S. HRG. 106–39

NUCLEAR REGULATORY COMMISSION: REVIEW OF PROGRAMS AND 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

FIRST SESSION

FEBRUARY 4, 1999

Printed for the use of the Committee on Environment and Public Works

U.S. GOVERNMENT PRINTING OFFICE
55–912 CC WASHINGTON : 1999

For sale by the U.S. Government Printing Office
Superintendent of Documents, Congressional Sales Office, Washington DC 20402

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C O N T E N T S

NUCLEAR REGULATORY COMMISSION: REVIEW OF PROGRAMS AND REFORMS

THURSDAY, FEBRUARY 4, 1999

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 9:12 a.m. in room 406, Senate Dirksen Building, Hon. James N. Inhofe (chairman of the subcommittee) presiding.

Present: Senators Inhofe, Bond, and Graham.

Also present: Senator Sessions.

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

Senator INHOFE. The meeting will come to order.

I guess I should open with an apology here. We originally were going to have this set for last week, if you will remember. Six months and a week ago we said we would have a meeting in 6 months, but that was when they were starting to take depositions in the impeachment matter, and I learned a long time ago that when you're in recess, you don't have hearings because there's no one around. Well, I don't have too many here right now.

[Laughter.]

Senator INHOFE. But they are going to be here. I understand that Senator Graham is on his way, and Senator Sessions and some others.

We have a little bit of a timing problem, ladies and gentlemen, in that I just came from the National Prayer Breakfast; it didn't occur to me when we set this up that it was at the same time. And because of going back into trial, we are going to be having both the Democratic and Republican Caucuses, so we're going to go ahead and expedite this and maybe try to get it through in approximately 2 hours, maybe.

So I will go ahead and start with an opening statement.

I would like to recognize the new members of our subcommittee, who are not here yet but will be here: Senator Voinovich, Senator Bennett, and Senator Hutchison. Senator Hutchison, as we speak, is speaking at the National Prayer Breakfast, so she's going to be a little bit late.

We are going to have a very busy Congress in both oversight and on legislation, including both FEMA and wetlands authorization

bills, and I think we have 12 oversight hearings that we are scheduling at the present time.

One of our last hearings last year was on oversight of the Nuclear Regulatory Commission. We held that hearing exactly 6 months and 1 week ago, and at that time Chairman Jackson said we could "expect these results in 6 months." Well, you've had 6 months and 1 week, so we're going to have a lot more results than we thought we would have.

[Laughter.]

Senator INHOFE. At the July hearing we invited the commissioners back, and the witnesses from the second panel, to explain the impact of the changes that the NRC has implemented, and comment on the changes that the NRC has proposed. So I look forward to their testimony.

Since the July hearing, the NRC's effort to change has been positive. I want to be sure that it works.

On the issue of reform, I would be judging success by three measures. First of all, will the NRC meet its relicensing goal of processing the applications within 30 months? You will remember that 6 months ago we heard concerns that this could last for an interminable time.

No. 2, will the general regulatory reform goals be implemented throughout every level of the NRC?

And No. 3, will safety not be compromised?

The first and the third goals are self-explanatory. Regarding the second goal, I am concerned that the reforms at the NRC will be embraced by the commissioners and the senior managers, but that they will not filter down through the NRC workforce. What we need is a cultural change at the NRC. I think we're all aware that Chairman Jackson will be leaving the Commission at the end of her term—on June 30, I believe it is, of this year—and yet, you can have changes at the top and they don't filter all the way down through the ranks. We want to make sure that that does happen.

So we look forward to this hearing. I would also comment that we will have continued hearings. I think it is natural, and it is built into any bureaucracy, whether it's the NRC or anything else, if you don't have oversight, things tend to get very lax and, of course, you're going to probably have more oversight than you've had before, and this will be consistent; not just one spurt of it now, but it will continue throughout the years, at least as long as I chair this subcommittee.

At this time I would recognize Senator Bond, one of our fine members from Missouri.

OPENING STATEMENT OF HON. CHRISTOPHER S. BOND, U.S. SENATOR FROM THE STATE OF MISSOURI

Senator BOND. Thank you very much, Mr. Chairman. I certainly hope that our good friend, Senator Hutchison, is putting in a few good words for us. We need them in these days——

[Laughter.]

Senator BOND [continuing]. And I am glad she is covering us on that base.

These are very busy times, as the chairman has mentioned. I apologize that I have a whole bunch of other things going on, but

this is so important that I wanted to come by and extend my best wishes to Chairman Jackson and members of the Commission, particularly Commissioner Merrifield, whom we knew in a prior life, and we certainly enjoyed working with him there.

I know the Nuclear Regulatory Commission has a very important mission, and that is to ensure that civilian uses of nuclear materials are done in a manner consistent with the public's health and safety, our country's national security, and in protection of environment.

I want to take a moment to let the subcommittee, as well as the chairman and the members, know that I have some constituents in Missouri that are extremely concerned about the NRC's proposed revision of the medical uses of byproduct material regulation. It is going to be self-evident to anybody with whom I discuss this issue that I'm no expert on nuclear issues. I got out of physics just about the time they really started getting into that area, and I know very little about nuclear medicine. But I do have some experts at home, and I have experts located in St. Louis, MO, at Mallinckrodt. They are good corporate citizens and leaders in the field of nuclear medicine.

They have concerns that they have expressed to me, and I share them with you, that the NRC is continuing to propose regulations in areas where there is no statistically significant radiation risk to workers, members of the public, or patients. One of these areas is diagnostic nuclear medicine, which uses trace amounts of radioactive isotopes, given to patients to diagnose diseases such as cancer, heart disease, Alzheimer's, and AIDS.

I understand that after having spent approximately $2 million of user fee money, the Commission rejected—with no explanation—the recommendations of the National Academy of Science Institute of Medicine report, and that report found that for nuclear medicine, the risk and probability of harm occurring to a patient or a member of the public is extraordinarily low, and recommended that the NRC reduce its focus in low-risk areas.

I will not be able to stay for the question and answer portion. I will have my staff here. I would hope that you would be able to address that.

Mr. Chairman, if I could, I would like to be able to submit several follow-up questions for the record.

Senator INHOFE. Without objection.

Senator BOND. I would ask, Madam Chair, if you would keep my office posted on this extremely important issue—not just to the people at Mallinckrodt, but to the hundreds of thousands of people whose health may be benefited by their work.

I assure you, we will be following the NRC's action on this issue very closely. It is my hope that the NRC will work with all parties and use the best scientific, medical, and technological information available so that those who are interested in the medical uses of byproduct material can be sure that we reach a satisfactory outcome.

Mr. Chairman, I thank you very much for the opportunity to present these concerns, which are of great importance to me.

Senator INHOFE. Thank you, Senator Bond. We will be having a lot of written questions coming in, so we would certainly welcome

yours. I know that some of the other members—Senator Sessions is going to be here in 40 minutes, and others will be coming in and out—so you will probably receive more questions in writing, which will expedite this hearing. Because of today's schedule, that's probably a good idea.

The way we've divided the panels today is to start with the five commissioners from the NRC. The second panel will consist of industry groups and public interest groups and outside interests.

I would like to give you an overview of how we will proceed during the public hearing. We have nine witnesses who will be testifying today. I will also mention that while some members of the subcommittee couldn't be here today, their staff is here and they will be submitting questions, as I said before.

Each witness will be allowed 5 minutes for an opening statement, and as my little granddaughter says, "red, yellow, green, we all know what that means." So if you would try to stay within that.

Jeff, since this is your first hearing as a new commissioner, I am sure that you will adhere to your lights.

[Laughter.]

Mr. MERRIFIELD. Indeed.

Senator INHOFE. After the comments we will be asking questions; and then, of course, we will start with our next panel.

I think that since some of the questions are going to be for both, although it may be a little bit disruptive, we're going to try to get everybody at the table at the same time, and I think maybe we can do that with the cooperation of the people sitting on the first row.

So with that, Chairman Jackson, I will recognize you to begin with.

STATEMENT OF HON. SHIRLEY ANN JACKSON, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Ms. JACKSON. Thank you very much, Mr. Chairman and members of the subcommittee. Thank you for this opportunity to present the substantial regulatory improvements that the Nuclear Regulatory Commission has made in the 6 months plus 1 week since our last hearing.

Our reforms, which are rooted in initiatives begun over the last 4 years, have four goals: maintaining safety; reducing unnecessary regulatory burden; streamlining NRC regulatory processes, and enhancing our public credibility. I will highlight for you some of the significant accomplishments.

First, we have streamlined the major NRC program offices, reducing the number of managers, improving organizational efficiency, and decreasing our overall resource requirements. By the end of this fiscal year we will have 330 NRC managers and supervisors, less than half the 700 we had in September 1993. Our fiscal year 1999 budget will achieve our stated goal of an 8 to 1 staff-to-manager ratio.

Second, we have accelerated a fundamental shift in the NRC regulatory paradigm. This shift is rooted in the Commission's commitment to risk-informed and performance-based regulation. In the past 6 months we have increased stakeholder involvement, refined NRC internal license review practices, completed pilot programs for risk-informed graded quality assurance, in-service testing, and in-

service inspection, and are considering risk-informing the complete body of power reactor regulations.

In reactor oversight, perhaps the most substantial reform is our development of a comprehensive revision to our reactor assessment and inspection programs, built upon cornerstones of safe licensee performance that must be monitored to ensure no unacceptable risks in reactor operations.

Performance indicators, integrated with the results of risk-informed baseline inspections, will allow the NRC to draw objective conclusions and to take regulatory actions that are linked clearly to licensee performance.

In the past 6 months we also have reduced substantially the unnecessary NRC and licensee burden associated with low-level enforcement issues, while retaining those features essential to the oversight of licensee safety performance.

Third, we have established fair, effective, and timely processes for license renewals, license transfers, and associated adjudicatory reviews. As an example, the NRC staff will complete the initial safety evaluation report and draft environmental impact statement for the Calvert Cliffs application on schedule, next month. In the absence of a hearing, we anticipate a completed NRC review and Commission decision on the Calvert Cliffs renewal application by May 2000, which is 25 months after its submittal.

Despite these achievements, we clearly face continuing challenges, such as ensuring the integrity of our public petition process and examining our treatment of harassment and intimidation allegations. Other open issues include fire protection, the development of a risk-informed performance-based revision to our medical use regulations, and ensuring the readiness of our licensees for the year 2000.

In closing, I would like to emphasize to this subcommittee the Commission's commitment to completing and institutionalizing these regulatory reforms, as well as many others discussed in our written testimony and others not in the testimony, doing it in an enduring manner that will ensure long-range NRC effectiveness. In part, we are building this continuity through key rulemakings and Commission policy decisions that will guide future actions. In the larger sense, we are transforming the NRC regulatory culture and ensuring long-term stability by incorporating these changes into our agency-wide planning, budgeting, and performance management process, which is driven by our multiyear strategic plan and built upon the foundation of strategic assessment and rebaselining begun in 1995.

Let me just assure you that this institutional framework will assure not just short-time and short-term adjustments, but building a legacy for the 21st century. We are communicating with our stakeholders, both internal and external, especially our staff, both continually and with focus, and we don't underestimate the challenge of effecting and managing change, especially internal to the NRC. But the NRC has an excellent and dedicated staff, and the Commission and the NRC senior management team are committed to leading change by communicating and inculcating these reforms throughout the NRC organization.

With your continued attention and support, we will succeed.

Thank you. I will be happy to answer any questions after my colleagues.

Senator INHOFE. Well, thank you, Chairman Jackson, and thank you for your service and dedication. We will miss you when you are gone.

I would like to ask each one of you if you have any opening statement. We will start with Commissioner Dicus.

I would also want to ask you to include in your opening statements whether or not you agree with everything the chairman has said.

[Laughter.]

STATEMENT OF HON. GRETA JOY DICUS, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Ms. DICUS. That's going to be the beginning of my statement, I think.

Good morning. I am very pleased to have the opportunity to be here today and to be able to provide my views to the subcommittee on the important topics receiving attention at the NRC.

The written testimony presented by the Commission and summarized in the chairman's opening statement was agreed to and is supported by all of the commissioners. There is, however, concern expressed about the commitment of the Commission to continue down the paths in our testimony.

I can assure you that the Commission is committed to these activities. It is both internally and externally recognized that implementation of essential changes in the NRC's method of regulation requires time before we shift the NRC's internal regulatory culture, and for licensees to understand how to meet and to best utilize new methods of regulation. After all, we are asking professionals—those inside the NRC, together with those outside the NRC—that have been used to one method of regulation for a quarter of a century or more, to shift to a fundamentally new regulatory methodology.

The fact that the process of integration of these changes will take time should come as a surprise to no one. That recognition, however, reinforces the need for the Commission to be committed to pursuing these improvements so that a new regulatory culture can develop in an effective manner.

Therefore, let me assure you that the Commission will improve its regulatory structure for both nuclear power plants, as well as our materials licensees. The Commission will reach a determination on what constitutes an acceptable risk assessment for power plants. The Commission will determine appropriate regulatory use of those assessments. The Commission will find ways for the NRC to operate more effectively and efficiently, and the Commission will improve our ability to have early identification of plants that may be headed for problems in operations.

Given current commissioner terms, and if there are no reappointments of sitting commissioners, I will be the last of the commissioners at this table whose term will expire. My current term does not end until June 30 of the year 2003. I want to give you my personal assurance that as long as I am on this commission, I will continue to pursue more effective and efficient methods for achieving NRC's regulatory mission. My goal is to see the initiatives that the

Commission has begun advance throughout the coming years to a point where the long-term regulatory improvements currently planned are either completed or nearing completion before I leave the Commission.

Whatever changes in the Commission's makeup may occur in the coming years, I will continue to fully support, both internally and externally, the systematic improvements on which we have embarked.

Thank you.

Senator INHOFE. I want to thank you for that assurance, Commissioner Dicus. We appreciate it very much.

Commissioner Diaz.

STATEMENT OF HON. NILS DIAZ, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. DIAZ. Mr. Chairman, members of the subcommittee, I do appreciate the opportunity to make a short statement.

I do strongly support the many efforts at regulatory reform now underway at the NRC, and I do support the statements that my fellow commissioners have made. I assure you that I will work with my fellow commissioners to ensure that the initiatives are continued.

I would like to call your attention to one aspect of the activities that I have supported since my appointment as commissioner. This can be loosely characterized as "assuring due process." By "due process," I mean not just compliance with the minimal requirements of the law, but implementation of fairness and equity in all regulatory activities, as befits a democratic society.

You will forgive me if I am a little passionate on the subject of democracy, democratic institutions, and due process. That comes from having known what it is like to live in a society in which government is all-powerful and due process is unknown. It is that experience which makes me feel strongly that at every level of Government the rules must be clear, they must be evenly, fairly, and equitably applied, and the rules and the results communicated to the public without under-or over-estimation of the safety implications.

I have emphasized that due process at the NRC must apply to many things—to the senior management meetings and its watch lists; to our policies on license amendment exemptions and license renewal; to inspection assessment and enforcement; to the hearing process; and to the protection of whistle-blowers, with appropriate safety concerns, and to public communications.

A quick illustrative example. When I arrived at the Commission, the basis for placement of a plant on the NRC watch list was not transparent to either the Commission, the licensees, or the public. As you may recall, the Commission must now provide negative consent for the watch list. Explanation for such action has been made clearer, and we are revamping our entire inspection, assessment, and enforcement process.

The Commission has made considerable progress in this and in all other areas that I have mentioned, but we must ensure that this progress not only continues but is propagated throughout all our other activities.

In this respect, I believe the use of risk-informed regulations will bring technical due process to how we ensure safety by controlling risk and eliminating unnecessary burden.

A final point. I am very encouraged by the collegial decisionmaking being exercised by the Commission. I am thankful for the opportunity you have given me to make these remarks, and I look forward to the very beneficial effects that your oversight brings to the NRC.

Senator INHOFE. Thank you, Commissioner Diaz.

Commissioner McGaffigan.

STATEMENT OF HON. EDWARD MCGAFFIGAN, JR., COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. MCGAFFIGAN. Thank you, Mr. Chairman.

I join my colleagues in thanking you for the opportunity to testify today. As I said to you at the first hearing last July, I firmly believe that such congressional oversight hearings are essential, both for the Congress and for the Commission.

Mr. Chairman, I am very proud of the Commission's accomplishments over the past 6 months. By any measure, this has been one of the most productive periods in the 24-year history of the Commission. Chairman Jackson has listed some of the highlights. I want to call particular attention to the policy changes made on low, safety-significant, so-called "Level IV" violations.

None of us could defend our policy as it existed last July, nor did we try. Indeed, as we testified, we were in the process of changing that policy.

The chart to the left, which was part of the chairman's testimony, shows the reduction in Level IV violations requiring licensee response in the last 5 months. We are no longer diverting licensee resources to low safety-significant violations found by the NRC. Licensees are putting such findings into their corrective action programs and handling them as they would problems that they uncover themselves.

This change came after extensive conversations with our stakeholders, and was supported by both industry representatives and by Mr. Lochbaum of the Union of Concerned Scientists.

In the coming 6 months, Mr. Chairman, we will tackle additional issues in our enforcement policy, such as the issue of regulatory significance, as part of our overall effort to have an integrated inspection, assessment, and enforcement policy, and we will continue to involve our stakeholders in an unprecedented fashion.

We could not have achieved all these policy changes without the extraordinary effort of our staff. They are the ones who achieved the results on the chairman's list, and many others as well. They and we are managing and experiencing an extraordinary series of simultaneous changes in programs, processes, and people. It has been exceedingly difficult, but also exceedingly rewarding, to manage these changes. We are grateful to the Congress for giving us the buy-out authority that was essential to achieving the 8 to 1 employee-to-manager ratio in a fair fashion. We lost many good people in the last 6 months to retirement, but other equally capable people have stepped forward to carry on the change process.

Our goal is to continue the pace of change in the coming 6 months without slipping into the dysfunction that can often characterize institutions undergoing rapid change. I personally would welcome another hearing by this subcommittee in 6 months to check on our progress and to continue the productive dialog that you began with us last July.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, commissioner.

The newest commissioner, Commissioner Merrifield.

STATEMENT OF HON. JEFFREY S. MERRIFIELD, COMMISSIONER, NUCLEAR REGULATORY COMMISSION

Mr. MERRIFIELD. Senator Inhofe, Mr. Chairman, thank you very much for you kind initial comments. I don't have any prepared remarks, but first I would like to associate myself with the comments of my fellow commissioners. I do sincerely believe that we are all in agreement on those matters.

I do want to share with you more informally some observations that I have had since I have been a commissioner at the NRC, now totaling about 13 weeks at this point.

When I first went to the Commission, I didn't have an appreciation for the consistently high quality of the staff that we have at the NRC. I knew that we had some high quality staffers, but I didn't realize the consistency of that. What brought that to my attention initially as a new commissioner was that I had to staff my own office. I had to hire a number of people to be part of my office, and I interviewed probably 50 or 60 people in all who are employees of the NRC right now. One of the questions that I asked them went very much to the issue—of the three that you mentioned, No. 2—do they believe that the regulatory reform goals that we are initiating are appropriate? And were they, as staff, committed to the cultural change needed to make that happen?

The answer that I uniformly received was yes. I think the staff does believe that the changes that we have been making and that have been encouraged by your subcommittee are important. They take the NRC into the 21st century and put us in the regulatory environment in which we need to be. I think that is instructive and helpful.

Similarly, in visits that I have made to plants around the country, I have met with our regional inspectors, the folks at the very plants who are doing the Level IV violation work, and they too agree that we need to make that cultural change and are committed to it.

Finally, I met with a number of CEOs over the course of the last couple of months, many of whom have wanted to come in and meet me as a new commissioner. They too, when asked, uniformly agreed that the NRC is making the kind of changes needed to get us in the right place. So I think that's a very appropriate message.

A couple other things that I want to mention before I close. We are going to receive some questions, I presume, about where we stand on the Y2K issues, and I would be happy to address those in the question period, as well as follow up on some of the issues raised by Senator Bond on Part 35 that I feel we do have an appropriate answer for.

One final thing that I have found as a new commissioner. I think this is a unified Commission. I think that having five commissioners is important; I think we work better that way. One of the problems that has occurred at the Commission is that we had a lapse; we had a period where we only had a few commissioners.

As you are looking forward to making changes in our authority, as the authorizing committee, one that I would recommend is the notion of having an overlap so that the commissioners can stay on to the end of the calendar year, when their terms end. I think having a unity of the Commission is important, and I encourage this committee, as soon as there is a nomination, to move forward quickly with a replacement for Chairman Jackson, who will indeed be missed.

Thank you for permitting me to testify.

Senator INHOFE. Thank you, Commissioner Merrifield.

So that you will be aware of it, you mentioned Y2K. I also chair the Senate Armed Services Readiness Committee, and we're going to be having a joint hearing between this committee and the Readiness Committee on February 24, specifically on Y2K. So we probably won't be getting into that at this time.

We have had a lot of interest shown—Senator Lieberman, who is on this committee, has already submitted some questions, as has Senator Pete Domenici, who is not on this committee. So there is interest outside.

We have been joined by our ranking member on this committee, and I would ask Senator Graham for any opening statements or comments at this time.

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

Senator GRAHAM. Thank you very much, Mr. Chairman. I appreciate your holding this series of oversight hearings. I think the Nation is well served by having men and women of such distinction on the NRC. And as has been said by most, we have a particular responsibility to see that the Commission continues to not only be a functioning body, but more importantly, have the confidence of the American people in the very important regulatory activities that they conduct.

I welcome all the members of the Commission. I will have to say that I have a particular welcome for my friend, Commissioner Diaz, a fellow Floridian, who had contributed so much to our State before coming to this national responsibility. Before joining the NRC, Professor Diaz was director of the Innovative Nuclear Space Power and Propulsion Institute at the University of Florida. Our State is proud to have one of its most distinguished citizens in such a critical position.

Today we will be conducting an oversight hearing on regulatory reforms and changes within the Nuclear Regulatory Commission. I have a particular concern that is going to be the focus of my questions, so I would like to lay it out in my opening statement.

This hearing comes at a critical stage in America's use of nuclear power for commercial purposes. According to the Energy Information Administration, the percentage of electricity generated by nuclear power reached a peak of 22.5 percent in 1995. In the last 10

months of 1998, nuclear power generated 20.5 percent of our electric supply. The EIA projects that this percentage will continue to decline. By 2010, only 18 percent of our electric supply will be generated by nuclear power.

To summarize, over a 15-year period, from 1995 to 2010, nuclear as a percentage of America's electrical generation will decline from 22.5 percent to 18 percent.

I might say, I checked these numbers as they relate to my State of Florida, which has five nuclear plants at three sites, and found that the decline was similar. In 1995, 20 percent of my State's electricity was generated by nuclear; by 1998, that had declined to 16 percent, and the projection is on a similar declining glide slope through the year 2010.

We are particularly proud of Florida's nuclear plants, especially Turkey Point Nuclear Power Plant, one of the older plants in the country, which for the last three rating periods has received the highest scores available through the NRC.

During this decline in the percentage of our electric supply generated by nuclear power, we are facing some extreme challenges. A major set of those challenges relates to our national and international commitments to reduce greenhouse gas emissions and avoid impacting the global environment through climate change. Looking at carbon dioxide emissions alone, the use of nuclear power plants instead of fossil fuel plants that would have generated the same amount of electricity—nuclear plants have avoided two billion tons, two billion tons of carbon emissions, since 1973.

Today the size of our nuclear industry in the United States has reached and passed its peak. There are no new plants currently scheduled to come on line. Older plants are reaching the end of their service lives. At the same time, the demand for electricity in the United States is predicted to continue to increase.

So this raises a series of questions. One of those is how we are to meet these increasing demands for power while taking responsible action to reduce greenhouse gas emissions.

Now, I will submit one suggestion for response to that question which came in the form of a letter from one of my constituents, who is in the 4th grade at Callahan, Florida Elementary School. His letter stated as follows:

> The way we can stop from using so much oil is to make laws about using so much power. What people need to do is live in log cabins with nothing but lanterns and candles. That wouldn't use so much power.

[Laughter.]

Senator GRAHAM. While it is unlikely that we will adopt his suggestion, this student identified a basic law of energy economics—to reduce energy demand, we must change behavior. By implementing energy conservation programs and seeking alternative energy sources, we are moving toward this goal.

But projected increases in electricity demand indicate that there is much more to be done. We need a plan. I recognize that nuclear power's role in this plan is, to say the least, controversial. I recognize the concerns associated with the use of nuclear power and the waste it generates. I believe our subcommittee is committed to addressing these issues.

As we proceed through today's hearing, I would like to ask the committee members, the panelists, and the audience to keep the following questions in mind:

Is the current state of decline of our nuclear industry desireable?

Is the decline from 22.5 percent to 18 percent of America's electrical generation in a period of 15 years a desireable national policy and consequence?

What are the tradeoffs, including global warming obligations, that we will need to make if we are to meet our anticipated increased electric demands without a viable nuclear industry?

What will be the changes in behavior required of other sectors of our society and economy if we are to accept a continued decline in the proportion of our electrical generation met through nuclear power?

Is the current decline of our nuclear industry irreversible? Are we in a situation in which we are dealing with factors beyond our control, and thus rather than focus on change, we must focus on consequences?

If it were desireable to do so, how could the NRC impact the economic viability of the nuclear industry and reverse this trend?

The answers to these questions will be an integral part of our Nation's strategy to meet our future energy needs, and will be a determining factor in the domestic impact of actions to reduce greenhouse gas emissions.

I look forward to your comments and the comments of our colleagues and the other panelists who will be with us today. I also have a statement for the record from Senator Lieberman.

Thank you, Mr. Chairman.

[The prepared statement of Senator Lieberman follows:]

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

Thank you Mr. Chairman and I appreciate your holding this oversight hearing on the Nuclear Regulatory Commission. As you know, I have strongly advocated these hearings. I regret that I will be unable to stay for this hearing, but I must attend a markup in the Armed Services Committee.

This may be the last hearing before Chairman Jackson departs at the end of her term in June to become president of Rensellear Polytechnic Institute. I think there is widespread agreement that Chairman Jackson has made a tremendous positive contribution to the functioning of the NRC. I thank her for that contribution on behalf of the people of Connecticut. Regaining the trust of the citizens of southeast Connecticut in nuclear power has been a slow process, but the chairman's openness and responsiveness to the community and her total commitment to safety as a first priority have made an enormous difference. We wish her well in her new challenges.

In response to the last oversight hearing of this subcommittee, the NRC has set forth several performance goals: maintain safety, reduce unnecessary regulatory burden, increase public confidence and increase efficiency and effectiveness of key NRC processes.

These are worthy performance goals and they are well-stated. They probably could gain widespread approval. However, I am concerned about some of the details of these goals, and my concern comes from the work that the GAO has been doing for me over several years. The GAO's most recent project for me focuses on how the NRC defines safety, and whether some new NRC initiatives will improve the safety of reactors.

One of these new NRC initiatives is known as risk-informed regulation. On the surface, this sounds good: everyone wants regulations to take into account information about risk, in other words, make sure that the NRC and licensees focus resources in areas commensurate with their importance to health and safety.

But the GAO today raises questions about whether this new approach to regulation will actually make any difference in terms of improving the safety of reactors.

The GAO indicates that the NRC hasn't done the analysis necessary to determine whether this new approach will improve safety. The GAO also questions whether the NRC has the proper foundation to move forward with risk-based regulation. This approach to regulation assumes that the NRC and the licensees fully understand the design basis of a reactor, and that the reactor is in compliance with that design basis. Without this type of information, it is extremely difficult to make well-informed decisions about which problem presents the most risk and needs to be addressed first.

Unfortunately, however, our experience over the last several years has shown that the NRC and licensees often lack basic information about the design basis of a plant.

It's my view that before the NRC fully adopts this risk-based approach to regulation, it needs to convince the public that the approach will improve safety. I'm all in favor of reducing unnecessary regulatory burdens on licensees, but we need to keep in mind our first goal of insuring safety.

I'd like to take a few minutes to address one other issue, Mr. Chairman.

One of my major concerns over the last several years—in fact it was a big focus of my attention when I was the chairman of this subcommittee—has been the NRC's handling of whistleblowers. As we've learned from our experience at Millstone, whistleblowers can provide invaluable information about what's going wrong at a plant.

In recent years, Chairman Jackson has made significant strides in improving the way the Agency handles complaints from whistleblowers. But I was very disturbed recently at the NRC's approach to investigating allegations of harassment and intimidation associated with the layoff of 106 employees at Millstone. I asked for the Inspector General to investigate these layoffs, and he recently issued a report critical of the NRC's actions.

To her credit, Chairman Jackson immediately appointed an administrative law judge to do an independent review of the layoffs, although there is some concern that the investigators assisting the judge may not be independent of the Agency.

While I'm pleased with the chairman's swift response to the Inspector General's report, I'm concerned that her personal commitment to treating potential whistleblowers with seriousness and respect may not be as widespread throughout the Agency as it needs to be. In other words, it is important that policy directives from the top be implemented at all levels and that the Commission itself follows through on these policies.

Thank you again, Mr. Chairman, and I regret I cannot stay.

Senator INHOFE. Thank you, Senator Graham.

To demonstrate the flexibility of this committee, my idea has been rejected and we are going to go back to the original format, where you would stay here for questions. But if you could remain here while the other panel makes its presentation—will all five of you be able to do that?—so that in the event there is some contradiction, some of you can come forward?

Thank you.

Chairman Jackson, since this is probably your last appearance before this subcommittee, I again want to thank you for all the help you have been and for your dedication. As I said in my opening statement, I want to make sure that the reforms are fully implemented. I know you've worked hard, but you won't be here, and some of the other commissioners may not be here later on when we want to make sure that this is ongoing.

I just would ask you, Chairman Jackson, are you still on track for finishing each license renewal application within 30 to 36 months?

Ms. JACKSON. Yes, Mr. Chairman. Each milestone laid out in our license renewal schedule for the Calvert Cliffs application, and the Oconee application, each milestone has been met up through December 31, 1998, and it's still on track. There has been a high degree of management oversight. There is a License Renewal Steering Committee that has been set up, comprised of senior managers, who meet on a regular basis. Their job is to ensure that issues can

be resolved before they become sticking points, and the executive council has been directed by me to provide additional oversight to ensure that resources get moved around and that any policy issues are surfaced on a rapid basis.

But we have met all of our milestones; and, as you know, there were petitions for intervention which our licensing panels denied; and the Commission, in the case of the Calvert Cliffs application, upheld that position. If there is no contest, we expect to complete the Calvert Cliffs license renewal in 25 months, and that's ahead of the originally projected 30 to 36 months. But it is a very aggressive schedule, and it assumes no hiccups, but so far we are definitely on track.

Senator INHOFE. Well, that's good news, Madam Chairman.

I would like to ask each commissioner if they would like to comment, at least whether you agree or disagree, and elaborate if you wish.

Commissioner Dicus.

Ms. DICUS. Well, clearly I agree with what the chairman has said. The information she has provided to you is accurate. We are definitely, with Calvert Cliffs, a little bit ahead of schedule; and certainly with Oconee, we are definitely on schedule. Barring any unforeseen activities that would occur, something that we can't anticipate, we should certainly finish these as she said, Calvert Cliffs in 25 months and Oconee, if not ahead of time, certainly on schedule.

Senator INHOFE. Commissioner Diaz.

Mr. DIAZ. I totally agree. I do believe that a significant thing that has been done is to upgrade the way we conduct the hearing process. I think the changes that we are making there have been very beneficial.

Senator INHOFE. Commissioner McGaffigan.

Mr. MCGAFFIGAN. Sir, I also agree. I think the staff-licensee dialog has been extraordinary. We are talking almost weekly in public with both Duke and BG&E, Baltimore Gas & Electric, and that's a real change. But we have much better communication in this process than I think we've had previously.

Mr. MERRIFIELD. I would agree. And perhaps anticipating your next question, I think there's a uniformity among the commissioners and the staff to ensure that as we go along this process, we continue to find ways of saving time. And I think that internally we should be shooting for a shorter time period as we go through this renewal process.

Senator INHOFE. I would also like to ask any of you—maybe you, Chairman Jackson—can you foresee any reason why this would be delayed, anything that is out there that we may not be aware of right now that could cause an obstacle or a problem in meeting this schedule?

Ms. JACKSON. Well, I would say that there are always two potential vulnerabilities. One is that the public, with appropriate standing, does have the right to intervene, and the National Whistleblower Center did petition for a hearing. As I say, that was denied; the Commission upheld that. But they have the right to appeal that, and they have done that, and so really, that is a vulnerability, depending upon how the Appeals Court rules.

The other type of vulnerability is whether one gets stuck on any particular technical review issues that create a problem, and that's why we have the degree of oversight built into the process. And of course there's a third, having to do with the environmental impact statement process. But at this point we don't see any roadblocks in that regard.

Senator INHOFE. Any other comments?

Mr. MCGAFFIGAN. Sir, there is one additional one. The Advisory Committee on Reactor Safeguards has a statutory responsibility to look at each of these. We have built that into the process. We met with them yesterday, and they are trying to work in parallel. They look at the safety evaluation, not the environmental evaluation, and we have built in from November to February, approximately, for them to do their job, and they're starting it now. They're not going to wait until November; they're going to start getting briefed now. But that process at times can be a little bit of a wild card.

Ms. JACKSON. But I do believe that they are committed to trying to work with us.

Senator INHOFE. But you have, in anticipating that—that's not totally unforeseen——

Mr. MCGAFFIGAN. Yes. That's totally anticipated.

Senator INHOFE. Good.

Any other comments?

[No response.]

Senator INHOFE. One of the concerns you always have, or that I would have, is that other distracting issues might get in the way. Our concern is to make sure that this equipment is working safely and properly for the next 30 or 40 years or whatever the licensing is, but other issues could come up in there, like reliving the plant siting issues and all that, things that I would want to guard against.

Do you have any process to ensure that site issues aren't thrown into the renewal process?

Ms. JACKSON. The way the staff reviews are structured, they are predicated on review plans; we call them standard review plans, and they are built squarely on two regulations, one having to do with the actual technical reviews, 10 CFR Part 54, and one for environmental reviews.

In fact, a couple of years ago the Commission revised both the Part 54, but also Part 51, to allow more generic resolution of environmental issues. So those are what we've done to try to keep things on track.

But in the end, if you're having technical reviews, the staff has to do those reviews in a complete and a fair way. They are much more focused than they might have been otherwise. And the environmental reviews are being done in a fair and complete way, and the whole environmental impact statement process is also a public process.

So those are the kinds of things that are not totally within our control, but what we can control is the tightness of the review and adherence to our own schedule.

Senator INHOFE. Any other comments about that?

Mr. MERRIFIELD. I would add one other thing. One of the ways in which we can get off track is if the Commission doesn't provide

the right instructions to the staff, and we give them side issues and send them off into areas that they shouldn't be in. I think, speaking only for myself, license renewal is a top priority, and whenever I have an opportunity to meet with staff, I make it clear that that's an issue where they ought to be putting their attention.

Ms. DICUS. Just to add, the issues that we're dealing with with license renewal are what I call the "going forward" issues, the issues that have to do with aging, to ensure that the plant can be operated safely. It's not the past issues. For example, siting—that's been determined; that is not an issue that we will go back to during license renewal.

Senator INHOFE. Thank you very much.

Senator Graham—I do have another question, but I would like to defer to Senator Graham for questions at this time.

Senator GRAHAM. I know that a number of other plants which are reaching the end of their current permitted life are deferring an application for extension until they see the results of these first two plants. Do you think that is a desireable policy, for other plants to defer until these two are resolved before making a decision? Or would you recommend that those who feel that they want to extend the life should submit their applications while the two current ones are still in process?

Ms. JACKSON. Well, Senator, if I may start, in fact I think we've been "invitational" relative to having licensees come forward with license renewal applications. I think we've invited those.

The point we have made—and we are in dialog with a number of licensees who we expect within the next 2 years to submit license renewal applications, and that dialog is important so that we can stage those reviews and plan and make sure that we have the resources in place to do those reviews in as timely a manner as we can.

Second, we in fact have a group that meets with an NEI group on license renewal to continue to talk about issues, both generic and specific, to refine the process so as to give potential license renewal applicants more comfort that the process is getting better all the time.

And so my statement to you is, "invitational" and focused on planning is where we are.

Senator GRAHAM. Did anyone else want to comment on that question?

Mr. DIAZ. I just wanted to say that a little bit of delay sometimes is not bad, because the jury is still out. I think they are looking to see how the process works.

Also, it's a very complex economic decision that has to be phased into what are the other expenses that the plant will have to go through.

So a little bit of delay actually works OK for some people; however, the Commission would like to get the applications as early as possible so that we can put them into our license renewal process.

Ms. DICUS. The issue that the chairman brought up, about being almost invitational, we continue to hear of more and more applicants—utilities—that are considering license renewal, to the point where we are having those conversations with the industry to try to "gate" some of these renewal applications so that we do not get

a large number in 1 year where we're not prepared to deal with it. So we are discussing that with the industry.

Mr. MCGAFFIGAN. Sir, I would add that we do have budgeted, I believe, four for fiscal year 2000. We know that Arkansas Nuclear 1 announced that it is coming in in December; Turkey Point may be soon thereafter; and others, and we welcome that.

The best endorsement we're getting at the moment is from the applicants who are in the process. Mr. Mike Tuckman of Duke at a recent NEI meeting that I attended with Chief Nuclear Officers said, and I'm pretty close to a quote, "The water is good, come on in," to his fellow Chief Nuclear Officers at the plants around the country.

So I think that the process is working. We will improve it, as Commissioner Merrifield said, as we go forward, but we have a pretty sound process right now.

Senator GRAHAM. If I could, Mr. Chairman, I'd like to ask this panel the first of a series of questions that I outlined in my opening statement, and that is—I recognize that you're a regulatory body, not a macropolicymaking body, but you also are in a unique position to evaluate some of the most significant aspects of the macro issues surrounding this industry, such as the fundamental safety and compatibility of these plants with adjacent neighborhoods, the environmental consequences of the operation of nuclear, and so forth.

I indicated the statistics relative to what is happening now, a rather precipitous decline in the proportion of our electrical energy being generated by nuclear. Do you consider that this current state of decline in our nuclear industry is a desireable national trend?

Ms. JACKSON. Well, I am a proponent of nuclear power. I regulate it, but I believe in it. So no, I don't think it is desireable to have a decline. I think having a diversity of energy supply from an economic security point of view is an important goal.

In addition, I think as you implied in laying out the series of questions that you would like us to address, you spoke to the issues of global warming and mitigation of greenhouse gases, and I think we all recognize that nuclear represents an emissions-free source. But there is no free lunch. One has to maintain a compact with the public that allows nuclear power to flourish, and that does require the safe operation of the plants, and they are safe, but it also requires a belief by the public in the safe operation of the plants.

And then the final thing I would mention is that the issue of disposition of spent fuel and high-level waste does have to be resolved, because in the end that does affect both public credibility, and it has environmental impact if it is not addressed. It may not have impact relative to air quality, but it can have environmental impact in terms of grounds and contamination and the like. But we feel our regulatory regime at the moment allows for the safe storage of spent fuel and high-level waste onsite for as long as 90 years, but in the end there has to be a resolution.

Ms. DICUS. I agree with everything the chairman has said wholeheartedly.

I might also add—I can't quote the exact figures, but it's my understanding that if we continue to have a decline in use of nuclear-generated power, we will have to more than double our efforts to

meet our greenhouse gas reduction goals, and at tremendous additional cost to the Nation.

Senator GRAHAM. I remember a statement made by the Assistant Secretary of the Department of Energy with responsibility for energy statistical analysis, that if the United States in the year 2015 had the same proportion of its electrical generating capacity in nuclear that France does today—and I recognize that that is a theoretical but unrealizeable goal, but to use it as a standard—that if in 2015 we had the French standard, we would meet between 80 and 120 percent of our year 2015 greenhouse obligations. So it's an enormous strategic component of the Nation's obligation under the Kyoto agreement, and for our own national concern.

I think we need to think about the use of nuclear in terms of what are the consequences if we don't have nuclear, how much other behavioral change will be required elsewhere in our society and in our economy in order to make up for the lost opportunity to meet a substantial amount of our obligation through the use of nuclear-generated electricity.

So if I could, Mr. Chairman, just ask—the last question in my series was, if it is desireable to reverse this trend, how could the NRC impact the economic viability of the nuclear industry and contribute to such a reversal?

Ms. JACKSON. If I may begin, I believe there are four ways that the NRC has impact.

The first is how we conduct our business, and that is what has been the focus of this committee's attention. We are shifting the regulatory paradigm to become risk-informed and performance-based. We are shifting the regulatory paradigm to implement a new assessment, inspection, and enforcement program that is focused on the right things, that has clear thresholds built into it, and that provides a baseline level of oversight and burden, but no unnecessary burden beyond that. We are improving our internal operations through our planning, budgeting, and performance management process that is outcomes-focused and meant to make us more efficient and accountable. And we are being responsive to our various publics, to all of our stakeholders.

The second has to do with our facilitating continued operations of existing plants, and that is what license renewal is all about. We think that we have a good process, but one that has to be—and is—protective of public health and safety.

Third, we have to be responsive to new ownership arrangements as the electric utility industry restructures, and we think we have the basis for that in how we've been aligning ourselves in terms of license transfers. The Commission made a decision to add a part to 10 CFR Part 2 to allow more informal hearings for license transfers. But in addition, we have aligned ourselves internally in terms of the various reviews we have to do.

And finally, the fourth is that we have to be prepared to license new plants. We have laid the groundwork for that. There is a regulation that existed before any of us arrived on the scene; that's 10 CFR Part 52, but we've laid out a review plan relative to that. We have done design certification rulemakings for two advanced reactors, the Advanced Boiling Water Reactor and the Combustion En-

gineering System 80+, and last year we completed the final design approval for the Westinghouse AP–600 design.

So those four ways—how we conduct our business, allowing continued operations of existing plants, being responsive to new ownership and business arrangements in the electric utility industry, and preparing and laying the groundwork for license renewal—are four ways that we as regulators can do our jobs, but all in a way that is protective of public health and safety.

Mr. MERRIFIELD. Senator Graham, I would like to associate myself with the remarks of the chairman, both in her response now and in her previous response. I completely agree with them.

The only other thing I would add is this. For those of us who are supportive of the uses of nuclear power, there is an issue that we all have to grapple with now, and that is the practicalities of the cost of alternative forms of energy, such as coal and oil, which do have an impact on the decision of a utility to move forward with a new plant. And that's certainly something that we have no control over.

Finally, there is ultimately an issue of a utility deciding to move forward and build a plant. I think we've put ourselves in a position of being ready to act on that selection, with a design certification moving forward. We also have a process available if a utility would like to pre-designate a new site where they would like to build a plant; we can certify that selection as well and allow them to put that site on the shelf for future use.

So I think we have done what is necessary to move forward, and we are ready, willing and able if a utility moves forward with a plant design, and we will move forward and work on licensing that facility.

Mr. DIAZ. Senator, if I may add something?

In this process of reversing this trend, which I believe should be reversed, there are a series of political issues that need to be resolved. There are a series of economic issues that need to be resolved. There is the issue of the effectiveness of the Nuclear Regulatory Commission, which is a very important issue; that's one that we can deal with in a very tight and controlled manner.

And then there is the issue of public communications. This is a vital issue because unless this is addressed, there will always be the question out there whether this is really a viable and safe technology.

The composite of those political, social, economic, and regulatory issues is what could make it viable, to reverse the trend.

Mr. MCGAFFIGAN. Sir, one last comment, if I could.

The heart of the rule that Chairman Jackson mentioned was to take a two-step process and make it a single-step process in getting a combined operation and construction license. That was endorsed by Congress in 1992; former Senator Johnston was the prime mover in getting that endorsement of the Commission rule.

Our hearing process will obviously be challenged by any such application, and I think there is probably some concern about our hearing process. We have done what we can in the last few months, but the issue is very much before us, whether there are further reforms that we need to make in our hearing process to make it more streamlined for new applicants.

I just wanted to call that to your attention.

Senator INHOFE. Thank you, Senator Graham. I think those last two questions will be appropriate questions for the next panel, also.

Let me just wind this up. Last July I asked a question stemming from the two quotes, the one of the former commissioner, Dr. Remick, and another from the former head of the INPO, Dr. Pate. Let me read these quotes again and ask each of you to respond in terms of the cultural change and what you are anticipating in the future.

Dr. Remick said,

> The Commission does not know in detail how the Agency's programs are being performed in the field. The overemphasis on blind adherence to strict compliance in every confusing regulation, to strict compliance with documents never intended for that purpose, is in some cases diverting attention from more safety-related activities.

And Dr. Pate said,

> Headquarters and regional personnel routinely—every day, and indeed, every hour—impose requirements on the plants that the Commission or other senior managers would not support if, in each instance, you knew what was happening.

Since we read those quotes 6 months ago—why don't we start with you, Chairman Jackson, as to how you see this changing; not just what has happened over the last 6 months, but for the future.

Ms. JACKSON. OK. Senator, if I may, a member of my staff had a picture of a contorted road that he gave me not long after the hearing last July, and at the bottom was a phrase that said, "A bend in the road is not the end of the road unless you fail to make the turn."

[Laughter.]

Ms. JACKSON. So what I would like to posit is that, in fact, the Commission and all of the NRC is making the turn at the bend in the road, and we're doing that by virtue of the overall new assessment, inspection, and enforcement process that we are designing. It is not in place yet, one has to be honest, but we have worked with stakeholders, with NEI, with the Union of Concerned Scientists, in developing this. But I think we've taken some very specific short-term steps having to do with low-level violations, and you saw the trend graph; that is real. We have changed the enforcement process that way. But also, over the next couple of months we are going to align the overall enforcement program with the assessment and inspection program.

We are renormalizing the inspection program. We are creating what we are calling a risk-informed baseline inspection; it's what is the minimum that we need to do to assure public health and safety, but only go beyond that for cause. And that's going to cause a major change.

But we have an educational job to do—training, communication, education, coaching—with the staff, but you have arrayed behind us an excellent management team, and these folks have been making hard decisions, working themselves to death and working those who work for them to death, and they are working to drive all of the change through the organization.

I think that, coupled with the commitment you have heard from this Commission, is the greatest opportunity we have to ensure that we complete that bend.

Senator INHOFE. I think that is very well said.

Does anyone have any disagreement with that statement?

[Chorus of noes.]

Senator INHOFE. How about you in the audience? Any disagreement out there?

[Laughter.]

Senator INHOFE. Well, I appreciate that very much.

Do you have any further questions for this panel, Senator Graham?

Senator GRAHAM. No, Mr. Chairman.

Mr. MERRIFIELD. Senator, I agree with what the chairman said. I think it's a long road. We have made part of the travel on that road, but we are not there yet. The chairman mentioned Level IV violations; I think that's a measure of our progress. Another one which wasn't mentioned is the issue of confirmatory action letters, where we send out a letter to a licensee and want to confirm that they're taking an action. We have used a significant number of those in the past and have had a dramatic decrease in the number of those issued in the course of the last 6 months because of more stringent changes made.

We do need to keep on top of making sure that the decisions that we make as commissioners, that are implemented by our staff in Rockville, are followed through with our regions, and that is something that we need to continue to make more progress on. I think the efforts toward investigations and enforcement are a further effort to try to achieve that goal, and I certainly believe that it's something that we need to keep on top of in order to make sure that the actions that we've taken that have made progress in Level IV are consistent throughout the Agency and our regions.

Mr. DIAZ. Senator, if I may add something?

I have labeled this Commission an "engaging" Commission, and sometimes—I don't know whether it's at the right level or not—but one thing that we have been asking continuously is, what is happening at the interfaces among the different levels of the staff, between headquarters and the regions, between their staff, licensees, and stakeholders? And maintaining communication with the Commission will bring accountability to those interfaces. It is a very important way to effect the cultural changes that need to be made, so that the entire Commission and entire staff are actually focused on those changes.

Senator INHOFE. Yes, Commissioner Dicus?

Ms. DICUS. If I could, just for a few minutes, I agree with everything that has been said so far, because clearly we have a ways to go. We're not where we need to be yet, but we do have a map of the road and we know where we're going.

I think when we do get our enforcement policy redone, it will be a major step to completion, but also ensuring that we do provide the constant oversight and training necessary for those interfaces on the one-on-ones, the people who actually work closely with the licensees.

When I am in plants, I also talk to our resident inspectors. I get their feedback and I make them aware that this is something that is definitely on the Commission's plate.

Senator INHOFE. Good.

Yes, Commissioner McGaffigan.

Mr. MCGAFFIGAN. Just to make a point, the communications that we are having today, both with our stakeholders and internally, are a revolution. One of the NEI staff, Tony Petrangelo, has called it "NRC Glasnost."

We are trying very, very hard to be open with our staff, and I think we do know what's happening in the field today, and we partly know it directly and we partly know it through much-improved communication with our stakeholders.

So if there is something that has changed—and I think you challenged us on this at the last hearing—if there is a really major, fundamental change that is going to help, it is a revolution in communications. Dr. Rhodes is going to mention it later. We are fully aware that when we make extraordinary changes, the communication channels have to be open.

Senator INHOFE. Thank you very much.

Ms. JACKSON. Mr. Chairman, if you would just be indulgent with me for 30 seconds?

Senator INHOFE. Yes.

Ms. JACKSON. I do want to say it, so that you can have a concrete example. I actually have gone to all of our regions, as well as in headquarters, to have what are called "Chairman-staff dialogs," where I actually meet with groups of employees—not their management, just the actual employees, in groups of 15 or 20—to talk about what's going on, to talk about the change, the need for change, how it's going to impact them, to find out their concerns and discomfort, to walk it through.

In addition, the executive director for Operations, Dr. Travers, has begun doing a similar kind of activity, because it takes that kind of investment.

Senator INHOFE. Well, it does, Madam Chairman, and I appreciate that very much.

Senator Graham.

Senator GRAHAM. The responses to those last questions prompted an idea to which I am not going to ask for an answer now, but I would like to plant a question, and maybe you could respond in writing.

I do not believe that Congress should become involved in micromanaging an agency. I do believe we have the responsibility for oversight of the macro issues in the sense of whether the Agency is accomplishing its intended direction, the reason that it was established.

I would like to ask, how do you think this subcommittee could best carry out its function? For instance, what are the kinds of questions that we should be asking on a recurrent basis that relate to the fundamental policy issues affecting your agency and your relationship to the public interest in commercial applications of nuclear energy? What are the data bases that you would use to respond to those questions that we ought to be directed toward to monitor?

We can't exercise oversight by having a hearing once every 8 months. As any CEO of a large conglomerate would have, we have to have a continuous information flow that allows the CEO to have a sufficient command of what's happening to have a comfort level that the individual components of the conglomerate are making their contributions toward the corporate objectives.

What are the questions? What are the data files that we ought to be monitoring as they relate to the NRC's responsibility to the Nation's commercial nuclear industry?

I would like the answers to that in writing.

[Response to the question follows:]

We agree with you that the subcommittee's responsibility is for the oversight of macro issues and, as you state, not micro-managing an agency. In this regard, we respectfully believe that the subcommittee's oversight function can take place in several arenas. First, the subcommittee can provide oversight of the Agency to ensure NRC is protecting the public's health and safety by conducting its regulatory mission consistent with the national priorities of streamlining regulatory burdens while increasing our openness to the American public. For example, the subcommittee could provide oversight of NRC's efforts to avoid dual regulation in the decommissioning area. As you know, the interactions with other Federal agencies, particularly the EPA, have gone on for several years, and subcommittee guidance regarding the interpretation of our respective roles would be most welcome.

Second, notwithstanding our being an independent Commission, the subcommittee can enhance NRC's efficiency by involving us early in legislative initiatives of national import that could affect NRC's mission. For example, as the committee reviews CERCLA and/or RCRA legislation, the NRC can be a contributor to those discussions, since some of the affected sites are NRC licensees or are located in Agreement States.

Third, the Government Performance and Results Act provides a viable process that could assist the subcommittee in carrying out its oversight responsibilities. It includes interaction between the agencies and Congress to formulate agreed upon strategic goals and performance objectives, and to monitor the Agency's progress in achieving those goals and performance objectives. We are currently revising our strategic plan and performance metrics to clarify the direction of the Agency and the regulatory improvements we have underway to respond to congressional and stakeholder concerns. We plan to revise the plan in stages and to get feedback from our stakeholders through the process. We welcome and encourage the participation of the committee in revising our strategic plan.

Fourth, regarding potential metrics that NRC could be measured by, we suggest that the committee work closely with us on the following key documents: NRC's annual Performance Plan and our Monthly Status Report of Licensing Activities and Regulatory Duties. The Performance Plan will assist in measuring our success in implementing our new initiatives and the Monthly Status Report of Licensing Activities and Regulatory Duties has and can continue to be a vehicle to provide Congress information about how NRC is meeting its mission statement and objectives. Some refinements to the documents may be required to ensure that they provide both the subcommittee and NRC with the types of information and metrics that are necessary.

Lastly, we would also recommend more frequent informal interaction between subcommittee members and the NRC to discuss issues of importance and the status of the NRC's regulatory improvements. This can come in the form of periodic meetings between commissioners and subcommittee members as well as subcommittee staff attendance at NRC meetings on significant regulatory, strategic, and budgetary matters, visits to licensed nuclear facilities, and enhanced use of communication tools such as accessing information via the Internet from the NRC web site. All of the above would serve as an excellent forum to view NRC/stakeholder interaction and participate in discussions pertaining to issues and concerns facing the NRC and our licensees.

We believe that active subcommittee oversight can add value to NRC processes already on the way. It is our intent to continue to work with Congress and our stakeholders to ensure that our plans, recommendations, and initiatives for regulatory reform are appropriate, implemented, monitored, and reported, and that there is a continued focus and understanding of the initiatives and the success to be achieved.

Senator INHOFE. I appreciate that question. We look forward to getting the answer.

Senator INHOFE. I now ask that our second panel come to the witness table. As I said before, if the five of you wouldn't mind remaining, maybe on the first row, if others could help accommodate that request—that way you can be close-by.

Panel 2 includes Mr. Joe Colvin, president and CEO of the Nuclear Energy Institute; Ms. Gary Jones, associate director, Energy, Resources, and Science Issues, Resources, Community, and Economic Development Division, U.S. General Accounting Office; Mr. David Lochbaum, Nuclear Safety Engineer, Union of Concerned Scientists; and Dr. James T. Rhodes, Institute of Nuclear Power Operations.

You heard the instructions to the previous panel. I won't repeat those, but the same rules will apply.

We'll start with Joe Colvin, if you would start off with your presentation.

STATEMENT OF JOE F. COLVIN, PRESIDENT AND CEO, NUCLEAR ENERGY INSTITUTE, WASHINGTON, DC

Mr. COLVIN. Thank you, Mr. Chairman, good morning. Senator Graham, good morning. I am Joe Colvin——

Senator INHOFE. Let me comment to all four of you that we are going to try to hold onto our time on this because of the change, what's coming up on the trial and all that.

Go ahead. You are recognized.

Mr. COLVIN. Thank you, Mr. Chairman.

As you are aware, I am the president and chief executive officer of the Nuclear Energy Institute. My association represents the nuclear energy industry and sets industry positions and policies on major strategies and issues affecting the industry, including Federal regulations that ensure the safety of the 103 operating nuclear plants, operating in 31 States.

I want to thank you, Chairman Inhofe, for your leadership and thank the subcommittee for its continuing oversight of the regulatory process for our industry.

Issues concerning the regulation of our nuclear power industry are particularly important in the context of Senator Graham's discussions and at a time when Congress and other policymakers are recognizing the growing nexus between energy supply, energy needs, environmental policy, and the important role that nuclear energy must play in our Nation's energy mix now and into the future. I would be happy to comment on that more during the question and answer period.

In the 6 months since this subcommittee held its first hearing, the NRC commissioners and staff have made tremendous progress in taking the initial steps toward meaningful reform. Many longstanding issues are being brought to resolution, and I compliment the commissioners and the NRC staff for their efforts.

In this time period they have demonstrated that difficult issues can be resolved and important decisions can be made in an efficient and timely manner.

Nevertheless, the single most important challenge facing the nuclear energy industry, certainly in the near term, is the regulatory

process that consumes licensee and NRC resources on issues that have little or no safety significance and that produce inconsistency in assessing plant performance and enforcement. In that light, it is very important that Congress continue to provide ongoing oversight of and support to the Nuclear Regulatory Commission in this transition to a risk-informed, performance-based regulatory process.

We are at the beginning of a very long journey, and the task at hand is to make the appropriate changes in a timely manner and sustain the efforts begun last year. In that regard, I would like to summarize five recommendations for the congressional involvement needed to sustain these efforts that will, in our view, result in meaningful NRC reform.

First is that Congress should direct the Agency to prepare a multiyear strategic plan to achieve a safety-focused, results-oriented regulatory process. The NRC's long-range plan should include measurable goals and objectives to demonstrate progress toward reform of the regulatory systems and, more importantly, describe how these incremental changes, collectively, will achieve the desired goals.

Second, Congress should schedule another hearing by June of this year and direct the commissioners to provide this multiyear strategy for reforming the regulatory process at that time.

I believe the subcommittee should also continue to hold hearings approximately every 6 months until you are satisfied that the progress in reforming the process is proceeding in the right direction, at the proper pace, and that it will be sustained.

Third, the subcommittee should request the NRC to identify legislative changes needed to proceed with timely regulatory reform, issues such as amending the Atomic Energy Act in the area of antitrust reviews, foreign ownership, adjudicatory hearing processes, and so on.

Fourth, Congress should ensure that the Agency complies fully with the requirements of the Omnibus Budget and Reconciliation Act of 1990. The Agency should submit legislation, if necessary, to modify the Agency's fee structure so that nuclear power plant licensees will be assessed fees only for those programs from which they directly benefit. Additionally, the Agency's ability to collect user fees should be authorized annually by Congress until the Commission completes its regulatory reform initiatives.

Finally, Mr. Chairman, I think this subcommittee should resolve the impasse between the Nuclear Regulatory Commission and the Environmental Protection Agency over the establishment of dual regulations for radiation protection standards. This subcommittee has jurisdiction over both Federal agencies and should clarify that the proper scientific and regulatory authority to establish these standards should rest solely with the Nuclear Regulatory Commission.

I think, Mr. Chairman, that continued oversight of the NRC by this subcommittee is important for the reasons described to ensure that necessary steps toward broad reform of the Agency are being taken and will be taken in a comprehensive and timely manner. We've seen the Agency make significant progress in recent months, but we see the need to establish a longer-term vision and working

plan with the appropriate metrics to ensure that the regulatory changes indeed are implemented, and that we sustain these improvements.

Thank you, and I would be happy to respond to your questions during the question and answer period.

Senator INHOFE. Thank you, Mr. Colvin.

Ms. Jones.

STATEMENT OF GARY JONES, ASSOCIATE DIRECTOR, ENERGY, RESOURCES, AND SCIENCE ISSUES, RESOURCES, COMMUNITY, AND ECONOMIC DEVELOPMENT DIVISION, GENERAL ACCOUNTING OFFICE, WASHINGTON, DC

Ms. JONES. Thank you, Mr. Chairman, good morning.

Good morning, Senator Graham.

Since this committee's hearing last July, we would agree with NEI that NRC has accelerated many activities needed to implement a risk-informed regulatory approach and has established milestones for many others. We hope that momentum continues, because NRC still has an enormously complex task ahead. One of the messages of our testimony today is that NRC needs a road map to guide the implementation of the very activities it has under way.

Let me spend just a few moments highlighting some of the major activities still to be accomplished.

First, there are several basic issues that are not resolved after many years of addressing them. For example, for some plants, NRC does not have current or accurate design information, or confidence that final safety analysis reports have been updated. The 50.59 process that allows plants to make a change without prior NRC approval needs to be improved. These safety documents and the change process are the foundations on which safety regulation—deterministic or risk-informed—is based. For example, what is the potential impact if a utility does not have complete and accurate design information, or an outdated final safety analysis report? One result might be that evaluations relying on these documents can lead to wrong conclusions and jeopardize safety.

NRC and the industry view risk assessment as one of the main tools to be used to identify and focus on those structures, systems, and components of plant operations having the greatest risk, yet neither NRC nor the industry has standards or guidance that define the quality, scope, or adequacy of risk assessments.

Until recently, NRC did not consider whether and to what extent the Agency should revise all its regulations pertaining to nuclear plants to make them risk-informed. NRC staff have recommended to the Commission that changes to the regulation occur in a phased approach, beginning by defining "important to safety" and "risk-significant," and then requiring a higher level of safety assurance for those structures, systems, and components that are critical to safety under those definitions.

NRC has also not determined if compliance with risk-informed regulations will be voluntary or mandatory for the utility industry. NRC staff recommended to the Commission that implementation be voluntary, noting that it would be very difficult to show that requiring mandatory compliance would increase public health and safety. Voluntary compliance could send a signal that current

plants are less safe and could create two classes of plants operating under two different sets of regulations.

Changing to a risk-informed approach will be an economic decision for each individual plant. The cost to comply may outweigh the benefits for doing so, particularly for plants nearing the end of their operating licenses. Currently there is little cost-benefit data available.

Mr. Chairman, NRC continues to work on all these issues and many other issues impacting a risk-informed approach. However, NRC has been considering applying risk to the regulatory process for more than 10 years, and NRC officials predict it will be another 4 to 8 years before changes it has proposed have been implemented.

We found that NRC has about 150 separate activities under way that affect risk-informed regulation. It has developed or is planning to develop implementation plans for many of these activities. However, given the complexity and interdependence of NRC's requirements and the results of ongoing activities, such as industry pilot projects, it is critical that NRC clearly articulate how the various initiatives will help achieve the goals set out in the 1995 policy statement on risk-informed regulation. Although NRC's tasking memo and the implementation plan establish tasks and expected completion dates, they do not ensure that the short-term efforts are building toward NRC's longer-term goals and do not link the various ongoing initiatives. They also do not help the Agency determine appropriate staffing levels, training, skills, and technology needed in the timing of those activities to implement a risk-informed approach. It provides no link between the day-to-day activities of program managers and staff and NRC's overall goals for risk-informed regulation.

Given that NRC is essentially changing every aspect of how it regulates safety, a strategic plan would help ensure that NRC meets the challenges it has set for itself.

Although the Office of the Inspector General's 1998 report stated that the NRC staff had a strong commitment to protecting public health and safety, it admitted that they are confused about the new directions in the regulatory practices and challenges facing the Agency. While NRC is developing and implementing many mechanisms for better communication, a strategic plan that provides a clear path forward and connects all the ongoing activities would help staff understand when and if activities will affect them, what type of training they will receive, and how various activities interrelate.

Thank you, Mr. Chairman.

Senator INHOFE. Thank you, Ms. Jones.

Dr. Rhodes.

STATEMENT OF JAMES T. RHODES, CHAIRMAN AND CEO, INSTITUTE OF NUCLEAR POWER OPERATIONS, ATLANTA, GA

Mr. RHODES. Mr. Chairman, thank you and the other members of the subcommittee for the opportunity to represent the Institute of Nuclear Power Operations at this hearing.

At the July hearing I discussed the improvement our industry has made in the past decade, as measured by a number of perform-

ance indicators. Today I am pleased to inform you that the industry has continued this solid progress into 1999. Although the year 1998 began with a number of plants struggling with extended shutdowns, the industry made a strong comeback during the year. In fact, overall performance improved more in 1998 than at any time in recent years. Let me share with you a few key indicators of that improvement.

By the end of 1998, most of the plants that had begun the year in long-term shutdown were back on line, some 9 of 14 units in that situation. In addition, nuclear electric generation continued to increase during the year. For example, Commonwealth Edison recently reported that its nuclear program ended the year with a capacity factor of over 65 percent, more than 10 percentage points higher than their goal for the year, and more than 15 points higher than their 1997 results.

Also last July I reported to this committee that the trend of significant events per unit per year had decreased from 2.38 in 1985 to about .1 in 1997, and that is shown on this graph here. Today I am pleased to report even further improvement. NRC event data, confirmed by our own experience, shows an industry achievement of just over .04 events per unit this past year, as shown on this bar chart here, a tremendous improvement over this period, and even continuing through 1998.

The final noteworthy improvement is the number of plants in INPO's "excellent" category. Following each plant evaluation, which we perform about every 20 months for a 2-week period, INPO provides an assessment on a 1 to 5 scale, with category 1 being the excellent performers. The standards are very high. The levels of performance needed to earn an excellent rating have risen over the years. At INPO's annual Chief Executive Officers Conference in November we recognized 31 excellent plants. This is a record achievement and a dramatic increase from the six excellence awards first presented in 1986, and this shows a trend of excellent plants over that period of time.

Now I'd like to move to my second area of focus, the regulatory changes that are important for continued improvement in the nuclear power industry.

Many have said—and we certainly agree—that such changes will play a central role in the health of our industry. We continue to be encouraged by the openness that the NRC has demonstrated in communicating with its stakeholders. The open exchange of information and ideas is a key contributor to the safe and reliable operation of our Nation's nuclear power plants. This improved communication is evident through the NRC's periodic stakeholder meetings, enhancements in the license renewal process, and the ongoing development of the new reactor oversight process.

The new oversight process is especially important. It improves the Commission's ability to ensure public health and safety by better allocating resources and eliminating redundancies. Specifically, it will focus the inspection, assessment, and enforcement processes on safety-significant items. This will allow utilities appropriate control over activities and issues that are not safety-significant, but are vital to plant reliability and economic viability.

The proposed oversight process identifies several bands of plant performance. To achieve and remain in the uppermost band, nuclear plants will need highly effective self-assessment and corrective action programs. Let me point out that plant performance in these areas is routinely reviewed during INPO plant evaluations and plant assistance visits. Therefore, INPO's mission of promoting excellence in plant operations is fully complimentary with the new oversight process.

The NRC is undergoing significant changes in philosophy, processes, and personnel, including changes at the senior leadership level. We have seen change programs succeed and fail in the industry. To be successful, the NRC must have clarity of purpose, constant communication, training, and—most of all—persistence. This is hard work, but critical for success.

In conclusion, we at INPO believe the NRC is on the right track with its efforts to improve, although much work needs to be done. The changes focus directly on the Agency's mission, the protection of public health and safety. We will continue to work in cooperation with the NRC to help ensure the safe operation of our Nation's nuclear power plants.

Again, I appreciate this committee's interest in the regulation of a changing nuclear power industry. Your continued support and guidance will play an important role in helping the NRC provide truly effective regulation in pursuit of its mission.

Thank you very much.

Senator INHOFE. Thank you.

Mr. Lochbaum.

STATEMENT OF DAVID LOCHBAUM, NUCLEAR SAFETY ENGINEER, UNION OF CONCERNED SCIENTISTS, WASHINGTON, DC

Mr. LOCHBAUM. Good morning.

After the subcommittee's hearing last July, the NRC developed a plan to improve its reactor oversight program. The NRC intends to phase these improvements in at a few nuclear plants this year, and adopt them for all plants next year.

As I recently told the NRC commissioners, UCS believes that the NRC has a good plan. However, the plan's quality is not the most important factor in determining whether the NRC succeeds in this mission. What matters most is how well the Agency implements this program. Too often the NRC fails to follow its plans and does not regulate in a consistent, timely manner.

The NRC Inspector General recently reported to Senator Lieberman that the Agency failed to properly discharge its responsibilities to the people of Connecticut and to the workers at the Millstone Nuclear Power Station. These failures are particularly troubling because they involve the highest profile nuclear facility in the country. The NRC created a special projects office with responsibility for only that one site. The Inspector General documented numerous regulatory failures involving that office, despite its singular focus. The Inspector General also reported that many of the failures were caused by the NRC not following its own procedures and policies.

The Inspector General's report is the latest example in a long history of the NRC failing to follow through on its plans. Let me cite fire protection as an old—yet still ongoing—example.

The NRC created Appendix R, its fire protection rule, to 10 CFR Part 50 in January 1980 to address safety concerns following the serious fire at the Browns Ferry Nuclear Plant in Alabama in March 1975. Nineteen years later, the majority of nuclear power plants in this country do not now, and never have, satisfied the Appendix R requirements.

When Representative Markey asked the NRC about this situation in May 1997, the Agency replied in December 1997 that it was considering a revision to Appendix R. Nearly 2 years later, we understand the Agency is still thinking about doing this.

Last December, Representative Markey asked the General Accounting Office to investigate fire safety issues at nuclear power plants. In the meantime, the majority of nuclear power plants are operating in violation of these regulations. At the Salem Generating Station in New Jersey, for example, both reactors were shut down in 1995 through 1997 while its owner made extensive repairs to safety equipment.

Numerous fire protection deficiencies remained uncorrected during this lengthy shutdown. The NRC allowed both reactors to restart, despite knowing that fire protection requirements were not met. Not only that, but the NRC is content with the owner's plans to leave these problems uncorrected for several more years.

The NRC tolerates these violations because plant owners have taken so-called "interim compensatory measures." The most common of these measures involves workers, called fire watches, walking through the plants looking for smoke or flames. Such "interim" measures have been used for more than 6 years at some nuclear power plants.

But interim measures are not a substitute for permanent solutions. When I get a flat tire, I replace it with that spare mini-tire. That's an interim measure I can use until I get the flat fixed or buy a new tire. It would be irresponsible for me to undertake a cross-country trip on that interim spare tire. My poor judgment would place me and other travelers at undue risk. Likewise, it is irresponsible for the NRC to rely on fire watches indefinitely. This poor decision places millions of Americans living around nuclear plants at undue risk.

The risk from fire is real. The NRC reported that fire represents 7 to 50 percent of the overall core damage risk at nuclear plants. According to this data, there is a plant where the fire risk equals the risk from all other sources combined. So, the fire risk is real, and the regulations created to protect Americans from that risk are essentially being ignored by the NRC.

We respectfully request that this subcommittee compel the NRC to resolve the fire protection problems. The NRC must either enforce or revise its fire safety regulations. Continued neglect, predicated on "interim" compensatory measures and "considerations" of rulemaking, must end. The regulations were promulgated in direct response to the serious Browns Ferry fire. If another serious nuclear plant fire were to occur, the American public would be very

distressed to learn that these fire protection regulations had simply not been enforced.

Your subcommittee's oversight hearings have accelerated the NRC's change process. We sincerely appreciate the subcommittee's efforts in this regard. We trust that this subcommittee will not judge the NRC solely on its plans; we hope that you will evaluate the results from these new and improved processes, even though this data will not be available until later this year. We respectfully request that this subcommittee continue these efforts to ensure that the NRC reaps the maximum benefits from these plans.

Thank you.

Senator INHOFE. Thank you, Mr. Lochbaum.

We have been joined by Senator Sessions, and I would ask if Senator Sessions has any opening statement or comments at this time.

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

Senator SESSIONS. Thank you very much, Mr. Chairman. I enjoyed serving with you the last 2 years on this committee, and I've had a good deal of interest in this particular subject. I think it is important to raise it.

Mr. Lochbaum, I think you would agree that whether the NRC is doing a good job or not, they have more regulators per nuclear power plant than any other country in the world, so we have a right, I think, to expect good regulation.

But at the same time, we are at a point, having been involved with this committee on clean air issues, for example, where we have to recognize the challenge that is facing us. Ambassador John B. Rich to the International Nuclear—something or other, appointed by President Clinton—spoke recently at the Scottish Conference of the North Atlantic Assembly, and he made some dramatic statements. I think everyone here ought to read that address. It was a thoroughgoing analysis of all the issues involving nuclear power. It was a ringing call for meeting the challenge. Among other things, he stated that our electricity demands will double by 2050 for the world, they will double by 2050, and he said that the one technology capable of meeting large baseloads without greenhouse emissions is nuclear power. That's so obvious as to be beyond debate, it seems to me. He added,

> In the century ahead, mankind must place great reliance on harnessing the nuclear genie and using it to maximum effect if our needs are to be met and our security preserved.

Mr. Chairman, it seems to me that we are at a point where we have not brought on any more nuclear plants. Twenty percent of our power today is from nuclear energy. If that were to be eliminated, think how many tons of greenhouse gases and noxious sulfur dioxides and other pollutants would be released into the atmosphere. If other nations of the world move to coal plants to meet their burgeoning demands for electricity, we will have a serious worldwide problem of pollution. The best way to meet that is to somehow meet this challenge.

Nuclear engineering schools are closing in this country. Ms. Jackson and I shared some comments about that over dinner. They are

closing because there is so little demand, and this country ought to be the world leader in major innovations involving nuclear energy, and I hope that whatever comes out of this, that we will make sure that we preserve the safety of the nuclear energy industry, but at the same time we develop some sort of window or light at the end of the tunnel that would allow us to move forward with this energy source.

I believe that if it is done right, if the NRC helps develop model plans for plants, they could be brought on at much lest cost than the process that we've gone through before, and that can be done. I consider it a serious national issue, a matter of worldwide importance. We have to break down what I consider to be an irrational fear of nuclear energy, and "harness that genie," as Ambassador Rich has said.

Thank you for your leadership.

[The prepared statement of Senator Sessions follows:]

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

I would like to first thank Senator Inhofe for his leadership and commitment to exercise continued congressional oversight on the activities of the NRC. Last July, Senator Inhofe held a hearing in this subcommittee, which I participated in, to review the Nuclear Regulatory Commissions' oversight of nuclear safety in the United States. I am grateful Senator Inhofe has provided the opportunity for me to join the Clean Air and Nuclear Safety Subcommittee again today to assess the status of reform efforts by the NRC since the last hearing.

Nuclear Energy needs to remain a part of our domestic energy mix. Over the last 2 years, I've had an opportunity to serve on the Senate Environment and Public Works committee's subcommittee on Clean Air and Nuclear Safety. During that time, the subcommittee held numerous hearings illustrating the problems our nation faces in dealing with air pollution. The Clean Air Act has helped our nation to battle the air pollution problem by reducing the amounts of harmful air pollutants emitted into the environment. Those hearings have shown we are making significant progress, but as our energy needs rise, the technical ability to reduce overall air pollutants from traditional fossil fuel electricity plants becomes more and more limited.

Nuclear power provides over 20 percent of the electric power in this country and offsets thousands of tons of sulfur, nitrous oxide, carbon, mercury particulate matter and other pollutants each year. Without nuclear energy as part of our energy mix, it is unlikely we could have made the significant progress in reducing air pollutants recorded over the last 20 years.

The Energy Information Administration predicts the U.S. will need about a 30 percent increase in electricity generation by 2015. To meet this need and win our battle against air pollution, Nuclear Energy must continue to be harnessed safely and responsibly.

In November, I attended the 44th Annual Session of the North Atlantic Assembly in Scotland. The Ambassador to the United Nations International Energy Agency John B. Ritch III, appointed by President Clinton, stated in his presentation that electricity demands will double by 2050, and the one technology capable of meeting a large base-load with negligible greenhouse emissions is nuclear power. He added, "In the century ahead, mankind must place great reliance on harnessing the nuclear Genie, and using it to maximum effect, if our needs are to be met and our security preserved" (A Nuclear Perspective for the 21st Century, 44th Annual Session of the North Atlantic Assembly).

In order to foster an environment which encourages the development and implementation of safe nuclear power in the United States, regulatory obstacles which do not relate to safety must be minimized or removed. The nuclear industry has a stellar safety record in this country. There has never been a serious accident in this country which put the safety of our citizens in danger. The main reason the United States nuclear industry has been so safe is because of the careful oversight by the Atomic Energy Commission and later, the Nuclear Regulatory Commission. All United States plants must adhere to strict safety standards, with frequent inspections, redundant controls and containment systems.

There is a balance to be met when monitoring the operation and maintenance of nuclear power plants. While safety-orientated regulations and procedures foster the safe generation of nuclear power, subjective regulations which fail to focus on safety waste resources and place unfair costs on the ratepayers. This over regulation has detrimental effects on the operation of our current plants, discourages the construction of new plants and can result in the Nuclear Regulatory Commission overlooking real safety issues while focusing instead on non-safety-related management practices. Micro-management of nuclear plant operation, as illustrated by many of the NRC's Category 4 violations, discourages efficiency and may have the unintended consequence of actually compromising safety. The NRC needs to look at the safety of our nuclear plants and take decisive action when true safety problems are identified. The agency need not however, be involved in the oversight of non-safety-related management procedures at our nuclear power plants.

Testimony from the Nuclear Subcommittee's hearing last July illustrates that the Nuclear Regulatory Commission would be able to operate in a more efficient manner if the Agency refocused its efforts on safety and implemented a risk-informed regulatory approach. Regulations and enforcement procedures developed by the Atomic Energy Commission in the 50's and carried out by its successor, the Nuclear Regulatory Commission today, need to be updated to reflect the 90's state-of-the-art nuclear technology. Unnecessary regulations must be eliminated so that the NRC is better able to use its resources to keep our nuclear power plants safe. The NRC needs to focus its efforts on developing and enforcing proper safety regulations while at the same time encouraging the regulated community to develop efficient ways to meet those safety standards on their own.

The Nuclear Regulatory Commission needs to continue its streamlining efforts and learn to do more with less. Despite the decline in the number of Nuclear plants operating in the United States and the failure to bring new plants on line, the NRC continues to seek increases in appropriations and the fees it levies on ratepayers. The NRC has over 1600 employees to monitor 110 plants—a ratio of approximately 14.5 NRC employees to each plant, while the UK has fewer than 200 employees to monitor 35 reactors—a ratio of 5.7 to 1—with Japan and France sharing statistics similar to the UK. The United States has by far the highest number of regulators per plant.

Inefficient practices by the NRC delay licensing action and discourage the construction of new state-of-the-art nuclear power plants in this country. To keep nuclear power a part of our nation's energy mix, the NRC must develop a system which allows streamlined re-licensing of safe nuclear power plants nearing the end of their operating license while at the same time clearing the way for the construction of new plants in the future.

I am hopeful continued reform taking place at the Nuclear Regulatory Commission will help remove the regulatory hurdles faced by the generators of electric power in this country. At the same time, Congress and the Administration need to act responsibly to solve the problem of nuclear waste to pave the way for the implementation of safe, new technologies in the generation of nuclear power.

Senator INHOFE. Thank you, Senator Sessions. I associate myself with your remarks. I would also observe that Senator Graham expressed some similar interests in his opening remarks and in his questions.

Let's quickly go into questions.

First, Mr. Colvin, I would like to ask you, do you think that we can address these reforms that we've been talking about, going all the way through the NRC without an overall long-range strategic plan?

Mr. COLVIN. No, sir. As I said in my comments, I think that we have seen the Agency over many years undertake activities in what I would call a "disaggregated" or "incremental" basis. As we move forward to make the changes, as Ms. Jones from GAO indicated to us today, we need to have an approach that integrates the details of this plan and sets up the longer-range goals, such that as we move forward we can identify our progress against those.

With respect to that, we also need to identify the appropriate metrics and measurement tools that allow us to measure that progress. So I think we need to have a long-range goal; we need

to set that out; we need to have that ventilated with the stakeholders and with this committee, and then this committee through its oversight responsibility should measure the progress of the Agency as it moves forward in its reform activities.

Senator INHOFE. Let me make a request, then, Mr. Colvin, since you have answered the question the way you did. Let us ask you to help us—I know that the private sector is sometimes better equipped to do this—if you could help us, in consultation with other members of this panel, to develop a plan, a summary, we would like that very much—along, of course, with the Commission.

Mr. COLVIN. Yes, sir, we would be happy to participate in that dialog.

Senator INHOFE. I think the chairman is trying to say something.

[Laughter.]

Senator INHOFE. Come forward quickly, here.

Ms. JACKSON. In point of fact, even though we have not focused on it in these hearings, the NRC does have just such a plan, focused on goals, activities to support those goals, metrics that both act as filters for prioritizing and the measurement after the fact in terms of achieving those goals. It is a multiyear plan.

Senator INHOFE. Let me modify my request and ask that if you take your plan—and I would like to have a critique of this plan by the four members of this panel.

Ms. JACKSON. That is fine, because the process has been open. We have been working with Arthur Andersen in developing these plans, and it would be nice if people would acknowledge that.

Senator INHOFE. Why don't you remain up there, if you would, Madam Chairman. Save you from running back and forth.

[Laughter.]

Senator INHOFE. Mr. Colvin, last July you and a number of the witnesses raised serious issues on problems with the NRC, and now 6 months have gone by. I would like to have you tell us what you think, briefly, about the progress that has been made in the past 6 months.

Mr. COLVIN. Well, Mr. Chairman, I think, as I indicated in my brief oral comments, we have seen tremendous progress by the Agency within this time period. But again, these are steps that I consider to be some of the initial steps undertaken by the Agency, and this is a long journey.

I think from the industry standpoint we are not, and we cannot and should not be satisfied with the progress made within the regulatory forum until we see the sustained improvement out of the Agency that is necessary in this area.

I indicated in my comments that the singlemost important issue facing our industry as we move forward to ensure the continuity of energy supply, energy security and diversity, and meeting our environmental goals is really the regulatory issues that are affecting our ability to operate these plants efficiently and in a cost-effective manner.

We have other major issues, such as stranded investment and those related to the disposal of used nuclear fuel. But from the investment community's perspective and from the nuclear energy industry's perspective, the regulatory system is the system that needs the most reform and needs it with the greatest urgency, es-

pecially as we deregulate in various States and localities and move forward to remain competitive in this future deregulated market.

Senator INHOFE. Thank you.

Ms. Jones, I am calling on your experience in reviewing the NRC. Do you think the senior managers are communicating the reform plans down through the Agency effectively at this time?

Ms. JONES. Well, I heard what the commissioners said this morning, and I applaud the kind of communication networks that they are setting up within the Agency. It sounds like they have been working very closely with senior management and the senior managers are talking with the staff.

However, we have had a lot of visuals this morning in terms of where the Agency is going. We've talked about a road map. I think the chairman talked about a ''turn in the road.'' We're really just starting that turn; and I think it's really critical that the staff at NRC understand what's going on and are well-trained, and I think that's one of the points in terms of our strategy, that all of that would be very clear to staff in terms of the path forward.

Senator INHOFE. Well, let me make a request. If you would take the time, if you can do this, and you can let us know whether or not you can, to go through this and take a real close look at the cultural changes and come up with some kind of a preliminary report to us.

I'm going to call for the next hearing on this subject, on the NRC, to be September 23, so the request that we have made in terms of the critique of the chairman's plan, as well as the request of the GAO—if you could have something at that time that we could discuss so we could have a better monitoring effect as to what is going on, where we're going from here.

Could you do that?

Ms. JONES. We would be happy to work with you on that, Mr. Chairman.

Senator INHOFE. All right.

Let me defer now to Senator Graham for questions, and I have maybe one or two more.

Senator GRAHAM. Mr. Chairman, thank you very much. I have to express my apologies, that when I finish these questions I am going to have to leave for another commitment.

I would like to ask this panel—not for response today, but for subsequent follow-up—the same question that I asked the commissioners of the NRC. What are the kinds of questions, what are the data files, that this committee should be monitoring on an ongoing basis in order to exercise more effective oversight of the macro policy issues affecting the industry, the public safety, other public interests, and the NRC? I would be interested in your response to that question.

I asked a series of questions in my opening statement, the third of which was, is the current decline of our nuclear industry reversible? And I was concerned about an article that appeared in the January 27, 1999 Christian Science Monitor about the state of the nuclear industry in Europe, which has been much more committed to nuclear generally than we have. The article primarily focused on Germany, where ''the German government's decision to phaseout nuclear power generation, to halt reprocessing of spent fuel, is

causing a domestic and international storm for the new Chancellor.'' It goes on to point out that in Sweden there has been a referendum which states that the country should be nuclear-free by 2010, and that the government has announced that it will begin the close-down of the first of its 12 reactors. Switzerland has announced that it will draw up plans to phaseout its four plants. England has taken steps to reduce its nuclear plans for the future. And even France, which is the most advanced country, has indicated that it was pledging more investments in alternative energy development.

Are we running against a tide of resistance to nuclear that is irreversible, and therefore we ought to be making our plans in the context of the termination of an industry rather than extension or expansion of an industry?

Mr. COLVIN. Senator, I think the clear answer to that is no. In the United States over this last 2-year period we have seen what I would characterize as a ''rediscovery'' of the benefits of nuclear energy. We have seen, as we transition to a competitive marketplace and we look at protecting the environment both from the carbon dioxide or CO_2 area, the Kyoto Protocol issues, but more importantly from the clean air issues in maintaining clean air compliance in sulphur dioxides, nitrous oxides, ozone, particulate matter, and other emittants to the environment, that nuclear power has tremendous capability that has yet been untapped and unrealized.

Our policies in the United States, from the environmental perspective, do not credit non-emitting technologies, be they nuclear, hydro, or other types of renewables, from an economic standpoint. As a Nation we need to level this playing field to ensure that we can move forward with the appropriate technologies and credit them accordingly.

It is interesting from the international perspective that while they have had the primary growth and movement forward, they are just now beginning to face some of the issues that we have already addressed, especially in this transition to competition.

The last point I would make is that it is very easy, politically, to say that you're going to shut down 40 percent of your electricity system and do so in a very short time. Nuclear power can be the lowest-cost production. As we've seen in Sweden and other countries, it is very difficult to create an alternative energy that is competitive, cost-effective, and still meets other issues, such as the environmental and clean air concerns.

Mr. LOCHBAUM. I guess from our standpoint, there has been some talk today and in the past about the intangible values of nuclear power in terms of global warming and other aspects. We would look at the value that the industry itself places on nuclear power. Two plants traded hands last year, and the sale prices were less than 10 percent of the book value of these plants: the Pilgrim Plant and Three Mile Island Unit 1. That's on an open market. That's what the nuclear industry values these plants at. I think that's a very good indicator; money talks. I think that sends a very good message as to the value of nuclear power.

Senator GRAHAM. Any other comments?

To me, this article—and other developments—raise the question of sustained public acceptability of this industry. I have indicated

in my earlier comments, as the chairman stated, that I think nuclear has a very important role to play for a variety of our national interests. But I am frankly concerned as to whether the general public shares that feeling and will provide a sufficient amount of sustained support that will create an environment in which those who have to make some very significant financial investment decisions for their firms will be willing to do so, and therefore reverse this trend of declining nuclear as a percentage of our electric generation.

Mr. COLVIN. Senator Graham, I think it is important to realize that the public in general, over many years of public opinion polls, supports nuclear energy and the continued use of it in the United States. The polls typically indicate about two-thirds of the general public is in support.

We recently ran some polls of college-educated voting adults, those that participate in the public policy process. And again, 65 percent of those support the use of nuclear energy. In fact, when asked what would be the likely source of fuel for energy and electricity in the year 2015, the answer was overwhelmingly nuclear energy over solar or other types of energy, from that body.

More importantly, however, we see that there is a perception gap between what those individuals believe personally and what they believe their peers, neighbors, and others believe. And as a result we have undertaken, as an industry, a major activity to try to provide the information to these people to make the reasonable decisions, and I believe that the public, when called upon to make a decision over siting of a new power plant, be it of any type, will in fact consider these issues and look at the various aspects of these issues thoughtfully and come to the correct decision.

Senator GRAHAM. Mr. Chairman, I'm afraid I'm going to have to leave. Thank you very much.

Senator INHOFE. Thank you, Senator Graham.

I just have one, or maybe two, final questions, because we're going to try to adhere to our schedule.

Mr. Lochbaum, at the November meeting of the NRC stakeholders you compared the NRC's reaction to our Senate hearings as "a bad plant," one who reacts to an announced inspection as running around, developing action plans to address all the problems that they have been ignoring before, and set up "a good plant" which brags about the results they have seen from effective programs. Your analogy has not gone unnoticed here by this subcommittee, but I would like to ask you—you have been critical in the past, stating that the NRC has ignored some of what you consider to be the real safety concerns, while they pursue enforcement actions for minor violations.

Do you think that the changes that have been taking place at NRC have addressed these concerns that you have expressed in the past?

Mr. LOCHBAUM. The new oversight program has more indicators which should allow earlier detection of problems. But our concern is, again, there were indications in the past that there were problems at the Millstone, Salem, and other plants, and these indicators were not responded to by the NRC. So we are not concerned that there was a lack of indicators; we are concerned that there

was a lack of response. We are not sure that the new plan addresses the lack of response issues.

Senator INHOFE. All right.

Any other comments that anyone would like to make, particularly referencing where we're going from here and what you've observed in the past and your level of comfort and satisfaction?

[No response.]

Senator INHOFE. All right. We will wind up with Chairman Jackson.

Let me say before you give your final remarks, we hope you don't retreat to the log cabin that was referred to by Senator Graham——

[Laughter.]

Senator INHOFE [continuing]. That you stay and remain available, and perhaps return here after this service of duty as a witness, so that we can continue to use your expertise.

Ms. JACKSON. I would be pleased to do so. Since where I'm going will require lots of energy, I have a vested interest in ensuring that it exists.

Let me just say the following. What I have observed in the time that I have been at the NRC is this. Obviously, if there are longstanding neuralgias, whether they come from the side of Mr. Lochbaum who feels that NRC has not implemented the program that it has had the way it should—meaning, enforcing its safety regulations—or it comes from the side of some of the other witnesses, such as Mr. Colvin, who has indicated the feeling that NRC has been overly draconian in how it has done things, or as Ms. Jones says, that it just hasn't been clear about what its standards are, the point of the matter is that the NRC has begun to change. I think the kind of oversight that this committee has provided has been very helpful in that. But in point of fact, the kinds of changes that we're talking about are not going to happen overnight, so the kinds of metrics that you and Senator Graham have asked this group to provide that would be good to look at the NRC in the large, I think, is a good thing.

But just as it will take time to fully implement what has been set in motion, these things didn't just start 6 months ago. We would not have been able to achieve just what we've achieved up to this point if the seeds had not been sown some years ago.

But what I think this committee has done is, it has caused the NRC to accelerate and to refocus where it needs to go, and we thank you for that.

I think the real point now is for all of us to move forward in good faith and try to stay on the path upon which we have embarked, and I would be happy to come back at any time.

Thank you very much.

Senator INHOFE. Well, normally I would like to come down and thank you individually after such a hearing, but we're on a very tight schedule right now so I'll just thank you from here, and hope that you will recall what we're asking you for on September 23, and we look forward to seeing you. We will be notifying you of that meeting shortly.

Thank you.

[Whereupon, at 11:05 a.m., the subcommittee was adjourned, to reconvene at the call of the chair.]

[Additional statements submitted for the record follow:]

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

I thank the chairman for his leadership in this committee and fully support him in his efforts to facilitate change at the Nuclear Regulatory Commission. I also thank him for allowing me to offer a statement for the record at this time.

I congratulate Chairman Jackson on her new position. She has accomplished much during her tenure as Chairman of the NRC, and she deserves credit for her diligence and hard work as Chairman of the Commission.

Several factors converge that spur me to put considerable effort into creating an efficient and effective regulatory environment for nuclear energy production. The threat of global warming and the simultaneous push for deregulation require a concentrated effort on the part of policy makers, scientists, and regulators to formulate good solutions. One thing is certain, our energy mix will change in the very near future. It is up to us to decide whether that change contributes to the general welfare, health, and safety of the public as a whole.

This is, however, more than a matter of health and safety. U.S. energy policy is a matter of national security. And I am talking about both narrow and broad definitions of the term "national security." With each step made toward deregulation, the anticipated rush to the lowest cost, least capital-intensive energy source becomes more tangible.

While I am a great believer in the regulatory wisdom of the invisible hand, the future energy resources available to citizens of this country should not necessarily be left solely to calculations based on the principles of supply and demand today. I think everyone would agree that we need to be careful to ensure sufficient energy resources remain available for future generations. Moreover, the choices we make today will have long-standing effects on the environment our children inherit.

While there is much talk in the Administration and among environmental groups about "global warming" and "greenhouse gases," so far there has been little discussion about the merits of nuclear energy in preserving clean air. I intend to force this into the debate. At some point, persons serious about achieving the dual, and seemingly contradictory, objectives of meeting increasing energy needs and not emitting potentially harmful gases into the atmosphere will reach the following conclusion: nuclear energy provides the only option of a major base-load production capability that does not degrade air quality.

Chairman Inhofe and members of this committee understand that the Nuclear Regulatory Commission's actions directly effect the nuclear industry's future prospects. In a deregulated environment, all sources of energy will require increased attention to cost. At present, the cost factor for nuclear energy is severely and adversely impacted by the regulatory environment. Ensuring that nuclear energy remains competitive as an energy source in a deregulated environment requires focused attention on removing excessive, costly regulatory burdens.

I and other Senators have been pushing hard for the Nuclear Regulatory Commission to move toward a risk-informed, performance-based approach. Although it may seem counterintuitive for those who fear nuclear-anything, streamlining regulatory processes and easing the burdens faced by the nuclear industry will contribute to greater safety. Under current circumstances nuclear power plant licensees are forced to allocate resources in attending to aspects of plant operation that present little or no safety risk. This heightens the concern that important and risk-significant issues are not given appropriate attention.

For example, the NRC must devise efficient and cost-effective procedures for license renewal. Currently, 40 percent of our nuclear plant licenses expire before 2015. Nuclear plants owners that will require relicensing in the very near future are waiting to see how quickly existing applications are handled before submitting their applications. I understand that the Calvert Cliffs license renewal process should be done by May, a quick turnaround compared to others. I also know that there is still significant fat in even a 25-month license renewal process. The NRC must continue to be aggressive in trimming excess processes that have no bearing on risk to public health or safe operation of nuclear power plants.

Ensuring that sufficient decommissioning funds are available upon closure of nuclear power plants represents another critical issue. The current regulatory framework and tax structure for decommissioning is a concern confronting the nuclear industry, regardless of the regulatory environment. In the past, the rate-making proc-

ess had little or no relationship to fee collection. Moreover, states' desire to keep energy prices low kept these decommissioning fees artificially low. As a result, the nuclear industry faces excessive uncovered financial liabilities. Providing an assurance for meeting decommissioning obligations is not only significant to the nuclear industry. After a plant is shut down, the sole purpose of the decommissioning fund is to provide the means for adequate cleanup.

A related issue is the existing inequity in tax treatment of the decommissioning funds. These funds are not an asset and should not be taxed as such. As is the case of surface mining operations or solid-waste disposal, these funds represent a "cost of service" to ensure future cleanup and safeguard public health and safety.

These are just two examples of many issues that require our attention. I have several other concerns related to the nuclear regulatory environment, and I will continue to pursue rigorous oversight of the Nuclear Regulatory Commission's drive to achieve risk-based regulation. I am also currently working on a series of legislative measures to address my concerns—some of which concern the NRC directly and others focused on the role of nuclear energy in promoting low-impact energy sources.

Once again, I fully support the work of this committee and commend the chairman for continuing to pursue regulatory change at the NRC. I look forward to working with the members of this committee and others to ensure our future energy security.

STATEMENT OF SHIRLEY JACKSON, CHAIRMAN, NUCLEAR REGULATORY COMMISSION

Mr. Chairman and members of the subcommittee, the Commission is pleased to present to you the ongoing efforts of the Nuclear Regulatory Commission (NRC) to increase our effectiveness in nuclear safety regulation.

CONTINUOUS IMPROVEMENT THROUGH CHANGE

Overview

During our last hearing before this subcommittee, on July 30, 1998, I described a broad range of proposed improvements in our regulatory programs, with particular emphasis on the NRC oversight of power reactor licensees. Our appearance before this subcommittee played an important role in accelerating changes already underway at the NRC. On August 7, on behalf of the Commission, I issued a Tasking Memorandum to the NRC staff that established an aggressive agenda, including both short-term progress and longer term strategies. The overall goal of these reforms has been to maintain safety while reducing unnecessary regulatory burden, streamlining our regulatory processes, and enhancing our public credibility.

Significant Accomplishments

The Commission believes we have made substantial progress in this 6-month period, characterized by:

- Developing a comprehensive revision to the NRC reactor assessment and inspection programs;
- Establishing and adhering to an aggressive schedule for processing the Calvert Cliffs and Oconee license renewal applications;
- Issuing the Final Design Approval for the Westinghouse AP600 reactor design;
- Issuing guidance for streamlining NRC adjudicatory proceedings;
- Initiating and completing a rulemaking to establish informal legislative-style hearing procedures in license transfer cases;
- Achieving established milestones on the Three Mile Island license transfer application;
- Enhancing the timeliness of our reviews for improved Standard Technical Specifications reactor license amendments;
- Issuing Safety Evaluation Reports allowing risk-informed graded quality assurance, in-service testing, and in-service inspection at certain licensee facilities;
- Facilitating safe and small, but cost-beneficial, power up-rates at reactor facilities resulting in a net power up-rate, since the beginning of the up-rate program, of 2300 megawatts electric across the spectrum of all our licensees—the equivalent of two new large reactors coming online;
- Reducing unnecessary NRC and licensee burden associated with low-level enforcement issues, while retaining those features essential to the oversight of licensee performance;
- Approving the issuance of proposed regulations for medical use and high-level waste disposal that adopt a risk-informed, performance-based approach;
- Determining, in a timely fashion, that the proposed privatization of the U.S. Enrichment Corporation met regulatory requirements;

• Achieving established milestones for reviews of several dual-purpose spent fuel cask designs, including issuing a final Certificate of Compliance for one design, and a draft Safety Evaluation Report and draft Certificate of Compliance for another;
• Realigning the three major NRC program offices and eliminating the Office for Analysis and Evaluation of Operational Data (AEOD), reducing the number of NRC managers, improving organizational efficiency, and reducing our overall staffing and resource requirements; and
• Achieving Year 2000 readiness in NRC information systems.

The Commission is committed to completing and institutionalizing these and other changes in a manner that will ensure long-range NRC effectiveness. In part, we are ensuring this continuity through key rulemakings and Commission policy decisions that will guide future actions. In the larger sense, we are altering the culture of the NRC and ensuring long-term stability by incorporating these changes into our planning framework, which is built around our 5-year Strategic Plan, our annual budgets and Performance Plans, and our dynamic Planning, Budgeting, and Performance Management (PBPM) process (which requires outcomes-focused operating plans for each program area).

ORGANIZATIONAL AND PLANNING INITIATIVES

Realignments to Increase Effectiveness and Efficiency

As part of our efforts to be more effective and efficient and to reduce supervisory overhead, the Commission is realigning the three major NRC program offices.

• The Office of Nuclear Reactor Regulation (NRR) is reducing from seven divisions to five, resulting in a net reduction of 15 managerial and supervisory positions. This realignment establishes reporting lines that are consistent with major NRR program functions: inspection, performance assessment, license renewal, and licensing.
• The Office of Nuclear Regulatory Research (RES) is going from twelve branches to seven, eliminating 14 supervisory positions.
• The Office of Nuclear Material Safety and Safeguards (NMSS), despite growing program requirements, is eliminating 10 supervisory positions.
• The Commission also has eliminated the NRC Office for Analysis and Evaluation of Operational Data (AEOD), transferring its functions to other agency offices. These functions (event assessment, incident response, incident investigation, technical training, the review of generic requirements, and backfit program oversight) are being integrated with similar work in other NRC offices. The AEOD realignment reduces overhead by approximately 10 FTE, and we expect these synergies to improve effectiveness.

Other headquarters and regional offices will transition to new organizational structures by the end of the fiscal year. In total, these realignments will eliminate 88 managerial and supervisory positions.

The Commission has made notable progress in improving the NRC staff-to-manager ratio. When this effort was initiated in September 1993, the NRC had slightly over 700 managers and supervisors. That number has declined steadily, and the realignments described above will reduce it to 330 by the end of fiscal year 1999. Based on the NRC staffing levels in the President's fiscal year 1999 budget, we will achieve the stated Commission goal of an 8:1 staff-to-manager ratio.

We also have decreased the overall number of NRC employees, expressed in terms of full-time equivalent (FTE) staff years, from 2985 in fiscal year 1998 to 2896 in fiscal year 1999. Through the NRC use of buyouts, early retirements, and attrition, we project that actual staffing levels will continue to decrease to about 2835 by the end of this fiscal year. This pace of controlled staff reductions will allow us to achieve fiscal year 1999 and 2000 staffing level targets without compromising critical mission requirements. The NRC fiscal year 2000 budget request of $471.4 million and 2810 FTE, recently submitted to Congress, will provide the necessary resources to continue the timely implementation of the important regulatory changes discussed in this testimony, while continuing to ensure the fulfillment of our public health and safety mission. Based on the operational and regulatory program efficiencies achieved and anticipated, our fiscal year 2000 budget reduces the NRC staff by 175 FTE compared with fiscal year 1998.

We expect that, as we make our regulatory program more risk-informed and performance-based, we also will have opportunities to continue improving our overall operational efficiency and effectiveness through Planning, Budgeting, and Performance Management. There are, however, "up front" investments required to realign our regulatory approach and to put into place the supporting infrastructure that will yield future savings. The appropriateness of further reductions will be evaluated in

terms of both meeting our public health and safety mission and responding to the needs of the regulated community.

International Program Comparisons

At the July 1998 hearing, a Tim D. Martin & Associates (TDMA) report was introduced that compared "regulatory personnel loading per unit of nuclear generation" in the U.S. and other countries. The report implied that NRC had proportionally far more regulatory personnel than the other countries analyzed.

In response, we conducted a detailed review with our counterpart regulatory agencies in France, Japan, and the U.K. The results, which will be provided to the Congress as part of the final report, demonstrate that the nature and scope of specific regulatory programs in various countries differ substantially. Many U.S. programs, such as license renewal and operational experience evaluation, are not conducted in a substantive or formal way by other countries. Other programs, such as inspection, research, and high-level waste management, differ substantially in approach or infrastructure. Functions which, in the U.S., are performed under the umbrella of nuclear reactor regulation, in other countries reside in research or technical support organizations whose work may be given direction by the regulatory body. To be valid, any country-to-country comparison would have to take these factors into account.

Moreover, infrastructure differences—such as the degree of standardization of reactor design, the placement of licensees in the public or private sector, or the number of licensees—generally are outside of NRC control, but account for substantial variations in resource levels. Differences in the NRC regulatory approach, while more within our control, are shaped largely by expectations from the Congress and the public. This includes such considerations as the degree of independent verification required for licensee activities and the degree of public participation in regulatory activities.

Finally, each of the four countries has implemented or is considering major reorganizations and program reassessments. While each country can gain insights about the regulatory approaches used by others, the differences in industry and regulatory infrastructure, funding mechanisms, and stakeholder interests must be considered before drawing conclusions from broad comparisons. When these differences are considered, the apparent disparities in resource levels per unit of nuclear generation are diminished significantly.

Planning, Budgeting and Performance Management

As part of our efforts to ensure the effectiveness and efficiency of agency operations, the NRC has implemented the Planning, Budgeting and Performance Management (PBPM) process. In my testimony presented in March 1997 to the House Committee on Commerce, Subcommittee on Energy and Power, I reported that we had just initiated this system, and that it was designed (1) to establish a sensible, reliable process for defining agency goals; (2) to develop cost-effective strategies for achieving those goals; (3) to determine the resources needed to implement this strategic direction; and (4) to measure and to assess our own progress and overall performance. Since that time, we have expanded our use of this process as the dynamic core of our planning framework, a framework that will ensure the longevity and endurance of current regulatory reforms.

The fiscal year 1997–2002 Strategic Plan and fiscal year 1999 Performance Plan were the initial PBPM efforts, and both documents received high marks from the Congress, the Office of Management and Budget, and the General Accounting Office. The fiscal year 2000 PBPM process integrates the NRC Strategic Plan and Performance Plan more fully with our budget request. A recent Arthur Andersen evaluation, currently under NRC staff review, found that the NRC PBPM process is sound, and that it has improved our integrated planning efforts, consistent with the Government Performance and Results Act. In addition, the PBPM framework provides a means of ensuring the accountability of agency managers. We are applying the PBPM process in our three major program offices in planning our work and developing the budget for fiscal year 2001. The continuing work of Arthur Andersen is helping us to develop outcomes-based measures as "filters" to evaluate, prioritize, and sunset activities. In the feedback process, which PBPM requires, these measures also comprise the actual metrics for gauging performance.

Institutionalizing Change

We are moving the NRC aggressively toward being a more risk-informed and more performance-based organization. These efforts will strengthen the linkage between our performance goals, strategies, and resource requirements in the fiscal year 2001 budget. We are refining our existing Strategic Plan and Performance Plan to reflect the regulatory reforms underway. This approach will ensure that current

changes will be institutionalized in a manner that ensures long-term organizational effectiveness.

SHIFTING THE REGULATORY PARADIGM

Risk-Informed and Performance-Based Regulation

The Commission is overhauling the NRC regulatory approach to become more risk-informed and performance-based; to enhance safety focus; to improve effectiveness, efficiency, predictability, and scrutability; and to eliminate unnecessary regulatory burden in both the reactor and materials arenas. The accomplishments of the past 6 months demonstrate both an acceleration of existing efforts and the launching of new initiatives. We have increased stakeholder involvement, refined NRC internal practices, completed NRC pilot programs, and laid the foundation for risk-informing NRC reactor regulations over the longer term.

Increased Stakeholder Involvement: The Commission has increased substantially the involvement of the nuclear power industry, public interest groups, States, and other stakeholders through public meetings, extended workshops, and the solicitation of public comments through the Federal Register and the Internet. Stakeholder input customarily has played an important part in the formulation of NRC policies—for example, the Probabilistic Risk Assessment (PRA) policy statement and the formulation and initial use of NRC guidance on risk-informed regulation. More recently, stakeholder interactions have become even more integral to the development of options for Commission consideration on risk-informed revisions to reactor regulations and proposed improvements to NRC reactor oversight processes. The Commission believes that this increased interaction will be of substantial benefit, by ensuring a mutual understanding of technical and safety issues, stimulating a healthy dialog among all participants, promoting wider acceptance of our programs, and highlighting areas for additional research.

Changes to NRC Licensing Action Review Practices: As part of our commitment to risk-informed regulation, we have changed internal NRC operating practices. This has included providing additional guidance, training, and management attention to ensure that risk-informed licensing actions are given the appropriate priority. The completion of numerous plant-specific risk-informed licensing reviews has helped to sharpen the focus on safety while reducing reduce unnecessary regulatory burden. Two examples are:

- Extending allowed outage times for some systems without adverse effects on plant risk when certain precautions are taken, and
- Reducing in-plant inspection requirements for reactor vessel welds by as much as fifty percent.

In practical terms, these changes substantially reduce occupational radiation exposure, plant operational costs, and unnecessary shutdowns without adversely affecting public safety.

Progress on Pilot Programs: Risk-informed pilot programs have been completed through the NRC review of prototypical license amendment applications. We have approved pilot applications in three areas: (1) graded quality assurance, (2) in-service testing of pumps and valves, and (3) in-service inspection of important reactor plant piping. In each of these applications, our consideration of risk information provided a strong basis for a graded treatment of the regulated activities at certain licensee facilities, which allows both NRC and licensees to focus resources on equipment and activities with the greatest risk significance.

In another pilot application, the NRC reviewed certain requirements for post-accident hydrogen monitoring. By allowing more flexibility for the initiation of hydrogen concentration monitoring during an accident, reactor operator attention can be focused on more risk-significant matters.

These pilots have demonstrated that the implementation of the risk-informed programs can be accomplished without a significant change in risk, and that an acceptable level of quality and safety will be maintained. Lessons learned from the pilots will be used to improve future applications and NRC reviews.

Longer-Term Initiatives: The Commission is considering a proposal to redefine, in a broad-based manner, plant equipment needing special treatment in such areas as quality assurance, environmental qualification, operational controls, and engineering code requirements. The Commission also is considering a recommendation to "risk-inform" the complete body of power reactor regulations. In addition, we are facilitating the adoption of a risk-informed regulatory approach by making infrastructure changes through staffing and training, additional revisions to guidance documents, and the development of improved PRA methods.

License Renewal

Establishing a stable, predictable, and timely license renewal process is a top NRC priority. The Commission has issued a policy statement laying out its expectations for a focused review of license renewal applications, built upon our license renewal regulations. To date, all milestones for the license renewal reviews have been met. I have charged the NRC Executive Council with overseeing the license renewal reviews to ensure adequate resources are applied and to raise promptly any issues that require Commission review. Using case-specific orders, the Commission has established an aggressive adjudicatory schedule for reviewing the Calvert Cliffs and Oconee applications, aimed at completing the license renewal process in 30–36 months. We also have prepared procedures to control the reviews and to resolve generic renewal issues. NRC management meets monthly with the applicants to monitor progress and the resources expended, and to resolve renewal issues.

The initial safety evaluation report and draft environmental impact statement for the Calvert Cliffs application should be completed on schedule next month. Last December, the Commission denied an appeal from the petitioner on the Calvert Cliffs application and affirmed the Licensing Board denial of a request for hearing. The petitioner has sought judicial review. In the absence of a hearing, the NRC anticipates completing its review and a Commission decision on the Calvert Cliffs renewal application by May 2000, 25 months after it was submitted.

Regarding the Oconee application, the licensee responses to NRC requests for additional information are scheduled to be completed next month. Last December, the Licensing Board denied a request for hearing from the petitioner on the Oconee renewal application. The petitioner has appealed this ruling to the Commission. The NRC anticipates completing its review and a Commission decision on the Oconee renewal application no later than December 2000.

We also understand that we will receive our next license renewal application in December 1999 from Entergy for their Arkansas Nuclear One plants. Other applications may follow quickly, and we have asked for sufficient resources in our fiscal year 2000 budget to handle the anticipated new applications. Lessons learned from the initial reviews will help to streamline later reviews even further.

License Transfers and Adjudicatory Processes

The Commission has issued a final rule to establish an informal streamlined hearing process for license transfers. Under this newly adopted rule (Subpart M to 10 CFR Part 2), the Commission expects to complete informal hearings and issue final decisions on most license transfer applications within about 6–8 months of when the application is filed.

The NRC has completed final Standard Review Plans (SRPs) for antitrust and financial qualifications reviews, and a draft SRP for foreign ownership issues. SRPs document the process and criteria to be used by the NRC staff in performing its reviews, which improves the focus, effectiveness, predictability, timeliness, and efficiency of the process. During the coming months, the NRC expects to complete timely reviews of license transfer requests from Three Mile Island Unit 1 and the Pilgrim station.

The Commission currently is considering options for a more comprehensive streamlining of its adjudicatory processes. Concurrently, the Commission has been monitoring closely its adjudicatory tribunals to ensure appropriate adherence to the substantive and schedular provisions of the Commission Rules of Practice.

Other Licensing-Related Issues

Enhancements to License Amendment Review Processes: In July 1998, the NRC participated in an American Nuclear Society licensing workshop to identify opportunities for improving licensing processes both for the NRC and for licensees. The NRC and the Nuclear Energy Institute (NEI) established a joint task force to pursue process improvements based on recommendations developed at the workshop. In response to the workshop and self-assessments, the NRC is working to improve the timeliness of licensing reviews. Significant progress was made in these areas during the first quarter of fiscal year 1999, as measured by reductions both in the inventory of licensing actions and in the average age of actions in the inventory.

Improvements to the 10 CFR 50.59 Change Process: In October 1998, the Commission published for public comment proposed revisions to 10 CFR 50.59. Under this regulation, licensees are allowed to make certain changes to their facilities without prior NRC approval. The revisions to the rule are intended to clarify NRC requirements and to allow changes that will have minimal impact on the facility licensing basis. These revisions will both improve the effectiveness of this regulatory process and reduce unnecessary NRC and licensee burden. The NRC staff currently is ana-

lyzing the public comments and expects to complete a final rule package for Commission review and approval within a few months.

FSAR Guidance: Another NRC initiative is the development of guidance on updating final safety analysis reports (FSARs). The updated FSAR is used in routine safety analyses performed by the NRC, the licensee, and other interested parties. NEI, with significant input from the NRC, has developed a guidance document, outlining a voluntary process for removing excess detail from the FSAR, thereby simplifying both the FSAR and the updating process. We currently are considering a proposed regulatory guide that endorses this NEI document. That proposal should go out for public comment in the near future.

Improved Standard Technical Specifications: The NRC has improved the timeliness of reviews for converting power reactor licenses to improved standard technical specifications. This conversion improves consistency in interpreting and applying these requirements. In total, licensees for approximately 89 reactors have decided to convert to the new technical specifications, which licensees have projected will save from $150,000 to over $1M annually per site. To date, applications to convert have been received from 57 units, of which 43 units have been given approval, 17 since July 1998. We expect to issue approvals for an additional 10 units during the remainder of fiscal year 1999, which will eliminate the large backlog of applications under review over the last 2 years.

Refining the Use of Generic Communications: In August 1998, the NRC staff met with stakeholders to ensure an understanding of concerns related to NRC generic communications. Based on the results of that meeting, we are clarifying the definition and purpose of certain types of generic communications, documenting the generic communication process, and resolving related compliance backfit issues. As part of this effort, we are reviewing proposed generic letters earlier, and at a higher management level, and engaging stakeholders earlier in the process.

Improving the RAI Process: We have improved discipline in the process for requesting additional information (or RAIs) from licensees for license amendments and other NRC reviews. We have revised internal NRC guidance, trained appropriate NRC staff, held NRC staff and management accountable for the timeliness and quality of reviews, and developed an outline for general distribution that details the qualities looked for in licensee submittals. These efforts should help to reduce the need for, and the burden associated with, RAIs.

Reactor Inspection, Performance Assessment, and Enforcement

As previously stated, the Commission is taking a more risk-informed and performance-based approach in overseeing nuclear reactors. Since the July 1998 hearing, we have made considerable progress in identifying necessary changes to the inspection, assessment, and enforcement processes to improve their objectivity; to make them more understandable, predictable, and risk-informed; and to focus on aspects of performance that have the greatest impact on safe plant operation. These efforts have been guided, in part, by four performance goals used as "filters" to evaluate, prioritize, and sunset activities. Each activity is examined to see how it: (1) supports the NRC safety mission; (2) eliminates unnecessary NRC and licensee burden; (3) increases public confidence; and (4) increases NRC internal effectiveness and efficiency.

Assessment and Inspection Program Changes: The NRC staff has proposed to the Commission a new assessment framework, which builds upon the cornerstones of licensee performance that must be monitored to ensure that nuclear power reactor operations do not pose unacceptable risks to the public. The cornerstones support the NRC mission by ensuring that: (1) accident-initiating events are reduced; (2) accident mitigation systems are available, reliable, and capable of performing their intended functions; (3) barriers are sufficient to limit the release of radioactivity; (4) adequate emergency preparedness functions are maintained; (5) licensees have implemented adequate programs to protect the public and workers from radiation; and (6) security measures are in place to protect against sabotage. As part of the assessment framework, the NRC staff has identified performance indicators, performance indicator thresholds, and risk-informed inspections that would supplement and verify the validity of the performance indicator data.

This assessment framework provides a natural basis for a risk-informed baseline inspection program—a program that identifies the minimum level of inspection required, regardless of licensee performance, to ensure adequate NRC oversight and assessment of licensee performance. Developed using a risk-informed approach, the proposed baseline inspection program includes a comprehensive list of inspectable areas within each cornerstone of the assessment framework.

As currently proposed, the assessment process will integrate the performance indicators with the results of the risk-informed baseline inspections. This integration

will allow the NRC to make objective conclusions regarding licensee safety performance, to communicate these results effectively to the licensees and to the public. Even more significantly, the process includes specific thresholds—tied to the cornerstones of safety—that will trigger commensurate licensee and/or NRC action if they are exceeded. The process will provide both continual and periodic assessment of licensee performance.

We have developed these new processes through a series of stakeholder meetings with extensive and constructive dialog. The overall proposal was forwarded to the Commission on January 11, 1999, and released for public comment the next day. On January 20, the Commission met with the NRC staff and stakeholders to discuss these proposals, which we are reviewing currently.

Although the exact form of the final process is still under development, these broad-scale changes to reactor oversight clearly will result in several direct benefits:

- Increased objectivity by relying on performance indicators, where possible, and the risk-informed baseline inspection program, to provide the basis for determining performance, and from using risk-informed thresholds to determine expected regulatory and licensee response;
- Enhanced scrutability by relating inspection information and performance indicators more clearly to their impact on overall safety performance;
- Elimination of many current redundancies and inefficiencies by using a single, integrated assessment process;
- More direct consideration of risk insights in the new risk-informed baseline inspection program, as well as in the performance indicator thresholds;
- Greater assurance of safety performance so that appropriate licensee and NRC actions can be taken before performance degrades unacceptably;
- Reduction in unnecessary inspection and enforcement burden; and
- Enhanced public understanding of NRC assessments of licensee performance, further strengthened through annual local public meetings.

We have made considerable progress in reshaping these NRC regulatory programs. As we transition our programs, we will make major process changes incrementally, to allow testing and adjustment during piloting and implementation. Much work remains in bench-marking, conducting pilots, developing procedures, and training the NRC staff on the new processes. In addition, several key policy issues still must be resolved, such as whether changes are needed in NRC responses to events at licensee facilities.

Successful implementation will require continuing stakeholder involvement, as well as a significant investment of NRC staff and management resources. As currently proposed, the transition plan will include a *6-month pilot* at two sites in each NRC region, beginning this June. We will measure pilot program results against the success criteria and conduct a joint NRC-stakeholder workshop prior to full implementation. Existing processes, such as plant performance reviews and senior management meetings, will be replaced by the new risk-informed oversight process. The Commission already has suspended the Systematic Assessment of Licensee Performance (SALP) process, pending implementation of the new process. To verify that our objectives are being met, we plan to evaluate the revised oversight process after about 1 year of full implementation.

Enforcement Program Changes: In parallel with these improvements to our assessment and inspection programs, the NRC has made several changes to its enforcement program to reduce unnecessary NRC and licensee burden. On July 27, 1998, we issued enforcement guidance to clarify our existing Enforcement Policy. The changes ensure that: (1) licensees are given appropriate credit for identifying and correcting violations; (2) NRC and licensee resources are not expended on violations that do not warrant formal citations; (3) written responses to Notices of Violation are not required when necessary information is already docketed elsewhere; and (4) cases involving multiple examples of the same violation are treated consistently. The agency-wide implementation of this guidance has resulted in a significant reduction in the number of low-level (Severity Level IV) violations, particularly in the number of violations requiring a written licensee response.

On January 22, 1999, the Commission approved a change to the Enforcement Policy that will expand the use of non-cited violations. Except in limited circumstances, individual Severity Level IV violations now will not be cited, so long as they have been entered into the licensee corrective action program. Accordingly, the NRC inspection program will place more emphasis on assessing the effectiveness of licensee corrective action programs. This is consistent with the thrust of the risk-informed inspection process described earlier.

In addition to these short-term enforcement program changes, the Commission expects that the Enforcement Policy will be changed and integrated with the risk-informed inspection and assessment processes. These changes should include an ex-

panded policy supplement with violation examples that reflect more accurately the risk significance of potential violations in each topical area.

Continuing Challenges

Although we have made substantial progress in redesigning our regulatory programs, much work remains in making these programs more effective and efficient. Our efforts are far from complete. In addition, we recognize that new challenges surely will arise as we revamp our programs and take nuclear regulation into the 21st Century. These continuing and future challenges include:

- We are working aggressively with the nuclear power industry and other licensed nuclear facilities to ensure that their safety and security will not be adversely affected by the Y2K problem;
- We are examining the effectiveness and integrity of our petition processes, through which members of the public seek NRC action to ensure compliance with requirements and adequate protection of the public health and safety;
- We are reviewing carefully the NRC treatment of allegations involving harassment and intimidation at the Millstone nuclear power plants (including a specific review of certain Millstone harassment and intimidation cases), which we expect to lead to broader-based enhancements to NRC enforcement and investigations functions; and
- We are revising our regulatory programs for radioactive material to make them more risk-informed and performance-based, and to ensure that the regulatory burden is commensurate with the health and safety benefits of such regulations, including our medical use regulations in 10 CFR Part 35 and our fuel cycle facility regulations in 10 CFR Part 70.

Conclusion

Over the past few years, we have made substantial progress in improving our regulatory programs, and we have accelerated that progress in the past 6 months. As stated earlier, our interactions with this subcommittee have contributed to this success, and we welcome your continued constructive oversight. With sufficient resources, strong leadership, and broad support, we plan to continue our efforts to enhance the effectiveness and efficiency of the NRC by pursuing the paths that already have been charted. The Commission fully expects that new areas will continue to arise, requiring attention and additional effort. As with current areas of reform, we will continue to ensure stakeholder involvement in the change process. We believe that we have laid the groundwork not only for significant short-term adjustments, but for enduring improvements to the NRC regulatory paradigm, institutionalized and stabilized through incorporation into our performance-based planning process.

Thank you for your attention and consideration. We will be happy to answer any questions from the subcommittee.

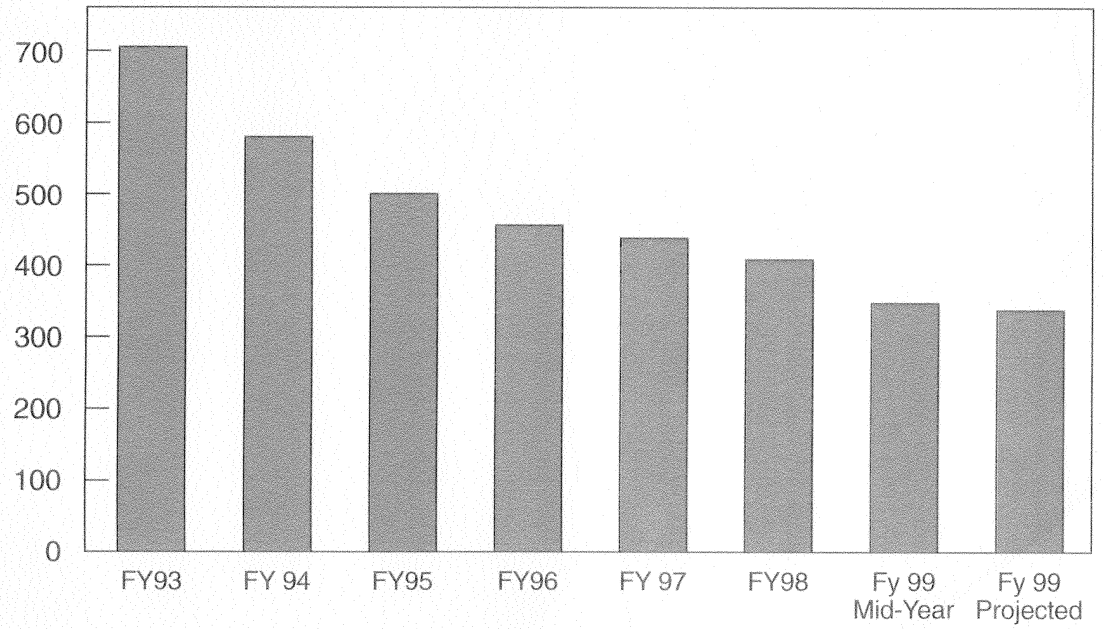
PERFORMANCE GOALS

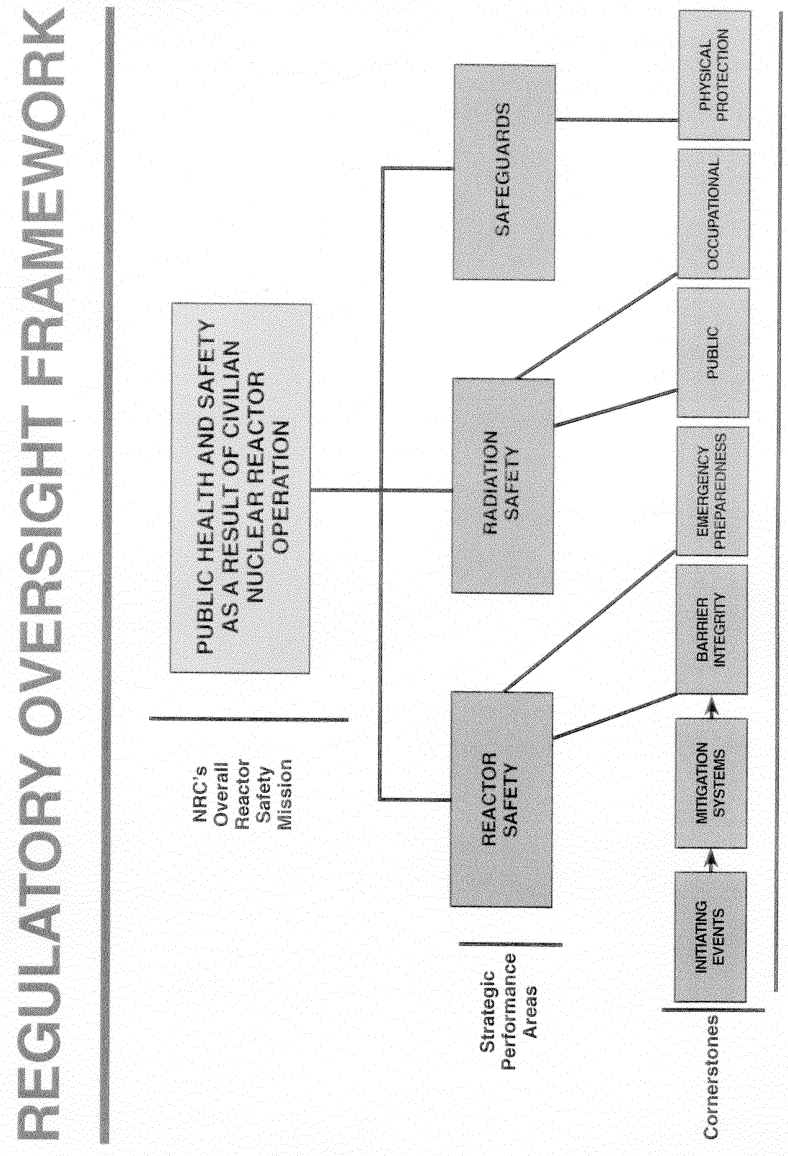
FOCUS ON ACHIEVING THE FOLLOWING OUTCOMES

- **Maintain Safety**
- **Reduce Unnecessary Regulatory Burden**
- **Increase Public Confidence**
- **Increase Efficiency/Effectiveness of Key Processes**

U.S. NUCLEAR REGULATORY COMMISSION

NUMBER OF SUPERVISORS

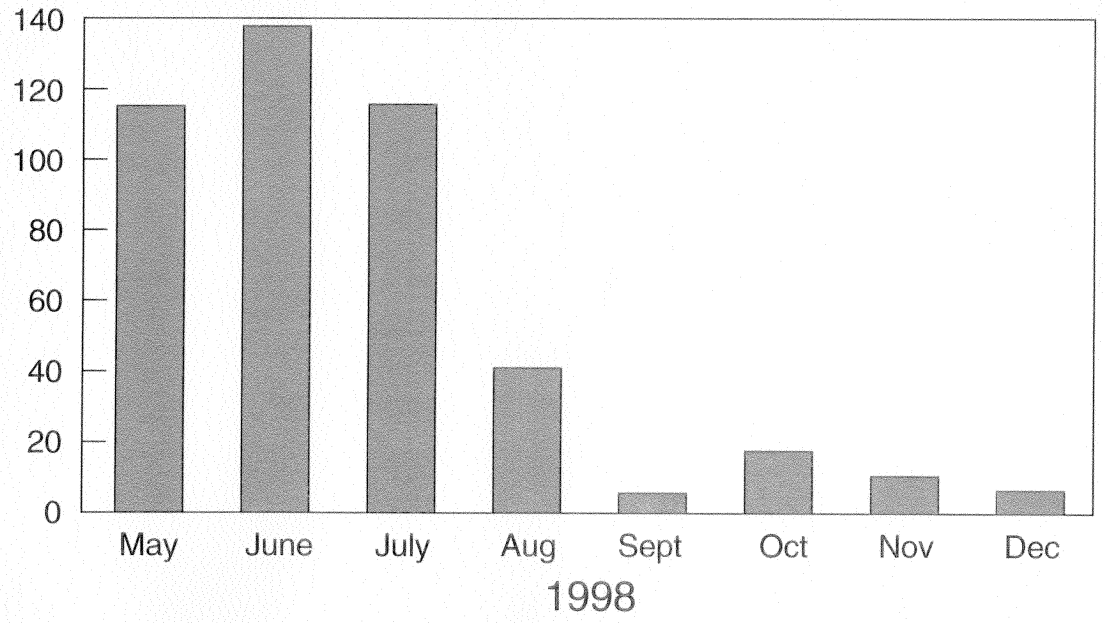



REGULATORY OVERSIGHT FRAMEWORK
NRC's Overall Reactor Safety Mission
PUBLIC HEALTH AND SAFETY AS A RESULT OF CIVILIAN NUCLEAR REACTOR OPERATION
Strategic Performance Areas
REACTOR SAFETY
RADIATION SAFETY
SAFEGUARDS
Cornerstones
INITIATING EVENTS
MITIGATION SYSTEMS
BARRIER INTEGRITY
EMERGENCY PREPAREDNESS
PUBLIC
OCCUPATIONAL
PHYSICAL PROTECTION

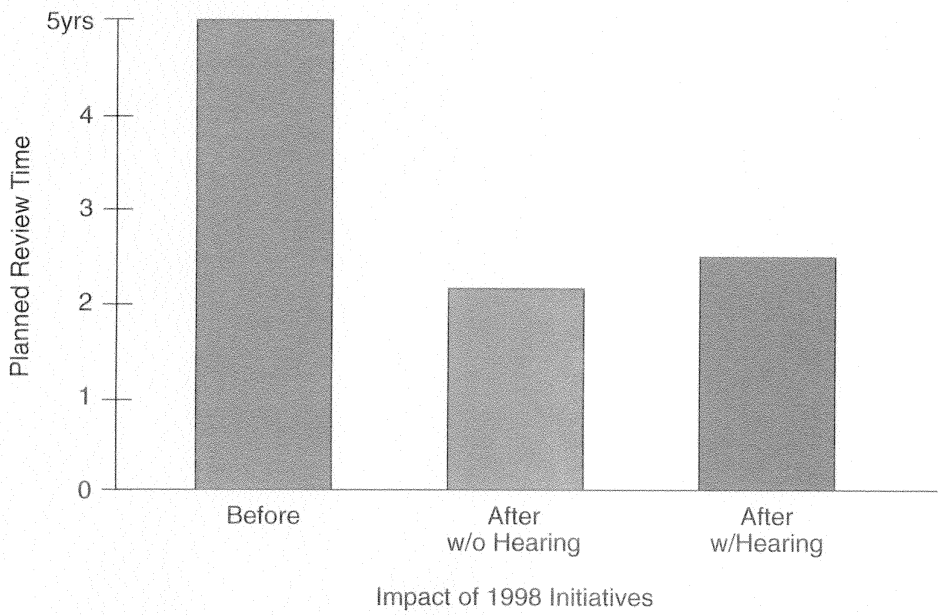
CONCEPTUAL MODEL FOR EVALUATING LICENSEE PERFORMANCE INDICATIONS

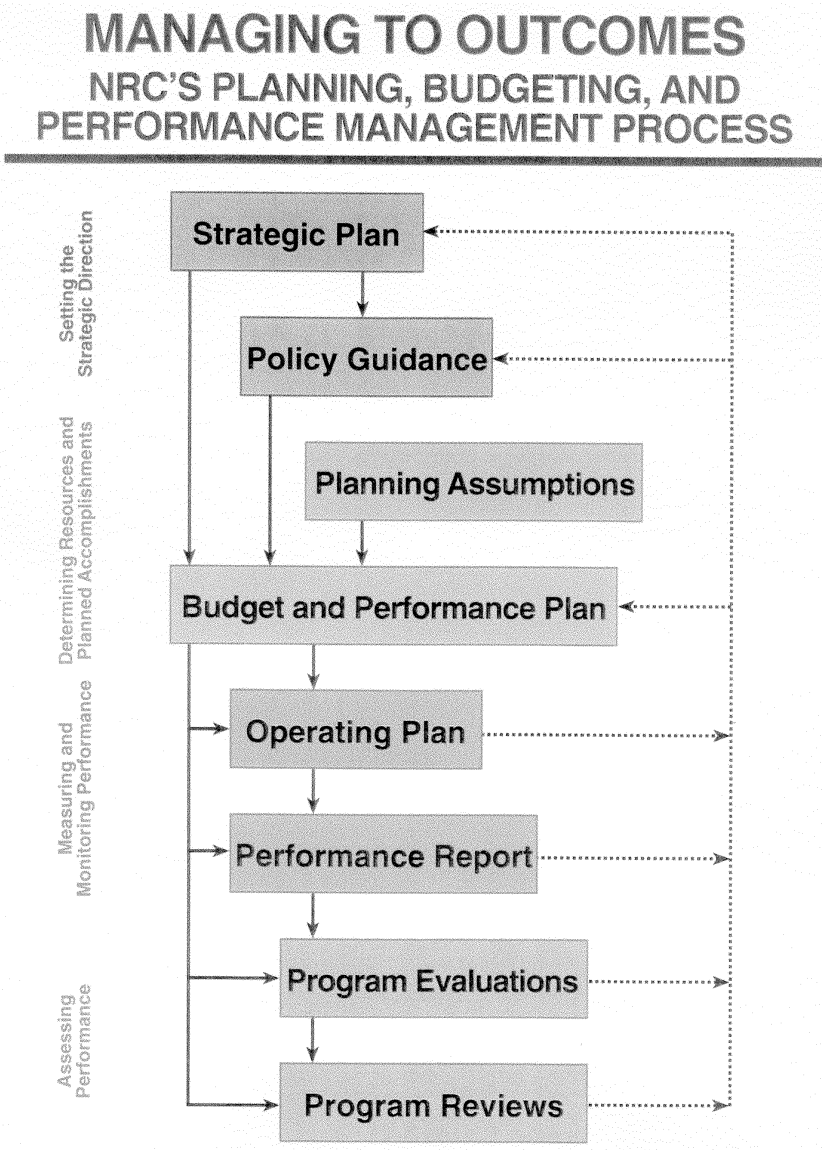
(SATISFACTORY PERFORMANCE – Licensee Response Band) – Cornerstone objectives fully met
(ACCEPTABLE PERFORMANCE – Increased Regulatory Response Band) -- Cornerstone objectives met with minimal reduction in safety margin
(MARGINAL PERFORMANCE – Required Regulatory Response Band) -- Cornerstone objectives met with significant reduction in safety margin
(UNACCEPTABLE PERFORMANCE – Plants not permitted to operate within this band) – Unacceptable margin to safety

RESPONSE REQUIRED SL IV VIOLATIONS
OPERATING AND RECENTLY SHUTDOWN PLANTS



LICENSE RENEWAL APPLICATION REVIEW





RESPONSES OF THE NUCLEAR REGULATORY COMMISSION TO QUESTIONS FROM CHAIRMAN INHOFE

Question 1. During the Hearing, Chairman Jackson discussed a long-range plan for reforming the Agency. How does this plan relate to the Tasking Memo? If they are different, please supply a copy of the long-range plan. In addition, please explain the difference between the two plans or the two goals.

Response. The NRC's long-range plan for reforming the Agency is embodied in an integrated Planning, Budgeting, and Performance Management (PBPM) process. This process, implemented with the FY 2000 budget cycle, sets the operational framework for the Agency to manage its programs and operations. Key components are: the Strategic Plan, the Performance Plan, the Budget and Operating Plans. We

are updating the Agency's planning documents to reflect the new directions, goals and strategy for the Agency. The PBPM approach will ensure that current changes will be institutionalized in a manner that ensures long-term organizational effectiveness. Our latest draft Strategic Plan will be shared with stakeholders, including Congress, for comment.

The August 7, 1998, Tasking Memorandum to the NRC staff established an aggressive agenda for accelerating changes already underway at the NRC, and making immediate additional, significant changes and improvements in a number of key areas. The specific actions and schedules in the tasking memorandum are incorporated into program Operating Plans. The updated Strategic Plan and Performance Plan will capture the higher level performance measures, goals and strategies associated with these and other initiatives.

Question 2. Can you provide a list of those regulatory activities that the NRC directly bills its licensees? How much of your fee income is derived from each activity? What percent of your fee income is derived from direct service fees?

Response. The NRC assesses two types of fees to its licensees: 10 CFR Part 170 fees for activities performed for a specific licensee or applicant (based on Independent Offices Appropriation Act) and 10 CFR Part 171 annual fees for the remainder of NRC's budget (based on the Omnibus Budget Reconciliation Act of 1990). Part 170 fees are assessed for inspections and licensing activities, including pre-application efforts and reviews of new license applications, renewal applications, amendment requests, topical reports, standard plant designs, and decommissioning plans. The annual fee recovers NRC's other regulatory costs that are not recovered from Part 170 fees (e.g., research, rulemaking, and incident response). The Part 170 fees collected in FY 1998 by the two main classes of licensees are:

Classes	Licensing	Inspection	Total
Reactors	$28.2M	$59.6M	$87.8M
Materials	$7.5M	$4.3M	$11.8M
Total	$35.7M	$63.9M	$99.6M

For FY 1998, of the total $459M collected in fees, $99.6M, or 22 percent was collected from Part 170 fees.

Question 2(a). The NEI witness, Mr. Colvin, stated that nearly 80% of your fees are not directly tied to a particular service provided by the NRC. Do you agree with that figure?

Response. No. The NRC mission to ensure the adequate protection of the public health and safety recognizes that the NRC serves a broader need than just providing a specific service to a licensee or applicant. As stated in the response to the previous Question 2, approximately 20 percent of our budgeted costs are recovered through fees for licensing and inspection activities performed by the NRC for specific licensees and applicants (10 CFR Part 170 fees). However, this does not mean that the remaining 80 percent does not benefit our licensees or the public or is not necessary for the NRC to provide regulatory oversight. For the NRC to carry out its mission, it must perform certain functions that are not requested by specific licensees or applicants, but which are, in fact, a service provided to categories or groups of licensees. For example, we must perform rulemaking, safety research and generic studies and maintain an incident response center. Such actions, either directly or indirectly, are of benefit to certain groups of licensees. The NRC does make an effort in assessing such fees to attribute these costs to the groups of licensees receiving the generic benefits of these regulatory activities. Also some costs, such as for licensing and inspection services provided to Federal agencies and nonprofit educational institutions, are recovered through annual fees because we are precluded by law or policy from charging fees to those organizations.

Question 2(b). Has the amount of general fees increased as a percent of total fees charged to licensees over the past five years? If so, would the NRC provide an analysis explaining the change?

Response. The percentage of fees collected through Part 171 annual fees (general fees) to total fees has remained relatively constant over the past 5 years. Over the past two years, the Commission has made decisions which will result in an increase in Part 170 fee collections, shifting costs away from annual fees. These decisions recognize that, with few exceptions, agency work directly identifiable to a licensee should be billed to that licensee. As a result of this change, the NRC estimated Part 170 fee collection for FY 1999 will be approximately $10 million more than FY 1998. The Commission will be proposing rule changes which would result in further increased collection of Part 170 fees.

Question 2(c). Do you agree with the industry's position that your fees need to be more directly tied to services performed? Does your current fee structure comply with the 1990 Omnibus Budget Reconciliation Act's requirement that fees be related to services performed?

Response. We agree, in general, that an identifiable licensee or applicant who receives agency services should be billed accordingly. This objective is not always attainable for legal and policy reasons. For example, current law precludes us from charging Federal agencies Part 170 fees, and public comments have supported continuing to recover costs for certain activities through Part 171 annual fees. As stated in the response to the previous question 2(b), over the past two years, the Commission has changed its policies so that more costs will be recovered directly from specific licensees and applicants. However, when NRC activities have a generic relationship to a group of licensees, NRC sees nothing inequitable about apportioning the costs of those activities to the appropriate group of licensees through Part 171 annual fees.

Our current fee structure complies with the provisions of the Independent Offices Appropriation Act and the Omnibus Budget Reconciliation Act of 1990. The Inspector General has recently issued an audit report that concluded that one area, Part 170 hourly rates, needs to be reviewed to assure compliance with the full costs provisions of OMB Circular A–25, "User Charges." The CFO is initiating a study by a multi-office team to review this matter.

Question 2(d). Doesn't it make sense, from both a safety and policy point of view, that those licensees that are necessitating the most regulatory action be assessed more fees?

Response. Yes. In general, licensees that require more licensing and inspection attention will be assessed more fees under 10 CFR Part 170. In developing the annual fees by category, we also take into consideration where the generic resources are being used and charge those categories of licensees accordingly. Therefore, in both Part 170 and Part 171 fee assessments, the charges represent either a directly identifiable benefit or a reasonable relationship to the NRC's cost of providing the regulatory service to the licensee. However, to meet the 100 percent fee recovery requirement, the NRC's annual fees include costs for activities that do not directly benefit licensees. These activities are discussed in response to Chairman Inhofe's Question 3.

Question 2(e). Do you believe that your budget submissions as well as your annual rule regarding fee schedules provide adequate information for the industry and others to analyze, understand, and critique those submissions?

Response. The budget submissions and our annual fee rules provide sufficient information for our licensees and other interested parties to analyze, understand and critique our submissions. Each year public comments are solicited on an annual proposed fee rule which describes the development of the proposed fees and outlines the Part 170 and Part 171 fee amounts. The final fee rule provides a response to those comments. Each year when a proposed rule is issued, a copy with a summary of the proposed changes is mailed to each licensee so that they may quickly assess the impact of the rule. A copy of all working papers providing backup data and other detailed information on the development of the fees is made available for public review in the NRC public document room. Additionally, the Agency responds to many inquires on its fee policies and practices and periodically meets with individual licensees to discuss particular issues.

Because the Commission has decided to rebaseline its fees in FY 1999, the Commission has directed the staff to ensure that the proposed fee rule provides sufficient information for all its licensees to analyze and understand. Rebaselining fees could result in significant changes to the annual fees for many NRC licensees.

Question 3. You have agreed in previous hearings that certain portions of your budget, such as the international programs, should not be included in the user fees. Please submit to the subcommittee a list of those programs, and their budgets, that do not directly benefit licensees, for FY 1999 and FY 2000.

Response. The following chart lists programs and their budgets that do not directly benefit licensees. These programs typically provide either a significant indirect benefit to our licensees or are essential for the NRC to effectively carry out its mission to protect public health and safety and common defense and security. These estimates include direct costs as well as the overhead and agency general and administrative costs of providing these services. Estimates for direct costs reflect resource allocations developed for the FY 1999 enacted budget and for the FY 2000 President's Budget. Estimates for overhead and administrative costs are based on hourly rates established by the 1998 fee rule and do not reflect changes that may result from the final 1999 fee rule.

Activities Proposed for Fee Exclusion

[Dollars in Millions]

Activity	FY 1999 Budget Estimate	FY 2000 Budget Estimate
Regulation of Federal Agencies	3.0	3.0
Regulation of Nonprofit Educational Institutions	3.8	3.8
Regulation of Small Entities	5.2	5.2
Regulatory Support to Agreement States	12.4	11.0
Site Decommissioning Management Program	5.7	7.4
Generic Decommissioning and Reclamation Activities	10.7	10.7
International Activities	4.2	5.0
Agreement State Oversight	5.5	5.3
Total	50.5	51.4

Question 4. At the hearing, Chairman Jackson indicated that the license renewal application for the Calvert Cliffs Plant would be, barring any glitches, completed in 25 months, well ahead of the proposed 30–36 month schedule. Is the lack of intervention on the Calvert Cliffs application primarily responsible for the reduction in schedule? Are there improvements that can be made in the NRC review process to further reduce the schedule?

Response. The Commission denied the only petition for intervention in the Calvert Cliffs license renewal proceeding. Therefore, there will not be an adjudicatory hearing in this proceeding. This is the principal factor in the reduction in schedule to 25 months. There may be additional opportunities to improve the NRC renewal schedule for Calvert Cliffs and Oconee. After the NRC issues the renewal safety evaluation report, the staff will meet with the licensees for Calvert Cliffs and Oconee, Baltimore Gas and Electric (BGE) and Duke Energy, respectively, to discuss the scope of safety issues that need to be resolved and review and revise, as appropriate, the scope of the license renewal reviews and schedule milestones. It should be noted that the intervention petitioner has sought judicial review of the Commission's decision to deny intervention. That issue is currently before the D.C. Circuit Court of Appeals.

The NRC is developing experience from the review of the first two renewal applications, as well as the resolution of generic renewal issues and technical reports, which will achieve further efficiencies in the future.

Question 5. Aging of nuclear power plants is an ongoing process. Many existing licensee programs as well as elements of NRC's regulatory oversight focus on ensuring that aging is not detrimental to the safe operation of the plants. In fact, the foundation for the license renewal regulation is that continuation of current licensing basis activities and regulatory oversight ensure the public health and safety as plants move beyond 40 years of operation.

Given this principle, is the focus of the NRC review of a renewal application on the aging that is not being managed under the current license? Is the Calvert Cliffs review being conducted in this manner? If it is not, can the process be made even more efficient without impacting safety?

Response. The focus of the NRC's review of the renewal applications is the adequacy of the aging management programs for specific passive structures and components needed to ensure safe plant operation for the period of extended operation. The renewal rule reflects a focused review because those parts of the existing licensing basis related to active components, system design, operating margins, emergency plans, security and other matters that do not involve aging are excluded from the scope of review under 10 CFR 54. Moreover, where a renewal applicant proposes to rely on existing maintenance and surveillance programs to manage aging effects for the structures and components within the renewal review scope, the NRC's review effort is limited to a determination of whether there is an aspect of aging that is not being adequately managed. The staff is currently examining this aspect of its reviews to determine whether changes to its review process are appropriate.

The NRC is developing experience from the review of the first two renewal applications, as well as the resolution of generic renewal issues and technical reports, which will achieve further efficiencies in the future. In particular, the NRC staff is developing a matrix of the common aging management elements for each of the major existing maintenance and surveillance programs. This effort is intended to improve the review guidance for the NRC staff so that their efforts will be focused even more than that provided by the 1995 amendment to the license renewal rule such that further efficiencies can be achieved.

Question 6. When will the Commission reach a decision regarding the options that were presented to you by staff for risk-informing your regulations and when do you believe you will complete the process of risk-informing all of your regulations?

Response. The options were presented to the Commission in SECY–98–300 for nuclear reactor regulations. The Office of the Secretary of the Commission anticipates that a decision on these options will be finalized within the next several weeks. These estimates range from approximately 4 to 8 years depending on the option, or combination of options, the Commission chooses.

Question 7. What do you believe the impact of risk-informing your regulations will be on your budget submissions in the upcoming years? Should Congress expect those submissions to reflect increases or decreases once the process of risk-informing your regulations is complete?

Response. The process of reviewing risk-informed reactor licensee submittals (as allowed by current regulations) and the update of risk-informed guidance documents is ongoing, and these activities are already reflected in the current NRC budget.

With respect to the effort to modify reactor regulations, the budget impact will vary as the project progresses. The NRC expects that resource expenditures to risk-inform our regulations will be higher in the first few years, with lower expenditures in subsequent years due to the benefits of a more efficient process in the areas of licensing reviews, inspection, and enforcement. These lower expenditures in later years are expected to more than compensate for the initial, higher expenditures.

The NRC staff has presented preliminary estimates of resource expenditures in SECY–98–300 for risk-informing the NRC reactor regulations. The impact on the budget over the upcoming years will be dependent on the option, or combinations of options, that the Commission decides on over the next several weeks. These decisions will be integrated into the Planning, Budgeting, and Performance Management Process which will identify the specific activities needed and the resource allocations to deliver the improvements.

For materials regulations, it is anticipated that, as with risk-informing reactor regulations, the resource expenditures for some materials areas will initially be higher in the first few years, and expenditures in the subsequent years may vary depending on the type of licensed activity and the outcome of the risk assessments.

Question 8. In promulgating rules, what is the Commission's policy on the timing and availability of implementation, inspection and enforcement guidance? Is draft guidance available when a proposed rule is noticed for comment, or is guidance developed after a rule has been finalized?

Response. The Commission policy is that, when possible, the draft guidance on implementation, inspection, and enforcement should be available when the proposed rule is published. Some rules are sufficiently simple or clear so that additional guidance on compliance is not needed. When industry standards are cited in a rule, NRC-specific guidance may not be necessary. In some instances guidance may be developed after publication of the final rule. Industry may take the initiative in developing guidance for implementing a rule and that guidance may be endorsed by the NRC. In some instances, the effective implementation date of the rule may be linked to the publication date of the guidance document.

Question 9. The NRC paper (SECY–99–007) recommending changes to the oversight process (assessment, inspection, and enforcement) is about 500 pages long. Is that much detail necessary to improve the clarity, consistency, and objectivity of the process? Is the Commission satisfied with the direction and progress on reforming the NRC's oversight process?

Response. The level of detail provided in SECY–99–007 is necessary. SECY–99–007 proposes a substantially revised process for overseeing the performance of commercial operating reactors. In addition to describing high level concepts related to the overall oversight framework and approach, it describes specific proposed changes to the Agency's inspection, assessment, and enforcement processes. SECY–99–007 serves as the primary vehicle for making recommendations available to stakeholders for review and comment. The level of detail included in the Commission paper is necessary to provide an understanding of the recommendations along with supporting rationale to enable respondents to provide meaningful comments. The NRC also has prepared a condensed summary of the proposed process. Having said this, the Commission did direct the staff to ensure future papers associated with the new oversight process are prepared in accordance with Vice President Gore's "Plain English" initiative.

Although the Commission is generally satisfied with the direction taken by the staff in developing revisions to the reactor oversight process, the Commission is continuing its review of the proposed revisions and considering additional information provided by the NRC staff in March 1999. While many significant challenges remain

for the NRC and the industry associated with completing process development and successfully transitioning to full implementation, progress made to date has been good and will support timely completion of this important initiative.

Question 10(a). How are you ensuring that the principles embodied in the revised oversight process result in a consistent approach to assessment, inspection, and enforcement?

Response. The NRC will ensure that the oversight process improvement initiative results in a consistent approach to assessment, inspection, and enforcement by: (1) developing an overarching hierarchical framework for the reactor oversight process along with high level principles regarding process design, (2) developing the inspection, assessment, and enforcement processes in accordance with the framework and principles, (3) incorporating outcome-oriented criteria for assessing performance, (4) ensuring the transparency and scrutability of the process, and (5) routinely monitoring and evaluating the NRC performance against performance measures. This approach has been and will continue to be used by the NRC, working with various stakeholders, as the Agency completes development and integration of the various processes. This need for consistency will be a principal focus of NRC headquarters systematic and ongoing review of regional operations.

Question 10(b). What specific changes are you planning to make to the enforcement process to improve its safety focus?

Response. Effective March 11, 1999, the NRC changed the way it addresses relatively non-risk significant violations (i.e., Severity Level IV violations) for operating reactors. The Commission recently approved revising the enforcement policy to change the treatment of Severity Level IV violations providing that except under limited, defined circumstances, individual Severity Level IV violations will normally result in Non-Cited violations. Additionally, closure of most Severity Level IV violations will be based on their having been entered into a licensee's corrective action program.

Importantly, this change does not change the expectation of compliance with NRC requirements but it does recognize the relatively low risk significance of these violations and the fact that most licensees generally resolve these issues in their corrective action programs commensurate with their safety significance. The net effect we expect is that licensee and NRC resources will be better utilized and available to focus on issues with greater risk significance.

Additional changes in our Enforcement Policy for both escalated and non-escalated issues are being considered as part of our ongoing efforts to redefine inspection and performance assessment processes. These proposed changes are intended to integrate effectively the reactor oversight processes of inspection, assessment, enforcement and reporting and contribute to a more risk-informed performance-based regulatory process. We will be prepared to discuss these changes during the September 1999 hearing.

Question 10(c). What have you decided regarding the term "regulatory significance"? If you are retaining the term, have you defined it? How is "regulatory significance" different from "safety significance"?

Response. The concept of regulatory significance encompasses (1) aggregation of violations, (2) willful violations including violations associated with discrimination issues, and (3) violations that impede the regulatory process such as reporting violations. Regulatory significance is a subset of safety significance. As used in aggregating violations, it addresses recurring or related violations for which, because of their programmatic nature and potential impact on safety, the root causes associated with the violations are more significant than their actual consequences.

The staff is developing a proposal for the Commission concerning the use of "regulatory significance." The staff does not intend to continue the use of the term. The aggregation of violations will not need to be used for reactor violations considered under the assessment process. It may continue to be used for other violations but with a closer nexus to safety consistent with the current staff practice as described in Enforcement Guidance Memorandum 98–009 issued on November 25, 1998. Violations involving willfulness and those that impede the regulatory process will be considered without the label of regulatory significance.

Question 11(a). When does the NRC plan to systematically assess the risk basis for cask licensing to ensure current and new requirements are focused on those areas that can be demonstrated to have an impact on safety?

Response. The NRC's Spent Fuel Project Office (SFPO) staff continually uses available risk information and insights in assessing current and new regulations impacting storage and transportation cask safety.

The staff has continually used risk information to upgrade its regulatory framework to clarify and improve the current storage regulations and to ensure that the

NRC regulatory program focuses on safety. For example, in preparing a conforming change to 10 CFR 72.48 (concerning a change process similar to 10 CFR 50.59), the staff proposed to expand the scope of the regulation to include the certificate of compliance holders in addition to the current licensees. After assessing comments from the industry, the staff decided to change this regulation further to ensure consistency and enhance usefulness, not only in the storage regulations, but in the transportation regulations as well.

Also, the staff made early efforts during the 1970's to apply risk assessment for the analysis of transportation risk, most notably, in the "Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes" (NUREG–0170), and "Shipping Container Response to Severe Highway and Railway Accident Conditions" (NUREG/CR–4829, also known as the "Modal Study"). More recently, the staff has applied probabilistic risk assessment in deciding to approve the one-time shipment of the Trojan reactor pressure vessel, with internals, for disposal at the U.S. Ecology site in the State of Washington. Also, the staff has nearly completed its re-validation of NUREG–0170 in light of proposed shipments of spent fuel to a repository (vs. reprocessing). The re-validation effort should be completed by the last quarter of FY99 and includes a computer evaluation of cask response to severe accidents and probabilities, the use of current health effects models, and studies of population distributions along likely shipment routes. The staff intends to use the results of NUREG–0170 re-validation in its efforts to update the Modal Study for the new generation of dual-purpose cask designs. The Modal Study update will focus on confirming severe accident probabilities and effects and will likely include partial or full-scale package tests. Moreover, the staff is encouraging more risk-informed decision-making with the U.S. Department of Transportation and the International Atomic Energy Agency. In addition, the staff intends to continue to use risk information in implementing its regulatory decisions.

Question 11(b). How and when does the Commission plan to address generic issues in cask licensing, e.g., higher burn-up fuels, better estimates of leakage rates and approval of innovative design approaches, that are impacting private fuel storage licensing, plans for licensing an interim storage facility, and decommissioning plants?

Response. The NRC's Spent Fuel Project Office (SFPO) staff is currently addressing a number of generic issues related to dry cask storage certification and licensing, as well as transportation package approvals. Last year, the staff began to augment its standard review plans with interim staff guidance documents (ISGs) to come to quick decisions about technical and regulatory issues without waiting for the standard review plan to be updated. This allowed the staff to continue its review with a sound technical or regulatory decision on a real-time basis. Currently, seven ISGs are in place and cover a range of topics. This information is available to all members of the public on the NRC Internet site.

Other ISGs are currently being developed, in cooperation with industry representatives, related to various generic topics; e.g., high burn-up fuels, burn-up credit, contents, rod buckling, and codes and standards. These ISGs are expected to be completed within the next 3 to 6 months, long before the lack of such guidance would impact licensing of Private Fuel Storage, L.L.C., (PFS), the Central Interim Storage Facility, or plant decommissioning. These ISGs and future ones will enhance the technical and regulatory review for licensing independent spent fuel storage installations and certification of dry cask storage systems and transportation packages. Prior to issuing an ISG, the staff typically discusses the ISG with industry representatives and other stakeholders at a widely attended publicly noticed gathering. For example, the ISGs in progress were discussed at a public industry workshop on March 2, 1999, attended by approximately 150 persons. Moreover, at this meeting, SFPO staff repeated that it does not desire to stifle innovative design approaches that meet the current regulatory framework. The staff does stress, however, that any innovative designs must be openly discussed with the staff and must meet the regulatory requirements that ensure public health and safety. Finally, the industry itself must develop issue-specific criteria and provide supporting data to the NRC so that the staff can develop an enhanced regulatory approach.

The staff will always consider an exemption to the regulations provided assurance of the public health and safety is maintained. Notably, the Department of Energy-Idaho Operations Office requested and was granted an exemption to the 10 CFR Part 72 seismic requirements which was based, in part, on probabilistic information provided by the Department. Additionally, to preclude the need for further similar exemptions, the staff is working to modify its seismic and geologic requirements for siting an independent spent fuel storage installation.

In a related matter, PFS was required to complete a thorough seismic study for its site characterization work which had not been completed at the time of the appli-

cation. This is not a generic issue, but is related specifically to the information required to be in the PFS application concerning the site chosen by PFS.

Question 11(c). How does the Commission plan to address these generic concerns without impacting the NRC's ambitious schedule for licensing new cask designs?

Response. The NRC's Spent Fuel Project Office (SFPO) staff is working on a number of issues in parallel with its technical and regulatory activities. While SFPO staff considers safety-oriented casework to be its prime focus and highest priority, staff has been directed to develop resolution to those issues that may impact or impede reaching a technical or regulatory decision.

Where required, the SFPO staff has sought assistance from others. For example, NRC's Office of Nuclear Regulatory Research is assisting in researching burn-up credit for final regulatory action. As stated in the response to Question 11(B), the staff is developing interim staff guidance so that an interim, but safe, regulatory decision can be reached prior to the Office of Nuclear Regulatory Research completing its review.

Additionally, during FY 1998, the Department of Energy provided the NRC with $4 million for the purpose of licensing a multi-purpose canister (MPC) design. The DOE is now using a market-driven approach in which private entities will apply to NRC for approval of spent fuel storage and transportation designs, and therefore DOE has no further interest in obtaining NRC approval for the MPC design. The NRC is now working with the Appropriations Committees to allow use of these funds for review of applications from private industry for approval of dual purpose canisters and other generic activities pertaining to canisters for the transportation, storage or disposal of high-level radioactive waste and spent nuclear fuel.

Question 12(a). The backfit rule is a critical tool to assess the risk posed by permanently shut down plants. When will the NRC apply its backfit rule to all rules and guidance impacting decommissioning plants?

Response. The Commission has approved the development of a backfit rule (or modification to 10 CFR 50.109, as appropriate) specific to plants undergoing decommissioning consistent with other competing priorities. In the interim, the Commission has directed the staff to continue to apply the current backfit rule to the extent practicable to plants undergoing decommissioning.

Question 12(b). When will the Commission provide guidance addressing the reduced risk posed by shutdown plants to ensure the critical approvals needed to proceed with decommissioning can be in place 1–2 months after a plant shuts down?

Response. In March 1999, the NRC initiated a reevaluation of all ongoing decommissioning rulemaking activities to ensure that the reduced risk associated with permanently shutdown reactors was properly reflected in all decommissioning requirements. A public meeting with Nuclear Energy Institute representatives has been scheduled to solicit industry assistance in determining the level of risk posed by these plants and the associated time periods after which many regulatory requirements may be reduced. A new risk-informed framework and schedules for these rules are expected by mid–1999.

Question 13(a). Is the NRC currently contemplating any changes to the physical safety requirements placed on nuclear plants?

Response. The staff has proposed, and the Commission is considering, changes in the safeguards performance assessment process to better utilize industry and NRC resources while at the same time assuring that plants maintain an appropriate level of readiness. Depending upon the approach chosen by the Commission, changes to regulations in this area may result. The Commission is also considering a rulemaking plan which would ultimately result in allowing licensees to revise security provisions during decommissioning commensurate with the risk presented by these facilities.

Question 13(b). What are the perceived threats to security that the current, and proposed, regulations intend to address?

Response. The NRC design basis threat (DBT) statements were first promulgated in the late 1970's. Absent an historical basis of attacks on nuclear facilities or of thefts of strategic special nuclear material, the Commission concluded that the use of design basis threats were appropriate. The threat statements, one for radiological sabotage and one for theft and diversion, are hypothetical threats against which physical security systems are designed, and they provide a standard with which to measure changes in the real threat environment; are used to develop regulatory requirements; and provide a standard for evaluation of the performance of implemented safeguards programs. The threat characteristics enumerated in the DBT are based on extensive analyses of actual terrorist characteristics that were commonly demonstrated and could reasonably be expected in an adversary, on experienced analytical judgement, and on intelligence community assessments.

To ensure the continued adequacy of the DBTs, NRC staff continually review threat-related intelligence, including information on vehicle bombings and other attacks worldwide. Staff also maintains an active liaison program with other Federal agencies concerned with terrorist threats and counterterrorism efforts, and performs DBT comparability reviews with the Department of Energy. The results of these efforts and staff conclusions are formally documented and provided to the Commission every 6 months, or as needed. Based on current staff analyses, no modification of the DBT is warranted at this time.

Question 13(c). Has the list of threats changed over the past several years?

Response. Each of the design basis threat (DBT) statements used to design physical protection systems has been changed once. The DBT for theft of strategic special nuclear material (SSNM) was modified in 1987 to include the use of a vehicle for transporting personnel and equipment during an attempted theft. This change was made in order to maintain comparability with DOE's threat guidance regarding protection of SSNM. The design basis threat statement for radiological sabotage was modified in 1994 to include: (1) use of a vehicle by an adversary to transport personnel and equipment to power reactor vital areas, and (2) the use of a vehicle bomb to attack the power reactor facility. These changes were made in response to two events that occurred in February 1993. In that month a vehicle intrusion occurred at the Three Mile Island nuclear facility and the World Trade Center was bombed. Subsequent to the Oklahoma City vehicle bomb attack on April 19, 1995, and the twin vehicle bombing attacks on the U.S. Embassies in Kenya and Tanzania on August 7, 1998, the NRC confirmed that the design basis vehicle bomb remained valid.

Question 13(d). Over the past 10 years, how have the physical safety requirements of nuclear plants been changed?

Response. With respect to rulemaking, the following table summarizes rulemaking activities in the physical protection area from 1988 to the present. The ''Title'' column indicates both title and the type of facility to which the rule applies. The ''Purpose'' column gives a brief summary of the rule and indicates whether the amendments increase or decrease security requirements.

Physical Protection Rulemakings—1988 to Present

Title	Purpose
''General Criteria for Security Personnel'' (53 FR 403), 1/7/88 (power reactors and fuel facilities).	Amends medical examination scheduling. Neither increases nor decreases security requirements.
''Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste'' (53 FR 31651), 8/19/88 Independent Spent Fuel Storage Installations (ISFSIs).	Establishes licensing requirements for independent spent fuel storage installations and high-level radioactive waste, including physical protection requirements. Increases security requirements.
''Safeguards Requirements for Fuel Facilities Possessing Formula Quantities of Strategic Special Nuclear Material'' (53 FR 45447), 11/10/88 (fuel facilities).	Upgrades physical protection measures to include tactical response force, vehicle barriers, double perimeter fence, etc., for NRC/U.S. Department of Energy (DOE) comparability. Increases security requirements.
''Access to Safeguards Information (54 FR 17703), 4/25/89 (power reactors).	Implements Federal legislation. Increases security requirements.
''Fitness for Duty Program (FFD)'' (54 FR 24468) 6/7/89 (power reactors).	Requires FFD programs at power reactors to assure workforce is not under the influence or impaired for any cause. Drug-free workplace. Increases security requirements.
''Fingerprint Cards: Increase in Fee'' (55 FR 3039, 1/30/90 (power reactors).	Administrative change to fee. Neither increases nor decreases security requirements.
''Fingerprint Cards: Increase in Fee'' (55 FR 35563) 8/31/90 (power reactors).	Fee increase. Neither increases nor decreases security requirements.
''Access Authorization Program for Nuclear Power Plants'' (56 FR 18997), 4/25/91 (power reactors).	Establishes an access authorization program. Increases security requirements.
''Fitness for Duty Program'' (56 FR 41922), 8/26/91 (power reactors).	Permits, under certain conditions, employment actions based on preliminary test results. Decreases security requirements.
''Fingerprint Cards: Resubmittal Procedure Change'' (57 FR 7645) 3/4/92 (power reactors).	Procedural amendment. Neither increases nor decreases security requirements.
''Minor Amendments to the Physical Protection Requirements'' (57 FR 33426), 7/29/92 (power reactors and fuel facilities).	Minor clarifying changes. Neither increases nor decreases security requirements.

Physical Protection Rulemakings—1988 to Present—Continued

Title	Purpose
''FFD Programs: NRC Partial Withdrawal of NRC Information Collection Requirements'' (57 FR 5543), 11/25/92 (power reactors).	Responds to the U.S. Office of Management and Budget's finding that NRC failed to demonstrate a compelling need for certain information. Neither increases nor decreases security requirements.
''Clarification of Physical Protection Requirements at Fixed Sites'' (58 FR 13699), 3/15/93 (fuel facilities).	Clarifies Commission's regulatory intent. Neither increases nor decreases security requirements.
''Licensees' Announcements of Safeguards Inspections'' (58 FR 29521), 5/21/93 (fuel facilities).	Increases the effectiveness of unannounced safeguards inspections. Increases security requirements.
''FFD Requirements for Licensees Authorized to Possess, Use, or Transport Formula Quantities of Strategic Special Nuclear Material (SSNM)'' (58 FR 31467), 6/3/93 (fuel facilities).	Implements an FFD program at Category I sites. Increases security requirements.
''Day Firing Qualification Courses for Tactical Response Team Members, Armed Response Personnel, and Guards at Category I Facilities'' (58 FR 45781), 8/31/93 (fuel facilities).	Revises day-firing qualifications to enhance skills. Increases security requirements.
''Modifications of FFD Program Requirements'' (59 FR 502), 1/5/94 (power reactors and fuel facilities).	Reduces random testing rate. Decreases security requirements.
''Fingerprint Cards: Change in User Fee'' (59 FR 661), 1/6/94 (power reactors).	Administrative change. Neither increases nor decreases security requirements.
''Annual Physical Fitness Performance Testing for Tactical Response Team Members, Armed Response Personnel and Guards at Category I Licensees'' (59 FR 38347), 4/13/94 (fuel facilities).	Provides increased assurance that the licencee response force is able to perform duties under strenuous tactical engagements. Increases security requirements.
''Temporary Access to Safeguards Information'' (59 FR 38553), 7/29/94 (power reactors).	Minor procedural changes. Neither increases nor decreases security requirements.
''Protection Against Malevolent Use of Vehicles at Nuclear Power Plants'' (59 FR 38889) 8/1/94 (power reactors).	Requires vehicle bomb protection at operating power reactors. Increases security requirements.
''Certification of Gaseous Diffusion Plants'' (59 FR 48944), 9/23/94 (fuel facilities).	Applies physical protection requirements to gaseous diffusion plants. Increases security requirements.
''Reduction of Reporting Requirements Imposed on NRC Licensees'' (60 FR 13615), 3/14/95 (power reactors).	Reduces licensee burden. Decreases security requirements.
''Changes to Nuclear Power Plant Security Requirements Associated with Containment Access Control'' (60 FR 46497) 9/7/95 (power reactors).	Deletes a requirement, to decrease licensee burden, without degradation of physical protection. Decreases security requirements.
''Changes to Nuclear Power Plant Security Requirements'' (62 FR 63640), 12/2/97 (power reactors).	Deletes certain requirements associated with protection against an insider threat, to decrease licensee burden without compromising physical protection. Decreases security requirements.
''Physical Protection for Spent Nuclear Fuel and High-Level Radioactive Waste'' (63 FR 26955), 5/15/98 (ISFSI).	Clarifies physical protection requirements for spent nuclear fuel and high-level radioactive waste stored at independent spent fuel storage installations.

RESPONSES OF CHAIRMAN JACKSON TO QUESTIONS FROM SENATOR CRAPO

Question 1. Approximately one year ago, the NRC undertook several pilot projects to investigate the appropriateness of NRC oversight of Department of Energy nuclear reactor programs. The NRC adopted limited programs at the Savannah River, Lawrence Berkeley, and Oak Ridge facilities. How would you gauge the results so far?

Response. Although the pilot facilities selected by DOE represented only a small portion of the DOE Complex, the results so far indicate that DOE's non-weapons related programs can be effectively regulated by NRC and continue to operate safely. Few changes in facilities, procedures, safety programs, and safety documentation (including Safety Analysis Reports) would be necessary. DOE initiatives such as WorkSmart Standards and Integrated Safety Management Systems could easily be incorporated into an NRC risk-informed, performance-based regulatory framework. Most technical, policy, and regulatory issues, including safety and safeguards and enforcement, encountered during the Pilot Program could be handled adequately within the existing NRC regulatory framework. However, to date the pilot program has concentrated on individual facilities located on a much larger DOE site. The

next logical step in the pilot program would be to evaluate a pilot DOE site with all of its individual facilities.

NRC could develop a regulatory framework that would be risk-informed, taking into account the age, material condition, and operating status of the DOE facilities. NRC brings a national perspective to the regulation of DOE because NRC regulates a wide spectrum of activities including the public and private sector and facilities with a wide range of risks.

Based on the fact that the Pilot Program identified only a few needed changes in DOE facilities or procedures, NRC anticipates the cost to DOE of making the transition to external regulation would be relatively small. However, the costs will vary depending on the degree to which DOE facilities are already in compliance with DOE's own requirements. For example, the costs for bringing the USEC gaseous diffusion plants into compliance with DOE and NRC requirements has proven to be significantly higher than what was indicated in the Pilot Program because of the large costs required to bring the plants into compliance with long standing DOE safety and security requirements. DOE believes the costs to be much higher than the NRC believes. A program to place a few facilities like the Lawrence Berkeley National Laboratory under NRC regulation might clarify this issue.

Question 2. Given the limited nature of the programs, would the information uncovered from the studies give a good understanding of how NRC oversight of an entire facility would function?

Response. Yes. Within its scope, the Pilot Program has provided NRC with a very good understanding of how oversight of an entire site would function. Although the Pilot Program included only one entire site, Lawrence Berkeley National Laboratory (LBNL), and two facilities within large complex sites, the Receiving Basin for Offsite Fuel at Savannah River Site and the Radiochemical Engineering Development Center at Oak Ridge National Laboratory (ORNL), the Pilot Projects and associated activities provided information on how NRC could oversee entire DOE sites.

At LBNL, the NRC found the radiation safety program adequate to protect public health and safety. NRC concluded that LBNL could be licensed by the NRC using a broad-scope materials license, similar to those issued at large universities.

During the Pilot Projects at the Savannah River Site and the ORNL, it became clear that it would be more efficient to regulate an entire site than a single facility within a complex site, because such facilities depend on the shared-site infrastructure for many of the key elements of safe operation (e.g. radiation protection, waste management, emergency preparedness, safeguards and security). NRC did conduct a brief overview of the non-defense facilities at ORNL in order to better understand the shared-site issues.

Licensing reviews of DOE facilities would be facilitated by taking credit for the reviews already performed by DOE. It is evident from the Pilot Projects that DOE requirements, in general, provide a safety and security envelope that is comparable to that provided by NRC regulation.

Question 3. What is your impression of external (NRC) regulation of DOE activities? Under what conditions would this be optimized?

Response. The NRC continues to believe that NRC regulation of DOE nuclear facilities would result in the key advantages identified by the DOE Working Group; i.e., that external regulation (1) would allow DOE to focus on its primary missions, (2) eliminate the inherent conflict of interest arising from self-regulation, (3) enhance safety and stability, (4) lead to a safety culture comparable to the commercial industry, (5) be consistent with domestic and international safety management practices, (6) enhance DOE credibility by an open process, and (7) enhance public confidence in DOE. In particular, external oversight of DOE through an open process which allows involvement of State governments and other stakeholders will increase public confidence that DOE is taking the right action.

NRC is already regulating several DOE activities under existing law and could potentially regulate others. These activities are identified in the enclosed matrices, "Existing Regulatory Relationships between NRC and DOE and Privatized DOE Facilities/Activities Performed by Private Companies only for DOE" and "Potential Regulatory Relationships between NRC and DOE and Privatized DOE Facilities/Activities Performed by Private Companies only for DOE." It has been NRC's experience that the primary cost of external regulation has been the cost for DOE to modify its facilities to meet its own requirements prior to external regulation. Legislation that clearly indicates responsibilities for NRC, DOE, and other Federal agencies may be the best approach to resolving many of the issues that have arisen in the Pilot Program. The NRC staff currently is preparing a white paper for Commission consideration on the results of the Pilot Program and the technical, regulatory, and legal issues that have been explored by the Pilots.

Existing Regulatory Relationships between NRC and DOE and Privatized DOE Facilities/Activities Performed by Private Companies only for DOE

Facility/Activity	Nature of Oversight	Legal Basis	Issues
Uranium Mill Tailings:.			
Title I site (Remedial action sites).	Review, concur on remedial action plan and license DOE for long term care.	UMTRCA	Law required completion of surface reclamation by 9/30/98. All but 2 sites met date.
Title II site (Active sites)	After termination of commercial license, DOE becomes the general licensee.	UMTRCA	none
High Level Waste Repository	Prelicensing consultation; license.	Energy Reorg. Act 1974, Section 202, NWPA.	Resolution of key tech. issues at Yucca Mnt. HLW standards for Yucca Commission views on viability assessment
Independent Spent Fuel Storage Facilities:.			
Fort St. Vrain	License	Energy Reorg. Act 1974, Section 202.	none
TMI–2 Spent Fuel Debris	License	Energy Reorg. Act 1974, Section 202.	none
Naval Reactors:.			
Cores	Review	Economy Act	none
Transport/Packages Fuel Fabrication.	Certify	Economy Act	none
Nuclear Fuels Service	License	AEA (AEC Regulatory Decision).	Awaiting NFS submittals for NRC review and approval
BWX Technologies, Inc.	License	AEA (AEC Regulatory Decision).	
Gaseous Diffusion Plants (leased by USEC).	Certification	AEA, Energy Policy Act of 1992, USEC Privatization Act of 1996.	Backfit to meet seismic design criteria; SAR upgrade
Non-site-specific central interim storage facility topical report (SNF).	Review	Energy Reorganization Act of 1974, Section 202.	Report is non-site specific
DOE dry transfer system topical report.	Review	Energy Reorganization Act of 1974, Section 202.	Part of the central interim storage facility
DOE burnup credit topical report.	Review	Energy Reorganization Act of 1974, Section 202.	none
DOE Transportation Packages (38).	Review, certify	AEA, HMTSA	none
West Valley Demonstration Project.	Develop D&D criteria, review, consult.	WVDP Act, 1980	Criteria for D&D; Reinstatement of license for State after completion
WIPP Transportation	Review and certify packages	WIPP Land Withdrawal Act of 1992.	none
Test of Tritium Production in Commercial Reactors.	Review; Issue conforming license amendments.	AEA	Possible package review; Legislative framework

Existing Regulatory Relationships between NRC and DOE and Privatized DOE Facilities/Activities Performed by Private Companies only for DOE—Continued

Facility/Activity	Nature of Oversight	Legal Basis	Issues
Greater than Class C Waste Disposal.	License	Low-Level Rad Waste Policy Amendments Act of 1985.	Storage until disposal; Timely availability of disposal capacity; Cost of disposal; Impact on reactor decommissioning
Foreign Research Reactor Spent Fuel Shipments/ Package.	Review	AEA	Public concern about transportation
MOX Fuel Fabrication and use.	Prelicensing Consultation; License.	Energy Reorg Act of 1974 as amended, AEA.	Need to update Part 51, S–3

Potential Regulatory Relationships between NRC and DOE and Privatized DOE Facilities/Activities Performed by Private Companies only for DOE

Facility/Activity	Nature of Oversight	Legal Basis	Issues
Hanford TWRS	Technical Assistance; Potential License.	1997 Approp. Act	Legislation needed to authorize NRC regulation
Savannah River Tanks (residues).	Review; potential license for HLW residues.	Economy Act NWPA; Energy Reorg Act of 1974.	Application of incidental waste criteria to tank waste
Aluminum Based Spent Fuels dry storage.	Review	Economy Act NWPA; Energy Reorg Act of 1974.	Criteria for storage; Suitability for disposal
Brookhaven High Flux Beam Reactor.	Review; technical assistance	Economy Act	Review start date
External Regulation Pilot Projects.	Simulated regulation	1999 Approp. Act	Legislation needed
Privatization Spent Nuclear Fuel Projects:.			
Peach Bottom Unit 1 Cores I and II.	Potential license	Energy Reorganization Act of 1974.	DOE must declare as excess to R&D
Shippingport LWBR			
TRIGA			

Question 4. What resources would the NRC need in order to regulate DOE? How much more staff? How much more funding? How do these compare with DOE internal regulation?

Response. The Pilot Program included only three facilities, which do not represent the entire DOE complex. While the Pilot Program did not gather enough information to support an estimate of the resources, staff, or funding needed for NRC to regulate the entire DOE complex, NRC did develop cost estimates for regulating the three facilities included in Pilot Programs. Precise resource estimates for NRC to regulate all or some of the DOE nuclear complex are difficult to develop without the completion of additional, more complex, pilot projects. These costs would be comparable to the costs for regulating commercial nuclear facilities and would be comparable for similar facilities with similar risks.

The following table provides the cost estimates for NRC to regulate Lawrence Berkeley National Laboratory (LBNL), Oak Ridge National Laboratory, Radiochemical Engineering Development Center (REDC), and Savannah River Site, Receiving Basin for Offsite Fuel (RBOF):

Pilot	NRC transition costs	NRC annual costs
LBNL	1 FTE	0.2 FTE

Pilot	NRC transition costs	NRC annual costs
REDC	2.8 FTE plus $200K for technical assistance	0.1 FTE with an additional 0.5 FTE for first few years
RBOF	2.5 FTE plus $100K for technical assistance	0.3 FTE

The NRC does not have sufficient information to compare its regulatory costs to those of DOE internal regulation. However, the cost to DOE could be minimized, potentially resulting in a net savings, by reducing the level of DOE oversight of the regulated activities to a level consistent with a corporate oversight model. If DOE does not decrease its oversight activities, costly, burdensome, dual regulation may well result.

RESPONSES OF CHAIRMAN JACKSON TO QUESTIONS FROM SENATOR GRAHAM

Question 1. In your testimony you state that the Commission has aimed at completing the license renewal process for the Calvert Cliffs and Oconee Plants in 30 to 36 months.

You also state that lessons learned from the initial reviews will help to streamline later reviews even further.

Therefore, in the interest of establishing a stable, predictable and timely license renewal process, will you be able to reduce the 30–36 month time period for the later reviews for license renewal, and if so, what is your estimate for the length of time?

Response. As stated in the chairman's testimony and discussed in the response to Senator Inhofe's Question 4, the NRC expects to improve the 30-month review schedule for Calvert Cliffs by at least five months, which includes the time saved based on dismissal of the hearing requests in that case. Aside from time savings related to case specific hearing issues, the NRC expects that the 30- to 36-month review schedule can be improved for future reviews, but those improvements are anticipated primarily from the later review stages that have not yet been performed for the Calvert Cliffs and Oconee reviews. When the first two renewal applications are completed, the NRC intends to reflect on the achievements and make additional improvements in the schedule for future renewal applications.

Question 2(a). In your testimony you state that the initial safety evaluation report and draft environmental impact statement for the Calvert Cliffs application should be completed on schedule next month.

Do you have any preliminary results from these reports?

Response. The preliminary results of the safety review have been discussed during public meetings with Baltimore Gas and Electric and Duke Energy over the last few months, and are documented in associated meeting summaries. The NRC staff used those meetings to expand the public record relative to the NRC review of the scope and effectiveness of aging management programs for Calvert Cliffs and Oconee, beyond that described in the applications. That information is expected to provide the necessary technical basis to complete the safety evaluation and minimize the number of potential open items that would need to be resolved before a renewed license could be granted.

The supplement to the environmental impact statement for Calvert Cliffs was issued by letter dated February 24, 1999. Comments on those findings are being sought during a public meeting on April 6, 1999, and throughout the 75-day public comment period. The NRC staff issued the initial Safety Evaluation Report on renewal of the Calvert Cliffs license on

March 19, 1999.

Question 2(b). Were there any "show stoppers?"

Response. No. The staff has not identified any safety issues thus far that cannot be resolved with appropriate license conditions or inspection requirements. The environmental review did not identify any significant environmental impacts associated with license renewal.

Question 3(a). Is there a way that the NRC can more closely link the fees levied against each licensee to the NRC resources expended on each licensee?

Response. As discussed in Chairman Inhofe's Question 2(b), during the past two years NRC has taken steps to improve the linkage of fees levied against specific licensees to the resources expended on each licensee. These decisions recognize that with few exceptions, agency work directly identifiable to a licensee should be billed to that licensee.

We will continue to link the generic regulatory costs, such as rulemaking and research efforts to the classes of licensees that cause us to incur the cost in accordance with the Omnibus Budget Reconciliation Act of 1990. These generic costs are assessed to licensees as Part 171 annual fees. It should be noted that the NRC has identified approximately 10% of its budget that would be more appropriately funded from the General Fund. If legislation was enacted to reduce the percentage amount the NRC must recover through fees, this would more closely align agency efforts for licensees with the fees assessed to those licensees. A listing of these programs and costs are found in the response to Chairman Inhofe's Question 3.

Question 3(b). It seems that assessing licensees annual fees more consistently with the regulatory oversight required may provide financial incentives for plants to improve their performance. Do you agree with this statement?

Response. In general, licensees that require more licensing and inspection attention will be assessed more fees under 10 CFR Part 170. In developing the annual fees by category, we also take into consideration where the generic resources are being used and charge those categories of licensees accordingly. Therefore, in both Part 170 and Part 171 fee assessments, the charges represent either a directly identifiable benefit or a reasonable relationship to the NRC's cost of providing the regulatory service to the licensee. That having been said, we would point out that the NRC makes no deliberate attempt to use fees as an incentive or disincentive for plants to improve performance. The Commission believes that fees should not be a primary factor in determining the work to be performed in response to NRC's health and safety mission. NRC's safety-related decisions cannot be driven by fees. The NRC must carry out its statutory mission which recognizes that the NRC serves a broader need than just providing a specific service to a licensee or applicant.

As the Congress is aware, the NRC is in the process of making a comprehensive revision to its reactor assessment, inspection, and enforcement programs. This will be built upon cornerstones of safe licensee performance that must be monitored to ensure no unacceptable public risks in reactor operations. As an outgrowth of that process, licensees requiring more oversight and for which we expend the greatest resources will continue to bear a proportionately higher share of the Agency costs through Part 170 fees.

Question 4. A recent NRC Office of Inspector General report raised some questions about how the NRC handled concerns that two or more workers at the Millstone nuclear power plants in Connecticut may have been let go because they raised safety concerns.

The Inspector General report concluded that the NRC staff at first found that such discrimination probably had occurred, but then reversed itself without providing the written documentation to support the changed conclusion.

What steps is the NRC taking to make sure the lack of accountable documentation of decisions does not recur?

Response. In response to the findings of the Inspector General, the Commission directed the NRC staff to review the findings, assess lessons learned, and recommend and take necessary corrective actions. The NRC staff completed this review in January 1999. The Office of Enforcement issued detailed enforcement guidance on January 14, 1999, and February 26, 1999, that requires the staff to prepare and maintain an internal status summary for each significant enforcement action the Agency considers. Although this administrative form is not an official record of the Agency decision, the staff has been directed to use it to record important information related to the enforcement decision-making process. The guidance also emphasizes the importance of updating the form based on subsequent changes to the agreed-upon enforcement strategy, including the rationale for the change.

The Commission has also directed an independent panel headed up by the Acting Chief Judge of the Atomic Safety and Licensing Panel to review the cases reviewed the by Inspector General and the enforcement and investigation process and make recommendations for process improvements. This review was completed on March 12, 1999, and is currently under Commission consideration. In addition, the NRC staff has initiated a broader review of the Agency's investigation and enforcement functions and will take appropriate actions.

Question 5. In your testimony you state that you are revising the regulatory programs from radioactive material to make them more risk-informed and to ensure that the regulatory burden is commensurate with the health and safety benefits of such regulations, including medical use regulations in 10 CFR Part 35.

When the proposed rule revising Part 35 was issued in early fall, many stakeholders stated that the proposed rule was not risk-informed, that there was insufficient time to offer meaningful comments, and that both the comment period and date to finalize the rule should be significantly extended. The Commission responded to

these requests by extending the comment period by 30 days. A number of groups including the American College of Nuclear Physicians, Society of Nuclear Medicine, American College of Radiology, and others requested that the Commission extend the final rule date, which is now set for May 1999. This request was also supported by the Organization of Agreement States, which represents state radiation officials.

In light of the strong support by the regulated medical community for an extension of this May 1999 date, would the Commission consider extending the May 1999 date for finalizing the rule?

Response. In March 1997, in follow-up to several internal and external reviews, the Commission directed that 10 CFR Part 35 be restructured into a risk-informed, more performance-based regulation by June 1999. The Commission's intent is to focus the rule on those medical procedures that pose the highest risk, from a radiation safety aspect, while decreasing the oversight of low-risk activities. The Commission previously extended the public comment period by 30 days and reviewed a significant number of insightful public comments. The Commission is currently considering extending the schedule for the final rulemaking to more adequately incorporate the significant number of public comments reviewed.

Question 6. This next question is specifically addressed to Commissioner Diaz. Commissioner Diaz, I am aware that you met with some of the representatives of the nuclear medicine communities as well as some of my constituents. Could you please summarize the outcome of that meeting?

Response. As you may know, on January 28, 1999, I met with Dr. Robert Carretta, President of The Society of Nuclear Medicine; David Nichols, Society of Nuclear Medicine; and Mr. Roy Brown, Mallinckrodt Medical. We discussed their concerns about the proposed regulation of diagnostic nuclear medicine procedures in the new NRC Part 35. In particular, they believe that these low-risk procedures would be over regulated by the new rulemaking. In this regard, I expressed my belief that a risk-informed Part 35 would differentiate between diagnostic and therapeutic procedures; with the former (diagnostic procedures) having many fewer requirements than the latter (therapeutic). In fact, I believe that in the diagnostic area the NRC could regulate by requiring that records be kept and made available to our inspectors. However, I emphasized that in this and other issues regarding Part 35, I retain an open mind, look forward to reading the public comments and would make my decision based on the Part 35 rulemaking record.

RESPONSES OF THE NUCLEAR REGULATORY COMMISSION TO QUESTIONS FROM SENATOR BENNETT

Question 1(a). In response to inquiries by the Army Corps of Engineers, the NRC has recently indicated that it will not assert regulatory authority over certain uranium and thorium processed wastes referred to as "11e(2) radioactive byproduct material." In an apparent change of position, NRC now contends that it does not have jurisdiction over byproduct material located at sites that were not licensed prior to 1978 when the Uranium Mill Tailings Radiation Control Act (UMTRCA) was enacted. The NRC interpretation is referenced in two pending RFP's in which the Army Corps indicates it will accept proposals for disposal of 11e(2) radioactive waste at ordinary landfills not regulated by the NRC.

What is the NRC's response to the pending RFP's by the Army Corps?

Response. As a general matter, the NRC has no regulatory responsibility regarding the Army Corps' management of radioactive material under the FUSRAP program.

In addition, the NRC does not consider its actions regarding FUSRAP as a change in position. Earlier, the NRC said that it would not assert regulatory authority over this material. Later, the NRC said that it would not assert regulatory authority over this material because NRC does not have legislative authority to regulate this material. This later statement is not a change in position.

Question 1(b). What is the NRC's response to a 1998 resolution by the Conference of Radiation Control Program Directors which calls on the Commission as a matter of public health and safety to regulate the disposal of uranium and thorium mill tailings referred to as "11e(2)" radioactive byproduct material, even if it was generated prior to 1978?

Response. The resolution of the Conference of Radiation Control Program Directors cannot, of course, confer jurisdiction on the NRC where jurisdiction does not exist under Federal law. As discussed below in the answer to Question 1.E, the critical question regarding NRC jurisdiction is whether a site where this activity took place was licensed by the NRC on or after the date the Uranium Mill Tailings Radi-

ation Control Act (UMTRCA) became effective, not when the material at the site was generated (Section 202; 42 USC 2111).

Question 1(c). If pre-1978 11e(2) byproduct material is not regulated by NRC, can this radioactive waste be disposed in ordinary solid waste landfills?

Response. NRC does not have jurisdiction over 11e(2) byproduct material generated before 1978 unless it exists at a site that was licensed by the NRC on or after November 8, 1978, the effective date of new section 83 of the Atomic Energy Act. Pre–1978 11e(2) byproduct material not regulated by the NRC is under the jurisdiction of other Federal and State agencies, including the Department of Transportation and the Environmental Protection Agency.

Question 1(d). If 11e(2) radioactive byproduct waste were disposed of in regular solid waste landfills, wouldn't this again raise the controversial specter of the Below Regulatory Concern (BRC) issue that NRC confronted in 1990?

Response. The Commission developed criteria and procedures to implement the concept of "Below Regulatory Concern" (BRC) in 1986 and 1990 consistent with Congressional directive in the Low-Level Radioactive Waste Policy Amendments Act of 1985 (LLRWPAA). These actions and procedures were eventually withdrawn by the Commission in 1993 as directed by Congress in the 1992 Energy Policy Act. The LLRWPAA applies only to materials defined by that Act as low-level waste (LLW) and expressly excludes 11e(2) byproduct material from the definition of LLW (section 2(9)).

If NRC or an Agreement State authorized disposal of 11e(2) byproduct material waste in regular solid waste landfills, it could raise similar concerns to those expressed by the public in response to the NRC's "Below Regulatory Concern" policy.

Question 1(e). How would the NRC's interpretation of 11e(2) jurisdiction affect the licensing of companies such as the Atlas Corporation in Moab, Utah, where radioactive byproduct materials were created both before and after 1978?

Response. The language of section 83 of the Atomic Energy Act (42 U.S.C. 2113(a)) (AEA), was added to the AEA by UMTRCA. Section 83 a. provides that any NRC license for covered activities in effect on or after the effective date of section 83 (November 8, 1978) must include the terms and conditions that the NRC determines are necessary to assure that the licensee can comply with the decontamination, decommissioning, and reclamation standards prescribed by the Commission. The Moab NRC license was in effect on and after the effective date of section 83 of the AEA. Therefore, all materials in the tailings impoundment at the site are subject to NRC jurisdiction, whether these were produced before or after 1978. The critical factor in determining jurisdiction over the waste or tailings produced by the processing of ore for its source material content is whether a site where this activity took place was licensed by the NRC on or after the date UMTRCA became effective, not when the material at the site was generated.

Responses by the Nuclear Regulatory Commission to Questions from Senator Bond

Question 1. The NRC has collected data on medical misadministrations since 1980. This data includes misadministrations involving diagnostic Nuclear Medicine. On March 20, 1997, the Commission directed that the revision of Part 35 be risk-informed and performance-based. Please explain based on the data the NRC has collected since 1980 what risks were identified specifically for diagnostic Nuclear Medicine.

Response. Prior to initiating the revision of the regulations for diagnostic nuclear medicine, the Commission thoroughly reviewed several extensive assessments, including the external review conducted by the National Academy of Sciences–Institute of Medicine (NAS–IOM), a 1993 NRC internal senior management review, and the Commission's Strategic Assessment and Rebaselining Project. Although the Commission decided not to adopt the NAS–IOM study recommendations, the Commission considered the risk assessment information, including information on comparative risks of ionizing radiation in medicine, in the NAS–IOM report. Both the NAS–IOM Committee and the NRC Advisory Committee on the Medical Uses of Isotopes recognized that quantifying levels of risk in radiation medicine is problematic.

During the development of the overall revision of Part 35, NRC staff considered risk information provided by members of the public and professional societies, professional medical standards of practice, and event databases maintained by NRC, to determine where oversight of low-risk activities could be decreased and where there needed to be continuation, or even broadening, of the regulations governing high-risk activities.

Additional information on risk that was considered by the staff included the National Council on Radiation Protection and Measurements Report No. 93, ''Ionizing Radiation Exposure of the Population of the United States,'' NCRP Report No. 100, ''Exposure of the U.S. Population from Diagnostic Medical Radiation,'' and NCRP Report No. 105, ''Radiation Protection for Medical and Allied Health Personnel.'' These reports provide data on the exposure to a large number of medical patients and workers, and, consequently, the large collective doses, associated with this use of radioactive material.

The Commission proposed revisions to 10 CFR Part 35 and solicited comments during a 120-day period, which ended on December 16, 1998. All the risk information received in writing during the public comment period, as well as the information received at the three public meetings held during the public comment period, is being carefully considered to determine if additional improvements should be made to achieve the goal of restructuring Part 35 into a risk-informed regulation.

Question 2. The regulated medical community has suggested that the NRC, based on data by leading experts, (National Academy of Sciences–Institute of Medicine, National Council on Radiation Protection and Measurements, and a 1993 NRC internal management report), move to only enforce the radiation protection thresholds of 10 CFR Part 20 and the training and experience requirements of 10 CFR Part 35 for the regulation of low-risk diagnostic Nuclear Medicine. James Smith, the Technical Assistant to Chairman Jackson, first raised this proposal at a November 5, 1998, meeting between representatives of the Nuclear Medicine community and the Commission staff as one possible way to address the concerns of the diagnostic Nuclear Medicine community while also meeting the directives of the Commission to strive for a ''performance-based'' regulation. Why has there been no further consideration of this proposal by the Commission or NRC staff working on the revision to 10 CFR Part 35? Are 10 CFR Part 20 and the training and experience requirements of 10 CFR Part 35 not sufficient in meeting the NRC's requirements that the public, workers and patients be protected and the physicians and technologists be properly trained? Would this not be an example of true ''performance-based'' regulation?

Response. The Commission has been considering this proposal. During the development of the proposed rule the staff eliminated requirements in the current Part 35 that are contained elsewhere in the Commission's regulations, such as the radiation protection requirements in Part 20. In some cases, where justified by risk, more specific requirements were maintained in Part 35. The majority of the requirements that were maintained apply to the high-risk therapeutic uses of radioactive material.

The proposed revisions to Part 35 include specific requirements, not included in Part 20, that are necessary to protect occupationally exposed individuals and the public, similar to requirements in Parts 31–39 for other materials licensees such as industrial radiography. For example, the Part 35 requirement to provide instructions to operators of therapeutic medical devices is not addressed in Part 20, but is necessary for the protection of the operators.

Another reason why there needs to be specific requirements for the medical use of byproduct material in Part 35 is that Part 20 does not apply to doses received as a result of exposure of patients to radiation for the purpose of medical diagnosis or therapy. The NRC does not regulate the physicians' determination as to the correct doses to be prescribed to patients. However, minimal requirements are needed, for example, to ensure that the doses to patients are in accordance with the physician's directions. In other words, the primary focus of NRC regulation is providing that the correct patient receives the correct dose of byproduct material at the correct site and via the correct mode of administration.

The Commission agrees that Part 35 could be more performance based and is considering the recommendations made by the diagnostic nuclear medicine community and the commenters. NRC staff is in the process of analyzing many comments received on the proposed rule. Staff will consider the impact of maintaining the training and experience requirements in Part 35 and eliminating all other diagnostic nuclear medicine requirements. Some specific areas for consideration will be deletion of requirements for: determining the activity of diagnostic dosages prior to administration; labeling syringes and shields containing byproduct material; and routinely calibrating survey meters and instruments used to determine the activity of a radioactive drug prior to administration.

Question 3. After having spent approximately 2 million dollars of user fee money the Commission rejected, with no explanation, the recommendations of the National Academy of Science–Institute of Medicine report (NAS–IOM). This report found that for nuclear medicine, the risk and probability of harm occurring to a patient or a

member of the public is extraordinarily low and recommended that the NRC reduce its focus in such low risk areas. What scientific or other information did the Commission base its rejection of the NAS–IOM report?

Response. The NAS–IOM study was conducted because NRC sought an evaluation of whether the rules, policies, and procedures of the current regulatory framework for medical uses of byproduct material fulfilled the NRC's statutory responsibilities for protection of public health and safety. Based on its review of the report and consultations with relevant agencies, the Commission was not persuaded by the NAS–IOM report's overall recommendation to Congress that NRC should not be the Federal agency involved in the regulation of Atomic Energy Act materials in medicine. The Commission continues to believe that the conclusions in the report were not substantiated and that the recommendations should not be pursued.

The report was not rejected on the basis of its analysis of risks of ionizing radiation in medicine. In fact, the risk assessment information in the report, including the information on comparative risks of ionizing radiation in medicine, was considered during the rulemaking process in developing proposed revisions to 10 CFR Part 35. The NAS–IOM report concluded that "no comprehensive raw data are available to make exact comparisons" between risks of medical modalities (pg. 124). In addition, both the NAS–IOM report and the NRC's Advisory Committee on the Medical Uses of Isotopes (May 8, 1997, Commission briefing) recognized that quantifying levels of risk in radiation medicine is problematic.

The Commission was not persuaded by the recommendations of the NAS–IOM report with regard to regulation of byproduct material for medical use. The Commission reached this decision, in part, based on comments received from some State and Federal agencies on the report. Some State and Federal agencies, such as the Department of Health and Human Services, Food and Drug Administration, to which additional responsibility would have fallen if the NRC adopted the recommendations, indicated that they did not support the recommendations in the report.

STATEMENT OF JOE F. COLVIN, PRESIDENT AND CHIEF EXECUTIVE OFFICER NUCLEAR ENERGY INSTITUTE

Mr. Chairman, Ranking Member Graham and distinguished members of the subcommittee, my name is Joe Colvin. I am the president and chief executive officer at the Nuclear Energy Institute, the Washington, DC, policy organization for the nuclear industry. I am pleased to testify this morning about the need for comprehensive reform of the Nuclear Regulatory Commission's regulatory process that provides oversight of the commercial nuclear energy industry.

The Nuclear Energy Institute sets industry policy positions on various issues affecting the industry, including Federal regulations that help ensure the safety of 103 operating nuclear power plants in 31 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.

SUMMARY OF KEY POINTS

Nuclear power plants, which produce nearly 20 percent of America's electricity, are our largest source of emission-free energy—an important consideration as Congress and other policymakers recognize the growing nexus of energy and environmental policy. Among the Congress, and indeed across the United States, there is a growing awareness that this is a proven industry with more than 2,000 reactor years of operating experience and with a product that will become even more valuable as we meet the demands of the 21st century.

Without nuclear energy, the United States will find it impossible to meet increasingly stringent U.S. clean air regulations as well as international carbon dioxide reduction goals. The nation's nuclear power plants provide clean air benefits while producing electricity at a competitive price—with production costs that are a fraction of a cent higher than coal-fired electricity and more cost-effective than natural gas, solar or wind power. Members of Congress increasingly are recognizing the important benefits of nuclear energy to our economy, our environment and energy future. This subcommittee's hearing last year, the first Nuclear Regulatory Commission oversight hearing in more than 4 years, is but one piece of tangible evidence of this increased policymaker recognition.

The single most important challenge facing the nuclear energy industry is a regulatory process that consumes licensee and NRC resources on issues that have little or no safety significance and that produces inconsistency in assessment and enforce-

ment. Mr. Chairman, I cannot overstate the importance of this subcommittee's oversight, which has been instrumental in encouraging the NRC commissioners and staff to complete work on many long-standing issues, including outlining a plan to adopt risk-informed approaches to regulations for nuclear power plants, and revising the assessment process to use objective plant performance measures. The NRC has a number of promising regulatory reform initiatives underway. However, much work remains to be done and Congress should continue to provide the oversight that had already initiated meaningful reform of the NRC's regulatory process. The task at hand is sustaining the effort started last year.

Specifically, the NRC should be encouraged by this subcommittee to develop and implement a long-term strategic plan as well as focusing on activities that can be completed in the near term. The NRC's long-range strategy should include these 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.

Congress plays a vital role in assuring that Federal nuclear regulations recognize the transition to a competitive electricity market while protecting public health and safety and preserving the nation's energy security. In that regard, Congress should direct the NRC to prepare a multi-year plan to achieve a safety-focused, results-oriented regulatory process—with clear accountabilities within the Agency—that protects public health and safety.

This multi-year plan 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 I described earlier, 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 as a result of the transition to a competitive electricity market.

Mr. Chairman, the industry recommends that this subcommittee schedule another hearing by June and direct the NRC commissioners to present both the annual and multi-year strategies for reforming the regulatory process at that time. The subcommittee should then continue to hold hearings every 6 months until you are satisfied that progress in reforming the regulatory process is proceeding in the proper direction, at the proper pace and that it will be sustained. The committee then should schedule hearings, perhaps annually, to oversee NRC reform.

The NRC should also identify legislative changes needed to proceed with timely regulatory reform, such as amending the Atomic Energy Act with respect to foreign ownership, antitrust reviews and the adjudicatory hearing process. The commission should also support tax code amendments to ensure that nuclear plant decommissioning trust funds receive the same tax treatment when plants are purchased or plant licenses are transferred. Decommissioning must be adequately funded in a competitive market and the trust funds should be protected from bankruptcy.

Current law requires the NRC to collect approximately 100 percent of its budget from user fees on licensees. 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 its budget. This practice is contrary to sound and accountable budgeting. Congress should 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 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 not be included in nuclear plant licensee user fees, but should be included in a specific line item on the NRC's budget, subject to the authorization and appropriations process. Additionally, the Agency's ability to collect user fees should be authorized annually by Congress until the commission completes its regulatory reform initiatives.

Finally, this subcommittee should resolve the impasse between the NRC and the Environmental Protection Agency in setting radiation protection standards. This subcommittee has jurisdiction over both Federal agencies and should clarify that the proper scientific authority for this issue rests with the NRC, which has the expertise in setting standards for nuclear facilities. The commission's regulations have proven effective in protecting public health and safety as well as worker safety.

BACKGROUND

In July 1998, I testified before this committee during a hearing of tremendous significance—one that has prompted the NRC to re-examine its fundamental regulatory practices and to begin the transition to a more focused, objective regulatory system for the nuclear power industry. Today, there is a greater recognition of the need for change at the NRC. The industry and other stakeholders have, during the past 7 months, participated with the commissioners and NRC staff in productive dialog to better understand all perspectives as the Agency moves toward meaningful reform. The increased support and oversight from Congress has played a key role in this broad examination of the current regulatory system, and continued support from Congress will be essential to achieving sustained regulatory reform at the NRC.

As Commissioner Nils Diaz testified last July, 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 where the traditional cost-of-service market is yielding to a competitive market that places a premium on the ability of companies to provide excellent service safely and efficiently. Nuclear power plants are competitive today, with average production costs second only to coal-fired power plants. But in a competitive market, inefficient regulation can detract from safety and clearly impact nuclear plant economics.

Unlike any other electric generation source, nuclear power is unique because the costs of the entire electricity production lifecycle—including the uranium fuel manufacturing process, NRC regulation, waste management and plant decommissioning—are included in the cost of electricity to consumers. To remain competitive with other generation sources that do not internalize many of these expenses, all costs in the nuclear fuel cycle must be appropriate and reasonable. Plants will close if they cannot compete, raising potential electricity system reliability problems. Moreover, the nuclear electric generation will be replaced by power plants that emit greenhouse gases and other air pollutants. If that scenario unfolds, the United States will find it impossible to meet increasingly stringent U.S. clean air regulations and international carbon dioxide reduction goals.

I don't believe that that is the intent of Congress. In fact, the hearing by this subcommittee last July demonstrated that, for the first time since the mid–1980's, Congress has a strong interest in ensuring that the industry is regulated in a manner that protects public health and safety, but in a way in which the industry is not unduly burdened.

The United States has the largest commercial nuclear power industry in the world, and we are the global leaders 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 improved safety performance. The NRC's regulatory approach must also recognize these substantial improvements in nuclear plant performance. The industry's commitment to excellence in plant operations has resulted in dramatic gains in both safety and efficiency. Since 1985, for example, NRC data shows that the average number of significant events at U.S. plants has declined from nearly 2.5 per unit in 1985 to an average of .04 per unit in 1998. Moreover, improvements in nuclear plant operating efficiency since 1990 are equivalent to adding 11 large generating units to the national electric grid—further evidence of the industry's contribution to serving new electricity demand while meeting our nation's clean air goals.

The NRC has taken many steps to improve agency procedures since the July 30, 1998, hearing. These initial steps represent the beginning of the sustained agency commitment required to provide a transition to a regulatory system that mirrors the industry's improvement. The NRC's regulatory innovation must result in a safety-based regulatory process that is focused on adequate protection of public health and safety. To continue the process toward risk-informed, performance-based regulation, the Agency should establish objective, clear regulatory thresholds that clearly convey the NRC's regulatory expectations and the associated actions of an accountable and responsible regulator.

With many states preparing to move toward a competitive electricity market, it is imperative that the NRC begin now to implement the following fundamental changes:

NEAR-TERM PRIORITIES

• Implement a new regulatory oversight process with plant assessment rooted in a clear safety basis and inspection levels based on objective plant performance. NRC enforcement activities should be risk-informed and consistently applied so that li-

censee and NRC attention is clearly focused on items that are directly related to protecting public health and safety.

- Undertake timely, efficient proceedings for nuclear power plant license transfer and license renewal. For example, the NRC must meet or better the 30- to 36-month target for responding to the license renewal applications by Baltimore Gas & Electric Company and Duke Power Company. Experience gained from these first two reviews should be used to refine the process and allow the NRC to respond even faster to subsequent license applications.
- Adopt an initial set of risk-informed, performance-based regulations, including those related to maintenance, and undertake pilot projects to evaluate applying risk insights more broadly to the entire nuclear power plant.
- Apply risk-informed, performance-based regulations to the licensing and oversight of major materials licensees, such as fuel fabrication facilities, and to NRC regulation of medical applications.

INTERMEDIATE PRIORITIES

- In the 2000–2002 timeframe, the NRC must transition to more objective, risk-informed nuclear plant regulation in which regulatory requirements are commensurate with risk.
- As the NRC moves toward reform of its regulatory process, the commission must examine what appropriate levels of staffing and budget are required. The industry believes the Agency should ultimately optimize its resources, including an examination of its organizational structure, to conform with the new vision of regulatory oversight. The commission must allocate resources in a manner that ensures adequate staff support to set the foundation for broad regulatory reform.
- Reforming plant security requirements to ensure the adequate safety of the plants from any threat, including terrorists, while providing the balance to ensure that those security measures don't impact plant safety during the operation of these facilities.

LONG-TERM PRIORITIES

- Moving toward reforming the construction and operating license process for new advanced reactor designs. The Department of Energy's recent analysis of measures required to reduce greenhouse gas emissions to 3 percent below 1990 levels includes the construction of 42,000 megawatts of nuclear-powered electric generation. The energy and environmental reality will require the industry and the NRC to begin examining how to license new nuclear power plants in an efficient manner.
- Apply risk-informed insights to the remainder of the Agency's regulations, including the design bases for both existing and new nuclear power plants.

The regulatory environment is improving, but continued congressional oversight of the NRC is an important factor for continued improvement. For its part, the industry must continue to improve nuclear plant performance and be vigilant in assuring adequate protection of public health and safety. Similar to the industry's process and cultural changes in the 1980's and 90's to establish world-class safety performance, the NRC must undergo sweeping change, including a cultural change within the Agency. This change requires long-term vision and commitment, and must ultimately include clearly articulated goals for the staffing and budgetary requirements of a more efficient and safety-focused regulator. The industry recognizes the need for the NRC to fully develop its strategic direction and accurately identify the staff and organizational needs to make a successful transition. However, the commission must ultimately optimize its resources and examine its organizational structure once the transition to a new regulatory process is complete.

NUCLEAR POWER PLANTS POISED FOR SUCCESS IN COMPETITIVE MARKETS

In providing one-fifth of U.S. electricity supply, nuclear energy is our nation's largest source of emission-free electricity. Nuclear energy also provides clean air benefits at a competitive price—with production costs that are a fraction of a cent higher than coal-fired electricity and more cost-effective than natural gas, solar or wind power. Most U.S. nuclear power plants compete as low-cost electricity providers today and are well-positioned as states open their electricity markets to competition. Measured solely by economic factors—operating and maintenance costs plus fuel costs, ongoing capital requirements and general and administrative expenses—most nuclear units will be very competitive in a deregulated electricity market. In fact, many nuclear plants should be able to improve their economic performance even further.

Production costs at nuclear power plants in the last 3 years continue to fall well below those the nuclear energy industry incurred at the start of the decade. Mean-

while, plant performance—measured by the capacity factor of plant operation—has in the last 2 years reached record high levels.

In a restructured environment that eliminates the rate base, earnings will be based solely on the difference between an electric generating plant's going-forward costs and the market price of power, and fully depreciated nuclear plants will demonstrate enormous potential. Nuclear power's marketplace appeal is evident in the purchase of Three Mile Island 1 by AmerGen, the joint operating company formed by PECO Energy Company and British Energy, and the purchase of Boston Edison Company's Pilgrim nuclear power plant by New Orleans-based Entergy Operations Incorporated. Also, Baltimore Gas & Electric Company and Duke Power Company have filed applications with the NRC to extend operations at five nuclear units for an additional 20-year period. Entergy Operations Incorporated in late January announced it plans to extend the license of one of its nuclear units, with a formal application expected in December. These events will become more frequent as electric utilities reposition themselves in the wake of state restructuring initiatives.

NRC MUST TRANSITION TO SAFETY-FOCUSED, RESULTS-ORIENTED AGENCY

The industry has built a solid record of safe, efficient performance at nuclear power plants as it enters a new business environment. But the industry's continued commitment to safe nuclear plant operation must be accompanied by the NRC's ability to fulfill its mission as a strong and credible regulator. Both are essential to build and maintain public trust and confidence in nuclear energy.

As this subcommittee discussed last July, industry concerns over NRC regulation go back many years. Over time, regulatory requirements have become progressively more detailed and prescriptive. New requirements often are layered on top of old ones, without weeding out duplication and inconsistency. The result is that the regulatory process has no objective, measurable safety threshold. Many of the industry's regulatory concerns are long-standing, and previous NRC reform initiatives have not been sustained.

Congressional interest in the NRC has helped spark greater progress in many agency projects that are essential for a new regulatory process. Chief among those projects is developing a risk-informed, performance-based process for assessing plant performance. In a performance-based approach, the NRC would establish basic requirements and set overall performance goals, and plant management would decide how best to meet those goals. This approach is more sharply focused on safety because resources are applied to plant systems and equipment commensurate with their importance to safety.

Last October, the NRC redirected resources to concentrate on the development of a risk-informed, performance-based assessment process in three overaching strategic areas: reactor safety, radiation safety and plant security. This new process will provide a sharper focus on public health and safety—and because it incorporates the use of objective criteria—it will be much easier for the utilities and the public to understand regulatory expectations for nuclear plant operations.

Consistent with the risk-informed assessment process, similar changes are needed in the Agency's enforcement process. Last October, the industry proposed changes to the NRC enforcement policy based upon guiding principles that are consistent with broader reforms being undertaken to improve NRC regulations and policies. These principles include:

- Enforcement should be risk-informed so that licensees and NRC attention is clearly focused on items having actual consequences or high-risk significance for public health and safety. Enforcement should not result in the expenditure of NRC and licensee resources on non-safety significant violations.
- Enforcement should be consistent with the safety focus of the performance assessment process, but should not drive the assessment process or be used as a surrogate for assessment activities.
- Enforcement should be based upon readily understandable, objective criteria that are consistently and predictably applied. Enforcement should not be based on new interpretations or expanding views of compliance, or be driven by subjective terms.

The industry has strongly encouraged the NRC to apply these principles as it reviews the enforcement policy. Such reform is necessary to ensure that the policy is risk-informed, objective and properly focused on safety.

SIGNS OF REGULATORY IMPROVEMENT

- The NRC has made tangible progress in some areas toward reforming the regulatory process since this subcommittee held its first oversight hearing last July. The commission has initiated programs to implement risk-informed regulation, inspec-

tion and enforcement programs, and has made notable progress in several projects it already had underway in 1998. The commission and staff should be commended for their initial steps toward regulatory reform. Some specific areas in which the NRC has made progress in recent months include:

- The NRC staff has submitted to the commissioners a plan to adopt a risk-informed approach to 10 CFR 50, the basic regulatory oversight rules for nuclear power plants.
- The release of final safety evaluations for in-service inspection pilot programs. The NRC has adopted a risk-informed approach to inspecting welds of reactor coolant systems. These inspections are based on methodologies that rely on data from 20,000 previous weld exams. This risk-informed approach to inspections is being piloted at three nuclear plants. Industrywide, it is expected to reduce occupational radiation exposure by 15 percent as well as reduce the cost of inspection by $15 million to $25 million annually.
- Revising the nuclear plant assessment process to use objective plant performance indicators and risk-informed inspection findings. These changes promote a more understandable and predictable assessment process. Consistent with the new approach, the NRC has suspended the Systematic Assessment of Licensee Performance (SALP) program. The agency is considering eliminating the subjective SALP program and the release of the "watch list"—the list of those plants requiring increased regulatory attention—by 2000.
- A 30- to 36-month target for renewing licenses for Baltimore Gas and Electric Company's Calvert Cliffs plant and Duke Power Company's Oconee plant. By maintaining this timeframe, the NRC can refine its process of reviewing license renewal applications and target resources on the most relevant issues. Subsequent license renewal applications should be reviewed more quickly.
- The commission issued a rule in December 1998 to establish a more efficient procedure for processing nuclear plant license transfers. The number of license transfer applications has increased from two to three per year to 20 in 1997 and 15 in 1998. The commission must remain committed to efficient reviews of transfer applications. Otherwise, the economic viability of licensees who must respond rapidly to changing market forces will be placed at risk.
- The NRC has established a process for reviewing certification of containers for storing and transporting used nuclear fuel within 1 year of a vendor's submission, which is a dramatic improvement over past practices.

Despite these initial steps toward reform, Congress must sustain this momentum by encouraging the NRC to continue improving its internal processes, such as increasing the efficiency of reviews, safety evaluations and the consideration of license renewal applications.

An efficient nuclear licensing process is especially crucial so that nuclear operating companies can make timely business decisions required in a competitive market. The economic viability of a license transfer proposal can change entirely due to the length of a commission review. The public interest can best be served when a relicensing process is managed expediently and not delayed by an unnecessarily lengthy, undisciplined hearing process. The NRC has recognized the importance of swift action in these cases and should be commended for its attention in 1998 to improving the licensing process. The commission should continue to ensure timely reviews and disciplined licensing board proceedings related to license transfers or amendments, and ensure that issues raised by intervenors in NRC proceedings are based on legitimate safety issues.

REDUCING USER FEES AND ELIMINATING DUPLICATIVE RADIATION STANDARDS

Other industry issues also require agency reform and legislative attention. Last year, Congress approved a single-year extension of the NRC's authority to collect 100 percent user fees from licensees. The Omnibus Budget and Reconciliation Act of 1990, as amended, requires that the Agency recover approximately 100 percent of its budget authority by assessing licensees annual fees consistent with the regulatory benefits derived. Most of those fees are collected as a generic assessment equally levied against licensees, creating, in effect, a "miscellaneous" category to describe nearly 80 percent of its budget. This practice is contrary to sound and accountable budgeting. Legislation is needed to modify the fee structure so that licensees are assessed only for those NRC programs necessary to regulate them. Unrelated agency expenditures, such as international activities and regulatory support to agreement states or other Federal agencies, should not be included in nuclear plant licensee user fees, but should be included in a specific line item on the NRC's budget, subject to the authorization and appropriations process. Additionally, the

Agency's ability to collect user fees should be authorized annually by Congress until the commission completes its regulatory reform initiatives.

On another front, this subcommittee is uniquely positioned to resolve the impasse between the NRC and the Environmental Protection Agency in setting radiation standards. This duplicative regulation exists in many areas, but is most apparent in establishing radiation standards for a national repository for used nuclear fuel. This subcommittee has jurisdiction over both Federal agencies and should clarify that the proper scientific authority for this issue rests with the NRC, which has the expertise in setting standards for nuclear facilities. The commission's regulations have proven effective in protecting public health and safety as well as worker safety. Conversely, EPA has little direct experience in regulating the use of radioactive materials and relies on a regulatory philosophy that lacks a scientific underpinning. The industry encourages this subcommittee to take actions necessary to eliminate dual regulation of nuclear facilities.

A ROAD MAP FOR COMPREHENSIVE REFORM

Mr. Chairman, Congress should continue its close oversight of the NRC and support effort to replace its outdated regulatory scheme with a risk-informed, performance-based process that is focused on those areas most important to safety. I cannot overstate the importance of this subcommittee's oversight, which has been instrumental in the NRC commissioners and staff completing work on many long-standing issues, including outlining a plan to adopt a risk-informed approach to NRC regulations and revising the assessment process to use objective plant performance indicators.

Congress plays a vital role in assuring that Federal nuclear regulations recognize the transition to a competitive electricity market while protecting public health and safety and preserving the nation's energy security. In that capacity, allow me to summarize the industry's recommendations for congressional action:

- Require the NRC to prepare and maintain a multi-year strategic direction to achieve a safety-focused, results-oriented regulatory process—with clear accountabilities within the Agency—that protects public health and safety. This long-term strategy should incorporate the principles discussed in this testimony and include the use of annual plans, which include meaningful regulatory reform objectives with measurable results. The commission should apprise Congress of its progress through periodic status reports.
- Schedule a hearing in June and direct the NRC commissioners to present the Agency's multi-year strategy for reforming the regulatory process at that time. The NRC should ultimately optimize its resources, including an examination of its organizational structure, to conform with the new vision of regulatory oversight.
- Ensure the NRC adheres fully to the requirements of the Omnibus Budget and Reconciliation Act and submit legislation, if necessary, to modify the fee structure so that licensees are assessed fees only for those NRC programs related directly to licensee regulation. Most of those fees are collected as a generic assessment equally levied against licensees, creating, in effect, a "miscellaneous" category to describe nearly 80 percent of its budget. This practice is contrary to sound and accountable budgeting. The agency's ability to collect user fees should be authorized annually by Congress until the commission completes its regulatory reform initiatives.
- Resolve the impasse between the NRC and the Environmental Protection Agency in setting radiation protection standards. This subcommittee has jurisdiction over both Federal agencies and should clarify that the proper scientific authority for this issue rests with the NRC, which has the expertise in setting standards for nuclear facilities. The commission's regulations have proven effective in protecting public health and safety as well as worker safety.

Mr. Chairman, the industry requests that this subcommittee continue its close oversight of the NRC to ensure the necessary steps toward broad reform of the Agency are being taken in a comprehensive and timely manner. The NRC has made tremendous progress in recent months, but it must establish the long-term vision and work plan for making the regulatory framework for the commercial nuclear energy industry risk-informed and performance-based, and focused on those areas most important to protect the health and safety of the public.

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

NUCLEAR REGULATORY COMMISSION: STRATEGY NEEDED TO DEVELOP A RISK-INFORMED SAFETY APPROACH

Mr. Chairman and members of the subcommittee: We are here to testify about the actions that the Nuclear Regulatory Commission (NRC) has taken to move from its traditional regulatory approach to an approach that considers risk in conjunction with engineering analyses and operating experience-termed risk-informed regulation. NRC believes that a risk-informed approach would reduce unnecessary regulatory burden and costs, without reducing safety.

Our testimony today is based on ongoing work we are conducting for Senators Lieberman and Biden. Specifically, our testimony discusses the (1) issues that NRC needs to resolve to implement a risk-informed regulatory approach and (2) status of NRC's efforts to make two of its oversight programs—overall plant safety assessments and enforcement—risk-informed. In addition, in January 1999, we provided the Congress with our views on the major management challenges that NRC faces.[1] Our testimony discusses these challenges and their relationship to NRC's efforts to consider risk in its regulatory activities.

In summary, we are finding that:

- Since July 1998, NRC has accelerated some activities needed to implement a risk-informed regulatory approach and has established and set milestones for others. However, NRC has not resolved the most basic of issues; that is, that some utilities do not have current and accurate design information for their nuclear power plants, which is needed for a risk-informed approach. Also, neither NRC nor the nuclear utility industry have standards or guidance that define the quality or adequacy of the risk assessments that utilities use to identify and measure the risks to public health and the environment.[2] Furthermore, NRC has not determined if compliance with risk-informed regulations will be voluntary or mandatory for the nuclear utility industry. More fundamentally, NRC has not developed a comprehensive strategy that would move its regulation of the safety of nuclear power plants from its traditional approach to an approach that considers risk.
- In January 1999, NRC released for comment a proposed process to assess the overall safety of nuclear power plants. The process would establish generic and plant-specific safety thresholds and indicators to help NRC assess overall plant safety. NRC expects to phase in the new process over the next 2 years and evaluate it by June 2001, at which time NRC would propose any adjustments or modifications needed. In addition, NRC has been examining the changes needed to its enforcement program to make it consistent with, among other things, the proposed plant safety assessment process. For many years, the nuclear industry and public interest groups have criticized the enforcement program as subjective. In the spring of 1999, NRC staff expect to provide the Commission recommendations for revising the enforcement program.
- In January 1999, we identified major management challenges that limit NRC's effectiveness. The challenges include the lack of a definition of safety and lack of aggressiveness in requiring utilities to comply with safety regulations. NRC's revised plant safety assessment and enforcement initiatives may ultimately help the Agency address these management challenges and carry out its safety mission more effectively and efficiently.

BACKGROUND

NRC is responsible for ensuring that the nation's 103 operating commercial nuclear power plants pose no undue risk to public health and safety. Now, however, the electric utility industry is faced with an unprecedented, overarching development: the economic restructuring of the nation's electric power system, from a regulated industry to one driven by competition. According to one study, as many as 26 of the nation's nuclear power plant sites are vulnerable to shutdown because production costs are higher than the projected market prices of electricity.[3] As the elec-

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[1] *Performance and Accountability Series: Major Management Challenges and Program Risks: Nuclear Regulatory Commission* (GAO/OCG–99–19, Jan. 1999).

[2] Risk assessments systematically examine complex technical systems to attempt to quantify the probabilities that a potential accident will occur and the resulting consequences. By their nature, risk assessments are statements of uncertainty that identify and assign probabilities to events that rarely occur.

[3] *World Energy Service: U.S. Outlook* (Standard & Poor's, Apr. 1998).

tric utility industry is deregulated, operating and maintenance costs will affect the competitiveness of nuclear power plants. NRC acknowledges that competition will challenge it to reduce unnecessary regulatory burden while ensuring that safety margins are not compromised by utilities' cost-cutting measures.

Since the early 1980's, NRC has been considering the role of risk in the regulatory process, and in August 1995, NRC issued a policy statement that advocated certain changes in the development and implementation of its regulations through an approach more focused on risk assessment. Under such an approach, NRC and the utilities would give more emphasis to those structures, systems, and components deemed more significant to safety. The following example illustrates the difference between NRC's existing and a risk-informed approach. One particular nuclear plant has about 635 valves and 33 pumps that the utility must operate, maintain, and periodically replace according to NRC's existing regulations. Under a risk-informed approach, the utility found that about 515 valves and 12 pumps presented a low safety risk. The utility identified 25 components that were a high risk but would have been treated the same as other components under the existing regulations. If the utility concentrated on the 120 valves, 21 pumps, and 25 components that have been identified as having a high safety risk, it could reduce its regulatory compliance burden and costs.

NRC HAS NOT RESOLVED MANY ISSUES NEEDED TO IMPLEMENT A RISK-INFORMED REGULATORY APPROACH

NRC staff estimate that it could take 4 to 8 years to implement a risk-informed regulatory approach and are working to resolve many issues to ensure that the new approach does not endanger public health and safety. Although NRC has issued guidance for utilities to use risk assessments to meet regulatory requirements for specific activities and has undertaken many activities to implement a risk-informed approach, more is needed to:

- ensure that utilities have current and accurate documentation on the design of the plant and structures, systems, and components within it and final safety analysis reports that reflect changes to the design and other analyses conducted after NRC issued the operating license.
- ensure that utilities make changes to their plants based on complete and accurate design and final safety analysis information.
- determine whether, how, and what aspects of NRC's regulations to change.
- develop standards on the scope and detail of the risk assessments needed for utilities to determine that changes to their plants' design will not negatively effect safety.
- determine whether compliance with risk-informed regulations should be mandatory or voluntary.

Furthermore, NRC has not developed a comprehensive strategy that would move its regulation of nuclear plant safety from its traditional approach to an approach that considers risk.

Utilities Do Not Have Accurate and Reliable Design Information for Some Plants

Design information provides one of the basis for NRC's safety regulation. Yet, for more than 10 years, NRC has questioned whether utilities had accurate design information for their plants. Inspections of 26 plants that NRC completed early in fiscal year 1999 confirmed that for some plants (1) utilities had not maintained accurate design documentation, (2) NRC did not have assurance that safety systems would perform as intended at all times, and (3) NRC needed to clarify what constitutes design information subject to NRC's regulations. As of November 1998, NRC had taken escalated enforcement actions for violations found at five plants—Three Mile Island, Perry, H.B. Robinson, Vermont Yankee, and D.C. Cook. NRC took these actions because it did not have assurance that the plants' safety systems would perform as intended. One utility, American Electric Power, shut down its D.C. Cook plant as a result of the inspection findings.

NRC does not plan additional design team inspections because it concluded that the industry did not have serious safety problems. NRC's Chairman disagreed with this broad conclusion, noting that (1) the inspection results for the five plants indicate the importance of maintaining current and accurate design and facility configuration information, (2) the inspections did not apply to the industry as a whole but to only certain utilities and plants within the industry, and (3) other NRC inspections identified design problems at other such nuclear power plants as Crystal River 3, Millstone, Haddam Neck, and Maine Yankee. The commissioners and staff agreed that NRC would oversee design information issues using such tools as safety system engineering inspections.

The 26 inspections also identified a need for NRC to better define the elements of a plant's design that are subject to NRC's regulations. NRC staff acknowledge that the existing regulation is a very broad, general statement that has been interpreted differently among NRC staff and among utility and industry officials. According to NRC staff, it is very difficult to develop guidance describing what constitutes adequate design information. Therefore, NRC has agreed that the Nuclear Energy Institute (NEI) would provide explicit examples of what falls within design parameters.[4] NEI plans to draft guidance that will include examples of design information and provide it to NRC in January 1999. Concurrently, NRC is developing regulatory guidance on design information. NRC staff expect to recommend to the Commission in February 1999 that it endorse either NRC's or NEI's guidance and seek approval to obtain public comments in March or April 1999. NRC officials could not estimate when the Agency would complete this effort.

NRC Does Not Have Confidence That Safety Analysis Reports Reflect Current Plant Designs

At the time NRC licenses a plant, the utility prepares a safety analysis report; NRC regulations require the utility to update the report to reflect changes to the plant design and the results of analyses that support modifying the plants without prior NRC approval. As such, the report provides one of the foundations to support a risk-informed approach. Yet, NRC does not have confidence that utilities make the required updates, which results in poor documentation of the safety basis for the plants.

NRC published guidance for the organization and contents of safety analysis reports in June 1966 and updated the guidance in December 1980. NRC acknowledges that the guidance is limited resulting in poorly articulated staff comments on the quality of the safety analysis reports and a lack of understanding among utilities about the specific aspects of the safety analysis reports that should be updated. On June 30, 1998, NRC directed its staff to continue working with NEI to finalize the industry's guidelines on safety analysis report updates, which NRC could then endorse. Once the Agency endorses the guidelines, it will obtain public comments and revise them, if appropriate. NRC expects to issue final guidelines in September 1999.

Erroneous Evaluations Can Erode Design and Safety Margins

According to NRC documents, if a utility does not have complete and accurate design information, the evaluations conducted to determine whether it can modify a plant without prior NRC approval can lead to erroneous conclusions and jeopardize safety. For more than 30 years, NRC's regulations have provided a set of criteria that utilities must use to determine whether they may change their facilities (as described in the final safety analysis report) or procedures or conduct tests and experiments without NRC's prior review and approval.

However, in 1993, NRC became aware that Northeast Nuclear Energy Company had refueled Millstone Unit 1 in a manner contrary to that allowed in the updated final safety analysis and its operating license. This led NRC to question the regulatory framework that allows licensees to change their facilities without prior NRC approval. As a result, NRC staff initiated a review to identify the short-and long-term actions needed to improve the process. For example, in October 1998, NRC published a proposed regulation regarding plant changes in the *Federal Register* for comment; the comment period ended on December 21, 1998. NRC requested comments on criteria for identifying changes that require a license amendment and on a range of options, several of which would allow utilities to make changes without prior NRC approval despite a potential increase in the probability or consequences of an accident. NRC expects to issue a final regulation in June 1999.

In addition, in February 1999, NRC staff expect to provide their views to the Commission on changing the scope of the regulation to consider risk. NRC's memorandum that tracks the various tasks related to a risk-informed approach and other initiatives did not show when NRC would resolve this issue.

Making Its Regulations Risk-Informed Will Be a Challenge to NRC and the Industry

Until recently, NRC did not consider whether and to what extent the Agency should revise all its regulations pertaining to commercial nuclear plants to make them risk-informed. Revising the regulations will be a formidable task because, ac-

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[4]NEI has members from all utilities licensed to operate commercial nuclear plants in the United States as well as nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry. NEI establishes unified nuclear industry policy on such matters as generic operational and technical issues.

cording to NRC staff, inconsistencies exist among the regulations and because a risk-informed approach focuses on the potential risk of structures, systems, or components, regardless of whether they are located in the plant's primary (radiological) or secondary (electricity-producing) systems. With one exception, NRC has not attempted to extend its regulatory authority to the secondary systems.

NRC staff and NEI officials agree that the first priority in revising the regulations will be to define their scope as well as the meaning of such concepts as "important to safety" and "risk significant" and integrating the traditional and risk-informed approaches into a cohesive regulatory context. In October 1998, NEI proposed a phased approach to revise the regulations. Under the proposal, by the end of 1999, NRC would define "important to safety" and "risk significant." By the end of 2000, NRC would use the definitions in proposed rulemakings for such regulations as definition of design information and environmental qualification for electrical equipment. By the end of 2003, NEI proposes that NRC address other regulatory issues, such as the change process, the content of technical specifications, and license amendments. After 2003, NEI proposes that NRC would address other regulations on a case-by-case basis.

NRC staff agreed that the Agency must take a phased approach when revising its regulations. The Director, Office of Nuclear Regulatory Research, said that, if NRC attempted to revise all provisions of the regulations simultaneously, it is conceivable that the Agency would accomplish very little. The Director said that NRC needs to address one issue at a time while concurrently working on longer-term actions. He cautioned, however, that once NRC starts, it should be committed to completing the process. At a January 1999 meeting, NRC's Chairman suggested a more aggressive approach that would entail risk informing all regulations across the board. NRC's memorandum that tracks the various tasks related to a risk-informed approach and other initiatives did not show when the Agency would resolve this issue.

NRC Does Not Have A Standard for the Content of Risk Assessments

NRC and the industry view risk assessments as one of the main tools to be used to identify and focus on those structures, systems, or components of nuclear plant operations having the greatest risk. Yet, neither NRC nor the industry has a standard or guidance that defines the quality, scope, or adequacy of risk assessments. NRC staff are working with the American Society of Mechanical Engineers to develop such a standard.

However, this issue is far from being resolved. The Society is developing the standard for risk assessments in two phases (internal events and emergency preparedness). NRC staff estimate that the Agency would have a final standard on the first phase by June 2000 but could not estimate when the second phase would be complete. To ensure consistency with other initiatives, in December 1998, NRC staff requested the Commission's direction on the quality of risk assessments needed to implement a risk-informed approach. Since it may be several years until NRC has a standard, the Commission should also consider the effect that the lack of a standard could have on its efforts to implement a risk-informed regulatory approach.

NRC Has Not Determined Whether Compliance With Risk-Informed Regulations Would Be Mandatory or Voluntary

NRC has not determined whether compliance with revised risk-informed regulations would be mandatory or voluntary for utilities. In December 1998, NRC's staff provided its recommendations to the Commission. The staff recommended that implementation be voluntary, noting that it would be very difficult to show that requiring mandatory compliance will increase public health and safety and could create the impression that current plants are less safe. In its analysis, the staff did not provide the Commission with information on the number of plants that would be interested in such an approach. In January 1999, the commissioners expressed concern about a voluntary approach, believing that it would create two classes of plants operating under two different sets of regulations.

Utilities may be reluctant to shift to a risk-informed regulatory approach for various reasons. First, the number of years remaining on a plant's operating license is likely to influence the utility's views. NRC acknowledged that if a plant's license is due to expire in 10 years or less, then the utility may not have anything to gain by changing from the traditional approach. Second, the costs to comply may outweigh the benefits of doing so. Considering the investment that will be needed to develop risk-informed procedures and operations and identify safety-significant structures, systems, or components, utilities question whether a switch will be worth the reduction in regulatory burden and cost savings that may result. Third, design differences and age disparities among plants make it difficult for NRC and

the industry to determine how, or to what extent, a standardized risk-informed approach can be implemented across the industry. Although utilities built one of two types of reactors—boiling water or pressurized water reactors—each has design and operational differences. Thus, each plant is unique, and a risk-informed approach would require plant-specific tailoring.

NRC Has Not Developed a Strategic Plan to Implement a Risk-Informed Approach

Since the early 1980's, NRC has considered applying risk to the regulatory process. NRC staff estimate that it will be at least 4 to 8 years before the Agency implements a risk-informed approach. However, NRC has not developed a strategic plan that includes objectives, time lines, and performance measures for such an approach.

Rather, NRC has developed an implementation plan, in conjunction with its policy statement on considering risk, that is a catalog of about 150 separate tasks and milestones for their completion. It has also developed guidance for some activities, such as pilot projects in the four areas where the industry wanted to test the application of a risk-informed approach. In one case, NRC approved a pilot project for Houston Lighting and Power Company at its South Texas plant, and the utility found that it could not implement it because the pilot project would conflict with other NRC regulations.

Given the complexity and interdependence of NRC's requirements, such as regulations, plant design, and safety documents and the results of ongoing activities, it is critical that NRC clearly articulate how the various initiatives will help achieve the goals set out in the 1995 policy statement. Although NRC's implementation plan sets out tasks and expected completion dates, it does not ensure that short-term efforts are building toward NRC's longer-term goals; does not link the various ongoing initiatives; does not help the Agency determine appropriate staff levels, training, skills, and technology needed and the timing of those activities to implement a risk-informed approach; does not provide a link between the day-to-day activities of program managers and staff and the objectives set out in the policy statement; and does not address the manner in which it would establish baseline information about the plants to assess the safety impact of a risk-informed approach.

In a December 1998 memorandum, NRC staff said that once the Commission provides direction on whether and how to risk-inform the regulations and guidance on the quality of risk assessments to support their decisions for specific regulations, they would develop a plan to implement the direction provided. The staff did not provide an estimated timeframe for completing the plan.

THE STATUS OF NRC'S ASSESSMENT AND ENFORCEMENT PROCESSES: MANY UNANSWERED ISSUES REMAIN

For many years, the nuclear industry and public interest groups have criticized NRC's plant assessment and enforcement processes because they lacked objectivity, consistency, predictability. In January 1999, NRC proposed a new process to assess overall plant performance based on generic and plant-specific safety thresholds and performance indicators. NRC is also reviewing its enforcement process to ensure consistency with the staff's recommended direction for the assessment process and other programs.

NRC Is Trying to Make Its Plant Assessment Process More Objective and Transparent

In 1997 and 1998, we noted that NRC's process to focus attention on plants with declining safety performance needed substantial revisions to achieve its purpose as an early warning tool and that NRC did not consistently apply the process across the industry.[5] We also noted that this inconsistency has been attributed, in part, to the lack of specific criteria, the subjective nature of the process, and the confusion of some NRC managers about their role in the process. NRC acknowledged that it should do a better job of identifying plants deserving increased regulatory attention and said that it was developing a new process that would be predictable, nonredundant, efficient, and risk-informed.

In January 1999, NRC proposed a new plant assessment process that includes seven "cornerstones."[6] For each cornerstone, NRC will identify the desired result, important attributes that contribute to achieving the desired result, areas to be

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[5] *Nuclear Regulation: Preventing Problem Plants Requires More Effective NRC Action* (GAO/RCED–97–145, May 30, 1997) and *Nuclear Regulatory Commission: Preventing Problem Plants Requires More Effective Action by NRC* (GAO/T–RCED–98–252, July 30, 1998).

[6] The seven cornerstones are: initiating events, mitigation systems, barrier integrity, emergency preparedness, and public, occupational, and physical protection.

measured, and the various ways that exist to measure the identified areas. Three issues cut across the seven cornerstones: human performance, safety conscious work environment, and problem identification and resolution. As proposed, NRC's plant assessment process would use performance indicators, inspection results, other such information as utility self-assessments, and clearly defined, objective decision thresholds. The process is anchored in a number of principles, including that: (1) a level of safety performance exists that could warrant decreased NRC oversight, (2) performance thresholds should be set high enough to permit NRC to arrest declining performance, (3) NRC must assess both performance indicators and inspection findings, and (4) NRC will establish a minimum level of inspections for all plants (regardless of performance). Although some performance indicators would be generic to the industry, others would be plant-specific based, in part, on the results that utilities derive from their risk assessments. However, the quality of risk assessments and number of staff devoted to maintain them vary considerably among utilities.

NRC expects to use a phased approach to implement the revised plant assessment process. Beginning in June 1999, NRC expects to pilot test the use of risk-informed performance indicators at eight plants, by January 2000 to fully implement the process, and by June 2001 to complete an evaluation and propose any adjustments or modifications needed. Between January 1999 and January 2001, NRC expects to work with the industry and other stakeholders to develop a comprehensive set of performance indicators to more directly assess plant performance relative to the cornerstones. For those cornerstones or aspects of cornerstones where it is impractical or impossible to develop performance indicators, NRC would use its inspections and utilities' self assessments to reach a conclusion about plant performance. NRC's proposed process illustrates an effort by the current chairman and other commissioners to improve NRC's ability to help ensure safe operations of the nation's nuclear plants as well as address industry concerns regarding excessive regulation. NRC's ensuring consistent implementation of the process ultimately established would further illustrate the commissioners' commitment.

NRC's Enforcement Process Continues to be In a State of Flux

NRC has revised its enforcement policy more than 30 times since its implementation in 1980. Although NRC has attempted to make the policy more equitable, the industry has had longstanding problems with it. Specifically, NET believes that the policy is not safety-related, timely, or objective. Among the more contentious issues are NRC's practice of aggregating lesser violations into an enforcement action that results in civil penalties and its use of the term "regulatory significance."

To facilitate a discussion about the enforcement program, including the use of regulatory significance and the practice of aggregating lesser violations, at NRC's request, NEI and the Union of Concerned Scientists reviewed 56 enforcement actions taken by the Agency during fiscal year 1998. For example, NEI reviewed the escalated enforcement actions based on specific criteria, such as whether the violation that resulted in an enforcement action could cause an offsite release of radiation, onsite or offsite radiation exposures, or core damage. From an overall perspective, the Union concluded that NRC's actions are neither consistent nor repeatable and that the enforcement actions did not always reflect the severity of the offense. According to NRC staff, they plan to meet with various stakeholders in January and February 1999 to discuss issues related to the enforcement program.

Another issue is the use of the term "regulatory significance" by NRC inspectors. NRC, according to NEI and the Union of Concerned Scientists, uses "regulatory significance" when inspectors cannot define the safety significance of violations. However, when the use of regulatory significance results in financial penalties, neither NRC nor the utility can explain to the public the reasons for the violation. As a result, the public cannot determine whether the violation presented a safety concern.

NEI has proposed a revised enforcement process. NRC is reviewing the proposal as well as other changes to the enforcement process to ensure consistency with the draft plant safety assessment process and other changes being proposed as NRC moves to risk-informed regulation. NRC's memorandum of tasks shows that the staff expect to provide recommendations to the Commission in March 1999 that address the use of the term regulatory significance and in May 1999 on considering risk in the enforcement process.

MAJOR MANAGEMENT CHALLENGES AND PROGRAM RISKS

In January 1999, we provided the Congress with our views on the major management challenges that NRC faces. We believe that the management challenges we identified have limited NRC's effectiveness. In summary, we reported that:

• NRC lacks assurance that its current regulatory approach ensures safety. NRC assumes that plants are safe if they operate as designed and follow NRC's regulations. However, NRC's regulations and other guidance do not define, for either a licensee or the public, the conditions necessary for a plant's safety; therefore, determining a plant's safety is subjective.

• NRC's oversight has been inadequate and slow. Although NRC's indicators show that conditions throughout the nuclear energy industry have generally improved, they also show that some nuclear plants are chronically poor performers. At three nuclear plants with long-standing safety problems that we reviewed, NRC did not take aggressive action to ensure that the utilities corrected the problems. As a result of NRC's inaction, the conditions at the plants worsened, reducing safety margins.

• NRC's culture and organizational structure have made the process of addressing concerns with the Agency's regulatory approach slow and ineffective. Since 1979, various reviews have concluded that NRC's organizational structure, inadequate management control, and inability to oversee itself have impeded its effectiveness.

Some of the initiatives that NRC has underway have the potential to address the first two management challenges. However, the need to ensure that NRC's regulatory programs work as effectively as possible is extremely important, particularly in light of major changes taking place in the electric utility industry and in NRC. Yet changing NRC's culture will not be easy. In a June 1998 report, the Office of the Inspector General noted that NRC's staff had a strong commitment to protecting public health and safety.

However, the staff expressed high levels of uncertainty and confusion about the new directions in regulatory practices and challenges facing the Agency. The employees said that, in their view, they spend too much time on paperwork that may not contribute to NRC's safety mission. The Inspector General concluded that without significant and meaningful improvement in management's leadership, employees' involvement, and communication, NRC's current climate could eventually erode the employees' outlook and commitment to doing their job. This climate could also erode NRC's progress in moving forward with a risk-informed regulatory approach. According to staff, NRC recognizes the need to effectively communicate with its staff and other stakeholders and is developing plans to do so.

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 LOCHBAUM, UNION OF CONCERNED SCIENTISTS

After the subcommittee's hearing last July, the Nuclear Regulatory Commission developed a plan to improve its reactor oversight program. The NRC intends to phase in these improvements at a few nuclear plants this year, and then adopt them for all plants next year.

As I recently told the NRC commissioners,[1] UCS believes that the NRC has a good plan. However, the plan's quality is not the most important factor in determining whether the NRC succeeds in its oversight mission. What matters most is how well the Agency implements its program. Too often, the NRC fails to follow its plans and does not regulate in a consistent, timely manner.

The NRC's Inspector General recently reported[2] to Senator Lieberman that the Agency failed to properly discharge its responsibilities to the people of Connecticut and to workers at the Millstone Nuclear Power Station. These failures are particularly troubling because they involved the highest profile nuclear facility in the country. The NRC created a Special Projects Office with responsibility for only one site—Millstone. The Inspector General documented numerous regulatory failures involving that office despite its singular focus. The Inspector General also reported that many failures were caused by the NRC not following its own procedures and policies.

The Inspector General's report is the latest example in a long history of the NRC's failing to follow through on its plans. Let me cite fire protection as an old, yet still ongoing, example. The NRC created Appendix R, the fire protection rule, to 10 CFR Part 50 in January 1980 to address safety concerns following the serious fire at the Browns Ferry Nuclear Plant in Alabama in March 1975.

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[1] Union of Concerned Scientists, Presentation to NRC commissioners, "Looking for Goldilocks: The NRC's Inspection, Assessment, and Enforcement Programs," January 20, 1999. (Attached)

[2] Nuclear Regulatory Commission Inspector General,. "NRC Staff's Handling of Harassment and Intimidation Complaints at Millstone (Case No. 99–015)," December 31, 1998.

Nineteen years later, the majority of nuclear plants do not now, and never have, satisfied the Appendix R regulations. When Rep. Markey asked the NRC about this situation in May 1997, the Agency replied that it was considering a revision to Appendix R. Nearly 2 years later, we understand that the Agency is still thinking about revising the regulation. Last December, Rep. Markey asked the General Accounting Office to investigate fire safety issues at nuclear plants.

In the meantime, the majority of nuclear plants are operating in violation of fire safety regulations. At the Salem Generating Station in New Jersey, for example, both reactors were shut down from 1995 to 1997 while its owner made extensive repairs to safety equipment. Numerous fire protection deficiencies went uncorrected during this lengthy shut down. The NRC allowed both reactors to restart despite knowing that fire protection requirements were not met. Not only that, but the NRC is content with the owner's plans to leave the problems uncorrected for several more years.

The NRC tolerates violation of its fire protection regulations because plant owners have taken so-called interim compensatory measures. The most common of these measures involves workers, called fire watches, walking through the plants looking for smoke or flames. Such "interim" measures have been used for more than 6 years at many plants.

But interim measures are not a substitute for permanent solutions. When I get a flat tire, I replace it with a spare mini-tire. That's an interim measure I can use until I get the flat fixed or a new tire. It would be irresponsible for me to undertake a cross-country trip on that interim mini-tire. My poor judgment would place myself and other travelers at an undue risk. Likewise, it is irresponsible for the NRC to rely on fire watches indefinitely. This poor decision places millions of Americans living around nuclear plants at undue risk.

The risk from fire is real. The NRC reported[3] that fire represents 7 to 50 percent of the overall reactor core damage risk at nuclear plants. According to this data, there is a plant where the fire risk equals the risk from all other accident scenarios combined. So, the fire risk is real. And the regulations created to properly manage that risk are essentially being ignored by the NRC.

We respectfully request that this subcommittee compel the NRC to resolve the fire protection problems. The NRC must either enforce or revise its fire safety regulations. Continued neglect, predicated on "interim" compensatory measures and "considerations" of rulemaking, must end. The regulations were promulgated in direct response to the serious Browns Ferry fire. If another serious nuclear plant fire were to occur, the American public would be very distressed to learn that these fire protection regulations had not been enforced.

Your subcommittee's oversight hearings have accelerated the NRC's change process. We sincerely appreciate the subcommittee's efforts in this regard. We trust that this subcommittee will not judge the NRC solely on its plans. We hope that you will evaluate the results from these new and improved processes, even though this data will not be available until late this year. We respectfully request that this subcommittee continue these efforts to ensure that the NRC reaps the maximum benefits from its plans.

LOOKING FOR GOLDILOCKS: THE NRC'S INSPECTION, ASSESSMENT, AND ENFORCEMENT PROGRAMS

The NRC staff is to be commended for the comprehensive and thorough reactor oversight process improvement recommendations detailed in SECY–99–007. They faced a daunting challenge while seeking a "Goldilocks" oversight process—one that is not too stringent or too lax, but just right. A large number of our concerns have been addressed. On paper, this process appears fundamentally sound and capable of successfully meeting the stated expectations. However, it must be noted that, on paper, so was the old process. It's not the process that will make or break this effort, it's the implementation.

The process was developed with an objective of increasing public confidence in the NRC's regulatory function. Key elements of the new process are these seven cornerstones of plant safety:

(1) limit the frequency of initiating events;

(2) ensure the availability, reliability, and capability of mitigating systems;

(3) ensure the integrity of the fuel cladding, reactor coolant system, and containment boundaries;

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[3] Nuclear Regulatory Commission, NUREG–1150, "Severe Accident Risks: An Assessment for Five U.S. Nuclear Power Plants," June 1989.

(4) ensure the adequacy of the emergency preparedness functions;
(5) protect the public from exposure to radioactive material releases;
(6) protect nuclear plant workers from exposure to radiation; and
(7) provide assurance that the physical protection system can protect against the design-basis threat of radiological sabotage.

Even though these cornerstones are easier to understand than the concepts evaluated in the SALP process, the proposed reactor oversight process is substantially different than the old process. The public needs a chance to understand the proposed process. The transition plan has a column labeled "Communication." Other than a few press releases and a 30-day comment period for the overall process, there's not much in the way of educating the public. The draft documents and SECY paper may be useful working documents for the NRC and industry, but they cannot be used to educate the public. They contain too much nukespeak (i.e., technical jargon and acronyms). A brief, plain-English description of the proposed process should be developed before the comment period begins and provided in the Federal Notice.

Inspection Process

The NRC's limited inspections provide it with a very small slice of the overall safety picture at nuclear plants. It is important that the NRC properly characterize its findings. Based on my experience prior to joining UCS, it appeared that inspection findings were graded on a curve because the threshold for a non-conforming condition seemed lower at a plant which the staff believed to have performance problems than it was at a plant that the staff believed was doing OK. The staff's feelings toward licensees must not influence inspection findings to prevent a self-fulfilling prophecy situation.

Since the proposed baseline inspections will concentrate on areas not covered by performance indicators, there will be little chance to confirm or refute inspection findings. Findings that are too positive or too negative will likely pass through to the assessment process unchallenged. Findings that are "just right" are very important.

The NRC's Inspection Manual tells inspectors what to examine and how often, but does not provide much assistance in the form of objective acceptance criteria. As a result, inspectors are being asked to evaluate the condition of a plant component or a plant owner's process without benefit of an "answer key." As the Inspection Manual chapters is revised, the NRC should provide objective acceptance criteria whenever possible. Otherwise, inspections findings may continue to be influenced by the staff's perceptions of licensee performance.

The NRC should post *all* the inspection reports issued for each operating nuclear plant within the past year on its internet website.

Assessment Process

In Table 4.1, the staff listed the following success criterion for the assessment process:

Number of executive over-rides (cases where the outcome is something different than the input) at end-of-cycle review is less than 5 percent.

Since there are about 25 plants in each region, this would consider one plant in each region or five plants in one region being handled subjectively as a success. That is wrong. That would be carrying over a major flaw of the SALP process into the new process. The appropriate goal should be *no* executive over-rides. None. The staff, on occasion, may be justified in over-riding the assessment results with its judgment, but that situation should not be considered to be a successful outcome of the assessment process. Executive over-rides should be used very sparingly and not routinely accepted.

The proposed assessment process relies heavily on performance indicators. We have the following concerns regarding the use of these indicators:

- The Reactor Coolant System specific activity PI has a green-to-white threshold of >50 percent of the Technical Specification limit. This PI is intended to monitor the integrity of the fuel cladding barrier. In April 1998, UCS provided a technical report to the NRC on our research which concluded that it is illegal and potentially unsafe for nuclear plants to operate with any fuel leakers. We have since submitted 2.206 petitions on the River Bend and Perry plants because these plants are operating with known fuel leakers. In our report and our petitions, we have challenged the bases for the RCS specific activity Technical Specification. We respectfully request that the NRC staff answer our nuclear safety concerns raised nearly a year ago before adopting this PI.
- The Containment Leakage PI has a green-to-white threshold of >100 percent L_A. Containment leakage is a virtually meaningless indicator. The containment integrated leak rate tests are performed every 18 to 24 months with the plants shut

down. If leakage exceeds 100 percent L_A the plant will not restart. Thus, it is highly unlikely that this PI will be anything but green. A PI that doesn't ever change color is worse than useless because it provides a false sense of security.

Speaking of false senses of security, the containment leakage PI would have been in the green at DC Cook even though that facility's containment spray and ice condenser systems were severely degraded. The appropriate containment PI would be the reliability of the containment heat removal systems.

- The Safety System Performance Indicators suffer from the same problem that afflicts the probabilistic risk assessments—they do not properly account for system degradation caused by passive design problems, or "blunders" to use Dr. Thadani's term. For example, the Emergency Power PI has a green-to-white threshold of >0.025. In NRC Inspection Report 50–213/96–201, dated July 31, 1996, the staff concluded:

The most significant issue noted by the team was the failure of the [Haddam Neck] licensee to appropriately consider design-basis scenario loads on the Class 1E station batteries sizing calculations. Specifically, the licensee's calculation did not account for all of the loads associated with a LOCA coincident with loss-of-offsite-power, and did not demonstrate that the battery voltage would remain above the minimum level required for operation of equipment.

In other words, the safety-related batteries at Haddam Neck, which passed the Technical Specification surveillance tests for years with flying colors, would have failed in event of an accident due to a design problem. Yet, design problems like these do *not* count against the system reliability numbers. The PI's must reflect that reality or they will provide misleading signals.

Curiously, while the Haddam Neck inspection report documented numerous problems with systems intended to protect public health and safety, the systems needed to generate electricity worked well.

- For the Physical Protection cornerstone, both the personnel screening process performance and the personnel reliability program performance indicators have a green-to-white threshold of 3–5 reportable events. The time period is not specified. We assume it is 1 year, but it should be clearly defined.

Attachment 1, Table 5 provides the action matrix proposed for assessment program results. The second column states actions the NRC just might take for one or two inputs in the white. Is it one or is it two? The appropriate threshold should be clearly defined.

The fourth column on Attachment 1, Table 5 states actions the NRC may take for repetitive degraded cornerstones et al. While the proposed response are prudent, the trigger for this response is too subjective. Since this response level is that level which failed at Millstone, Salem, DC Cook, etc., it is vital that it be as clearly defined as possible to prevent repeating those oversight errors.

Enforcement Process

The current Enforcement Policy is rumored to be non-punitive. In the current Enforcement Policy, the staff identifies an apparent violation of Federal safety regulations and provides the licensee an opportunity to explain its case at a pre-decisional enforcement conference. The staff can then impose a civil penalty on the licensee. The licensee can pay the fine or appeal it.

"Punitive" is defined as "inflicting, involving, or aiming at punishment." "Punishment" is defined as "a penalty inflicted on an offender through judicial procedure." Thus, it seems reasonable to conclude that a process which collects multi-million dollar civil penalties from offending licensees through an administrative process which affords the opportunity to both contest the violation and appeal the penalty is, in fact, punitive. If it waddles like a duck, swims like a duck, and quacks like a duck, it's a duck. Let there be no mistake—the Enforcement Policy is punitive. The good news is that it's supposed to be punitive.

The bad news is that enforcement actions are so randomly applied that the policy is totally ineffective. While there are plenty of examples to illustrate arbitrary and capricious enforcement actions, the classic cases are those associated with the duration of the non-conforming condition. The statute permits the NRC to assess a penalty of up to $110,000 per violation per day that the violation existed. The staff rarely invokes this provision. In 1996, the NRC fined the LaSalle licensee for about 20 days of a problem. In 1998, the NRC did not fine the DC Cook licensee a problem lasting about the same duration. The staff must develop the means to consistently and meaningfully apply the per day provision of the statute.

General Observations

The staff went to considerable effort to identify how the outcome from the inspection, assessment, and enforcement processes will be communicated to stakeholders.

It is also necessary to complement these communications with much better documentation of staff decisions that produced the outcome. The nuclear industry is required by NRC regulations to provide a paper trail for decisions affecting nuclear safety. The staff's decisions have the same importance as those made by licensees, yet the documentation standards are significantly less rigorous. The staff must, as a minimum, meet the industry's standards.

RESPONSE OF DAVID A. LOCHBAUM TO A QUESTION FROM SENATOR GRAHAM

Question. In your testimony you emphasize the risk of fire at nuclear power plants. You support this emphasis by referring to an NRC report from 1989 that states that fire represents 7 to 50 percent of the overall reactor core damage risk at nuclear power plants. It is my understanding that this report has been superseded by more recent reports on risk at each individual nuclear power plant site.

Do the newer risk reports reach the same conclusions about the risk of fire at nuclear plants?

Response. In October 1996, the Nuclear Regulatory Commission published NUREG–1560, "Individual Plant Examination Program: Perspectives on Reactor Safety and Plant Performance," which reported on the Agency's review of the plant-specific risk assessments submitted for each operating nuclear power plant site. While the fire risk is not explicitly addressed in this document as it was in the 1989 document (NUREG–1150) that I had referenced, Section 7.3 stated:

> The average CDFs [core damage frequencies] from the NUREG–1150 PWR analyses fall within the ranges of the CDFs estimated for the PWRs in the IPEs [individual plant examinations]. Similarly, the average CDFs for the NUREG–1150 BWR analyses fall within the ranges of the BWR IPE values. The mix of relative contributions of accident sequences in the IPE results is consistent with the NUREG–1150 results.

In July 1998, the Nuclear Regulatory Commission published NUREG–1521, "Technical Review of Risk-Informed, Performance-Based Methods for Nuclear Power Plant Fire Protection Analyses." In Table 4.1 of this document, the NRC provided the fire risk for twelve (12) nuclear power plants. The fire risk for Indian Point 2 was listed as 68% of the overall core damage risk while the fire risk for the Limerick 1 plant was listed as 53% of the overall core damage risk.

In my presentation, I stated that the fire contributed up to 50% of the overall core damage risk. It appears from this recent NRC data that I underestimated the fire risk.

STATEMENT OF JAMES T. RHODES, CHAIRMAN, PRESIDENT AND CHIEF EXECUTIVE OFFICER, INSTITUTE OF NUCLEAR POWER OPERATIONS

Thank you, Mr. Chairman. I am James T. Rhodes, chairman, president and chief executive officer of the Institute of Nuclear Power Operations, based in Atlanta, Georgia. Let me thank you for the opportunity to represent INPO and provide testimony at this hearing.

Today, I will focus my remarks on three areas. First, I will discuss the progress made by the industry since my testimony to this committee last July. Second, I will highlight regulatory initiatives that have been and will continue to be a key factor in progress for the nuclear power industry. And third, I will focus on the importance of effectively managing the change process, particularly as it relates to the regulatory initiatives. This last point is especially important given the number of organizational changes taking place at the NRC, including the announced departure of Chairman Jackson.

CONTINUING INDUSTRY PROGRESS

In July, I discussed the improvement our industry has made in the past decade, as measured by a number of performance indicators. Today I am pleased to inform you that the industry has continued this solid progress into 1999.

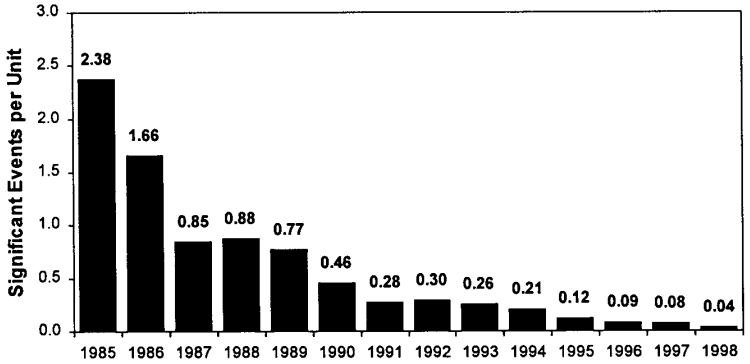
Although the industry began 1998 with a number of plants struggling with extended shutdowns, the industry made a strong comeback last year. In fact, overall performance improved more in 1998 than at any time in recent years. Let me share with you a few key indicators of that improvement.

By the end of 1998, most of the plants that began the year in long-term shutdown were back on line, producing electricity for their customers. This includes plants such as Northeast Utilities' Millstone Unit 3 and Commonwealth Edison's Quad Cities Station Units 1 and 2 and LaSalle County Station Unit 1. In addition, current

data indicate that nuclear electric generation continued to increase in 1998. For example, Commonwealth Edison recently reported that its nuclear program ended the year with a capacity factor of 65.5 percent—more than 10 percentage points higher than their goal for the year, and more than 15 points higher than their 1997 results.

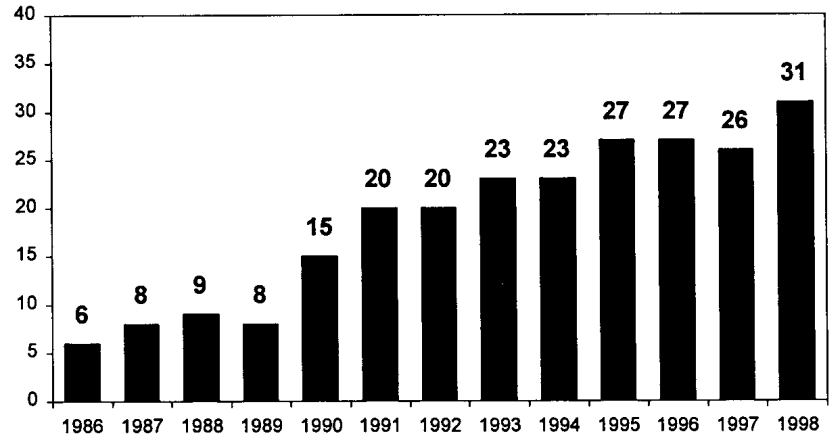
Also, last July I reported to this committee that the trend of significant events per unit per year had decreased from 2.38 in 1985 to about 0.1 in 1997—a reduction factor of more than 20. Today I'm pleased to report even further improvement. NRC event data, confirmed by our own experience, shows an industry achievement of only .04 events per unit this past year. This data is represented on the graph below.

Significant Events Annual Industry Average



The final improvement of note is the number of plants in INPO's "Excellent" category. Following each plant evaluation, INPO provides an assessment number—on a scale of 1 to 5—with category one being the "Excellent" performers. At INPO's annual Chief Executive Officers conference in November, we recognized 31 such plants, the most ever. The standards are very high, and the level of performance needed to earn an excellent rating has risen over the years. This graph shows an impressive, positive trend for the industry.

Number of INPO Excellent Plants



REGULATORY INITIATIVES

Now I would like to move into my second area of focus—the regulatory changes that are important to continued improvement in the nuclear power industry. We applaud the regulatory initiatives that the Commission has underway. The progress made so far demonstrates the potential for ongoing improvements in the regulatory process. Many have said, and I will reiterate, that improvements such as these will play a central role in the health of the industry.

We continue to be encouraged by the openness being displayed by the NRC in communicating with its stakeholders. This open exchange of information and ideas is a key contributor to the safe and reliable operation of our nation's nuclear power plants.

This improved communication is evident through the NRC's periodic stakeholder meetings, the enhanced review and approval process for license renewal, and the ongoing development of the new reactor oversight process. This new oversight process is especially important. It enhances the NRC's ability to ensure public health and safety by more effectively allocating its resources and eliminating redundant oversight. Specifically, it will focus the inspection, assessment and enforcement processes on safety-significant items, allowing utilities appropriate control over activities and issues that are not safety-significant, but are vital to plant reliability and economic viability.

We recognize that for plants to achieve and remain in the upper band of performance defined in the proposed new oversight process, they will need highly effective self-assessments and corrective action programs. Let me point out that among the many areas we look at, plant performance in the areas of self-assessments and corrective actions is routinely reviewed during INPO plant evaluations and during our plant assistance visits. Therefore, INPO's mission of promoting excellence in plant operations is fully complementary to the new oversight process.

Another example of beneficial change is the significant reduction in items identified as Level IV violations. As you may be aware, these violations relate to issues that are not—on their own—of serious concern. As part of its progress toward risk-informed regulation, the NRC has clearly recognized the benefits of restricting violations to safety significant items, while using the inspection reports as the appropriate tool for highlighting potential areas for improvement. This in turn encourages the utilities to be even more rigorous in analyzing their own operations. They can be confident that proactive self-identification of minor, non-safety-related issues will not automatically result in civil penalties.

EFFECTIVELY MANAGING CHANGE

Having discussed the continuing improvements in the nuclear industry, and the regulatory initiatives that have supported these improvements, I would like to now turn my attention to the importance of effectively managing the change process within the NRC. We have had the opportunity to discuss this subject at recent stakeholder meetings and feel it is important to cover it here.

INPO has had extensive experience with change management. Currently, we have a series of initiatives underway to improve how we carry out our mission to promote the highest levels of safety and reliability in the operation of nuclear electric power plants. Therefore, we appreciate what the NRC faces as it strives to change and more effectively meet its regulatory responsibilities. NRC is currently undergoing significant philosophy, process, and staff changes, including changes at the senior leadership levels.

We've seen many utilities challenged with managing change. Some have had success, others have struggled. Based on our observations and experience, it is clear that change requires clarity of purpose, constant communication, training, and, most of all, persistence and hard work.

I'll begin with clarity of purpose. A clearly defined, long-term plan and simple goals are necessary. With clarity and simplicity, change leaders throughout the organization can help ensure strong support at all levels.

Second, constant communication is critical for success. Communication must be two-way, involving both sending information and receiving feedback. The stakeholder meetings are good examples that need to be applauded and need to continue. Being flexible enough to use relevant feedback from the stakeholders throughout the change process will contribute to the Agency's ultimate success.

Internal communications are equally important. We understand the NRC commissioners and senior staff are communicating their expectations throughout the organization. We all know that there can probably be no such thing as too much communication. But then—just as importantly—management must listen to employees to

ensure that the messages are being received and understood. Of course, follow-up action must be taken where appropriate.

Third, preparing and training NRC employees for change, and helping them succeed, is another fundamental ingredient. Our experience shows that organizations often underestimate the effort required to engage and train the work force on significant changes. The NRC must look hard at the ability of its work force to digest and internalize the many process changes being made. NRC staff will be asked to do different things and in some cases to think differently about their jobs. Frontline employees such as the site resident inspectors are important interfaces with the plants and therefore critical points. They must not only understand the changes but also be able to implement the changes from day-to-day.

Also, additional skills training may be needed as the organization changes, particularly in light of new assignments, work force reductions, retirements and transfers of experienced employees. Further, it is important that the NRC's award and recognition system support employees who successfully implement change.

Finally, success comes down to persistence and hard work. What the NRC is undertaking includes a change in culture. Cultural change takes time, tremendous energy, and most of all, significantly more persistence and hard work than is often expected. In time, change can be anchored into the culture of the organization—but only through an ongoing, systematic effort.

Overall, we're encouraged by what we see happening at the Agency thus far. But as Chairman Jackson has said, ''Performance is what performance does.'' We've seen many organizations with great intentions have their change programs fall short because of poor implementation. Given the far-reaching effects of the changes the NRC is initiating, persistent and consistent execution of the change process is absolutely crucial to success. This—as I said, and as you well know—will take an immense amount of hard work.

In the meantime, we encourage the NRC to continue improving its responsiveness to industry needs, such as timely license amendments, transfers and renewals, and reducing administrative burdens. Additionally, while maintaining appropriate data propriety, increased information sharing may also help reduce duplication and administrative burdens.

In conclusion, we at INPO believe the industry—and indeed the public—wants and needs a more predictable, objective and responsive nuclear regulator. We're encouraged by what the Agency is attempting to do—that is, to become a more risk-informed, performance-based regulator. We believe the NRC is on the right track with its efforts to improve the inspection, enforcement and assessment processes, focusing on items directly related to the Agency's mission—the protection of public health and safety. We are encouraged by the fact that the commissioners, the Executive Director for Operations, and the regional administrators recognize the importance of change management. We at INPO will continue to work in cooperation with the NRC to help ensure the safe operation of our nation's nuclear power plants.

Again, I appreciate this committee's interest in the regulation of a changing nuclear power industry. Your continued support and guidance will play an important role in helping the NRC provide effective regulation to help assure the safety of our industry.

Thank you very much.

STATEMENT OF STEVEN M. FETTER, FITCH IBCA, INC.

I appreciate the opportunity to testify on behalf of Fitch IBCA in the U.S. Senate Subcommittee on Clean Air, Wetlands, Private Property and Nuclear Safety's ongoing oversight of the Nuclear Regulatory Commission (NRC). Fitch IBCA is an international rating agency, based in New York and London, with over 700 employees in 21 offices around the world.

The manner in which the NRC carries out its responsibilities during the electric utility industry's transition to competition will have a profound impact as to the role nuclear power will play within the restructured environment.

As I testified 6 months ago, the NRC is at the center of investors' perceptions of the financial risks facing the U.S. nuclear industry. In evaluating utilities that operate nuclear plants, debt and equity investors study closely the processes and actions of the NRC. To the extent that these regulatory responsibilities are carried out in a consistent and predictable manner, investors find comfort with the outlook for both individual nuclear utilities and the nuclear industry as a whole.

I am encouraged that the constructive intentions offered by NRC Chairman Shirley Ann Jackson and the other NRC commissioners at the July 1998 subcommittee hearing appear to be bearing fruit. The NRC has convened public sessions to seek

out stakeholder views on a wide range of technical and safety issues. It is input like this, from the front lines so to speak, that will make it more likely that the NRC's and the nuclear industry's goal of a more risk-informed and performance-based regulatory approach will be achieved.

In July, I highlighted my hope that the processes to review nuclear plant license renewal and transfer could be structured to proceed as expeditiously as possible without compromising appropriate consideration of safety issues. Early indications are that the NRC has set the same goal.

The agency is aiming to complete the Calvert Cliffs and Oconee license renewal cases within two to 3 years from the filing of the applications, a target which, if met, will bode well for the timely handling of additional renewal applications that will be filed in the future.

Similarly, the NRC has issued a final rule providing for a streamlined process for reviewing nuclear plant license transfers. Under the rule, the NRC will seek to complete consideration of most license transfer applications within a 6 to 8 month period after the application is filed. The reviews of the transfer requests relating to Three Mile Island Unit One and the Pilgrim Nuclear Station appear to be on schedule.

While these recent activities at the NRC are encouraging, continued oversight by this subcommittee is called for. It is important that the ongoing transition within the membership of the NRC does not set back these gains. As a former chairman of a state regulatory commission who chose to move on to new life challenges, I know that some of my policy initiatives survived into the new regime and some were cast aside. This subcommittee can play an important role in assuring that the progress made during the past year under Chairman Jackson is maintained under new leadership.

For example, the movement to a risk-informed and performance-based regulatory regime will take time, so periodic assessments by the NRC, the Congress, and other stakeholders will undoubtedly help the process. Likewise, the history of regulatory proceedings, both at the Federal and State level, becoming unduly delayed because of contentious issues is well-known.

It is important that the NRC maintain focus on the movement of license renewal and transfer applications through the process. The timetables the NRC is proposing for each of type of proceeding seem appropriate both from a safety viewpoint as well as from the perspective of the financial community. If the NRC is able to deliver on the promise held out by recent events, I believe investors will be supportive of nuclear power playing a key role in the competitive utility world going forward.