a nuclear power plant site after utilities complete their decommissioning. EPA has authority for establishing radiation standards for all aspects of decommissioning, including acceptable levels of residual radiation. To date, EPA has not issued such standards. In the absence of EPA's standards, in 1997, NRC issued standards that utilities must meet to decommission nuclear plant sites and terminate their NRC licenses.

We previously reported that EPA does not agree with NRC's residual radiation standard.¹⁰ NRC's standard sets a dose limit of no more than 25 millirem per year from all sources, including groundwater.¹¹ To put this standard in perspective, the average level of natural background radiation in the United States is about 300 millirem per year. In fact, the disagreement between the two agencies has been characterized by both its length and its acrimony. EPA started to develop residual radiation standards in 1984 but has not yet finalized them. Nevertheless, EPA's position is that NRC's licensees should be required to decontaminate nuclear plant sites to a level of 15 millirems of residual radioactivity per year and to clean up groundwater to the same limit as drinking water standards. EPA's Administrator has stated that the agency may apply the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 to sites that have been or are being decommissioned if NRC and EPA do not reach an agreement on the applicable standards.

Currently, NRC's licensees are using NRC's regulations and related guidance to plan for or to decommission their nuclear power plants and related facilities. However, if NRC's licensees are ultimately required to comply with the stricter EPA standards, they may have to perform additional cleanup activities and incur additional costs. Neither NRC staff nor EPA officials could estimate the amount of additional cost, but both said it could be very high. To ensure that NRC's licensees do not face dual regulation, in 1999, the House Appropriations Committee strongly encouraged EPA and NRC to adopt a memorandum of understanding, which is being developed, to clarify EPA's involvement at NRC sites and to report to the Committees on Appropriations by May 2000 on their progress. Although the nuclear industry was encouraged by the directive to resolve the stalemate through a memorandum of understanding, NEI has said that the industry is uncertain given EPA's history whether the memorandum will be completed and/or resolve the problem. NEI also stated that the Congress may need to intervene to resolve the conflict between the two agencies.

NRC and EPA also disagree on the radiation standards that would apply to DOE's high-level waste repository at Yucca Mountain, Nevada. The Nuclear Waste Policy Act of 1982 made NRC responsible for licensing the construction and operation of DOE's repository for high-level radioactive waste on the basis of general environmental standards to be issued by EPA. The Nuclear Waste Policy Amendments Act of 1987 directed DOE to investigate a site at Yucca Mountain, Nevada; and the Energy Policy Act of 1992 directed EPA to develop a specific health standard for the Yucca Mountain site. In August 1999, EPA issued a proposed rule in the *Federal Register* on the environmental radiation protection standards for Yucca Mountain. In the standards, EPA proposes that DOE not only limit exposure to an individual from radioactive material to 15 millirems per year from all sources but also protect groundwater to drinking water standards. In commenting on EPA's proposal, NRC noted that EPA has not demonstrated a need for a separate groundwater limit or that the 15 millirems limit was necessary to protect public health and safety and the environment.

NRC is not alone in its objection to EPA's proposed requirement for a separate groundwater standard—NEI, the National Academy of Sciences, and others have also raised concerns. For example, NEI noted that far from enhancing public health and safety, a separate EPA groundwater standard could result in a repository design that is actually less protective of public health and safety. NEI noted that meeting a separate groundwater standard would require smaller waste containers in more tunnels, spread over a larger area which would require more ventilation systems. NEI said that a larger, more open repository would release more naturally occurring radon during excavation and the repository's operations, thereby increasing the total radiation dose. Likewise, the National Academy of Sciences' Board of Radioactive Waste Management commented that the separate groundwater standard appears to duplicate the protection provided by the 15-millirem-per-year stand-

¹⁰ *Nuclear Regulation: Better Oversight Needed to Ensure Accumulation of Funds to Decommission Nuclear Power Plants* (GAO/RCE-99-75, May 3, 1999).

¹¹ Rem is a unit of measurement of the effect of radiation doses to human beings. A millirem is one thousandth of a rem.

ard. The Academy also said that a separate groundwater limit may greatly complicate the licensing process and have a negligible impact on the protection of the public. It further noted that the Academy does not believe that a scientific basis exists for establishing a separate limit.

Mr. Chairman and members of the subcommittee, this concludes our statement. We would be pleased to respond to any questions you may have.

STATEMENT OF DAVID E. ADELMAN, PROJECT ATTORNEY, NUCLEAR PROGRAM,
NATURAL RESOURCES DEFENSE COUNCIL, INC.

Good morning Mr. Chairman and members of the subcommittee. My name is David Adelman and I am project attorney with the Natural Resources Defense Council ("NRDC"). Thank you for allowing me to address the issues related to the Nuclear Regulatory Commission's proposed rule on the unrestricted release and recycling of radioactively contaminated materials.

NRDC opposes the Nuclear Regulatory Commission's ("NRC") proposed rule that would permit the unrestricted release of radioactively contaminated materials for use in such things as home appliances, cars, and other consumer products, and that would expose unprotected workers processing contaminated materials at scrap mills to potentially significant levels of radiation. NRDC has fundamental concerns about whether such standards can be implemented safely particularly in light of the revelations surrounding the Department of Energy's ("DOE") Paducah, Kentucky, facility, improper releases of radioactively contaminated materials from DOE's Santa Susana facility in California, and continuing environmental and radiation safety management problems at both private and government facilities generally. Further, NRDC has serious questions about the uncertainties in the estimates of the risks of recycling radioactively contaminated materials to workers and the public. For these reasons, NRDC opposes the NRC's proposed rule and the NRC's current practice of allowing unrestricted releases on a case-by-case basis until these uncertainties are resolved and the NRC has obtained general public acceptance that radioactively contaminated materials can be recycled safely.

NRDC is a national non-profit membership environmental organization with offices in Washington, D.C., New York City, San Francisco and Los Angeles. NRDC has a nationwide membership of over 400,000 individuals. As you may be aware, NRDC's activities include maintaining and enhancing environmental quality and monitoring federal agency actions to ensure that federal statutes enacted to protect human health and the environment are fully and properly implemented. Since its inception in 1970, NRDC has sought to improve the environmental, health, and safety conditions at and surrounding nuclear facilities operated by the DOE and commercial nuclear facilities licensed by the NRC and their predecessor agencies.

I. THE NRC RULE REPRESENTS A DRAMATIC CHANGE IN POLICY TOWARDS
DEREGULATION OF RADIOACTIVELY CONTAMINATED MATERIALS

In March 1965, the NRC established "Criteria for the approval of products intended for use by the general public." 30 Fed. Reg. 3462-63. The NRC notice sets forth its policy for products containing radioactive substances intended for use by the general public without any regulatory controls on the consumer-user. Approval depended upon a product being unlikely to expose individuals to more than a few hundredths of the NRC dose limits and the radioactive components having utility. The NRC noted specifically that it "considers that the use of radioactive material in toys, novelties, and adornments may be of marginal benefit. . . . Applications for approval of 'off-the-shelf' items that are subject to mishandling especially by children will be approved only if they are found to combine an unusual degree of utility and safety." 30 Fed. Reg. 3462 (March 16, 1965). For many years, NRC has acknowledged the complexity and risks of permitting consumer products to contain radioactive substances.

In 1986 and 1990, the NRC proposed policies on radiation levels that would be considered "below regulatory concern" ("BRC"). The 1990 policy would have permitted the deregulation of certain radioactive wastes, materials, and emissions. In the early 1990's the public, states, and Congress rejected the NRC's BRC effort to deregulate contaminated scrap metals and other materials for unrestricted recycling. The NRC's BRC policy was formally revoked by Congress in the Energy Policy Act of 1992, and the NRC rescinded both policies soon after. In part because of the NRC's deregulation efforts, at least sixteen states have passed regulations or laws that are stricter than the federally proposed allowable releases, most with the intent to continue regulatory control if the federal government allows deregulation. The present rulemaking represents yet another attempt by NRC to modify its regulation

of regulated materials by establishing broad-based deregulation standards for radioactively contaminated materials.

Until recently, DOE has also had a policy that generally precluded the release of radioactively contaminated materials for unrestricted and unregulated sale in U.S. markets. It was not until former Assistant Secretary of Environmental Management Al Alm issued a policy statement in September 1996 promoting, on a provisional basis, recycling of radioactively contaminated scrap steel that DOE formally altered its long-standing policy disfavoring unrestricted release of contaminated materials although, this policy originally focused narrowly on restricted end uses of recycled steel at DOE facilities. Further, DOE's policy is being implemented on a conditional basis while DOE evaluates the safety and economics of recycling these materials. However, in response to strong public- and private-sector opposition, Secretary Bill Richardson recently blocked further releases of "volumetrically" contaminated metal, but not surface-contaminated metals, from DOE facilities until the NRC resolves whether to proceed with a free-release standard.

Accordingly, although recycling of radioactively contaminated materials has been considered by both the NRC and DOE, and permitted on a small scale by both agencies, the proposed NRC rulemaking represents a major change in policy towards deregulation, which has consistently received substantial public opposition. At the same time, unprecedented quantities of radioactively contaminated materials, such as scrap metals and concrete, are becoming available from the decommissioning of NRC-licensed and DOE facilities. Estimates by the Environmental Protection Agency ("EPA") indicate that more than 1.5 million tons of radioactively contaminated metals alone may become available for recycling, most of which would come from DOE sites.

II. THE NRC AND DOE LACK CREDIBILITY WITH THE AMERICAN PUBLIC

Public concern about radioactively contaminated materials remains high because of DOE's history of regulatory mismanagement, the technical challenges, and the direct impacts recycling radioactive materials will have on consumer products. Moreover, these concerns have been significantly heightened since the public learned that the major NRC contractor responsible for the technical evaluation of possible standards, Science Applications International Corporation ("SAIC"), is at the same time working directly for BNFL, Inc. the DOE contractor that is undertaking the first large-scale recycling of radioactively contaminated metals on regulatory compliance issues. This direct conflict of interest has seriously undermined public confidence in the objectivity of the NRC's proposed rulemaking and caused the NRC to initiate an investigation of SAIC and its other contractors on this and other potential conflicts of interest.

NRC therefore must convince a very wary public that it can implement a rule safely, that the underlying science is sound and untainted, and that deregulation is not simply a means of externalizing the decommissioning costs of NRC-licensed and DOE facilities onto the public by recycling radioactive waste into consumer products. Otherwise, the NRC risks creating the backlash it experienced in 1992 when it attempted to deregulate and causing potentially significant economic harm to the recycling industry, particularly for scrap metals, by burdening it with radioactive wastes that undermine public confidence in recycled products. As the National Research Council ("Council") concluded in a 1996 DOE-commissioned report, public acceptance and understanding are essential.

The 1996 Council study concerned the decommissioning of the DOE's three gaseous diffusion plants. The report included extended analysis of recycling options for the large quantities of scrap metal that would be generated in the decommissioning process. The Council's report included the following recommendations and findings:

- If recycling of scrap metal were to proceed, promulgation of credible national standards for the unrestricted release of radioactively contaminated materials is a necessary prerequisite.
- It is essential that a meaningful stakeholder and public involvement process be implemented before recycling of *any* radioactively contaminated materials occurs.
- Recycling of contaminated materials could cause significant health risks to workers and the public.
- Great care must be taken to ensure that releases of contaminated steel does not increase residual radioactivity in the nation's steel supply to an unacceptable level, particularly because increases in contaminants have been observed in the past.

Despite the absence of accepted standards and any meaningful public involvement, the DOE is proceeding with the first large-scale recycling of contaminated scrap metal at the Oak Ridge K-25 gaseous diffusion plant. In a legal challenge to

the DOE's failure to complete an environmental impact statement for the project, federal district court judge Gladys Kessler found:

- that the potential for environmental harm from the Oak Ridge project is great, especially given the unprecedented amount of hazardous materials that would be recycled;
- that DOE should have prepared an environmental impact statement for the Oak Ridge radioactive metals recycling project; and
- that it was "startling and worrisome" that, from an early point on, there was no opportunity for public scrutiny or input on a project of such grave importance. In addition to the problems identified by Judge Kessler, it appears that under the NRC's regulations the project is proceeding without a valid license. Tennessee lacks the regulatory authority to grant a licensee where radioactively contaminated materials are recycled for use in consumer products. See 10 C.F.R. Parts 30 and 40 and 10 C.F.R. 150.15(a)(6).

The NRC nonetheless supports the Oak Ridge project despite these deficiencies and the present rulemaking it is considering. Moreover, the Oak Ridge project is qualitatively different from prior, more-limited releases because of its scale approximately 100,000 tons of scrap metal will be recycled and the types of contaminated materials. The DOE's decision to proceed with the Oak Ridge project, and the NRC's support of it, have further compromised the credibility of the NRC's public participation process. With the Oak Ridge project proceeding under NRC's blessing, public stakeholders question whether a standard is predetermined and whether the proposed NRC rulemaking will fully and fairly consider all of the alternatives, including halting all releases of radioactively contaminated materials. NRDC firmly believes, consistent with the Council's report, that *NRC should cease licensing unrestricted releases of radioactively contaminated materials until it resolves these issues and that DOE should also halt all unrestricted releases of radioactive materials from its facilities.*

III. THE NRC'S PROPOSED RULEMAKING RAISES SERIOUS IMPLEMENTATION PROBLEMS

1. *The Total Quantity of Radioactively Contaminated Materials to be Released for Use in Commercial Products is Unknown*

According to Environmental Protection Agency ("EPA") estimates, NRC-licensed facilities contain about 650,000 metric tonnes of scrap metal that could be recycled (~80% carbon steel; ~20% stainless steel); however, EPA's upper bound on this estimate is about twice this value. EPA estimates that DOE facilities currently store about 171,000 metric tonnes of scrap metal; although, the upper bound on this estimate is about twice this value. Decommissioning of DOE facilities according to EPA will generate approximately another 925,000 tonnes (~85% carbon steel; ~15% equally divided between copper, aluminum, and stainless steel), but the actual quantity could be several times higher than this value. There are no estimates of the total quantities of other radioactive materials (e.g., concrete, soil, industrial wastes) that could be deregulated.

Because of these uncertainties, it is unclear how the NRC can reasonably evaluate the human health impacts of its standard. It is essential that the NRC clearly explain how it plans to estimate, in a scientifically sound manner, the total quantity of radioactively contaminated materials to which the public could be exposed, particularly because some radioactive contaminants remain hazardous for many thousands of years. Indeed, several radionuclides such as technetium and uranium have extremely long half-lives, which adds another layer of complexity to NRC's assessment of the aggregate amount of radioactively contaminated materials that will be in commerce at any given time.

The NRC claims that the risks from contaminated metals are limited because contaminated scrap metal will make up less than one percent of the scrap metal being processed in any given year, which would reduce their potential risks. However, this estimate does not take into account scrap mills, particularly mini-mills, that may receive a disproportionate amount of radioactively contaminated metal. At these facilities, recycled metal could be released without being mixed with any clean metal. Under these circumstances, the NRC's claims of significant dilution are merely hypothetical. As in the prior EPA study, the risks from contaminated materials must be evaluated assuming no dilution.

Similarly, because of public concern about aggregate effects of radiation from contaminated materials, it is essential that the NRC provide information on and estimates of exposures from multiple pathways—under its current analysis the NRC limits its evaluation to certain exposure scenarios without providing adequate information on the broader context of potential exposures. Only with this information will the public be able to assess the relative contributions from different sources and

pathways, e.g., the impact of technetium-99 contamination in consumer products relative to that of cobalt-60 or what pathways are most important for each radionuclide. This information should be tabulated and presented in several examples illustrating the effects of different radionuclides in specific circumstances.

Finally, the NRC limits its analysis to the average member of each critical group, i.e., the group of individuals expected to receive the greatest exposure to each radionuclide. In EPA's earlier study, its risk analyses were based on the "reasonably maximally exposed individual" ("RMEI") for standard setting, which does not entail the same kind of averaging employed in the NRC analysis. The NRC should use the more conservative RMEI in its risk assessments; although, a comparison of the normalized dose factors calculated using average critical group member with those derived using the RMEI would also be informative. And the NRC should not limit itself to assessing excess cancer deaths; in particular, it should evaluate the unique risks posed to children and teratogenic effects.

2. Surveying and Monitoring for Radioactive Contamination is both Technically Challenging and Costly

Survey measurements for radioactive contamination are difficult and challenging where large, complicated pieces of equipment, such as that found at DOE and NRC facilities, are involved. Problems that can undermine effective surveying include the following:

- Complex geometries with difficult to reach surfaces are challenging to measure accurately, and workers will tend to avoid these measurement areas.
- Large errors can be introduced into measurements of volumetric contamination if the contaminant concentration is not uniform or if the geometry of the contaminated piece is complicated.
- Even where measurements are straightforward, the accuracy of the measurements is limited by the presence of unavoidable background radiation.

Typical measurement uncertainties, even for the most favorable geometries, are likely to be several percent; more complex geometries will result in greater measurement uncertainty. In its study, EPA acknowledges that current detection instruments may not be sensitive enough to detect contamination reliably under a 1 mrem/y standard, which is a "reasonable" level often quoted by regulators. For example Cobalt-60, a major contaminant in materials at NRC-licensed facilities and an important radionuclide in risk assessments, could be difficult to detect under a 1 mrem/y standard. If a standard is set, the NRC must be able to demonstrate that the available detection equipment can reliably survey materials to satisfy its standard. Conversely, if NRC identifies an acceptable standard but adequate detection equipment is not available for certain radionuclides, unrestricted release of materials contaminated with those radionuclides should be prohibited.

These technical constraints raise several basic issues:

- It is unclear whether the detection equipment available can protect the public against improper releases of radioactively contaminated materials if a stringent standard were set.
- No data have been provided estimating the rate of potential false negatives (measurements that incorrectly find that a piece of equipment is not contaminated).
- NRC has not conducted any assessments of the potential impacts of improper releases on workers or the public.
- NRC has not demonstrated that surveying can be conducted adequately for the large quantities of scrap metal available for recycling at NRC-licensed and DOE facilities.

3. Risks Posed by the Different Radiological Contaminants Could Impede Reliable Implementation of a General Standard

Several factors influence the threat posed by a given radioactive element:

- (1) whether the radionuclide remains in the recycled material or partitions into a byproduct of the recycling process (e.g., for metals it can partition into the metal product, slag, or baghouse dust);
- (2) the type of radiation the radionuclide emits (i.e., alpha, beta, gamma);
- (3) the residence time of the radionuclide in an individual once it is ingested; and
- (4) the length of the radionuclide's half-life.

For example, some radionuclides like uranium-238, plutonium-239, neptunium-237, and technetium-99 are extremely long lived, some have long residence times like plutonium and neptunium, and some partition almost exclusively into the recycled metal, such as technetium and cobalt.

These different characteristics mean that radionuclides present substantially different risks to workers and the public and present different challenges from a regulatory perspective. For example, radionuclides that partition exclusively into the

slag that is generated during recycling are less likely to pose a significant threat to the public through commercial products, but pose potentially significant risks to workers. Establishing an across-the-board rule under these circumstances raises the potential for substantial regulatory problems and could undermine safe implementation of a standard. Factors that differentiate radionuclides from a standard-setting perspective include uncertainties in estimates underlying risk assessments, types of risks, likelihood of improper releases (violations), and level of public concern. For example, more uncertain risks should lead to more conservative standards or rejection of a standard altogether. Similarly, the degree to which future uses are foreseeable should factor into this analysis.

For radionuclides that partition into the recycled material, NRC must be particularly vigilant in ascertaining the potential uses and risks posed by the residual radioactive contaminants. Where these risks cannot be reliably calculated, the scrap materials should not be recycled for unrestricted use. The NRC bears the burden of demonstrating the safety of its rule under real-world conditions.

In addition, where radionuclides partition into recycling byproduct materials, such as metal slag produced during smelting, the NRC must evaluate requiring proper disposal of such materials at regulated facilities under "as low as reasonably achievable" ("ALARA"). This applies particularly to metal slag—which is sold for, among other things, soil conditioning and ice control—because it is of low economic value and certain long-lived radionuclides concentrate in it during the melting process.

4. The Economics of Radioactive Materials Recycling Will Undermine Safe Implementation of a Standard

Except in the case of nickel, and to a lesser extent copper, the primary economic gain from recycling scrap metal and other radioactively contaminated materials derives from avoiding disposal costs. This means that from an economic perspective there is little difference between limiting standards to restricted releases, such use solely within DOE or NRC-licensed facilities, versus permitting unrestricted recycling of such materials.

However, the savings from avoiding disposal are often more than offset by the costs of cleaning the materials to meet unrestricted release standards and, to a lesser extent, costs from surveying the materials for radioactive contaminants. Unless there are effective regulatory oversight mechanisms and significant penalties for regulatory violations, companies engaged in recycling will (1) maximize the amount of material they release without cleaning it; and (2) seek to limit survey costs. The economics of the radioactive recycling therefore strongly favor lax implementation of surveying requirements and compliance with release standards. Given the amount of material potentially available, the economic incentives, the limits of survey equipment, and the poor track record of the nuclear industry in managing radioactive materials, issuing an NRC standard could result in substantial quantities of material being released in violation of whatever standard might be set.

As discussed above, the NRC must evaluate the potential impacts from such improper releases and ensure that there are regulatory mechanisms to protect the public against them. It is the practical challenges of implementing a standard that represent the greatest source of public concern, even if a safe standard, in principle, were identified. Further, where the risks—particularly to workers—from improper releases are particularly great, the NRC should limit the scope of the permissible types of releases to foreclose the possibility of serious or chronic risks to workers and the public.

The NRC is required to ensure that all recycling is in compliance with ALARA and to conduct an analysis in conformance with the ALARA principle as part of any rulemaking. At minimum, the NRC must be particularly diligent in conducting an ALARA analysis in circumstances where the economics either make disposal marginally more expensive than unrestricted release or where restricted release is an option. It is therefore essential that the NRC include analyses of a variety of circumstances under which recycling could occur to assess fully how ALARA applies. Any such ALARA analysis should not be limited to a global assessment, but include focused analyses of particular releases under specific conditions.

IV. PUBLIC CONCERN AND THE LEGACY OF THE NUCLEAR INDUSTRY'S MANAGEMENT OF RADIOACTIVE MATERIALS

In addition to the problems raised by the lack of public notice and comment in the Oak Ridge project and the direct conflicts of interest of the NRC's major contractor, the present rulemaking is being developed in the context of decades of mismanagement of radioactive wastes at DOE facilities. DOE mismanagement has caused incalculable environmental harm, threatened the health, and in some cases lives, of many DOE workers and U.S. citizens, and created an environmental deba-

cle that will cost more than \$250 billion to remedy. Unfortunately, these problems are not merely historical artifacts:

- In 1994, the Conference of Radiation Control Program Directors (“CRCPD”) found that “[r]adioactive materials has been tracked offsite, into homes, businesses, and elsewhere. . . . States have surveyed people, homes, businesses, rental cars, and trucks. Significant contamination events continue to occur at the DOE facilities due to lack of adequate health physics for all its operations.”

- In 1999, the regulatory deficiencies identified by the CRCPD were found at DOE’s Paducah, Kentucky, plant, as well as evidence that DOE contractors had illegally disposed of radioactive materials in local sanitary landfills, at random sites in a local state wildlife preserve, and through largely unmonitored on-site recycling operations.

- Over the past year the Los Alamos, Livermore, and Savannah River sites have been cited by DOE or the Defense Nuclear Safety Board for regulatory compliance violations.

- In January 2000 at DOE’s Santa Susana Filed Laboratory just outside Los Angeles, EPA discovered that DOE had illegally released radioactively contaminated wastes for disposal at municipal dumps, sold and recycled radioactively contaminated metals, and sent contaminated trailers to local schools without even conducting adequate monitoring.

- In February 2000, a major radioactivity leak occurred at Indian Point nuclear plant in New York.

These continuing problems undermine public confidence in either DOE’s or NRC’s ability to ensure that radioactively contaminated materials are managed safely. Moreover, in the wake of the Paducah findings, it is disturbing to consider that the Oak Ridge field office, which also has authority over the Paducah plant, is responsible for overseeing the Oak Ridge radioactive metals recycling project. And it is completely unreasonable to assert that the NRC’s rulemaking will not cause DOE to adopt a similar standard because Secretary Richardson has explicitly linked the Energy Department’s policy to the NRC’s rule.

The NRC’s proposed rulemaking will directly affect the ability of DOE and its contractors to release radioactively contaminated materials, which DOE has time and again failed to manage safely even in fully a regulated environment. In the absence of significant changes within DOE or, at the very least, independent regulatory mechanisms to ensure that radioactive materials are properly managed by DOE, the public has little reason to believe that free releases from DOE facilities, which contain the bulk of the inventory, will occur without serious adverse impacts. It is therefore essential that the NRC consider the practical, technical, and administrative limitations of the entities that will be responsible for releasing contaminated materials into U.S. markets, and that it factor these constraints into its decision on how to proceed.

In the absence of fundamental changes, the NRC should not proceed with this rulemaking, and the NRC and DOE should impose a moratorium on the unrestricted recycling and sale of radioactively contaminated materials for use in, among other things, consumer products until these issues are resolved and public confidence is restored.

STATEMENT OF WILLIAM E. KENNEDY, JR., MEMBER OF THE BOARD OF DIRECTORS,
PRESIDENTIAL REPRESENTATIVE, HEALTH PHYSICS SOCIETY

INTRODUCTION

Mr. Chairman, Ranking Member Graham, and distinguished members of the subcommittee, my name is William E. Kennedy, Jr. I am a member of the Board of Directors of the Health Physics Society, an independent non-profit scientific organization of professionals who specialize in radiation safety. Health Physics Society President, Raymond H. Johnson, Jr., has asked that I represent the Society today and wishes to thank the committee for providing this opportunity for the Society to serve as a resource on this matter. I am pleased to testify today on the efforts of the Health Physics Society and the American National Standards Institute (ANSI) to develop a formal consensus standard on the release of contaminated materials, including metals, and to comment on the current U.S. Nuclear Regulatory Commission’s (NRC) rulemaking in this area. In addition to being on the Board of Directors of the Health Physics Society, I am past chairman of an ANSI Writing Group chartered to develop a National Consensus Standard on Clearance, or the release of materials from radiological controls. The final standard, titled “Surface and Volume Radioactivity Standards for Clearance” ANSI/HPS N13.12–1999, was pub-

lished in January of this year. Since 1986, I have also served as a consultant to the International Atomic Energy Agency (IAEA), an agency of the United Nations, to develop scientifically based release criteria that will be applied to international commerce.

The Health Physics Society includes over 6,000 members in over 40 countries that are currently engaged in the practice, science, or technology of radiation safety. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. As a non-profit scientific organization, we are not affiliated with any government, industrial, or private entity. The Society is affiliated with the International Radiation Protection Association, the American Academy of Health Physics, the American Board of Health Physics, the National Academy of Sciences, the National Council on Radiation Protection and Measurements, and other Scientific and Professional Societies and Institutions. The Society is in a unique position to provide informative, scientific positions that are independent of both government and industry.

HEALTH PHYSICS SOCIETY POSITION

The Health Physics Society has taken a formal position on the release of contaminated materials, including metals, in response to the NRC's recent rulemaking process. I have included a copy of this position statement at the end of my testimony for your information.

Based on this position statement it is my testimony to you today that the Health Physics Society believes:

- establishing uniform standard criteria for the clearance or release of radioactively contaminated materials is a necessary and important part of protecting the public and the environment from radiation exposure
- regulations for radiation protection should be based on consensus standards, including those issued by ANSI and the Health Physics Society. the primary radiation protection criterion should be a dose standard and should consider all radiation pathways
- the primary dose criterion should be related to screening levels that can be used to establish radiation survey programs that will ensure the dose level will be met, and
- the ANSI Standard N13.12 should be adopted by U.S. Federal Agencies for application to the clearance or release of materials from radiological controls.

CLEARANCE CRITERIA WILL INCREASE RADIATION PROTECTION

The motive for establishing clearance criteria is not to produce unnecessary sources of radiation, but rather to increase protection of the public by establishing strict standards and guidelines to ensure that harmful sources are controlled, while conserving our natural resources.

BACKGROUND INFORMATION

The development and use of release criteria is not unique to radiation and radioactive materials. For example, the Food and Drug Administration sets acceptable levels of pesticides in foods and the U.S. Environmental Protection Agency (EPA) sets contamination levels in water and soil in the cleanup of land contaminated with hazardous materials.

Comprehensive, unconditional release criteria for materials, equipment, and facilities with low levels of radioactive contamination have been needed in the United States for several decades. In addition to invoking radiation protection requirements during facility operation, release criteria would serve as the basis for deciding what materials require disposal as radioactive waste.

In 1964, the Health Physics Society, under the auspices of ANSI, began the technical evaluation of clearance, resulting in early drafts of ANSI N13.12. These early drafts of the clearance standard were based primarily on detection levels that could be achieved using field instruments, with secondary concerns about the potential individual doses that may result. An early draft version of ANSI N13.12 was consistent with the surface contamination limits that were published by the U.S. Atomic Energy Commission in the 1974 version of Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, which is still in use by the NRC today.

However, the criteria in Regulatory Guide 1.86 are not risk based, and are not consistently applied across all situations. The current rulemaking under consideration by the NRC addresses updating these existing release criteria and the process used to make release decisions.

ANSI STANDARD N13.12

The decision to continue efforts to develop an ANSI standard was driven by the continuing need for comprehensive release criteria, changing national and international guidance, and risk or dose based regulations. In 1993, the Health Physics Society Standards Committee, in agreement with ANSI Committee N13, established a technical writing group to develop the final N13.12 clearance standard. The final clearance standard was approved in August 1999 as N13.12, Surface and Volume Radioactivity Standards for Clearance and was published in January 2000.

The purpose of ANSI Standard N13.12 is to provide guidance for protecting the public and the environment from radiation exposure. It does this by specifying a primary radiation dose criterion and derived screening levels for the clearance of items that could contain radioactive materials. The standard sets a primary radiation dose criterion of 1 millirem per year (mrem/y), and provides derived screening levels that define the allowable amount of radioactivity per unit surface area or per unit mass.

PERSPECTIVE ON THE ANSI N13.12 PRIMARY DOSE CRITERION

In our deliberations, the ANSI writing group considered international dose criteria for release of materials. These dose criteria have been defined by the IAEA and have been adopted by most nations. They state that the dose rate to an individual in the population expected to receive the highest dose from the released material should not exceed 1 mrem/y, i.e., exactly the same criterion contained in ANSI N13.12.

This primary dose criterion is a very low dose rate. Part of the reason for selecting a dose rate so small was to ensure that members of the public that may be exposed to multiple sources of radiation would receive only a small fraction of the doses permitted by Federal regulations. The 1 mrem/y dose rate is an even smaller fraction of the doses they receive from background sources. For example, Americans typically receive about 300 mrem/y from natural background sources, including radon in their homes. The dose standard defined in ANSI N13.12 is only 0.3% of the dose Americans normally receive from these natural background sources. For perspective on the yearly dose in this criterion, I would like to point out 1 mrem is about 20% of the dose I will have received from cosmic rays at an altitude of about 35,000 feet while flying to attend this hearing and returning home.

This 1 mrem/y dose rate is also considered to be a "Negligible Individual Dose" by the Congressionally Chartered National Council on Radiation Protection and Measurements. Materials that meet the ANSI Standard N13.12 criteria are only slightly contaminated and should not be confused with low-level radioactive waste.

Thus, there is a solid scientific basis and a good regulatory rationale associated with the dose criteria defined in ANSI N13.12.

CURRENT ISSUES REGARDING THE NRC RULEMAKING

The focus of the current debate associated with the NRC rulemaking is the recycle of contaminated metals, and fears that consumer products will become contaminated to unacceptable levels. However, the subject of clearance covers much more, including establishing uniform, dose-based, radiation survey criteria. Currently, nuclear facilities regulated by the NRC, States, or the DOE can release materials, on a case-by-case basis, if no radiation can be detected using field instruments. This practice does not imply that radioactive contamination does not exist, only that none is "detected." The determination of what can be detected can vary from facility to facility. By establishing clearance standards in the NRC regulations, there will finally be uniform guidance in the United States on acceptable detection levels that are, hopefully, consistent with those recommended by the IAEA and accepted by the international community. The existence and application of uniform monitoring and survey criteria should reduce the potential for the unintentional release of radioactive materials.

Recycling cleared metals would not mean the dilution of highly contaminated metal with other metal in the industry. Rather, it would mean the careful sorting of metals, using standard criteria, such that no metals above the 1 mrem/y clearance criterion would find their way into commerce. Metals containing levels above the standard could be further decontaminated or sent for low-level radioactive waste disposal if decontamination to the clearance criteria could not be achieved. The credibility of the United States' radiation protection framework is at stake since many other countries have already adopted uniform clearance criteria that the U.S. currently does not have.

Industry standards, such as ANSI Standard N13.12, can play an important role in the regulatory process. In fact, the White House Office of Management and Budg-

et (OMB) issued proposed revisions to Circular A-119, Federal Participation in the Development and Use of Voluntary Standards. These revisions are the outcome of the National Technology Transfer Act of 1995 (Public Law 104-113) signed by the President in March 1996. The law now requires federal agencies to use voluntary, industry standards developed by the private sector whenever possible. The purpose of this requirement is to eliminate excessive costs to the government by developing its own standards. As a recognized standards institute, standards developed under ANSI must be considered. Agencies who choose not to use private-sector standards are required to document their actions to the Secretary of Commerce. Thus, ANSI Standard N13. 12 should play a key role in the development of Federal regulations and policy regarding clearance.

CLOSING COMMENTS

Mr. Chairman, as I have outlined, the Health Physics Society believes that it is important that clearance or release criteria for low levels of radioactive materials be established to provide consistency in radiation protection requirements, thereby increasing protection of the public. The establishment of strict standards and guidelines will ensure that potentially harmful sources are controlled, while conserving our natural resources. We strongly support the continuation of the NRC rulemaking in this area, and we encourage the NRC to adopt the criteria outlined in ANSI Standard N13. 12.

STATEMENT OF THE METALS INDUSTRY RECYCLING COALITION: AMERICAN IRON AND STEEL INSTITUTE, AMERICAN ZINC ASSOCIATION, COPPER AND BRASS FABRICATORS COUNCIL, NICKEL DEVELOPMENT INSTITUTE, SPECIALTY STEEL INDUSTRY OF NORTH AMERICA, STEEL MANUFACTURERS ASSOCIATION

The Metals Industry Recycling Coalition ("MIRC") is a coalition of trade associations representing a broad spectrum of the metal industries. MIRC is comprised of the American Iron and Steel Institute ("AISI"), the American Zinc Association, the Copper and Brass Fabricators Council ("CBFC"), the Nickel Development Institute ("NiDI"), the Specialty Steel Industry of North America ("SSINA"), and the Steel Manufacturers Association ("SMA"). The members of these associations oppose the release of radioactively contaminated scrap metal into the stream of commerce.

Recycling—The metal industries are among the nation's largest recyclers. The free release of metal from nuclear facilities into the stream of commerce would create serious problems for metal recyclers and pose a significant threat to the high rate of recycling that metal industries have worked so hard to achieve. The result could be a public policy disaster.

Our Recommendation—Scrap metal originating from fuel cycle facilities, i.e. nuclear power plants, licensed by the United States Nuclear Regulatory Commission ("NRC"), and from facilities that are or were formerly operated by the Department of Energy ("DOE") should not be released for unrestricted recycling or reuse as products in commerce or for export. Much of this metal may be radioactively contaminated.

Rather, NRC and DOE should adopt a policy of restricted release of scrap metal from nuclear facilities. Restricted release should be specifically limited to the following—provided that, in either case, the scrap metal meets specified health-based standards at the point of use or disposal:

- (1) Recycling or recovery at a dedicated, licensed facility for use only at an NRC-licensed fuel cycle facility or at nuclear facilities operated by the DOE; or
- (2) Disposal at either a licensed radioactive waste landfill or an industrial or municipal landfill.

Until health-based standards and appropriate monitoring requirements are developed through the rulemaking process, scrap metal from nuclear facilities should not be released even on a restricted basis. NRC and DOE must work together to ensure that the release criteria and restrictions adopted by the two agencies are congruent.

The metals industries recognize that nuclear facilities have items that were not used in a way that would cause them to become contaminated. These items, such as cranes, metal desks, and filing cabinets, should be released for re-use for their original purpose, provided the items meet health-based standards when monitored according to stringent monitoring requirements established through the rulemaking process. They should not be released into the scrap supply, however.

Reasons: *Consumer Perception*.—The release of radioactively contaminated scrap metal from nuclear facilities for unrestricted recycling into industrial and consumer products could adversely affect the marketability of metal products made from recycled scrap and, more broadly, the marketability of all metal products. The public's

perception is that any level or type of radioactivity is unsafe, official assurances to the contrary notwithstanding. Several media reports have already generated public concern. Metal recycling industries have worked hard to build public confidence in the safety and utility of products made from recycled metal. This confidence would be lost if the public, rightly or wrongly, perceives such products to be unsafe. For this reason, metal companies have not, and will not, accept scrap that is known or perceived to be radioactively contaminated.

Economic Impact.—The presence of radioactive scrap in the stream of commerce imposes enormous operating constraints on metal producers who are trying to keep radioactivity out of their mills and out of their products. At considerable expense, U.S. metal producers have installed sophisticated radiation detectors to screen out the small quantity of contaminated scrap metal that arrives at their mills. A government policy under which radioactively contaminated metal could be free released into the stream of commerce would greatly increase the volume of radioactive scrap metal arriving at the gates of steel mills and other metal melting facilities.

Currently, metal producers reject loads of scrap that trigger radiation detectors, because of the potential consequences of melting shielded sources of radioactivity. The unrestricted release of scrap metal from nuclear fuel cycle and DOE-operated facilities, however, would present a far more onerous problem, as scrap metal with slight levels of surface or volumetric contamination can trigger the radiation detectors at metal companies across the country, leading to increased rates of scrap load rejections. This, in turn, would cause additional problems for scrap suppliers and transporters who will have to manage and arrange for the ultimate disposition of the rejected scrap.

Recycling Impact.—Currently, recycling is accurately perceived as a social good and thus something to be encouraged. The unrestricted release of radioactively contaminated scrap metal from nuclear facilities for recycling would tarnish this perception. Aversion to radioactive risk could lead consumers to avoid products made of metal, especially those with a recycled metal content. The industry would lose the public's trust in the integrity and safety of products made with metal. Hence a regulatory program allowing unrestricted release of scrap metal from nuclear facilities likely would lead to lower rates of metal recycling, producing an adverse impact on the environment.

Conclusion.—Congress should not permit NRC to authorize the unrestricted release of scrap metal from nuclear fuel cycle and DOE-operated facilities into the stream of commerce. Rather, NRC should establish scientifically sound, health-based standards for the restricted release of such metal. This is the most economically and environmentally sound solution. The metal industries cannot become a dumping ground for the discards of the global nuclear age.

CLEARANCE OF MATERIALS HAVING SURFACE OR INTERNAL RADIOACTIVITY

POSITION STATEMENT OF THE HEALTH PHYSICS SOCIETY

The Health Physics Society* welcomes the opportunity to participate in the process initiated by the Nuclear Regulatory Commission for development of standards for the clearance of materials having surface or internal radioactivity. The Society believes that the definition of clearance levels is an important part of the standards that provide for the safe handling, use, and disposal of radioactive materials.

The position of the Society relative to radiation protection regulations and standards for the general public have been established in previous Position Statements of the Society. Portions of these positions relative to the clearance of materials having surface or internal radioactivity are:

(1) we support regulations for radiation protection that are based on the National Council of Radiation Protection and Measurements' (NCRP) recommendations for dose limits for individual members of the public;

* The Health Physics Society is a non-profit scientific professional organization whose mission is to promote the practice of radiation safety. Since its formation in 1956, the Society has grown to approximately 6,000 scientists, physicians, engineers, lawyers and other professionals representing academia, industry, government, national laboratories, the department of defense, and other organizations. Society activities include encouraging research in radiation science, developing standards, and disseminating radiation safety information. Society members are involved in understanding, evaluating, and controlling the potential risks from radiation relative to the benefits. Official position statements are prepared and adopted in accordance with standard policies and procedures of the Society.

(2) we recommend that constraints¹ be applied to all regulated, non-medical, non-occupational sources of radiation exposure to the general public, excluding indoor radon, such that no individual member of the public will receive in any one year a total effective dose equivalent (TEDE)² exceeding 100 mrem (1 mSv)³ from all such sources combined; and,

(3) we recommend that dose limits be applied *only* to individual members of the public, *not* to the collective dose to population groups.

Expansion and clarification of these recommendations specific to clearance of materials having surface or internal radioactivity further leads the Society to take the position that:

(4) we recommend that regulations for radiation protection be based on consensus standards of the American National Standards Institute (ANSI) issued by the Health Physics Society Standards Committee in keeping with the intent of Public Law 104-113 "National Technology and Transfer Act of 1995" and OMB Circular A-119 "Federal Participation in the Development and Use of Voluntary Consensus Standards";

(5) we recommend that primary radiation protection standards be all pathway TEDE standards with screening levels related to quantities that can be *measured* such that compliance with these levels will result in the primary dose standards being met for reasonable and likely scenarios;

(6) we recommend that these screening levels be derived with consideration of the principle of as low as reasonably achievable (ALARA); and,

(7) we support the adoption of ANSI Standard N13.12 (1999), "Surface and Volume Radioactivity Standards for Clearance", which is consistent with positions (1) through (6) above.

ANSI STANDARD N13.12

Clearance is the removal from further control, of any kind, of items or materials that may contain residual levels of radioactivity. In 1964, the Health Physics Society, under the auspices of ANSI, began the technical evaluation of clearance, resulting in early drafts of ANSI N13.12. These early drafts of the clearance standard were based primarily on detection levels that could be achieved using field instruments, with secondary concerns about the potential individual doses that may result. An early draft version of ANSI N13.12 was consistent with the surface contamination limits that were published by the U.S. Atomic Energy Commission in the 1974 version of Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, which is still in use today.

In 1993, the Health Physics Society Standards Committee, in agreement with ANSI Committee N13, established a technical writing group to develop the final N13.12 clearance standard. The charter of the writing group was to develop a consensus clearance standard that would be protective of public health based on the recommendations of the International Commission on Radiological Protection (ICRP). Recommendations of the NCRP that have been adopted as the regulatory basis in this country are consistent with those of the ICRP. The standard was also chartered to consider both surface and volume radioactive contamination, consider radiation detection issues, and consider international issues such as the clearance principles outlined by the International Atomic Energy Agency and international trade implications for recycled or reused items or materials.

The final clearance standard was approved in August 1999 as N13. 12, Surface and Volume Radioactivity Standards for Clearance. This standard provides both the individual dose criterion of 1 mrem per year for clearance and derived screening levels for groups of similar radionuclides. The standard also allows for clearance, when justified on a case-by-case basis, at higher dose levels when it can be assured that exposures to multiple sources (including those not covered by the standard) will be maintained ALARA and will provide an adequate margin of safety below the public dose limit of 100 mrem/y (TEDE). It was recognized that there were several complex

¹ "Constraints" refer to restrictions placed on sources or practices in order to achieve the dose limits that apply to an individual.

² The total effective dose equivalent (TEDE) is the sum of the absorbed doses that will be delivered to the separate organs or tissues during the lifetime of an individual from one year's intake of radionuclides plus irradiation by external sources, with each organ or tissue dose weighted for the type of radiation producing the dose and with an estimate of the risk that the organ or tissue will develop a radiation induced cancer or result in a genetic effect.

³ The Sievert (Sv) is the international (SI) unit of dose equivalent or of effective dose equivalent; 100 mrem = 1 millisievert (mSv). The Society endorses the use of SI units; however, because U.S. regulatory agencies continue to use traditional units in regulations, this position statement uses the traditional unit for dose equivalent, i.e., mrem, throughout the document.

issues that would make it difficult to fully implement the clearance standard. As a result, some of these issues were defined to be beyond the scope of the standard, including: naturally occurring radioactive materials, radioactive materials in or on persons, release of a licensed or regulated site or facility for unrestricted use, radioactive materials on or in foodstuffs, release of land or soil intended for agricultural purposes, materials related to national security, and process gases or liquids.

RESPONSES OF RALPH E. BEEDLE TO ADDITIONAL QUESTIONS FROM SENATOR BOB SMITH

Question 1. NRC's success is primarily contingent on industry performance. What is the industry doing differently in this new environment to ensure public safety continues to receive the appropriate level of commitment and to support NRC's efforts to improve performance?

Response. The nuclear power industry's performance in 1999 demonstrated outstanding safety, reliability and electricity production. This level of performance could not have been achieved without an extraordinary commitment to public safety and to improving all facets of nuclear power plant operation. Data compiled by the World Association of Nuclear Operators (WANO) demonstrate that, by every measure WANO tracks, including unit capacity factor, unplanned automatic plant shut-downs, safety system performance and industrial safety, the nuclear industry is performing at a high level of safety and reliability. Attached are the WANO indicators showing industry improvements in performance over the last 20 years.

Recognizing the critical importance of safe operation, the industry is actively supporting regulatory reform to focus licensee and NRC resources on those matters that have the greatest importance to public health and safety. The Revised Reactor Oversight Process (RROP) represents a major step in ensuring that public safety is the paramount emphasis for licensee and NRC resources. Under the RROP, the industry is voluntarily providing the NRC with performance indicator data that evaluate plant safety performance in seven key areas. The industry has worked extensively with the NRC to develop the entire RROP and supported a nine-plant pilot project that was completed in November 1999. The RROP now has been implemented for all operating nuclear power plants.

Self-assessment and corrective action programs have been shown to be important to the continued safety improvements within the industry and are a key element in the RROP. Thus, the Institute of Nuclear Power Operations (INPO) recently developed a self assessment and corrective action program guideline that has been issued to each utility. Utilities are actively assessing their programs against the guideline and making appropriate adjustments. This important area will be part of the INPO plant evaluation process beginning this summer.

The industry also is actively supporting an initiative to risk-inform the regulations governing power reactor operations to improve the safety focus. Revisions to the regulations would be based on risk insights from probabilistic safety analyses (PSA) and the extensive operating experience accumulated within the industry to date. The industry recently submitted to the NRC for its review a document that will provide assurance that PSA studies have the necessary quality and completeness to provide appropriate risk insights. In addition, the industry is developing a guideline document for identifying safety-important equipment and how this equipment should be treated to ensure it is capable of performing its intended function. These documents are being shared with the NRC. They serve as the basis for industry interactions with the NRC and for moving forward on this important project.

At bottom, the industry's extraordinary commitment to safe, reliable performance and continuing improvement in operations, combined with its support for a more effective, safety-focused regulatory approach, benefit the consumer and the public.

Question 2. Although public acceptance of nuclear power seems to be improving, the industry still suffers from a negative public perception. Besides your safety record, what is the industry doing to improve its image and publicize its safety record more effectively?

Response. NEI and its members have engaged in a sustained communication effort to articulate to the public the many benefits of nuclear power, including advertising on a local and national basis, extensive efforts to educate the public through community and other outreach efforts, grass roots activities and polling.

On a local level, electricity utilities regularly provide speakers on nuclear energy to civic and other groups, as well as host civic and school groups at visitor's centers located at or near nuclear power plant sites. Research consistently demonstrates that those who have visited a nuclear power plant view nuclear energy more favorably than those who have not.

Electric companies also have active programs to assist teachers in developing lesson plans and student materials on nuclear energy as part of the science curriculum. Just this week, a group of about 50 teachers toured Florida Power & Light's Turkey Point Nuclear Power Station to get a better understanding of the plant itself. Organized by FP&L and the Miami-Dade Public Schools, the tour and additional instruction will help teachers provide their classes information on nuclear power, the principles behind it and plant operation.

On a national level, since 1998 the Nuclear Energy Institute has undertaken a communications program specifically designed to educate opinion leaders on the benefits of nuclear technologies. NEI advertises in national publications like *The Washington Post*, *The Washington Times*, and *The Wall Street Journal* and on Washington, DC-area radio stations. The advertising program is designed to raise public awareness of the many benefits of nuclear technologies, including those used in producing electricity, medical research and treatment, food safety, and space exploration. The communications program also includes submission of articles by professionals in these fields in large daily newspapers across the United States.

NEI also established a comprehensive web site (www.nei.org) that is used regularly by members of the general public, educators and students at all levels and professionals in the industry seeking more information about nuclear power. This site is especially beneficial to keep the public informed about emerging issues regarding nuclear technologies.

Although these communications programs help develop public support for nuclear energy, the record levels of safety in nuclear power operation and efficient and reliable performance of more than 100 nuclear power reactors in the United States are essential for favorable public opinion toward the industry. The industry has publicized the results of annual indicators of performance—the WANO performance indicator report—to national media and to opinion leaders across the country.

As the Nuclear Regulatory Commission continues to implement the new safety-focused regulatory oversight process, the use of the internet will extend detailed information on nuclear power plant operations to anyone who has access to the world wide web. An important feature of this transparent approach to communicating about nuclear energy, the NRC's plant performance ratings in 18 categories, will be available in real time on a quarterly basis. The public can also retrieve detailed inspection reports for each nuclear power plant from the NRC's web site.

Extensive public opinion research demonstrates that the industry's improved operation and safety record is beginning to bolster already high levels of support for nuclear energy by the public. Public confidence in nuclear power plant safety is turning distinctly higher, and overall public support for nuclear energy may be on an upswing.*

- Perceptions of plant safety are much more favorable now than at any time since the question was first asked in 1983. In the early 1980s, about half of Americans rated nuclear power plants as safe and now 80 percent believe they are safe.

- Confidence in "my local electric company's ability to operate a nuclear energy plant safely and correctly" continues to increase. It is especially high among people who said that their electric company operates a nuclear power plant.

- The percentage saying nuclear energy should play a very important role is edging back up. Only 12 percent said nuclear energy should not play an important role—an all-time low.

Enclosed is a copy of the most recent public opinion report based on research sponsored by the industry.

Question 3. Where does the industry see itself in twenty years? What regulatory environment would you envisage then?

Response. The nuclear energy industry and many individual policy makers and opinion leaders expect nuclear power to account for an even greater percentage of electric generation in the U.S. throughout the next 20 years. DOE's Energy Information Agency has predicted that there will be an increase in demand for electricity to support economic growth. This growth in demand will necessitate more nuclear power generation—and likely the construction of more nuclear power plants—given nuclear power's excellent safety record, high reliability and "clean air" contribution to the environment.

However, retaining nuclear power as part of a sound national energy policy requires the federal government and its administrative agencies to pursue policy initiatives to address issues that will have a significant impact on the industry's future. Some of those issues are listed below:

* Source: Telephone interviews, April 7-9, 2000, with a nationally representative sample of 1,000 U.S. adults, margin of error plus or minus three percentage points, Bisconti Research, Inc.

- There must be a national energy policy that ensures diversity and reliability of energy supply, both of which favor retaining, if not increasing, the use of nuclear power. Explicit policymaker recognition of nuclear's role in maintaining a diversified energy portfolio is critical. This recognition should come through implementation of the strategies identified in DOE's Comprehensive National Energy Strategy and the President's Committee of Advisors on Science and Technology report, both of which call for, among other things, DOE support for industry efforts to renew operating licenses and government sponsored nuclear research initiatives.

- The NRC must continue to adapt to a maturing industry and to develop an effective, safety focused regulatory framework. The NRC has made substantial efforts to reform its regulatory approach, including implementing an innovative regulatory oversight process that is more risk-informed and performance-based and, more broadly, developing risk informed, performance based regulations. While the industry supports the NRC's ongoing efforts to develop a more effective regulatory regime, Congress should continue its oversight of the NRC to ensure that the agency's actions recognize improved industry safety levels and the NRC implements sound budgeting practices and strategic planning.

- The federal government must fulfill its longstanding obligation to provide for central storage of used nuclear fuel. The national policy for management of used fuel was codified in the Nuclear Waste Policy Act of 1982 and 1987 amendments. Although DOE currently is evaluating placement of a repository in Yucca Mountain, without additional legislation the program will not yield timely results, forcing some plants to use temporary onsite storage. In addition, the government's breach of its contractual obligation is creating a taxpayer liability that could exceed \$56 billion.

- Federal and state policy makers must explicitly recognize the intrinsic economic value of nuclear power as a greenhouse gas emission-free energy source. Maintaining nuclear power's emission free capacity is necessary to prevent increases in the emission-reduction requirements imposed on emitting technologies. In addition, state and federal policymakers should (1) consider ways to allow nuclear energy to capture the clean air compliance value produced by emission-free sources of generation, (2) ensure that nuclear energy is fairly labeled, and (3) ensure that nuclear energy is treated equally with other non-emitting grid capable electric generating sources if an emission-free portfolio standard is adopted.

- Congress must eliminate the duplicative regulatory schemes that have allowed EPA to become involved in issues that are more appropriately subject of NRC authority. (For example, EPA has threatened to overturn NRC's regulatory decisions by seeking remediation under Superfund for sites decommissioned in accordance with NRC requirements. Another example of unnecessary and unproductive dual regulation is the application of the Resource Conservation and Recovery Act to commercial mixed wastes.)

In response to the question regarding the future regulatory environment envisaged by the industry, we would expect that NRC regulation would continue to focus on the safety aspects of the plant, evolving to rely even more heavily on risk-assessment processes in evaluating and regulating plant operation. The end result of the various NRC regulatory reforms being implemented, and those we expect to be implemented in the future, will be a regulatory environment that requires adherence to strict safety standards but does not permit the agency to attempt to "manage" nuclear plant operations.