DEFENSE NUCLEAR FACILITIES SAFETY BOARD

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PUBLIC MEETING

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WEDNESDAY,
SEPTEMBER 10, 2003

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The meeting was held at 9:00 a.m. in the Public Hearing Room, Suite 300, 625 Indiana Avenue, NW, Washington, D.C., John T. Conway, Chairman, presiding.

PRESENT:

JOHN T. CONWAY, Chairman
A.J. EGGENBERGER, Vice Chairman
JOHN E. MANSFIELD, Member
R. BRUCE MATTHEWS, Member

STAFF PRESENT:

RICHARD A. AZZARO, General Counsel
J. KENT FORTENBERRY, Technical Director
JAMES J. McCONNELL, Deputy Technical Director
KENNETH M. PUSATERI, General Manager

ALSO PRESENT:

CYNTHIA CARPENTER, Nuclear Regulatory Commission
THOMAS H. BECKETT, Naval Reactors
RUSSELL GIBBS, Nuclear Regulatory Commission
EDWIN HACKETT, Nuclear Regulatory Commission
STORM KAUFFMAN, Naval Reactors

FINAL
TRANSCRIPT
11/03/03 K. Moyley

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8:56 a.m.

CHAIRMAN CONWAY: On the record. Today's meeting and hearing were publicly noticed in The Federal Register on August 4. The meeting and hearing are held open to the public in accordance with the provisions of the Government in the Sunshine Act. To further the President's Initiatives under Executive Order No. 12862 and to provide timely and accurate information concerning the Board's Public and Worker Health and Safety Mission throughout the Department of Energy [DOE] defense nuclear complex, the Board is recording this proceeding through a verbatim transcript and videotape.

As a part of the Board's E-Government Initiative, the meeting is also being made available over the Internet through video streaming. The transcript, associated documents, public notice, and videotape will be available for viewing in our public reading room on the seventh floor of this building. In addition, an archived copy of the video streaming will be available through our web page for at least 60 days.

Today's meeting is the first in a series during which the Board will examine the DOE's current and proposed models of safety oversight and management of the contracts and contractors it relies upon to safely accomplish the mission assigned to DOE under the Atomic Energy Act of 1954 as amended. We will focus on DOE's proposed new initiatives and what impact, if any, they may have upon assuring adequate protection of the health and safety of the public and workers at DOE's defense nuclear facilities.

Our purpose here today, and the remainder of hearings in this series, is to bring together information gained by those who have first hand management, investigative, and oversight experience in the high risk enterprises that potentially pose high risks to the public health or safety, including the workers charged with day-to-day operations. Our intention is to provide a forum where relevant information can be presented and assessed so that we may understand and hopefully gain the maximum benefit from hard-earned experience.

We view the presenters that we will hear from as partners in this initiative. It is our hope and belief that through this joint effort, we may gain a clearer view of the optimum safety management tools that DOE can employ as it safeguards the Nation's trust.

As we proceed in these hearings, we believe it is important to our success in this initiative that we state - and that all those attending to this undertaking understand - we are not here to criticize or judge past incidents, the conditions that brought them about, or the manner in which they ultimately were dispositioned. Simply stated, we meet to learn from the past so that we do not repeat errors: that instead, we may discern if past experiences might offer a blueprint to a responsible path forward. Our success or failure will depend upon full and frank discussion.

The subject matter we now discuss requires this, and the national interest and the public trust compel it. So it is in this spirit that I welcome today's presenters, members of the public, members of the press in our audience, and those viewing our proceeding electronically.

In today's meeting, we will receive the testimony from experienced representatives of the Nuclear Regulatory Commission [NRC] and the Office of Naval Reactors [NR] as to their safety oversight models. In accordance with the Board's practice, and as stated in The Federal Register notice, we will welcome comments from interested members of the public at the conclusion of testimony. (See Attachment A for Mr. Conway's Opening Statement.)

Let me say this. Well, first let me turn to Dr. Eggenberger. Would you like to make any comments?

VICE CHAIRMAN EGGENBERGER: No, I really have nothing to add, except I would like to say that it's very important for us to understand how the various witnesses look at the whole idea of technical management oversight related to safety. That's what we really need to try to learn: the experiences that these people have had and the lessons learned, because at the DOE we have three entities. We have the Headquarters, the field offices, and the contractors.

It's important that the technical management oversight related to safety is understood in the DOE frame of mind. This also goes along with some of the issues that have arisen in some of the initiatives that are being undertaken by the Department. That's all. I just don't want to say anything more. I'm here to learn.

CHAIRMAN CONWAY: Dr. Mansfield.

DR. MANSFIELD: Thank you, Mr. Chairman. I agree with Dr. Eggenberger. This is not, in my view, an investigative hearing into something that went wrong someplace. Rather, we're here to learn. Specifically, we're here to learn the effects of the institutional culture that has been established within DOE and other organizations as a result of their approach to technical management. I think we have to take this seriously because we've seen events, most recently Columbia, where questions of institutional culture were raised, and issues have to be addressed about whether things like that could be fixed.

John Logsdon, one of the members of the Columbia panel, defined "culture" as what you do when you don't have anything better to go on or any better instructions or something of that nature. That seems to be it. We've seen what defective cultures can do and how they can degrade safety. I, for one, am going to be looking at this series of hearings as a way to see what we can learn about how to improve DOE safety culture. Thank you, Mr. Chairman.

CHAIRMAN CONWAY: Dr. Matthews.

DR. MATTHEWS: Yes. I have a few comments that I would like to basically read. First, I want to thank our colleagues from Naval Reactors and [the] Nuclear Regulatory Commission for taking time to come here and talk to us about your oversight experiences. Our organizations share oversight safety responsibility for hazards in nuclear operations, and we share a common goal of protecting the health and safety of the public and workers.

One of the fundamental characteristics of a strong safety culture is a willingness to learn. That's really what we're here to do today: to learn from your experiences in overseeing complex nuclear organizations. The Board is interested in your knowledge as others have said because the Department is on a course to modify contracts to improve productivity and change oversight responsibilities, to assure safe operations, and, quite frankly, increase productivity and strengthen oversight are fundamentally good strategies.

But there are some questions that come out of it. Will the changes improve or diminish safety? Will the likelihood of a high consequence catastrophic event that can occur in these complex high hazard operations increase? Will they stay the same? Or will it decrease? Frankly, I don't know what the answers are to those questions, so we'll be looking for those.

I do have some concerns. Let me explain the changes as I understand them just to put it in context. I think they are threefold. Firstly, there are performance-based contracts that are being designed to provide what appear to be significant financial incentives to the contractors for delivering on schedule and in budget with apparent disincentives for failure to meet performance measures and indicators. Again, you can't argue with contracts that increase productivity. This is always good for the taxpayer.

Secondly, the goal to strengthen DOE line management oversight processes is being done by delegating more authority and responsibility to the field elements to oversee the day-to-day operations of the contractors against those requirements that are in the contract. Thirdly, DOE contractors will be expected to establish comprehensive self-assessment programs to monitor and evaluate all work performed in their contracts. Again critical, rigorous, creditable self-assessment is an important element of good safety. If correctly done, it should decrease safety risks.

In this model, the Office of Independent Oversight will continue to periodically check the effectiveness of the contractors and DOE line management assessment programs. DOE Headquarters will continue to issue safety directives and mission requirements.

So, in summary, I see a triangle for the foundation of self-assessment based on increased contractor self-assessment, increased line management self-assessment close to where the work is being done, and then a smaller section, which is the independent oversight performed out of Headquarters. These changes, in my view, and I come from the contractor side for many years, are (really) part of a decades-old pendulum swing that (really) has attempted to balance safety and productivity. That's really the issue that I see going on.

If you recall in the Cold War era, safety was primarily expert-based: the experts at the laboratories and at the production sites. There were few regulations and very little safety oversight at that time. Productivity in building up the stockpile was extremely high during this period of time. However, I believe, risks were uncomfortably close to the edge. Certainly, environmental insults were considerable during this time.

All that came to a halt at the end of the late `80s, early `90s, primarily because of the end of the Cold War. But oversight during this period was manifested by what I call the "Tiger Team" approach.

If you remember (those), it's when very prescriptive regulations came on the weapons complex from all directions. Oversight was frequent, constant almost, but very disorganized and hard to understand. Contractors had a hard time implementing the changes that were put in place at this time. As a result, productivity plummeted largely because not much was being done. Safety risks decreased, but not because of better safety practices. It was because basically nobody was doing much work during that period of time.

I think DOE and others realized the futility of this rigorous approach, and a common sense method of safety emerged in the mid `90s called "Integrated Safety Management" [ISM] which basically influenced a standards-based, risk mitigation approach to safe work. It really was very well accepted and implemented by contractors. Oversight was still frequent, but it was more focused with a common set of standards. I believe productivity increased, and safety awareness certainly was significantly better from this. In my view, the ISM approach found a nice balance between productivity and safety.

The latest initiative, as I see it, builds on the successes of Integrated Safety Management, but is aimed at giving more of the responsibility and flexibility to the contractors in order to increase productivity. Again, my concern, and this is personal, is that you may be pushing a little closer to the edge and the possibility of a nuclear accident. That's why we're interested in it. Decisions for balancing productivity versus safety will primarily be in the hands of the contractor, as I understand it. Independent oversight seems to be decreasing by DOE due to risk change during this. I don't know the answers, but information from this meeting and the following meetings should really help us and the DOE to benefit from your experiences. So I'm looking forward to hearing your comments.

CHAIRMAN CONWAY: Thank you. Kent, do you have anything?

MR. FORTENBERRY: No, I don't.

CHAIRMAN CONWAY: All right. Jim McConnell, our Deputy Technical Director. Jim.

MR. McCONNELL: Good morning. My name is Jim McConnell. I am the Deputy Technical Director for the Defense Nuclear Facilities Safety Board. I'm pleased to be providing some opening remarks on behalf of the Board's Staff.

This is the first in a series of public meetings that will focus on how best to provide oversight of hazardous government activities. Consistent with the Board's enabling legislation, the purpose of this meeting is to assist the Board in evaluating approaches to oversight in use by or under consideration by the DOE. In this context, I'd like to define oversight, at least; as we're going to discuss it today, to include contractor self-assessment, DOE line management assessment of its contractors, and independent assessment.

As we've all already described, this is an important subject from a safety perspective because oversight is the activity that ensures that safety expectations are actually met. Through oversight, DOE and its contractors assure themselves, their work forces, and the public that hazardous defense nuclear activities are designed, constructed, operated, maintained, and decommissioned in a manner that will ensure safety.

Initially, we'll be hearing from several organizations that have valuable information and experience with various forms and models of oversight. But before we start, it would be useful to put oversight, and particularly DOE oversight, in perspective.

Oversight can be considered as part of a system by which organizations ensure that mission objectives are being satisfied. I'll describe the system in more detail shortly, but first I will also describe how at DOE the elements of the system change depending on their mission objectives. This is complicated in some parts for the DOE because the Department has several different roles and potentially competing objectives associated with them. This is because the DOE sometimes acts as a customer, sometimes acts as an owner, and sometimes acts as a regulatory agency.

The basic system by which the DOE or any similar Government agency ensures that its contractors clearly understand and achieve the Government's expectations comprises three elements, in my view. The first element is rules, directives, consensus standards, and best practices that communicate requirements and expectations. The second element is a contract that establishes specific details of cost, scope, schedule, performance, and methods of interaction between DOE and its contractors to accomplish specific work. The third element is oversight, which ensures that the expectations established in the regulations and in the contract are actually met.

Through oversight, DOE checks to ensure that its expectations are understood and are being fulfilled. If they are not, action is taken as prescribed in the regulations or in the contract to address the problem. In this manner, the three elements of the system (requirements, contracts, and oversight), work together to determine what DOE will receive from its contractors.

As a government agency, DOE has many mission objectives, as I've already alluded to. These include national security, research and development, remediation of surplus facilities and sites, and from our perspective extremely important, protection of the public, the workers, and the environment.

For much of its work, DOE relies upon contractors to perform its inherently-risky activities in government-owned facilities. Additionally and importantly, DOE establishes and enforces its own nuclear safety requirements, although we all acknowledge there are many requirements on the Department that come from other sources.

This structure that I have just described has many advantages, but it is not without its challenges. For example, DOE has three main roles as I described: customer, owner, and enforcer of requirements. These roles sometimes have competing demands that must be reconciled for the Department to achieve its overall mission.

As a customer, it is expected that DOE will focus its attention on the deliverables called for in its contracts. In this role, DOE's expectations are intended to define as clearly as possible the goods, services, and results that the Government seeks. In DOE's terminology, this is the "what" that is specified for delivery. DOE's oversight as a customer is focused on ensuring that high quality deliverables are provided as efficiently and effectively as possible. In this role, DOE delegates a significant amount of flexibility to its contractors to determine how to provide those mission deliverables.

DOE also emphasizes its short-term objectives in its role as the owner. In this case, DOE is also responsible for thinking in the longer term about such issues as preserving its core capabilities and maintaining or replacing its capital assets. Another key aspect of the owner role is that DOE maintains ultimate responsibility for the accidents that could occur in its facilities as well as the long-term environmental consequences of its operations. Oversight in this role should focus not only on "what" is accomplished but "how" it is accomplished, because different approaches to satisfying short-term objectives can have varying impacts on long-term objectives and can pose greater or lesser risks to the public, the workers, and the environment.

DOE must be more self-reliant in this role because the timeframe of activities associated with these types of issues generally exceeds the length of a typical DOE contract. By self-reliant, I mean that DOE maintains a sufficient cadre of technically competent personnel to fulfill these responsibilities because these responsibilities cannot be delegated to the contractor.

In its enforcement role, DOE focuses on the work performed by its contractors and compares it to preestablished expectations for safety, security, financial management, and any other area of concern to the Government. These preestablished expectations are generally set forth in rules or directives. DOE's oversight in this role is aimed at ensuring that performance is consistent with requirements and identifying areas where performance improvement is needed. Enforcement is primarily a Government responsibility. It is important to note that the safety benefit of enforcement is bounded by the quality of the safety requirements that form the basis of the assessment and by the competence of the people who perform those assessments.

The complex system that I've just described is further complicated by the fact that DOE is currently implementing or is at least planning three simultaneous initiatives that affect this system. Specifically, DOE is changing its method of specifying requirements, changing the focus of its major contracts, and planning to change its oversight methods.

DOE is changing its directive system and its approach to promulgating requirements for its contractors to emphasize "what" is to be accomplished but not necessarily "how" it is to be accomplished. This approach is intended to provide contractors with the flexibility to tailor and streamline their approaches to their work to allow for improved efficiency and effectiveness. This approach has obvious potential advantages, particularly from the perspective of productivity.

However, given the significant inherent safety risks of DOE's mission, there is also potential for drawbacks to relaxing these centrally controlled safety requirements that have been developed based on the collective experience of the defense nuclear complex over the last 60 years. This is particularly concerning because much of that hard-won experience has refined how best to perform activities, not just what activities to do.

DOE is in the process of changing many of its contracts to specify and reward achievement of ultimate outcomes or results rather than intermediate process outputs. DOE contracts are increasingly specifying endstates, products, or conditions, but are becoming less prescriptive about methods to achieve those required outcomes.

For example, DOE may require a contractor to close a waste tank rather than specify how to treat and dispose of the waste in the tank. This can be a positive step to ensure that DOE's contractors are focused on producing the important results DOE expects. However, this approach can result in unintended consequences if DOE and its contractor personnel perceive that producing results warrants taking greater risks than should be considered acceptable.

DOE is in the early stages of an

initiative to revise its oversight model and methods. The asserted advantages of such a shift are that the government will get its work done more efficiently and just as safely, thus allowing a reduction in government costs and staffing while accelerating completion of its work. These improvements would be welcome. However, there is the potential that the new system will not be as effective as the one it is replacing, which could result in a decrease in safety. This is one of the reasons why the Board is conducting this current series of public hearings and meetings.

Through these meetings, the Board will examine what impact, if any, DOE's new initiatives in oversight and management of contractors may have on protecting the health and safety of the workers, the public, and the environment. Information presented at these meetings should provide the Board and the DOE with insights concerning both positive and negative aspects of various methods of oversight.

This morning, the Board seeks to gain a broad perspective by hearing about the experiences of other organizations that have used different forms of management and oversight. Some organizations have exerted rigorous oversight, while others have relaxed the level of oversight to varying degrees. Our intent is to explore with these organizations what they have learned as a result of using these various oversight models, particularly with regard to safety performance.

In subsequent public meetings, the Board will explore DOE's management and oversight policies. DOE personnel will be invited to discuss their new approaches to contract reform, contractor self-assessment, and federal oversight.

I'd like to end at this point by suggesting several explicit and practical questions that we may want to explore as we progress through this meeting and the others in the series.

1. Can the government's management and oversight be streamlined without degrading its ability to ensure health and safety?

2. What criteria should be used to judge the adequacy of the federal oversight system?

3. What criteria should be used to judge the adequacy of the contractor self-assessment program?

4. What are the minimum levels of federal or contractor oversight that should be maintained?

Subject to any questions from the Board, this ends my remarks. Thank you.

CHAIRMAN CONWAY: Thank you. All right. As I previously mentioned this morning, we will receive testimony from experienced representatives from other organizations. First, I would like to welcome representatives from the U.S. Naval Sea Systems Command, Mr. Thomas Beckett and Mr. Storm Kauffman. If you would be kind enough to give your names and titles so the stenographer can identify you for the record.

MR. BECKETT: Thank you, Mr. Chairman. Thomas H. Beckett. I'm the Deputy Director for Naval Reactors, a joint Department of the Navy/Department of Energy Program.

MR. KAUFFMAN: Storm Kauffman. I'm the Director of Reactor Safety and Analysis for the Naval Reactors Program.

CHAIRMAN CONWAY: Mr. Beckett.

MR. BECKETT: Thank you, Mr. Chairman, and let me thank you and the other Board Members for giving us the opportunity to testify today as to our oversight practices in support of the Naval Nuclear Propulsion Program. I would like to acknowledge the long and warm relationship we have with this Board and the sharing of ideas back and forth that we've done over the years as one of the key elements as we both execute our responsibilities to the public for nuclear safety in these very high risk areas.

A little truth in advertising before I start here. We were invited to come as representatives of the Naval Sea Systems Command [NAVSEA] and to talk about NAVSEA oversight. I believe that stems from a recent benchmarking exercise between NASA [National Aeronautics and Space Administration] and the Navy which was overseen as its agent by NAVSEA. It focused on two activities that are both high risk and successful. The first is the Submarine Safety Program, and the second is the Naval Reactors Program.

Today, I will only be talking about the record of the Naval Reactors Program. I would ask you to bear in mind that, as we talk about that, the lessons may not transfer from our organization to others due to different missions, cultures, leadership, or experience. I leave it to the Board then to take what lessons that you may be able to glean out of our experience and apply them in this other area.

Many times Admiral Rickover was asked to characterize what it is that he did to make his program successful, and his testimony is legion in this area. Most recently in 1979 post-Three Mile Island accident, he testified before the Congress as to how his program was organized and how he thought it was successful. It would be difficult for me to capture in a few words or slides the full extent of what I think brings our experience to bear, but let me try nonetheless.

There are a few things that I think are important, and I would like to highlight them first, if you'll bear with me, Mr. Chairman. I know much of this explanation of the Naval Reactors mission is not new to you, but in the interest of some of the people, I would like to proceed.

CHAIRMAN CONWAY: Fine. Excellent.

MR. BECKETT: We do have a focused mission, which is to provide militarily effective nuclear propulsion plants and ensure their safe, reliable, and long-lived operation. That is a very simple and yet elegant statement of our mission, which you will see talks about safety. In executing that, it's been very important that we have clear and total responsibility and accountability to the President and the Congress for all aspects of our mission's success or failure.

Likewise, we are organized in a very

simple structure which has been maintained over the years. Very important to us is the fact that our Director has an eight-year tenure, which was originally specified on Admiral Rickover's retirement by Executive Order from President Reagan and is now embodied in law. Most recently, the NNSA [National Nuclear Safety Administration] Act [Public Law] 106-65.

CHAIRMAN CONWAY: And I think that's a very important fact: that the Director has this relatively long assignment compared with other agencies, and has continuity, and has combined continuity with the experience. I think that's one of the essential requirements, if you will, that the President has given to your organization to assure that continuity for at least the eight-year period. That's excellent.

MR. BECKETT: And if I might, sir, Dr. Mansfield had talked about culture earlier. One of the common definitions out there today about culture is the collective experience of an organization's leadership. It's clear that without collective experience over many years, it's difficult to have a consistent culture.

The fact that we have a small headquarters organization with field activities reporting to us is important. I would also emphasize that our program specialized in the horizontal organizational structure with few levels reporting up to the senior admiral in this case. That is a very important part of who we are and how we do business.

We affectionately refer to this chart as our "starburst" chart because, no ego intended, but the star in the center is the Naval Reactors headquarters organization. I hope you will see that we're a lean Headquarters with 380 people, roughly half being technical people, engineers with engineering degrees and post-graduate engineering experience, and then the remainder of those 380 being clerical, administrative, and financial experts.

We manage 82 nuclear-powered warships for the Navy, over 40 percent of the nation's major combatants. That comprises 103 operating reactors, which is coincidentally the same operated or overseen by our sister agency in the Nuclear Regulatory Commission. And in the breadth of our responsibilities, we're responsible for the licensing of nuclear work in the nuclear-capable shipyards. We operate schools for the training of our operators. We, in fact, train about 2500 students per year in four operating reactor plants. We manage a specialized industrial base providing components to the program, and that comprises over 900 individual suppliers.

The reactor plant design and operation is overseen by dedicated DOE-owned, contractor-operated laboratories: Bettis and Knolls Atomic Power Laboratory [KAPL]. Each of these places has a Headquarters representative in the field who is charged with providing oversight for the individual organization to make sure that the mission is carried out.

The nuclear technology is a high risk, difficult technology. We thank Admiral Rickover for recognizing that up front and realizing that the way to manage an effort like this is through defense-in-depth, starting with a simple, rugged, and redundant design, including in the procurement of components rigorous quality control, operating with a level of formality in both quality control and in operations such that all procedures are documented, and compliance with those procedures is expected. Oversight, as I indicated before, extends beyond the direct field representatives reporting to the Admiral to other field activities that provide oversight and direct reporting to our Director.

But I would have to tell you that if there's one thing that distinguishes us from many of the other high-risk organizations, it's the people in the Headquarters organization and in the field. The key is those people that we have working in our Headquarters organization and in the field. Jack Crawford liked to refer to the "demanding customer." I like to refer to it as the "demanding and well-educated customer." We carefully select our people. We train them well. We keep them motivated by giving them responsibility and authority in their area of expertise.

I'm not going to go into great detail on our 55 years of operation other than to indicate that this slide shows some of the metrics of our success with an open record of accomplishment. I would say that continued success is dependent on our maintaining technical excellence in these areas. I would now like to turn it over to Mr. Kauffman to talk in a little more detail about our oversight activities.

CHAIRMAN CONWAY: Mr. Kauffman.

MR. KAUFFMAN: Thank you. I could go on in quite a lot of length and detail regarding our program philosophy and the way that we implement it.

But I'm sure the Board is well aware of a lot of those details. Past and present Board members and technical staff are former program alumni. In fact, some of the things I will talk about should sound quite familiar. Many of them were captured in the Board's own report, *TECH-10, [An Assessment Concerning Safety at Defense Nuclear Facilities—The Technical Personnel Problem]* in 1996, which was written by some former Naval Reactors alumni in part, so I won't dwell on some of those aspects.

In this case, I will go into further detail on the two items shown in dark blue: the centralized technical control and the emphasis on close and frequent technical oversight, because I think those are matters that pertain in particular to the Board's current interest. However, I would like to touch on a few of the other items.

The overarching safety approach is that safety responsibility cannot be delegated to contractors, but we do expect the contractors to take that responsibility as their own and ensure that all safety considerations are satisfied. In other words, they should do the job, maintain safety, as if we weren't there, but we do not delegate that safety responsibility to them. It remains ours.

We have worked very hard to ensure that all personnel in the organization, not just our Headquarters organization, but also throughout the contractors, the field offices, everyone in the program, we take personal responsibility for technical, safety, radiological controls, environmental matters, basically all aspects of work. A person is supposed to treat the job as if they owned it forever and, therefore, assure that it will operate satisfactorily in the long term. That requires an in-depth technical understanding of all aspects of the work at all levels. You can't know just your own job. You have to know how it fits into the overall whole, understand the right people to talk to and when to talk to them, when to communicate up and down the chain.

Headquarters is involved in really all aspects of Naval Reactors program work, design, operations, procedures, what we refer to as "cradle to grave." We're equipped with the knowledge to handle problems that come up anywhere in that process and carry that information through so that we're aware, when additional problems or issues develop, how they were resolved in the past.

We emphasize prompt reporting, evaluation, and correction of problems. One of the hallmarks of our organization is communications. We have parallel, multiple paths of communicating information. It's what an electrical engineer might call a "race condition," where you try and beat your equivalent in informing other people of what's going on so that you're sure that everybody who needs to respond to a problem promptly is aware and can get to work on it. That goes all the way up to the Admiral, in that there are multiple direct reports to the Admiral. He has multiple sources of information. I'll get to that in a minute.

As I said, we require personnel to have in-depth technical understanding of all aspects of the job. That requires rigorous and broad but practical training in the aspects of nuclear engineering and other technical details with naval nuclear propulsion. We emphasize continuing training at all levels and through a person's career.

But in particular, we take highly qualified, technical individuals out of college and have a standardized training program that includes a six-month stint, dedicated full-time, at our Bettis Reactor Engineering School to bring everybody up to at least an equivalent level of understanding of nuclear engineering as it applies to naval nuclear propulsion. Then there is a continuing training program after that. Part of this process includes a couple of weeks at a training prototype, where our staff actually gets to see a plan in operation. After that fixed training period, then we continuously look for opportunities to maintain people's proficiency and improve their technical knowledge. Admiral Bowman, as a former Chief of Naval Personnel, continuously emphasizes training and insists that we maximize training opportunities for even the most junior personnel.

DR. MANSFIELD: Mr. Kauffman, can I ask one question on that? Do you have in-house training? Do you have courses within Naval Reactors to which people are assigned to go?

MR. KAUFFMAN: Yes, we have multiple different ways of handling training. As I said, there's a six-month dedicated school.

DR. MANSFIELD: I mean in the course of five years after the six-month school.

MR. KAUFFMAN: A lot of those courses are offered, and individuals can sign up for them. We also have all-hands training opportunities on specific subjects. For example, I have a technical manager coming down this afternoon to give a presentation tomorrow on loss of coolant analysis techniques for the entire Headquarters staff. So we look for brief training presentations.

We offer training courses that include postgraduate courses given through the Naval Postgraduate School. We have Bettis and KAPL, our two laboratories, to provide training for individuals by sending personnel down. So we try and provide a variety of different training opportunities.

DR. MANSFIELD: Thank you.

MR. KAUFFMAN: Moving on to the technical aspects of the design: in designing naval nuclear propulsion plants, we emphasize conservative designs with ample safety margins. The objective is that it's best to prevent the casualties from occurring, but we recognize that we can't prevent every casualty, so we have defense-in-depth, multiple layers of protection, to respond if something does go wrong, either an operator error or an equipment failure.

Rigorous quality assurance of all aspects of our work is highly important to minimize the likelihood of those initial failures or at least minimize their severity should they occur. One thing that has come out in the evaluation of the Columbia loss is the importance of testing. That's always been a foundation of our program: that you test to determine how the system will behave, test to determine whether or not the design specifications are met, and that thorough testing of equipment goes on outside a ship on initial prototype equipment. It goes on in-ship with extensive test programs, and it even continues after a ship goes into operation as we continue to gather data on the performance of equipment and the reactor plant itself.

DR. MATTHEWS: Excuse me. Can I ask a question on that specific topic? How does Naval Reactors manage safety-related research? You rely on technical knowledge, but research is always evolving, materials, performance and hazard environments, LOCA [loss of coolant accident] tests. How do you manage that so that it's not tied into a mission-deliverable, and how it is applied across that board?

MR. KAUFFMAN: Obviously, there is a lot of applicable research that goes on outside the Naval Reactors program. So we stay as plugged in as possible by sending people to technical conferences and assuring that we are aware of what NRC, in particular, is doing. As far as our own research, we either respond to problems where you have something in-fleet, or you notice that something is not behaving as expected and establish a test program to go evaluate that condition and further research it, or hopefully you've done that testing up front.

When you initiate the design, you identify those places where you are going to do something different, something new, something beyond the past scope of experience, and establish a test program. Our laboratories are responsible for running that test, and both Bettis and KAPL have extensive test facilities, thermohydraulics and materials testing, and radiation testing.

What happens is the laboratories identify the need for some additional data or Naval Reactors directs them to evaluate the need for additional data. They prepare a recommendation for our approval. It goes to the individual group that has the lead in that area, for example, materials. It's assessed not only by that group but other groups that have an interest in how those materials perform: for example, the reactor engineering section.

Eventually, Naval Reactors will approve that testing, usually a good number of technical comments help guide the prime contractor the way that Headquarters thinks is appropriate. Then we follow the testing. Our field offices follow it on a daily basis. We follow it on a regular basis either with phone calls, periodic reports, or various trips to actually observe the testing.

DR. MATTHEWS: Thank you.

MR. KAUFFMAN: I'll try to wind up this slide. One thing the Naval Reactors Program is well known for is the principles of formality, discipline, and precision, and also skepticism, frankness, self-criticism, integrity, and attention to detail. All of those are easy to say. They are hard to implement. It's one of the reasons why Naval Reactors has tended to only bring people into the program directly out of college to try and train them in that questioning, open, skeptical attitude right from the start.

Then, once you've taught a person to ask the right questions, it doesn't matter if they move to radiological controls or material science or whatever. They can still be a very effective engineering manager by just making sure that people know what they are doing.

MR. FORTENBERRY: Mr. Kauffman, can I ask a question? One of your points here is this strong central technical presence. I wonder if you would speak a bit about the use of consensus standards as opposed to specific standards determined by this central technical organization.

MR. KAUFFMAN: I guess it's a little hard for me because I don't think we have consensus standards, if I understand what the term is supposed to mean. The way that we handle our technical requirements is that usually they originate through discussions initially between the prime contractors and Naval Reactors headquarters.

The prime contractors then developed them in detail. Those are provided as a formal technical recommendation. That technical recommendation is reviewed again in detail by all of the affected Naval Reactors groups at Headquarters. Naval Reactors frequently has numerous technical comments that go back and have to be resolved by the prime contractors.

Once we finally issue those standards, those are the standards. Those are the requirements. If a plant design, a procedure, something has to deviate from those requirements, in most cases that has to come to Naval Reactors for formal written approval.

MR. FORTENBERRY: So if I can just summarize, clearly there would be in existence consensus standards that could be utilized, but in your program, because you believe it's to your benefit and addresses the unique needs of your program, you've chosen to essentially develop those technical standards yourself and enforce them yourself.

MR. KAUFFMAN: In general, we take public standards and, for example, we follow NRC requirements, but we don't just cross-reference those standards. Instead we review them, determine what is appropriate for our particular design application, sea-going warships, and then adapt those and write them down and implement them for ourselves.

MR. BECKETT: If I could, there's a perfect example of this. That's in ISO 9000, which is the International Standard for Quality Organizations. We looked at that, and as a demanding customer, we concluded that there were some things that we would put on top of that International Standard in order to make it applicable for our business. So we wrote supplementary technical requirements which get invoked in addition to the ISO standard in order to make it applicable to our program.

MR. KAUFFMAN: To wrap on this slide, I could summarize to say that one of our basic approaches is to try and prevent big problems by working on the small ones. Or to refer back to that previous Board report from 1996, it's important to understand that apparently small lapses or malfunctions can eventually lead to serious safety consequences if they are not resolved and dealt with.

Regarding centralized technical control, that's really what Naval Reactors' program is about. As Mr. Beckett said, Admiral Bowman, our current Director, and all the directors previous, are responsible for all aspects of our work. To do that, the Admiral must receive frequent oral and written reports from all program activities. Those are not cursory reports. They are detailed, technical reports. He understands them. He asks questions about them. He tasks people to respond to him to identify what's going on regarding certain issues.

The Headquarters program itself relies on outstanding personnel, and all the management is technically trained. We do have a financial group, but other than that, everyone of the section heads, even in a project officer or program manager position, has technical training. When we briefed NASA about how we did business, one of the things they just also couldn't get over was the fact that our public affairs officer was technically trained. They just thought that was great because we were talking to technically trained people.

CHAIRMAN CONWAY: Let me ask you a question now. The U.S. Naval Sea Systems Command is a military organization, is it not?

MR. KAUFFMAN: Yes, sir.

CHAIRMAN CONWAY: You are a civilian, I believe.

MR. KAUFFMAN: Yes.

CHAIRMAN CONWAY: Now, the military officer, a commander or captain, who may be in your organization, does he depending upon his rank make technical decisions in this area? In other words, I guess to say, "Keep the sleeve off the table," if you are in the military in uniform.

MR. KAUFFMAN: One of the things that I was fascinated about when I first came to Naval Reactors -- because I'm one of the few people who came in as a civilian -- was the way Admiral Rickover set it up. You can't tell who is in the Navy. I was never in the Navy.

All the people wear civilian attire, so that there is no inherent rank issues in that you have somebody that's an ensign but the expert on materials arguing with a captain, who does not understand material issues. So he took that off the table, but, yes, we do have people ranging all the way from ensign up through captain, and then, of course, the Admiral himself. They are mixed in and basically indistinguishable in how they perform their job from the majority who are civilians.

Going back here, Headquarters' role is to directly oversee the adequacy of all technical requirements. To do that, we exercise technical approval over contractors, namely, the laboratories. We have a procurement prime contractor in addition. We have private and public shipyards that actually construct and do major overhauls on the naval nuclear powered ships. Then we have the vendor base that Mr. Beckett mentioned.

As I previously noted, there are multiple reporting chains to assure that issues are promptly brought to the attention of cognizant personnel, and that usually means multiple cognizant personnel. For example, a problem on a ship will not only be identified to more than one person at Naval Reactors Headquarters, but to shipyard management, to the field office that represents our Headquarters at that shipyard, and also likely to the prime contractor management. The process assures that we can direct and oversee all aspects of the program operation. To do that, we need to not only monitor but direct personnel actions related to the program. For example, as is well known, Admiral Rickover set up a process in which he would personally interview all incoming officers to the naval nuclear operating corps, and that is continued. Admiral Bowman still does that. So we have a direct hand in personnel selection. We obviously carefully select personnel for Headquarters, also.

We direct and oversee our own logistics functions within the Navy to assure that nuclear plant parts are available and maintain an adequate stocking level and quality. We control our special nuclear material, including safety analysis for shipments and proper escort procedures for shipments. We're responsible for research and development throughout the life of a plant all the way through to its disposal. As I'm sure the Board knows, we've dismantled on the order of 100 nuclear-powered submarines and cruisers, and about that number of reactor compartments have actually been taken to Hanford and placed there for permanent disposal.

To make all of this work properly, we need not just to put the requirements out there and hope they are met. The old saw is, "You don't get what you expect, you get what you inspect." So we have periodic audits by cognizant technical personnel. The advantage there is our Headquarters staff who are actually responsible for the technical requirements go out and participate in audits.

We don't have professional auditors, per se, that know auditing but don't know the technical aspects of the work. By sending the technical personnel out to do the audits, they get to see their requirements in action, understand what does and doesn't work, and they can provide some expert guidance on what has worked at other sites and may be an appropriate resolution for a problem they uncovered during an audit.

As Mr. Beckett said, our approach is as a knowledgeable and demanding customer. To do that, we have to make sure that the customer is fully qualified to assure nuclear safety. One important aspect of that is without an equivalent level of technical competence at Headquarters within the government staff, we feel we could not effectively engage in a technical dialogue with the expertise that we have at our prime contractors. So we work very hard to assure that our Headquarters people are as much expert in the details of our work as anybody at one of our contractors.

MR. FORTENBERRY: Mr. Kauffman, another question. A lot of attention is being brought on this strong central technical control in NR, and I certainly don't hear a lot of complaints about glacial speeds of getting things through the system. Apparently, all of your waivers, all of your exceptions, your technical requirements, the approval of those, the enforcement of those, are all funneled through this central technical control organization that you're referring to. I'm trying to get a sense of how you are able to do that where what one would expect would be this huge bottleneck by trying to maintain this kind of control.

MR. KAUFFMAN: I guess the key is prioritization. We deal with some issues where glacial pace may be acceptable and appropriate and other issues where it's an urgent fleet problem and it needs to be resolved now. Our Headquarters personnel understand pretty much from the day they start work that you put in the effort necessary to solve the problem in the timeframe that's required. So if a ship notifies us of an issue, we turn to and make sure that we come through all the technical resolution within the time required to support the ship or come up with an interim action that is safe and acceptable for ship operation while we go off and do the further research or evaluation that may be necessary if we can't squeeze it in the short time period available.

DR. MANSFIELD: And have you found that you can preserve your principle of differing adverse opinions in an accelerated process like that?

MR. KAUFFMAN: Yes. And people are not shy about expressing differing opinions. Admiral Bowman, in particular, has very strongly emphasized the airing of differing opinions and frequently can't believe it when we bring in an issue saying there are no differing opinions and that we've all agreed, because he pretty much just expects that there is someone out there.

DR. MANSFIELD: Even on these urgent fleet requests?

MR. KAUFFMAN: Yes. Now sometimes that means that we default to a more conservative course than we might on further reflection. Then as we come through the additional evaluation, we may back off somewhat on the initial action.

DR. MANSFIELD: Okay. Thank you.

CHAIRMAN CONWAY: Tom, do you want to say something?

MR. BECKETT: Yes, let me explain in a

little more detail the answer to your question. We do have tracking systems that track every piece of incoming correspondence to Naval Reactors requiring an answer. One of the jobs then of our project managers is to make sure their projects' needs are being met from a scheduler's standpoint. There is that pressure to get the answers out.

You mentioned waivers as one of the things, and I cringe a little because waivers are an anathema to our Headquarters organization. If, in fact, we believe in formality and documenting our requirements and then meeting those, you have no waivers. In fact, our default position is usually, "No waiver will be entertained." That cuts way down on the incoming correspondence.

There are occasions when a waiver may seem appropriate, when in fact what it means is your specification or overarching requirement was too narrow and needs to be broadened. That's more often what we do than waiver approvals themselves.

CHAIRMAN CONWAY: Mr. Kauffman.

MR. KAUFFMAN: And just to recap the discussion, centralized technical control, our approach is that the government provides technical direction, guidance, oversight for organizations, (our prime contractors, our shipyards, our nuclear crews), who are staffed by highly competent and experienced professionals. All of those people are expected to do their job, as I said, as if we weren't there, but then we provide the additional technical direction, additional oversight, and we have the responsibility for the safety and reliability of program operations.

To close, I'd like to briefly discuss our close, frequent technical oversight. As I said, inspection is the key to make sure that the requirements are actually being met. As Mr. Beckett mentioned, we have onsite field offices at most of our major locations, such as our prime contractor laboratories and shipyards, who do ongoing surveillance and auditing. At shipyards, they may stand monitoring watches where they just spend two hours watching how the crew or the shipyard does something.

Another aspect of our organization mentioned already by the Board this morning is the importance of self-assessment. We have been strongly emphasizing improved self-assessment capability. Our approach is we have an activity perform a self-assessment, and then we go out and do a periodic Headquarters-led review or audit of the activity. One of the things we look at is the quality of their self-assessment. Is it honest? Is it in-depth? If we find problems with the self-assessment or if we find problems the self-assessment doesn't identify, then that's one of the issues that gets raised.

CHAIRMAN CONWAY: Is this your people's self-assessment or the contractor doing the self-assessment?

MR. KAUFFMAN: It's the contractor doing the self-assessment. The general process, for example, for a shipyard is that the shipyard does their own self-assessment. Our field office does an assessment of self-assessment. The Headquarters team shows up, and they do an assessment of the self-assessment and go out and do the detailed onsite evaluation.

CHAIRMAN CONWAY: Do you do this in parallel or do you do it in series?

MR. KAUFFMAN: Do you mean the contractor self-assessment? It has to be done prior to our team arriving.

CHAIRMAN CONWAY: Okay. So then your person that is at the site, does he or she follow along watching the contractor do his self-assessment, or does he stand apart and let the contractor do it without him participating, and then does it in series?

MR. KAUFFMAN: The general approach is that the activity being evaluated does the self-assessment and provides it to the audit team. However, the audit team may request that they watch the activity, assess a particular job.

CHAIRMAN CONWAY: That's what I'm getting at.

MR. KAUFFMAN: So, for example, in radiological controls, what will frequently be done is: we almost always do a radiological controls drill, and part of the drill is that the activity performing the drill has their own monitors, their own evaluators, who are expected to write up issues that they note in performance of the drill. Part of our team's assessment then is the comprehensiveness, the validity, of the comments by the site's own monitors. So in certain areas, we do that assessment of the assessors.

MR. BECKETT: Let me explain, too, that self-assessment is a 365-day-a-year job. It's not just done prior to a major site audit or a major customer visit. So we expect any day of the year that we could show up sight unseen, unannounced, and be able to look at their self-assessment, see if they know where their weaknesses are, and see if they have actions in place or plans to address those actions.

MR. FORTENBERRY: Yes, if I can, Mr. Kauffman. What you were describing is layers of what some people would call "duplication." I would call it "redundancy" in terms of assessing. And the Chairman, I believe, was looking into the independence and whether or not that is critical or not.

For example, if you had one of your layers doing its operation jointly or sharing resources, you may, in fact, lose the redundant effect that I think you're trying to get by those various assessments. I believe what I heard was that it is important. You do protect that independence, which is different than saying you might request to watch an assessment, since you are evaluating that assessment. You do those separately is what I think the answer was. Right?

MR. KAUFFMAN: We call it "walking the fine line," which means that at the end of the day, we're responsible for the outcome. So there are times that you need to partner and being with the contractor to make sure that the outcome is successful. But in general, you can walk up to that line of being an effective oversight organization and not cross over. Because at the end of the day, if you're the regulator, you have to be ready to regulate.

MR. McCONNELL: But just to make sure that I understand, when these situations where the Naval Reactors assessor is time-coincident with the contractor's assessor, the reason is because your assessor is evaluating the performance of their assessor. They are not redundantly looking at the same thing.

MR. KAUFFMAN: That's part of it. In fact, if one of our people is evaluating a radiological job, they are assessing the evaluator that the site puts in place, but they are also assessing the job. So they may end up with comments on the actual technical work. They may end up with comments on the quality of the assessment of the technical work. Usually they end up with both.

CHAIRMAN CONWAY: Let me get this point. You have site representatives.

MR. KAUFFMAN: Yes.

CHAIRMAN CONWAY: Does the site representative have the authority to issue a stop order?

MR. KAUFFMAN: Yes.

CHAIRMAN CONWAY: So he or she in that position can stop the job if they think that it's not being done safely.

MR. KAUFFMAN: Yes. And if, for example, one of our prototype site representatives directs that one of our training reactors be shut down because of an issue, it requires Admiral Bowman's agreement, the Director's agreement, in order to start back up. So you have to come and explain to the Admiral what the issue was and why the corrective action is adequate to resume work. Now that's not true for everything. If you just saw a fall protection problem and stopped the job, you wouldn't have to go to the Admiral.

CHAIRMAN CONWAY: You follow the operational readiness reviews. In other words, something has been shut down because of a safety issue. They then, presumably the contractor, correct whatever the deficiency is. Now prior to starting up again, do you require the contractor to go through an operational readiness review to be sure that they have corrected the safety issue and/or the procedures now, and the personnel that will be providing the work know what they are doing?

MR. KAUFFMAN: Generally, yes. It depends on the severity of the issue. If the issue was that you were not following a procedure, and the reason why you weren't following the procedure, is you had the wrong procedure, and that's an obvious problem, then you may not have to do as big a corrective action program as you would if you just found that general performance of the personnel doing the work was substandard and required corrective action. The response varies with the severity of the issue.

Now I don't want to leave the impression that this happens all the time. It's in fact very infrequent. Most stop work situations are in fact initiated by the site itself because they recognize the significance of the Naval Reactors' representative having to step in and take that action. So they are very conscious of monitoring their own operations and taking appropriate corrective actions.

DR. MANSFIELD: And this injection of Naval Reactors management even from Headquarters, it's not particular to purely safety issues, but manufacturing issues in general? I realize that in your business quality is safety, but the manufacturing in general -- do you do stop work if you see that an outcome is not what you expect, paints the wrong color, rust where it's not supposed to be, things like that?

MR. KAUFFMAN: Yes, although it's secondary to your vendors. We don't necessarily have immediate visibility of that. So somebody making a small valve is handled differently than the shipbuilder who is actually assembling the ship in the shipyard.

DR. MANSFIELD: I see. Okay.

CHAIRMAN CONWAY: Mr. Kauffman.

MR. KAUFFMAN: To try and wind this up, I've already talked about direct reports to the Director, Admiral Bowman, and top Headquarters' staff on issues. Again, I would like to emphasize that those letters are not just filed, aren't read and burned. Frequently, those generate actions either at the initiative of the cognizant technical personnel who see them or fairly frequently at the initiative of Admiral Bowman himself, who will request further information or immediate action to resolve some issue discussed with him or covered in one of his periodic letters.

Part of the whole process is reporting any deviations from normal operations. We try to train all of our program personnel and, in particular, commanding officers of warships that if you see something that is unexpected, that's odd, don't assume that we know about it. Don't assume it's okay. Ask the question. Questioning attitude is again one of the principal philosophies in our program.

As we've already touched on, we pretty much require Headquarters' technical approval for just about every detail of design and procedure. That's a way not only of assuring that they are right and they are thoroughly reviewed, but also that we're fully aware of what's going on.

To finish up, our program feels that we've established high standards, but to maintain those high standards, you need constant vigilance. You need to take actions to assure performance, that those standards are actually met. We work very hard at that. It's a full time job.

CHAIRMAN CONWAY: Thank you. Dr. Eggenberger.

VICE CHAIRMAN EGGENBERGER: I'd just like to comment. I've heard all this many times as a 12-year former contractor to the program. That's the way it worked then, and I see it still works the same way. The thing that always impressed me was you always told me what you wanted. You always asked me how I was going to do it. Then you always asked me what standards I was going to use to achieve it. You always asked how long is it going to take, how much money is it going to cost, and go execute it. By the way, we'll watch you do that. It was very effective. Things got done on time, generally under budget, and successfully. My involvement was basically with the General Electric [GE] and the Combustion Engineering [CE] prototypes. We don't have very many of those left anymore. So I enjoyed being with the program. The lesson that I know I learned and that we are still learning from your program is the correct way to do things.

MR. KAUFFMAN: Thank you.

CHAIRMAN CONWAY: Dr. Mansfield.

DR. MANSFIELD: I made my comments already.

DR. MATTHEWS: I'm not quite sure how to phrase this question, but you've described a very rigorous process that obviously is valuable, and I agree with Dr. Eggenberger's comments. Without repeating your presentation, can you give me thoughts on how you keep your comfort level on those rare random events that surprise us all through our careers? Do you know what I'm asking you? It's one that you didn't expect. How do you sleep at night, I guess, against that type of thing?

MR. KAUFFMAN: Well, as Tom's pointing out in the box on the bottom, we try to prevent the big problems by working on the small ones. When you asked the question, the thing that immediately popped in my mind was an analogy that the predecessor to Tom used to always make, which is: "Naval Reactors is a lot like a duck. It looks placid and very calm above the surface, but it's frantically paddling if you look underneath."

That's sometimes our method of operation in that a fleet problem is identified to us, and we reassure the ship that we'll evaluate it, and we'll get back to you. We basically go to battle stations. We work very hard. We assess it. We ask all the "what if" questions. It can be a very frantic process. Fortunately, it's not frequent, but with those ones that are really surprising, we just marshal the resources that are necessary. We keep people at the prime contractors, at the shipyards, long hours evaluating and doing detailed technical assessments until we come through a determination as to whether or not it's okay because we've evaluated the unexpected condition and shown it's acceptable, or we have to take some kind of action.

For example, we had a case earlier this year where there was an issue about a particular circuit in a particular set of equipment. We spent about 36 hours frankly evaluating it, put out a procedural restriction for plant operations, and then worked people overtime in order to develop a permanent equipment fix to eliminate the need for the procedural restriction.

MR. BECKETT: Let me explain, too. We have a lot of confidence in the process we use when things go wrong. That involves putting all the facts down on the table to make sure you understand the full depth of what really happened, and then trying to come up with the root cause and corrective action. If you have confidence in that process, and then when you come up with a list of corrective actions and have smart people preparing them, and then smart people second guessing and overseeing them, you know you have the full universe of corrective actions down, and it's a matter of executing to that written formal plan.

MR. FORTENBERRY: I have a question.

CHAIRMAN CONWAY: Thank you. Go ahead.

MR. FORTENBERRY: You do make a point that conservative designs imply safety margins. Do you ever get pressure to examine, for example, "Are we safer than we need to be?" I'm interested in what kind of pressure, where it comes from, and how you deal with it. Maybe you are going overboard here, and you have too much conservatism, too much safety margin. Can you speak to that a little bit?

MR. KAUFFMAN: We have internal discussions regarding those balances as to whether or not this safety feature, this safety requirement really is appropriate and is necessary. One of the things that we wrestle with is that we're really dealing with four safeties. We're dealing with reactor safety, ship safety, personnel safety, and public safety. You can't solve all four of those with one set of requirements. You have to maintain a balance.

Fortunately, a lot of the things that you do for ship safety and reliability go a long way to enhancing reactor safety. So our approach is to try and make the requirements that are necessary to implement for reactor safety something that is a win-win type situation: figure out how to serve a dual purpose that actually improves the operational capability of the ship.

Not always is that the case. Sometimes you have to make trade-offs. In those cases, we engage in those sort of discussions, but we negotiate them internally -- get the agreement of the Director of the program. We may have a minority opinion that has to be aired, but eventually come to an agreement that really is not too far off. Those minority opinions are very minor differences in most cases.

MR. FORTENBERRY: And you're describing a situation where your organization is relatively free of such pressure. You just have internal discussion about the optimum or best way to approach things. Is that a fair statement?

MR. BECKETT: I wouldn't say that's true. In today's climate, it's always a reality that you need to do more with less, and we're not immune to that ourselves. The safest reactor is the shutdown reactor, but it's not very productive. So there's always a balance between productivity and safety. We try to balance that with a detailed understanding of the trade-offs and then make our best judgment.

The example is the S1W prototype reactor, which was first started up with the first power reactor in this country back in the early `50s. It had so many safety interlocks that it couldn't run. It stayed shut down. So Admiral Rickover decided that some trade-offs were necessary, disabled some of those safety features, and the rest is history. We've had a very success program.

MR. FORTENBERRY: And could I offer that

again, this centralized technical control, is that what you think allows you to deal effectively with that pressure because those decisions are being made by this technical competence and experience?

MR. BECKETT: Absolutely, the ultimate responsibility and authority rests with our Director. So decisions get bubbled up to the top and get made at that level.

DR. MATTHEWS: Can I follow up to that question? You have contractors that you fund to do work, and presumably they're partly in the business of making money. I'm curious how they make that trade that Kent just asked that question about. Do you watch that? How do you watch that?

MR. BECKETT: We have a unique contracting arrangement. The fee that the contractor earns is predetermined based on the level of effort that's in the contract. That level of effort is essentially written to a very simple specification: "Do what it is we ask you to do," as Dr. Eggenberger had indicated. So he doesn't have a financial interest in cutting corners. He has a financial interest only in providing long-term quality service to the program so those contracts can be renewed at the five- and ten-year intervals. We expect them to be as rigorous as we are in evaluating those trade-offs and making the decisions that are in the best long-term interest of the program and not in the short-term interest of the company or of whatever other pressure there is out there.

DR. MANSFIELD: So you don't have multiple performance incentives in the contract like, "Get this particular piece of work done by next June." You don't have imperatives that the contractor gets paid for if he achieves them on time.

CHAIRMAN CONWAY: Incentive awards is what he's asking.

DR. MANSFIELD: Incentives.

MR. BECKETT: With our DOE laboratories, we do not. There are some incentive features in shipbuilding, which is a necessary feature in something that's that complicated. There is an incentive to do better and a disincentive to do worse on both schedule and cost. Those are features of shipbuilding contracts but not of our design and laboratory operation contracts.

CHAIRMAN CONWAY: I might say that the Board receives each year your annual reports. We read them very carefully and try to learn from them. Also, your recent exchange program with NASA, that report, which is two volumes, we've gone through very carefully, also. In fact, I would like to put in the record at this point a letter that the Board sent to Admiral Bowman complimenting him on those reports, because we find them very helpful. (See Attachment B, for the Admiral Bowman letter) Thank you. Any other questions?

DR. MANSFIELD: I second that: especially the radiological safety reports and environmental reports.

CHAIRMAN CONWAY: Yes, very important, and we thank you. We thank you for your assistance here today. Thank you very much. Now we have the experienced representatives from the Nuclear Regulatory Commission, Ms. Cynthia Carpenter and Dr. Edwin Hackett. If you would each introduce yourselves for the record.

MS. CARPENTER: Good morning. My name is Cynthia Carpenter. I'm the Deputy Director of the Division of Inspection Program Management from the Nuclear Regulatory Commission.

CHAIRMAN CONWAY: And your associate?

DR. HACKETT: Good morning. My name is Ed Hackett. I'm the Project Director for NRC's Project Directorate II, which oversees the plants in NRC's

Region II, Southeastern United States.

CHAIRMAN CONWAY: And your associate?

MR. GIBBS: I'm Russell Gibbs. I'm the Senior Reactor Analyst in the Office of Nuclear Reactor Regulation.

CHAIRMAN CONWAY: Very good. Dr. Hackett, I thought you might have wanted to say something earlier.

DR. HACKETT: I did, Chairman, if that's appropriate at this point.

CHAIRMAN CONWAY: Sure.

DR. HACKETT: I was reacting to a question that the Technical Director raised where there are some obvious differences, as Mr. Beckett identified in his opening remarks, between how the NRC conducts business versus Naval Reactors.

CHAIRMAN CONWAY: That's why we're asking both of you here. We're trying to learn from your experience.

DR. HACKETT: It's an interesting contrast. One of the questions went to use of consensus standards, particularly in how we regulate. Of course, we actually prefer to regulate that way, when we can. We hold out that we have 51 percent of the stock, but in most cases, we have a regulation, 10

CFR 50.55(a), which directly endorses the ASME [American Society of Mechanical Engineers] code. That is a preferred path for us to operate through and we encourage that.

Often times, I think it was referred to earlier, there's sometimes a glacial pace associated with some of these consensus activities, and that the NRC can't afford to wait for that. In those cases, we'll act as was described by the Naval Reactors representatives, but we do try to go that path. I just thought I'd react to that one. Thank you.

CHAIRMAN CONWAY: Thank you. Cynthia.

MS. CARPENTER: Good morning. As I stated before, I'm the Deputy Director of the Division of Inspection Program Management. I have oversight responsibility for the Reactor Oversight Process [ROP]. My previous job before this was as the branch chief for the Reactor Inspection Program Branch, which meant that I had the program responsibility for the reactor oversight process.

It's a pleasure to be with you today to share some of the experiences that the NRC has had in the last couple of years in developing and in implementing the new reactor oversight process. [With me] today, as already introduced, Mr. Russell Gibbs is a former senior resident inspector in the field. He was actually in the field when we transitioned to the new process. He is also now one of our experts in probabilistic risk assessment. He's here with us today in case you have any questions in those areas.

Our division developed the Reactor Oversight Process, and we did this in conjunction with our four regional offices. Now we provide the program oversight responsibility for the ROP as it's implemented by the regional offices, and we just have the oversight responsibility.

Today I would like to share with you how the NRC interacts with our commercial nuclear power plants in the ROP. This begins each year with routine inspections that the agency conducts at each of the 103 operating facilities. It ends with an annual agency assessment of the licensees' performances. That's a culmination of the inspections that are performed throughout the year and also performance indicators that were established to provide an objective measure to measure performance. I'll also discuss some of the insights you might be interested in, in a program that we're trying to initiate right now in the licensees conducting their own self-assessment.

Before I go any further, I'd like to share with you the NRC's mission. Our agency is about 3,000 employees both in our Rockville Headquarters and our four regional offices. We're committed to protecting the public health and safety, and the environment from the effects of radiation from nuclear reactors, materials, and water facilities.

Our mission is to ensure that the commercial nuclear power plants are operated in a manner that provides adequate protection of the public health and safety and the environment and also protects against radiological sabotage and the theft or diversion of special nuclear materials. Today I'll talk to the part that oversees the commercial nuclear power plants. As I said, there are 103 operating reactors out there today.

An important aspect of our regulatory philosophy is that the licensees that we regulate have the primary responsibility to meet regulatory requirements and to ensure the safe operation of their facilities. The NRC, however, is the licensing authority, and we provide independent oversight of licensee activities through our inspections and our assessments of their performance, if warranted.

In our oversight role, we have also in the last few years taken significant steps towards a more risk-informed approach to regulation, where practical. We've changed our oversight process to include insights from probabilistic risk assessments. We believe that we're on the cutting edge of risk-informed government, and so far, we've had notable success with needed changes in this area.

Basically, this risk-informed approach to regulation is a graded approach on our part. The more important the issue is from a risk-informed perspective, the more that the NRC engages. In cases where risk technology is not practical, we use a more deterministic approach using available information and our past experience when needed.

In order to be a more efficient and effective regulator, the NRC established four strategic performance goals. These goals were established to resolve the various stakeholder input in the way that we regulate the licensees for which we have authority. These stakeholders are both internal to the NRC and external to the NRC. Several years ago, we and others recognized the need to improve our oversight of the operating plants. For commercial nuclear reactors, the ROP is the process that we now use to improve the way we regulate them.

Our performance goals include maintaining safety. It's important to note that we do not stipulate that we need to improve safety, but safety is to be maintained. We have specific goals for maintaining safety, such as maintaining a low frequency of plant events that could lead to a nuclear reactor accident. Having zero significant radiation exposures resulting from commercial nuclear reactors are ways that we measure this performance goal.

Enhancing public confidence. Prior to the new process, we and our stakeholders were concerned that the NRC did not clearly present our assessment of licensee performance. It was not objective. It was rather subjective in many cases. We've taken significant actions to address this particular concern.

For example, all of our inspection results and all of our assessments of the licensee performance are clearly presented to the licensees and to the public. We have a webpage. When you go to the webpage, you can see that every one of the inspection findings are noted, and how the agency has addressed them, and how the licensee has addressed them. These are easily viewed for each and every facility.

An example is that if you go to the

webpage, you'll notice that we have a color scheme. For issues that are very low risk significance, they are green. For issues that are high risk significance, it's red. We also conduct annual meetings in the vicinity of each and every power plant to inform the licensee and members of the public of our assessment of their performance, make NRC activities and decisions more effective, efficient, and realistic.

The commercial nuclear industry and others did not believe that our previous assessment process was predictable, that it was scrutable, and not always understandable. Many believed that we were too subjective. So the ROP was designed, and it's been effective in addressing these concerns.

We use an open, risk-informed process resulting in licensees and the public understanding more about oversight processes, particularly in the assessment area. The process, because it is risk-informed and is laid out in open and objective fashion, has significantly improved the effectiveness of our agency. Feedback from our licensees and other stakeholders has been very positive in this area.

Finally, reducing unnecessary regulatory burden. We made significant change in this area, primarily using probabilistic risk technology where possible to help us define what aspects of plant operation were most important. Based upon this information and our experience, the agency identified those aspects of licensee performance that are important to our mission and, therefore, merit regulatory oversight.

We also defined a threshold where issues that were below a certain level of risk would require the licensees to evaluate and correct it without NRC involvement. These are issues of very low safety significance. We do, however, at a later time go back and review selected issues and associated corrective actions to ensure that the licensees took appropriate corrective actions.

DR. HACKETT: Cindy, if I could make a further comment on that. That goes to a question that came up previously also. Maybe it's not unique to our environment, but certainly the unnecessary burden piece is a real challenge for the NRC. In a lot of cases, our regulations were designed very conservatively. Removing the conservatism is a difficult process for us to do. Cindy said, I think, a big help in that regard is the probabilistic risk assessment technology, but it's still something that we have to pay very careful attention to deterministic approaches and also defense-in-depth when we are going through this.

MS. CARPENTER: Next, let's discuss the development process. In the ten years prior to the development of the ROP, commercial nuclear power plants had been operated safely in overall plant performance. That was indicated by trends that both the NRC and the industry were tracking. This improvement in plant performance was attributed in part to successful regulatory oversight and also to the maturity of the industry.

Despite this success, the NRC recognized that the inspection, the assessment, and the enforcement processes sometimes were not clearly focused on the most safety important issues. It was redundant many times, and we were overly subjective with the NRC action taken in a manner that was at times neither scrutable nor predictable.

We believe that an independent regulatory oversight process is one in which the agency's decisions are based on unbiased assessments of licensee performance. Observations were also echoed by external stakeholders such as the Congress, the industry, and the public. This gave the NRC the opportunity to improve our regulatory oversight of our licensees.

To achieve our performance goals, we've made significant changes to our oversight of the nuclear power operations. We developed new objectives for the program, mainly improving the objectivity of the oversight process. So that the subjective decisions and judgment were not the central focus of our process, we needed to improve the scrutability of these processes, so that NRC actions had a clearer tie to licensee performance. We also needed to risk-inform the processes, so that NRC and the licensee resources were focused on those aspects of performance that have the greatest impact on safe operation.

The development of the program took over two years, and it continues to evolve today. We continue to make changes in the program to improve it and to incorporate lessons learned. You will hear from Ed, who will talk about the Davis-Besse lessons learned. There are many improvement items there for the ROP. As we continue through the process, we learn other lessons, and we continue to make those improvements, and we have long-term changes to the program.

Development of the new program started in

1999, and it was highlighted by a six-month pilot effort. This pilot included nine nuclear plants, and they were representative of two plants from each of the four regions. They represented different reactor types and also different containment types.

The pilots were then reviewed by the NRC, and there was also an advisory panel that was established under the Federal Advisory Committee Act [FACA] panel. The purpose of the pilot was to use the newly designed inspection procedures, the newly designed Significance Determination Process [SDP]. This is a process that is used to take inspection findings and to determine their risk significance to see at what level the Agency should engage. We also had performance indicators.

The outcome of the SDP, which is the risk significance of our inspection findings and independent performance indicators, are then summed up in what is called "an action matrix." This action matrix is the primary tool that we use to determine overall licensee performance and what actions that the agency should take. It lays out objectively and clearly based upon the significance of the inspection findings the number of inspection findings and those performance indicators that cross predetermined thresholds, what the appropriate regulatory response should be for overall performance.

During the program development, there was extensive public involvement both in the nuclear industry, which continues to be represented by the Nuclear Energy Institute [NEI], and public advocacy groups such as Union of Concerned Scientists, who provided input as we developed the program. We believed that in order to increase public confidence, that increased public involvement was necessary, and that involvement continues today. We have monthly meetings with all of our stakeholders to continue to oversee the program and to see what changes we need to continue to make in the program.

Today the ROP processes is in its fourth year of implementation. We believe that we've had notable success in meeting our performance goals. The nuclear industry, which some might say are our best external critics, acknowledges that we have made significant progress to improving our objectivity, our predictability, consistency, and understandability from the previous program.

We do, however, recognize that more improvements are needed in the program and the fundamental changes that we've made in our oversight process. Risk assessment continues to be an area of needed improvement. For example, attempting to determine the significance of an inspection finding for which no probabilistic risk information exists continues to present a challenge to us.

As I mentioned earlier, certain aspects of what we regulate are not probabilistically based, and others are immature in their development, the unforeseen situations which arise, such as what happened at the Davis-Besse plant. It's important to our process to have the flexibility that we quickly and we effectively adapt to these situations to allow us to perform our regulatory function.

As Ed will talk about in his presentation, it's essential that the lessons learned from Davis-Besse be successfully incorporated into the ROP so that we prevent future similar situations. We are actively doing that.

Finally, we have performance indicators. We continue to make changes to that also. One of the changes that we are looking at right now is a performance indicator which is very risk-based. That's important to us because if we adopt this performance indicator, that would mean that we would reduce our inspection efforts in that particular area.

CHAIRMAN CONWAY: Hold on a second. Dr. Eggenberger.

VICE CHAIRMAN EGGENBERGER: Can you give me an example of where you were performing regulation and were criticized for being too subjective?

MS. CARPENTER: In the old program, we used to have what was called a "problem plant list." It was not always clear to the licensees how they ended up on that list or how they received additional regulatory attention or additional inspections. So one of the things we've done is this action matrix that we have. If you have two performance indicators which cross the green-white threshold, they go from very low safety significance to low to moderate safety significance.

This action matrix makes it very clear what inspections the Agency will engage in. It's very clear to the utilities where they are at in the process, whether they are in what we call the "licensee response" column, a "regulatory response" column. It was not that clear previously. They didn't always understand why we suddenly would engage with inspections. If we engage now, with supplementary inspections, they understand that the reason is that they crossed the green-white threshold.

They crossed from findings that were low to moderate risk significance.

VICE CHAIRMAN EGGENBERGER: But under the previous methodology, a decision was made as to what color it should be, whether it was red or green or whatever box you put it in as to being a problem plant or not a problem plant. But wasn't there a methodology for determining how to do this?

MS. CARPENTER: There was. It was what was called the Systematic Assessment of Licensee Performance [SALP] process.

VICE CHAIRMAN EGGENBERGER: But did it track technologically?

DR. HACKETT: I guess I could chime in. I think what Cindy mentioned is the clear case, which was that SALP was a very effective process, and it did address the points that you're making.

VICE CHAIRMAN EGGENBERGER: Yes.

DR. HACKETT: I think that part of the ROP was aimed at was communicating that better.

VICE CHAIRMAN EGGENBERGER: Well, that's what I was trying to say. Was it just a matter of not telling or the people not knowing exactly the details of how you made your decision? Am I right?

MS. CARPENTER: That was right. It was

not always clear to the licensees and to the public how we came to some of the SALP scores. It was not always clear to them what kind of input was used into that. So it was considered to be more subjective than objective.

VICE CHAIRMAN EGGENBERGER: I don't want to argue with you, but what I'm trying to believe is that it was not subjective and that you did have the technical details located somewhere that allowed you to make the decisions. However, those details just hadn't been communicated in a way to the licensee. Am I right?

DR. HACKETT: I think that's the correct interpretation. Also I'd add that not all subjectivity is bad. Part of what Cindy said is that we want to have a risk-informed process for our inspections. However, we also want to have our experienced inspectors, I guess, for lack of better words, to be able to go from their gut. That might run contrary to risk-informing on occasion. They see something in a plant that they want to pursue, and that, particular thing is not high up in the action matrix. We want them to have the wherewithal to pursue that and they do under the program.

CHAIRMAN CONWAY: Okay. Thank you.

MR. FORTENBERRY: That question was along several lines actually. I'm sure you've had to address it before. What would be the downsides of having a more predictable -- Well, I guess it was a previous slide, "We are now very predictable." It reminds me of experiences that I've had under instructors where they said, "Now the point I'm about to say next is important," and of course immediately forget about everything else. That's sort of an analogy. I'm sure you've had to address the question before. How would you answer that, as far as: are there downsides to being totally predictable in terms of an oversight body?

DR. HACKETT: I think I'd say obviously the answer is, "Yes;" to be totally predictable or scripted, such that folks know where you are coming from every time to the point that we've heard and known that licensees keep databases on NRC inspectors and their predisposition for going after certain things. So that is a bad aspect of it.

The counter side to that -- I think this is like the Naval Reactors discussion of walking a fine line -- at least to me, the other piece of that is what we would call "regulatory stability," the ability of the licensees to look at the NRC with some level of consistency on how they are going to come down in certain areas, in a broader sense. But I think it is a bad thing to be too predictable in an inspection effort. I would agree with you.

MS. CARPENTER: But the program also is built with flexibility. The inspectors can, if they see a safety issue, follow that. The program is flexible. With the action matrix, it is predictable, but the other side of that is that we also have deviations to the action matrix. So if the licensee finds himself in a particular column of the action matrix, and maybe we don't think that's appropriate, we do have a method to say, "That's not the appropriate regulatory action, and we think that this is the appropriate regulatory action." So there is flexibility built into the program to allow us to basically do what we feel is the right thing. It just requires that we think that through, and that we have the approval of higher management in order to do that.

CHAIRMAN CONWAY: Dr. Hackett?

DR. MATTHEWS: I have a question in this evolution to risk-informed. I read a lot in the trade journals about utilities being able to reduce some of the controls on some of their safety systems because they aren't high significance and they didn't provide what people thought they were providing. I wonder if you could give me a little bit of how you see, as the regulator, that risk-informed has increased public health and safety.

MS. CARPENTER: It allows the agency to engage. I was an inspector under the old program. Under the old program, if I saw some place where they violated their license or if there was something in their technical specifications, which is part of their license or the regulations, that would be a violation, and I would pursue that. Because the inspector in the agency was pursuing it, so were the licensees. So they were focused over here, but you knew that it wasn't very risk-significant.

Today under the new program, it allows both the licensee and the agency to focus its resources on the most risk-significant, safety significant, issues. We can look at this other piece and say, "Yes, this was a requirement under the regulations." They put it in their corrective action program, and they correct it. It allows us then to move on to things that are more risk-significant. We are focusing our resources where it is most important. I think that's been the biggest benefit for both the utilities and for the agency today.

MR. GIBBS: There's no doubt. I was an inspector in the old program. I was an inspector in the new program. There was no doubt in my mind that as an inspector we focused on more important systems as we inspected the facilities, which I think addresses your question. How did we enhance public safety? That's how we did it. We went after the systems and problems that had the most payback, if you will, in a risk-informed environment.

DR. MATTHEWS: Did the risk information back up your "gut feeling" that you talked about earlier?

MR. GIBBS: Not always.

DR. MATTHEWS: Was it consistent?

MR. GIBBS: Most of the time, but not always. The probabilistic risk assessments that have been done have revealed what we call "insights." That's information that the deterministic engineer may not have thought about in the design of the system.

DR. HACKETT: I would add to Russ's comment, too. Early on, I think we learned a lesson the hard way. We started down this path saying this was "risk-based," and it's not risk-based. Risk-informed is a fundamental shift in philosophy. So we do retain other elements like defense-in-depth and being able to go from the gut and as Cindy mentioned, there is flexibility in the program. It is not just risk-based.

CHAIRMAN CONWAY: Does your site inspector have the authority to order a shutdown if there is a violation and he or she has no other authority to issue an audit?

MS. CARPENTER: No, they do not have the authority. That comes through Headquarters.

CHAIRMAN CONWAY: He would have to come back to the Commission itself.

DR. HACKETT: To the Headquarters.

MS. CARPENTER: The Headquarters. I think the actual authority to issue a shutdown is with the Office of Nuclear Reactor Regulation [NRR].

DR. HACKETT: The Director of NRR.

MS. CARPENTER: He actually issues the license to the facility, and he has the ultimate authority to order a plant to be shut down. They would make their recommendations through the regional office and then through Headquarters.

CHAIRMAN CONWAY: In your experiences over the years, has the NRC or its predecessor ever had an example where a site inspector thought it a violation sufficiently serious that [he] actually called back to

Headquarters for authority to have it shut down?

MS. CARPENTER: I don't think so. Not that I know of.

CHAIRMAN CONWAY: I have no recollection of reading of any.

DR. HACKETT: No, I don't believe that's been the case.

MS. CARPENTER: Our inspectors are our eyes and ears out in the field, but that authority rests with the Office Director for our Office.

CHAIRMAN CONWAY: Very good, Dr. Hackett.

MS. CARPENTER: On the next slide, I wanted to talk about resources for the program, and these are the resources needed for the ROP. I think the main message here is that although we've gone to a new reactor oversight process, we did not substantially reduce the level of effort that we considered necessary to ensure that we satisfy our mission. We've focused our inspectors in areas that potentially pose the greatest risk to the public.

We currently spend about 5,000 hours at a two-unit facility, and that is minimum inspection effort. It's about 2,000 direct hours. It's 5,000 hours on average across the country. The two resident inspectors as you mentioned are physically stationed at each facility. We have additional inspectors out of each of our regional offices. They perform other less frequent inspections.

The level of effort represents what we consider to be necessary to complete what we call the "baseline inspection program." This baseline inspection program combined with performance indicators contain the major elements of the inspection aspect of the ROP. The baseline inspection program is considered the minimum level of inspection that is required for a plant, regardless of the plant's performance, in order for the NRC to have sufficient information to determine whether plant performance is at an acceptable level.

The baseline inspection program is performed at each and every facility in the country each and every year. As I mentioned previously, the baseline inspection program was developed using the risk-informed approach to determine a comprehensive list of areas to inspect within the oversight framework.

In the event that a process determines that a particular inspection finding is above a certain threshold of significance or a performance indicator crosses a predetermined threshold, then the action matrix that we have directs that additional inspections - we call them "supplemental inspections" - will be performed at that facility.

The level of this effort of these inspections is dependent upon the number of findings or the performance indicators that cross the predetermined threshold or the significance of the findings that's been predetermined. So if the inspection finding crosses what we call the "green-white threshold," then the agency has predetermined inspection procedures in place to engage. If it would cross what we call the "yellow threshold," which would be moderate to high safety significance, then there is increasing inspection, increasing engagement on the part of the agency.

The ROP also requires resources for overall assessment of the licensee performance. We perform continuous inspection, continuous assessments of the licensees. We also do more formal quarterly, semi-annual, and annual assessments.

During these assessments, all of the inspection findings and the results of the performance indicators are reviewed to determine if we need to conduct additional inspections. As I mentioned earlier, a major element of the assessment process is that as long as inspection findings remain below a certain threshold of significance, we perform only the minimum inspection effort at that facility, and are less involved than in day-to-day operations of the facility.

We expect our licensees to implement their corrective action program to identify and correct problems without the NRC having to unnecessarily engage at lower levels of safety significance. This approach allows our inspectors to better focus on the risk-significant activities at a given facility and the capability to allow inspectors to do reactive inspections if needed. Unlike the inspection process, overall resources for the assessment process have not changed from the last program to this program.

The next thing I want to transition to is licensee self-assessment. As part of our ongoing efforts to improve the efficiency and the effectiveness of the ROP, we're currently evaluating a process to allow licensees to have credit for certain self-assessments that they might perform. We're considering allowing licensees to substitute a self-assessment of their own activities for certain predetermined NRC baseline inspection as long as the self-assessments were conducted in accordance with the guidance document that's being prepared at this time. These self-assessments will still be monitored by the NRC, but we estimate that the resource savings might be on the order of 50 to 75 percent for that particular inspection, with similar savings possible for NRC licensees, and again allowing the agency to redirect our resources to more safety-significant issues.

CHAIRMAN CONWAY: Let me ask a question, if I may. During the utility self-assessments when you have onsite inspectors, are they following it as it's being done? Do you hear what I'm trying to get at? Are they watching it as the self-assessment is being done, rather than waiting until it's done and then reviewing it?

MS. CARPENTER: Yes, that is the intent of this program. It's that the licensees would conduct their self-assessment. They would formally ask the agency to conduct a self-assessment, and there are only certain inspections that we're thinking about right now. One of them is the safety system design inspection. They would formally ask us; depending upon where their performance is at would determine how much. We definitely would be on the team. We would be overseeing the team for their self-assessment as it's happening.

CHAIRMAN CONWAY: So you are participating with them on their self-assessment.

MS. CARPENTER: We're watching what they're doing, exactly.

CHAIRMAN CONWAY: As it's proceeding.

MS. CARPENTER: Right.

CHAIRMAN CONWAY: Now that seems to be different from what I understood from Naval Reactors where they, if I heard them correctly, wait and let the contractor do his work and then review it and see how well it was done, but not following along and watching it in parallel.

MS. CARPENTER: We do that in the emergency preparedness area. The licensees conduct their exercises. They are critiquing themselves, and we oversee the drill itself, and we oversee their assessment of how they've done. But for these particular licensee self-assessments, the intent is that we will be there on the team observing what they are doing.

CHAIRMAN CONWAY: If you see it going down the wrong path, their self-assessment is missing, or it's not being done properly, then your site representative calls it to their attention at that time.

MS. CARPENTER: The site representative would call it to their attention, or whoever is monitoring the team, whether it might be the inspector onsite or it also might be someone from Headquarters or someone from the field office. They would then bring it to their attention.

CHAIRMAN CONWAY: During the time that this is completed and the utility has completed its self-assessment, you would expect it to be properly done because you are following it as it's done.

MS. CARPENTER: Yes, sir. That was part of the next slide. Self-assessment. As part of that, when they find inspection findings, again we would expect them, if they were very low risk significance, to put them in their corrective action programs and for them to follow up. If they are higher safety significance, the agency then would assess it as we do now through our Significance Determination Process.

VICE CHAIRMAN EGGENBERGER: Do you expect the licensee to have an ongoing self-assessment program? And before you answer that, you indicated that you were going toward the idea that there would be certain areas that you would allow him or her to do self-assessments in, and then that made me believe that's the only area he's going to do self-assessments in. So that's why I asked if you expect them to have a continuing self-assessment program on everything as Naval Reactors indicated that they expected their contractors to continuously self-assess.

MS. CARPENTER: Let me see if I get this right. We do not have a requirement that they conduct self-assessment.

VICE CHAIRMAN EGGENBERGER: Okay.

MS. CARPENTER: We do expect them, though, to be self-assessing themselves and to be finding problems, putting them into their corrective action program, assessing the significance, and fixing their problems. We know many times before a team inspection goes in that they will conduct self-assessment. Then our team will come in and do the inspection. So what we're talking about is instead of them doing a self-assessment in a particular area and then us coming in and doing it, that they would do it, and they would receive credit for having done the inspection.

The agency would then not follow on with an inspection. We would judge how well they did. If we find that they did not do a good job, then the agency would probably do either a follow-up inspection or they would be doing the inspections from then on.

VICE CHAIRMAN EGGENBERGER: Do you know whether INPO [Institute of Nuclear Power Operations] has any thoughts on this matter? You're the wrong person to ask but I thought you might know.

MS. CARPENTER: They do conduct plant evaluations.

VICE CHAIRMAN EGGENBERGER: No, I mean a position on whether a licensee should do continuous self-assessments regardless.

MS. CARPENTER: I don't know.

MR. McCONNELL: If I might, I have a question. You indicated that you had a certain subset of your NRC inspections that you are considering allowing the licensee to do in lieu of the NRC.

MS. CARPENTER: Right.

MR. McCONNELL: I'm checking my facts here. Then you went on to say that you would expect them to do their inspections to be done in accordance to the standards that you would provide, presumably such that you would assume that their inspection would be at the same level of rigor and the same quality as if you would have done it yourself.

MS. CARPENTER: Yes.

MR. McCONNELL: And then you go on to say that you expect savings from both the industry and the

NRC. May I get some insight into why you would expect to see that savings?

MS. CARPENTER: Why we expect the savings is as I said. Many licensees, when they know we're going to come and do design inspection or fire protection inspection, will conduct their own self-assessment. Then we come in and do our inspection. And there is a lot of support on the part of the licensee when our inspectors come in and are doing our inspection. So they are not only doing their own self-assessment, but then we're coming in and doing ours right behind that, and they are supporting everything that we're doing and then all the engagements with all of our inspection teams. So that's why we say we believe that there will be savings. We won't need to do that twice on the part of the part of the licensee then.

MR. McCONNELL: I think I understand. What you are saying is that the presumption was that there would be a stimulus of the NRC inspection, which would cause a serial process of contractor's self-assessment followed by an independent assessment. In this model, those two would occur at once, and that's why both organizations would see efficiency.

MS. CARPENTER: Exactly.

MR. McCONNELL: But that's the difference. That efficiency is because of the difference between that model and the one that the Naval Reactors just described where they rely on a serial process. Okay. I just wanted to be clear.

MS. CARPENTER: Yes, that was part of this last slide. What we're thinking at this point in time is that depending upon the licensee's performance, how many inspectors would we have that would actually be following along with the licensee and observing what they are doing. We also have requirements that we're putting on to the program.

In other words, an example of that would be such as Exelon, a very large company today with a lot of facilities. We have minimum staffing. There would be so many people on the team. How many of those people on this self-assessment team would need to be from outside of their organization? In other words, some of them would have to be outside of the station, and some of them would need to be outside of their organization. That is all part of what we're setting up with them.

What do we do with inspection findings? We expect them to use the same sort of rigor that we would use in our program and be looking at the same things. We also would expect that if they found inspection findings, there would be a process as to how we would handle those if they were very low safety significance into their corrective action program. So there are guidelines that we're setting up in order to conduct this program with them.

Right now, there is a guidance document. It is draft. We're in the process of reviewing that. We've provided comments back to the industry on that. The next step would be to conduct a pilot. We're hoping after the first of the year to conduct a pilot, and we're looking at one to two facilities per region right now for that to see how that goes. There are some concerns among our regional offices on this. This is something that we'll be looking with our regional offices on, also.

CHAIRMAN CONWAY: Kent.

MR. FORTENBERRY: Ms. Carpenter, just a quick question.

MS. CARPENTER: Sure.

MR. FORTENBERRY: Is there a role for unannounced inspections in this framework?

MS. CARPENTER: No, sir. There are not. Correct me if I'm wrong, but at this point in time, all of our inspections other than -- I have to make a distinction with the resident inspectors. We provide our utilities with a 12- to 18-month inspection schedule. When it comes to team inspections, radiological protection, emergency preparedness, they know when our teams are coming on site. They know when our inspectors will be there.

But remember, there are two resident inspectors that are stationed at each facility, and although they know the basic guidelines of what the inspectors are required to inspect, you could kind of say that those are somewhat unannounced, but they are onsite.

MR. FORTENBERRY: And this is consistent with the theme of predictability from the regulators.

MS. CARPENTER: Part of it also has to do with access controls to get on site and things like that. Yes. But it is part of that predictability, so right now, they do get a 12-month look ahead on inspection schedules, and we're moving to 18 months.

MR. FORTENBERRY: If it's appropriate, can I ask the NR folks about that concept of the unannounced inspection as opposed to, "Twelve to 18 months from now we're going to be inspecting this item"? Is that a topic that you can speak on?

CHAIRMAN CONWAY: Tom, would you maybe use the mike over here on the end?

MR. BECKETT: Yes, sir. Pardon me for taking your time. I think I indicated that we would expect 365 days a year, any day, the contractor to understand from self-assessment his weaknesses, and then we could come in and do that. Our program involves both announced and unannounced inspections. We mix the two and frankly see very little difference between whether it's announced or unannounced.

CHAIRMAN CONWAY: Thank you.

MS. CARPENTER: I think it's important to note also that although we do have two inspectors stationed at the facility, we also have requirements on them that they are to do what we call the "deep back shifts." So much of their time is to be coming in on weekends, after regular hours. They call it the deep back shifts, and they do have requirements to show up on site, but they are badged, and they do assessments.

CHAIRMAN CONWAY: Now your two inspectors who are site inspectors or representatives, do they have the capability of going through the guards? Do they have to wait for somebody to come out and bring them in?

MR. GIBBS: The resident inspectors have

unfettered access to the facility.

CHAIRMAN CONWAY: That includes keys to get in through the doors.

MS. CARPENTER: Yes, it does. That is a requirement.

MR. GIBBS: Everywhere on site.

MS. CARPENTER: That is part of our regulations. Our inspectors are to have unfettered access to anywhere on site that inside personnel also have.

CHAIRMAN CONWAY: And that includes the control room, of course.

MR. GIBBS: Absolutely.

DR. MANSFIELD: And any of the operators' meetings also?

MS. CARPENTER: Yes.

MR. GIBBS: Everywhere.

MS. CARPENTER: Any of the senior plant management meetings, our inspectors have unfettered access to that. That is an expectation.

MR. GIBBS: That's a regulatory requirement.

MS. CARPENTER: Exactly. It's 50.70, I think. That's the requirement. Okay. The other thing I will say is that we have seen in the past that some of our experience with licensees conducting self-assessments were not as rigorous as our own inspections. This is one of the concerns that our regional offices have. This is something that we have to look at.

If we find that their self-assessments are not as rigorous as we would have done, then of course the next time that they ask to do something, the agency would follow up, or there are provisions to actually do a follow-up, inspection in that area. That's all I have right now. I want to thank you very much and I'll be glad to answer any other questions you have.

CHAIRMAN CONWAY: Thank you. Dr. Hackett.

DR. HACKETT: Thank you.

CHAIRMAN CONWAY: While we are waiting, let me ask this. How long a term does a site inspector generally stay at a particular reactor complex?

MS. CARPENTER: It is now seven years.

CHAIRMAN CONWAY: Seven years.

MS. CARPENTER: It used to be five years, and a number of years ago because of the hardships of our inspectors, the maximum that an inspector may spend at one particular site is seven years. We find that many of our inspectors move on sooner than that. A lot of it is promotions. You know: from a resident inspector to a senior, and then they'll move to another facility, but seven years is the maximum, and that's written in our policy.

CHAIRMAN CONWAY: Thank you. Dr. Hackett.

DR. HACKETT: Thank you, Mr. Chairman. I have a different challenge today, which is to try and help walk you through a story that's very important to us in the nuclear industry. In general, it dovetails with what Russ and Cindy had been talking about. The thing I'll add on this slide is that during the timeframe from May to October 2002, I was Assistant Team Leader for the NRC's Davis-Besse Lessons Learned Task Force. That's the role in which I'll be presenting this information to you. As you've been doing, I think I found that these work most effectively when there is back and forth exchange and dialogue. I think that would be the best way to proceed.

For those who don't know about this, in February 2000, we discovered a corrosion cavity, and I have some graphics here to walk you through, on the Davis-Besse reactor vessel head during inspections for vessel head penetration cracking. These are the penetrations that come through for the control rod drives. They are Inconel and the vessel head is a carbon steel.

The extent of the corrosive attack was unprecedented. This was from a concentrated boric acid solution, but we still don't know exactly the particulars. It was a combination of leakage through the penetration of the primary coolant system and also most likely leakage from above in terms of some of the seals on the control rod drive assemblies themselves.

It set up a situation on top of the head that ended up in a very aggressive attack on the head, that as you can see on the slide here, degraded over six inches of carbon steel all the way down to the internal stainless steel cladding liner, which was all that remained as the pressure boundary over the degraded area. This was absolutely a function for which the stainless steel cladding was not at all designed. I think this has been characterized in the press as a "near miss" for the industry and for us, not a place we ever want to see ourselves go back to again.

I like to use props, so I brought one along. I don't know if this will be too heavy to pass around. I brought along a metallurgical section here to the Midland reactor vessel that shows some of the features that I'm talking about. I can hold it for the camera here, too, and I'll pass this around. I've marked the six-inch point on here to show exactly how much steel you are talking about degrading.

Also this shows some details of the through-wall weld and also the stainless steel cladding. You can pass that around. It is a bit on the heavy side. That was discomforting, on the order of a nine-inch wall. When we talk about conservatism, there's definitely some there.

In reaction to this, the NRC chartered a Lessons Learned Task Force, as I mentioned, in May 2002, and it was really aimed at answering the questions of: "Why was this event not prevented? How could this have happened?"

I'll talk you through some of the specifics. This came out a little bit scrunched up into PowerPoint here, but a typical pressurized water reactor. In the case that they specified, we are looking at the B&W [Babcock & Wilcox] design that illustrates some of the features I was mentioning earlier. On the top there, of course, you have the control rod drive assemblies and the penetrations that go into the top of the reactor vessel head are in this area here. That's where I'll be focusing.

This shows it to you a little bit better. This area right [here] is where the degradation cavity was on the Davis-Besse head. As I mentioned, pretty much along with the laser pointer here from the top right here all the way down to this inside piece was degraded over the area about the size of a football. It's been characterized as that most often in the media. Again, that was a combination of leakage through this penetration here, which was nozzle number three, which was due to stress corrosion cracking in the Inconel penetration and also leakage from the seals, above which had accumulated a crust of boric acid underneath this insulation.

Some other features I can mention, it's obviously a difficult area to inspect. There is a very high radiation area. Also, this has an access structure on it which has access holes in it. But to get in there and do a thorough inspection of this region on a B&W design is difficult. It's far more difficult on some of the other designs, unfortunately. B&W is actually one of the easier ones.

This is some detail of the penetration. The leakage that I'm talking about came through [the] wall on this material here, which is the Inconel. The cracks go through - in some cases there's both - what we call the "J-groove welds" down here, which are an austenitic weld metal that joins the Inconel to the carbon steel. They also go through the actual wall of the Inconel housing itself. Then what you set up apparently - we'll never know this for sure given the way things played out - a condition in this area here that was very conducive to accelerated attack of the carbon steel that was further complicated by a crust of boric acid and corrosion product that remained on top of the head.

DR. MANSFIELD: So you were indicating that the leaks and initial corrosion could have been from inside out.

DR. HACKETT: That's correct. What you'll see and what I'll talk to you about is that the state of the head up here over a fairly long period from probably about 1996 to 2002 was in a pretty bad state of maintenance. That is something that not only the licensee missed, was not focused on, nor was the NRC.

CHAIRMAN CONWAY: Wouldn't that have shown up in a refueling during that period of time?

DR. HACKETT: Absolutely. There were two refuels during that period of time during which the head was "inspected." Obviously those inspections were completely inadequate to have detected this phenomenon. That's part of what I'll go into.

The last piece, this shows the schematic. Then we'll see the actual photo. This shows the cavity. You can see from this penetration here, number three, the entire piece of the head through this region is gone all the way down to the cladding.

Actually something quite spectacular to me was when I figured this out at the time that the cladding was able to serve the function of the pressure coolant boundary as well as it did. It is not at all designed for that. It's about three-tenths of an inch of stainless steel weld.

Our research analysis actually showed that it would have held more than double the pressure of the reactor coolant boundary over that area. Obviously that would not have lasted forever. The debate rages as to how much longer you would have had, but it was probably on the order of months to a year before it would progress to the point that you might have lost that interface.

DR. MANSFIELD: So the span would grow.

DR. HACKETT: Right, exactly. The problem is trying to get into a debate with corrosion experts around the world of exactly how fast that would have progressed.

DR. MANSFIELD: But there wasn't any degradation of the properties of the stainless.

DR. HACKETT: No.

DR. MANSFIELD: So a properly designed discontinuous support of a thin stainless steel vessel might be able to serve as a pressure vessel.

DR. HACKETT: That's correct.

CHAIRMAN CONWAY: You said there are differences, disagreement, among the so-called experts, but you bounded it presumably so the most conservative if you will --

DR. HACKETT: Exactly. That's what we tried to do in our bounding. We always are nervous when we use the word "bounding," because as soon as we issue that from your mouth it's challenged or it's proven to be wrong. We thought the bounding estimate would be on the order of six months that the attack could progress that fast and spread out over a wide enough area that you might actually cause a breach. So again, as I said at the opening, far closer than we ever wanted to be.

This is actually what it looked like. Probably not the best picture, but here this is the top of the reactor vessel head around the side of the cavity. This dimension from here down to there is the six inches or actually I think it's about six and a half inches. Then what you're looking at right there is the stainless steel cladding, looking down from the top of the reactor vessel head end. Again far worse.

DR. MANSFIELD: How was the cladding fastened? Was it fastened to the inside?

DR. HACKETT: It's metallurgically bonded to the inside of the reactor vessel head through welding. It's a strip clad process that's put down. So that's the particulars. This is showing some pretty significant evidence here. These are the access holes that I was talking about, and you can see that in this case the refuel outage in 2000, which was two years before this was discovered, showed significant evidence of boric acid and corrosion deposit streaming down through these access holes. The unfortunate situation is that the head was left in this state for a significant period of time. Our best guess is four to six years.

DR. MANSFIELD: Would the access that is possible allow you to have used something like a borescope or some sort of remote television thing?

DR. HACKETT: Absolutely. Again, this is very similar. I read at least excerpts or parts of the Columbia Accident Board Report. There are a lot of similarities here. We had two major causes, technical and organizational. The technical one, I'd like to talk about. It's the easy part.

I don't want to underplay that, but I am a metallurgist by training, and we can fix things like that. We think we know how to fix stress corrosion cracking occasionally. We've been working on that at least most of my career. But those are the easier parts. The organizational elements, I think, are the greater challenge.

But in terms of the technical piece here, the parts that we had some difficulties with -- or let me back up and say that this piece here, the technical piece, for those of you who are familiar with the Columbia Accident Investigation Board Report, this would be our foam strikes. This was going on.

Our engineers were even in some cases aware of it and were numb to it because of my second bullet here, a mindset that boric acid on the reactor vessel head was not considered to be highly corrosive. The heads are hot and dry. "You don't have a corrosion cell set up there," was the mindset. You're just not going to get this phenomenon.

So there was an awareness of it, but there was also this mindset that it's not going to be this type of problem. Even if it ever got to this level, our inspection effort would catch it. You would have to have egregious leakage to result in this kind of attack, and our inspection effort would catch that type of thing. When, in fact, this happened with a very low leakage over a very long period of time, and we missed it.

The previous NRC assessments in this area were axial cracking in reactor vessel heads penetrations, Inconel penetrations. They were not considered to be an immediate safety concern, circa the mid-1990s. The French had a very opposite reaction to this in their program when they saw this. They were the first ones to see this stress corrosion cracking phenomenon in the Inconel. They reacted very much more aggressively than the NRC did almost 13 years ago now with an event that happened with their Buget plant.

The other thing that happened for us is we didn't make this linkage. Because of this -- I also have a fracture mechanics background. We're very concerned with cracks and the extent of cracks and the severity. That would have considered leak-before-break.

The Inconel is a forgiving material. You had axial cracks. It's not terribly safety significant from a fracture mechanics standpoint. I think it's fair to say the linkage was not made between the cracking in the vessel head penetrations and the boric acid attack even though there was ample evidence available to contradict that which was out there in the literature when the team looked through this.

CHAIRMAN CONWAY: Go ahead.

MR. FORTENBERRY: Dr. Hackett, quickly. These are all listed under technical. I would argue with you on that because of a couple of things I want to ask about.

DR. HACKETT: Good point.

MR. FORTENBERRY: One of them is something that we heard from the NR folks which is interesting, and that is waivers to requirements are essentially anathema in the organization, and you describe a situation where you had some cracking that clearly wasn't within the specifications of that component.

DR. HACKETT: Right.

MR. FORTENBERRY: You'd say limits can take just so much. You essentially accepted the condition as opposed to saying, "Unacceptable, it doesn't meet the requirements." You basically entertained a waiver that allowed the cracking and the bit of leaking, and here's where you come to based on something. I know in the Lessons Learned from your task force there was some discussion. I was a little bit confused or foggy about what they were saying, but they seemed to imply that this mindset was based on some risk-informed approach that said, "What is the probability -- I guess is the right way to say it -- of this amount of leakage leading to an unacceptable event?" Again, a decision was reached that said, "This is not one of those paramount high significance issues. We can afford to not focus on it."

Of course, the utility followed logic. You saw the streaming. You showed boric acid coming out, but again that's not the focus of, let's say, the regulatory [agency] imposing itself. That's why I argued that these are in fact the organizational part, which is not the focus of our session today, and trying to understand how you avoid things like this and, again, not trying to blame or criticize.

But it is interesting to compare what I heard this morning, which would have said, "We don't know what the effect of these cracks would be really, and some people could argue that it's okay, and some people might say that it's not. We can do a probabilistic assessment to say it's so much, but we're better off staying with doing it right, for example, and not allowing any cracks." Of course, that would have eliminated all the stuff.

DR. HACKETT: These are good comments. I did say technical here but I think there are all organizational and cultural aspects mixed in here. You hit on a very key point. In all honesty, the boric acid inspections in the plants by this point in time would not have been considered terribly risk-significant. Obviously that's the wrong answer.

But if you were looking at this on a risk cut, you are probably not going to get there with the NRC-mandated boric acid inspections. In fact, one of the findings of the team was that the boric acid inspection procedure was eliminated in the year 2000 based on exactly that. It wasn't making the cut.

DR. MANSFIELD: So this isn't a way of dealing with the problem by defining it as not important. I'm struck with something our Naval Reactor colleagues told me, "If anything happens that's not submarine-sound, you never ignore it." Does that accurately put what you told me one time? You don't define it out of existence. If anything looks like a non-reactor look, then [don't] ignore it. Is that the lesson I should take?

DR. HACKETT: I agree. That's very fair. The next piece tried to focus in more on the organizational pieces. Our team concluded that the event was preventable. There are three major contributing elements. The first one goes to failure to review, assess, and follow up on relevant operating experience. There's a wealth of experience in this area as it turns out.

It's sad to look back at that kind of thing, just like with Columbia, and find out that there was actually a history of boric acid attack events, none even approaching the severity, but that showed the potential for this type of thing to happen. There were numerous NRC communications. We communicate with our licensees through our generic communication process. We had issued numerous generic communications on the issues of stress corrosion cracking and boric acid. What we were failing to do was to integrate that all properly.

Then there was the very much stark contrast with the French experience, where they did operate as the Technical Director mentioned. They took a position very early on. They were not going to tolerate in cracking in these penetrations. They proceeded down a path that ultimately led to replacement of the majority of the heads on the French commercial fleet, which is coincidentally now where a lot of the U.S. fleet is going, but much earlier in the process.

CHAIRMAN CONWAY: The second bullet there with the, "NRC, the licensee, and industry failed to adequately review...": was this pretty well known out among the industry, among the other pressurized water reactor operators? Was INPO cut in on this do you think?

DR. HACKETT: They were, in fact, and I think they've done their own critique of their situation. I'm not familiar with the particulars. The information was all there. When we go into well known, I guess that goes to obviously it wasn't well known enough by the right people, but the information was all there, unfortunately.

The second piece goes to the licensee's performance. They, in our opinion, failed to assure that their plant safety issues would receive the appropriate attention. As Cindy mentioned in her presentation, that for the NRC is the first line. We're assuming that the licensees are doing their job.

Their performance and safety focus is their primary function. Our inspection program and our regulatory program is a check on what they are doing. They obviously, FENOC [FirstEnergy Nuclear Operating Company] in this case, the licensee, has owned up in their own self-critique that they had what they called the "production" rather than the safety focus. They were trying to keep the plant running. They were not focused on safety.

The last piece is what I'll spend the most time talking about today regarding the NRC. We really failed to integrate a lot of information that was available if you looked in the right places into appropriate assessments of their safety performance. This is probably over at least a five or six year period that this was occurring.

DR. MANSFIELD: I'm guessing now that you would not have failed if your inspectors were instructed to take note of anything that looked different in appearance, which means they have to know what different means.

DR. HACKETT: Right.

DR. MANSFIELD: So they would have to have a fleet-wide picture of what reactor vessel heads should look like.

DR. HACKETT: Another good point. Yes, that's true. One of the findings we also made -- and I think it was referenced previously to -- a questioning attitude. One of the findings on the team was that we did not see as much of a questioning attitude on the part of our own inspectors, certainly not on the part of the licensee in running these types of things down. It does go that there are some very specialized expertise obviously that would be required here, but there were some pretty egregious signs of things going wrong inside this containment, including multiple failures of the containment, air coolers that were fouled with corrosion product that was ferric oxide or ferrous oxide.

It was obvious that it was some carbon steel corroding to a fairly large degree in the containment, but the questioning attitude went towards, "They weren't pursuing that." Instead, they were changing out the containment air cooler filter elements more frequently.

CHAIRMAN CONWAY: Does this utility have a safety committee that was outside of the production part of the operation?

DR. HACKETT: They do, in fact, as do many of the licensees. They also did not pick up this.

CHAIRMAN CONWAY: That's what I was going to ask. Did this question ever come up in their committee meetings?

DR. HACKETT: Not that I'm aware of, certainly not in advance.

MS. CARPENTER: We also recognize that the inspectors were aware that they were changing out the filters. They were doing maintenance, maintenance that was usually every couple of years; they were doing it routinely, and I guess they got into a groupthink, and that happens. You asked about the rotation of the inspectors.

CHAIRMAN CONWAY: Yes.

MS. CARPENTER: That's one of the reasons that our inspectors do rotate out. It's one of the reasons we have region-based inspectors go out to the site, which is to maintain that questioning attitude of, "This just doesn't look right," rather than just taking on face value if the licensee says, "This is what it is." Suddenly, we were all going in that direction.

It's continued to emphasize in ROP. You have to question all the time: "This just doesn't make sense." It was more of an unusual maintenance situation and now it was being done routinely. Why did it change? That is one of the valuable lessons for us.

DR. MANSFIELD: And my previous comment about the value you would have had if you had a questioning attitude toward the visual appearance of it extends, of course, to anything that's out of its envelope, like the filter and things like that, which is operating in a way that wasn't designed into it. I'm kind of surprised that the owner wouldn't dig into that right away the way you would if your car starts doing something outside of its envelope.

DR. HACKETT: Exactly. That's a good analogy. The last piece I was going to mention here goes towards the resources and staffing. If there were more time, I could touch on a lot more things. Part of the discussion previously went towards continuity. Unfortunately on our part, we had nine program managers for Davis-Besse over a ten year period. It's unacceptable.

We should have more continuity than that in our project management effort. We had significant changeovers as Cindy mentioned in the inspectors who were onsite. So we had a definite lack of continuity. We had a NRC Region III which oversees the plants in that vicinity very challenged during that time with a number of former watchlist plants. Davis-Besse was, actually ironic to look back now, considered the top performer in the region before this event. So there definitely were some resources and staffing and continuity issues going on.

DR. MATTHEWS: This may be a good time to ask a question I had, and it refers back to your talk. The question is: how are you going to change your inspection and oversight program? I'm sure you're going to look at boric acid corrosion. That part's easy. But it's the cultural issues, the organizational issues, the safety culture issues, the human factors issues which are a lot more difficult to measure and predict the next type of problem. I was curious. Are you going to change anything in that area as a result of this, and what would they be?

MS. CARPENTER: Yes, sir. We are. Part of that is a constant reminder of "Lessons Past, Lessons Learned" to our inspectors. We have new staff come in, and with the new staff, the corporate memory disappears. It's a matter of trying to remind the staff continuously that their job is that questioning attitude. That's why they're out there.

The other thing is, Ed talked about operating experience. We were receiving that information. It was within the agency, but it was in various parts of the agency. No one took that piece of that and put it into the inspection program. So part of it also is building into the inspection program some of these lessons learned, going back and looking at some of these safety issues that were out there, some of the generic communications that we've issued. It's to put them into a database so that the inspectors can see that.

When an inspector picks up an inspection procedure and is going to go out and look at boric acid control, some of that operating experience that was out there is there for them to look at. It's to remind them that this was an event that happened a long time ago. Here's what's been happening out there. So, part of it is better training of our inspectors, building it into the inspection program, and keeping our technical staffs.

I think Ed will touch on this. We have a task force looking at: how do we do a better job of integrating operating experience, and how do we make sure that our licensees are doing the same thing? How do we make sure that they are asking those questions and that they are following up?

We're changing our corrective action

procedures to say, "Is the licensee making modifications? Are they deferring modifications so that they can come back on line faster? Look at those deferred modifications. Pick those out. Pick up some of those old operating experiences. What are they doing with those?" So these are different pieces that we are incorporating into it. There were a lot of great lessons learned out of this, and we're building it into the programs.

DR. HACKETT: On the next slide, I think in the interest of time I would go towards the bottom actually. In case anyone wants a more detailed treatment of this, the Lessons Learned Task Force Report addresses the area shown on the slide. It was completed almost a year ago now, and it is available on our website. I don't know what the download would take. It probably would be a little while. It's 96 pages I believe. There's a lot of detail in there, some of which I'll touch on in the next slides here.

Broadly speaking, these are some of the areas we've been talking about. To jump way ahead, here is where we made recommendation, not surprisingly, in the area of inspection guidance from things as simple as Dr. Matthews mentioned and straightforward as boric acid inspections and fixing that. Those inspections were dropped from the ROP. They are now back in obviously.

But more specifically, it goes towards the pieces Cindy was touching on: the lack of the questioning attitude, and reinforcing that through training and sessions like this with the NRC staff, which we've done many of; including this team had training sessions basically with the entire NRC Headquarters staff in all four regions with the idea of trying to tell the story and internalize and institutionalize these lessons learned as part of a good learning organization.

MS. CARPENTER: Part of that is also each of these were being put into the licensee's corrective action program. We're going to ask our inspectors to review corrective action reports and look for trends now. "Do you see that the same corrective action, the same problem, is coming up and the licensee is not fixing it?" That's the trend piece of it that we're going to build into the corrective action procedure to have them think more about that, to pull some of those out when they do the corrective action inspections every year, pull a sample of those out and take a look at those and see why aren't they fixing them, or is there something more that we see here.

DR. MATTHEWS: Let me ask, not to put too fine a point on this, but, okay, your inspector is out there and he sees boric acid. You know what to do. The action is straightforward. Now he goes out there, and he sees a lack of questioning attitude. What do you do with that?

DR. HACKETT: What we get to in the discussions is sort of back to when Mr. Reagan was President, the "Trust but verify." There is one I can share with you on this. It is our inspectors did question the maintenance of the head during this period, but where they didn't go as far as maybe we'd like to see them go, they would ask a question about the head, for instance.

As a specific example, "Was the inspection completed in 1998?" They would get the response of "Yes, the head was inspected." "What were your findings?" "Well, there was some boric acid there, but nothing that we haven't seen before. Not a big deal." That's as far as we pulled the thread.

Instead, maybe what we should have had was, "Where's the bore scope video from that inspection? I'd like to get a look at that and just let me conclude for myself what kind of state the head was in." Frankly, had they done that, already by

1998, that head was in a horrible state of corrosion and corrosion product, and we didn't do that. It wasn't offered up by the licensee either, but we didn't pull the thread. So that's the kind of example.

Cindy mentioned operating experiences as a big part of this effort. We spawned yet another task force that's looking at operating experience. A couple of items on that: we used to have an office at the NRC that was called the Office for Analysis and Evaluation of Operational Data. That office was disbanded in 1999, and it was our sort of centralized clearinghouse for assessment of operating experience.

Certainly what we found is that the NRC assessment of operating experience is a lesser function today than it was back then. That didn't help. It's not a cause and effect thing, but it certainly didn't operate in the right direction.

We mentioned consensus standards earlier. The ASME code in this case, which had inspections requirements for observation of the head that were -- we find in hindsight now -- completely inadequate. They call for what ASME calls a VT-3, which is a visual observation of the area basically so that you could just say that you laid eyes on it, and you saw it. It does not require removal of the insulation.

When you look at the B&W design or some of the Westinghouse designs, there would be no way to see this corrosion given that kind of inspection procedure. ASME is correcting that now. We've corrected it through generic communications, but at the time, that was a serious inadequacy.

DR. MANSFIELD: This question just shows my ignorance of the ASME code. Is there no provision in the ASME code for inspections when direct visual inspections are impossible because of insulation or coverings or things like that? Aren't there prescribed equivalent methods?

DR. HACKETT: There are. In fact, in this particular area, given the mindset that prevailed, it was not subject to those inspections, unfortunately. It was relegated to what they call VT-3. Obviously it's not anymore, but that was a serious shortcoming for the ASME Code.

Leakage monitoring requirements and methods on our part and the licensee were: we have a lot of the recommendations of the report. Go to this area because there was a very small amount of leakage over a long period of time, and it was very difficult to discriminate where that leakage was coming from, whether it was actually reactor coolant pressure boundary, which it ultimately was found to be, versus it was just seal leakage from above. So there was a tolerance on our part and on the licensee's part for what we thought to be seal leakage that was not considered terribly safety significant. So we are looking very hard at those.

I'll jump to the bottom one. Our executive director asked us to take also just a quick look as far as our team went on previous lessons learned reviews. We've done these before. Are we learning lessons? Are there similar themes that we're seeing here with Davis-Besse that came up with our previous one, Indian Point, when they had their tube rupture in the year 2000?

We found that there were some things that were common elements among all lessons learned. We hadn't brought all that together, all of which went towards follow-up on some of these activities that the NRC, I think, would characterize itself as an organization that reacts very well to these things. I think we did a very good job to reacting to this event, but we were not proactive, and we also had found that there were cases where we just didn't follow up adequately, which was one of the team's findings, particularly with regard to long-standing hardware-type problems.

It just turns out that there are 51 recommendations in the report. I just brought along a few here to share with you. I think the first one goes towards one of the pieces Cindy was referring to. We issue generic communications a lot in reaction to things that we find through inspection efforts or sometimes proactively if we anticipate that there might be a problem.

What we find is those generic communications generally achieve what we're wanting to do at the time. One of the things we're finding is that we do not do a good enough job in following up on a generic communication that is, say in this case, 13 years old. We had a boric acid communication that went out in 1988, and there were some initial follow-up inspections and a lot of intense activity, but two, five, ten years later, you are probably going to be dealing with an NRC staff that's not even very familiar with that generic communication. We have not followed up on it.

DR. MANSFIELD: Was that warning specific to rapid corrosion?

DR. HACKETT: That was not specific

necessarily to the rapid corrosion, but it did go to boric acid inspections and requiring those for the plants. We did not pay enough attention to that over time.

MS. CARPENTER: That's one place where the ROP needs to incorporate the lessons learned to occasionally go back and look at some of these issues that the staff has done a generic communication on and say, "Again, pull that generic communication out. What is the licensee [doing]? What did they say they were going to do? Are they still doing that? What are they doing today?" That is an area that the inspection program is following up on.

MR. FORTENBERRY: Is there an element of technical competency here in terms of understanding the interaction with the boric acid leakage and doing or performing the required or, looking back, the desired R&D [research and development] type activity to understand this, which then, of course, would have fed into some of these other actions? I don't see anything that speaks to that.

DR. HACKETT: There are. I apologize for that. To have gone through all these would have taken too long, but yes, absolutely. We have pieces that go to that.

MR. FORTENBERRY: Clearly, this wasn't an obvious issue. We are still debating about the specifics of it.

CHAIRMAN CONWAY: Kent, you'd better talk more into the mike if you want people to hear what you are saying.

MR. FORTENBERRY: I'm sorry. Clearly, this wasn't that straightforward. But going back to a topic that we've talked about a few times now, and that's the simple technical authority that the NR folks talked about and whatnot: can you parallel that in terms of how this problem was dealt with? I'm talking about back a long time ago when the issue first came up, and the issue was dealt with in terms of what do we need to do about it, and do we need to rip off all the insulation and go look at it? Was it a central authority that made that decision?

DR. HACKETT: At least part of my answer, I guess, is fact. Part of it would be opinion. We do not have that same type of structure. I think that's obvious that the NRC is a much more diverse and frankly bureaucratic structure than I'm sure Naval Reactors is. There are challenges inherent to that that we deal with.

In answer to your question, I'll back up to the technical competence. I think my answer, my opinion, is no. I don't think there were technical competence problems on the part of the NRC staff or, frankly, on the part of the licensee. Our team's findings were that there were people in place who were technically competent enough to have been aware of this and to have pursued it.

What we failed to do, in a single word that always comes back to me, is "integrate" the information. In looking back in time, I was in a different job at that time. I was one of the metallurgists that was involved in reviewing this situation.

To give you a good example, we were somewhat compartmentalized. I was in the assessment area that did the structural integrity review. So I was presented with, "You have some cracks in these Inconel housings and they are not through wall. There is some partial depth, and you're the fracture mechanics people. What does that mean to the safety of this structure?" The answer was that it doesn't really mean a whole lot to the safety of that structure. It's in pretty good shape even if you leave the cracks there. You watch them. You monitor them with some advanced inspection techniques, but it's okay to leave them there.

That was decoupled in our organization from the folks who were looking at the potential for boric acid attack. So that linkage was never made. That's a weakness that we're trying to address through some of the action plans that are in process right now. The proof will be in how well the NRC deals with this again, or better yet, in the Naval Reactors slide that showed obviously the better part, which is to sweat the details and focus on the small problems so you never get to something like this. That's where we want to be. I don't think we are there yet. I think we have some work to do, and that's part of what we're dealing with here.

MR. FORTENBERRY: Thanks.

DR. HACKETT: I'll just focus on the last one on here because this was a particularly tricky item for us. The reactor vessel was assumed in our probabilistic assessments not to fail. It's inviolate or sacrosanct. So we found ourselves really lacking in this area of analysis methods to assess the risks associated with passive component degradation. This was not something that we were focused on.

Cindy and Russ talked about the Significance Determination Process. It made that significance, the determination of that which is obviously, in a layman's sense, that this was a very significant thing. It was very difficult to deal with analytically because we did not have models that addressed this type of thing before.

DR. MANSFIELD: So you could get a PDF [probability density function], say, of probability of release as a function of volume and time for boric acid, but you didn't have a mechanism for turning that into probability of failure for the pressure vessel.

DR. HACKETT: That's correct. In this case, that was unanticipated. I guess I'll just move towards summing up here. We heard this throughout the presentations this morning. I had occasion as part of this analysis to review some books by a professor, Henry Petroski. I think he's at NC State. He's written a book on preventing structural failures.

What you see are these common elements, a lot of common elements between our effort and the Columbia Accident Investigation Board, for instance. A lot of it goes to communications and organization. These were some failings for us in terms of communicating up the chain what was going on at the site, at the plant, and through our inspections and the inspection effort itself, as I mentioned earlier, without a questioning attitude.

Also, the engineering design, in this case: What saved the day? Well, my hat's off to the designers, because you had six and a half inches of steel and it took six and a half inches of steel and the stainless steel liner still held. Not a place you want to be, but engineering design plays a key role in this. I think the nuclear industry is very fortunate to have that kind of backstop to this.

Then it goes to the operating experience piece. The last part is the timely dissemination of data and information. We did not do a good enough job of that in our effort internally at the NRC. The last slide.

DR. MANSFIELD: Excuse me. Could I ask a Naval Reactor's representative if those four points sound familiar, and would they add anything to that list?

MR. KAUFFMAN: Yes, they are familiar. I already talked about the importance of communicating problems to all the involved individuals and then taking timely action to resolve them. Conservatism in design, I talked about, "You get what you inspect, not what you expect." Those are key elements. There are a lot of other things that you could add, but this is a pretty good overview. I think if you are going to take away four top level things to keep in mind, this is a good list.

DR. MANSFIELD: Because we eventually want to consider a list like this for the Department of Energy sites as well.

DR. HACKETT: My very last slide just goes towards a couple of pieces that are somewhat unique, at least to the NRC, and some are not. The fact that the technical elements, as I mentioned earlier, are really only part of the story. Not to underplay it, but they are the parts that are easier to fix.

In our case, we had some real challenges in our regulatory framework in issues and then some policy issues. A good example of one to share with the Board here is we do not regulate safety culture. The NRC Commission has taken up that debate. In the past, they have decided that we don't have the appropriate wherewithal to measure safety culture. I think it's fair to say the Commission is now reevaluating that approach.

Also, we're going to be seeing a new composition of our Commission. It's ever a dynamic situation, but everywhere we did what we would call in this case the "Lessons Learned Task Force," a deep vertical slice on a particular issue. Everywhere we touched we saw safety cultural issues at this licensee that were disturbing. We do not regulate that. I think there's an overlap there with NASA's situation and the Columbia Board.

We have obviously the nature of the public interface for us. It's probably also very different from Naval Reactors. It's critical for us. We ever operate in a fishbowl, and we are accountable to the public in a very telling way. I think we think that's the way it should be. We report to the public. We're chartered to protect the public health and safety, but it makes the job very difficult to communicate this type of thing effectively the elements that Cindy mentioned as our strategic goals. Communication, we already talked about.

Even the study for me after this team was the importance of risk and communicating risk. I said actual and perceived. Perceived becomes actual. If we're talking to people, and we did, who live in the vicinity of this plant out in Ohio, their perceived risk is the risk. We have to be able to articulate that. It's a real challenge for us to do that in the most open and scrutable way. These are just some other elements and additional lessons for us as an organization that we're working our way through, too. That concludes my remarks.

CHAIRMAN CONWAY: Thank you. A.J.

VICE CHAIRMAN EGGENBERGER: I have no questions.

DR. MANSFIELD: This was very valuable. Thank you.

CHAIRMAN CONWAY: It was very helpful to us. I appreciate the time you've given us this morning. Thank you very much.

MS. CARPENTER: Thank you.

CHAIRMAN CONWAY: Now, as we indicated in our previous announcements, we always invite members of the public and representatives of the public to testify. I've been informed that Mr. Richard Miller, Government Accountability Project [GAP], would like to speak this morning. Is he present? Mr. Miller, welcome.

MR. MILLER: Good morning, Mr. Chairman and members of the Board. My name is Richard Miller and I thank you for carving me into your schedule today. I hope I can emulate the crispness of the briefing that you've received from your previous speakers. It's often the case that you come to speak to advise people on your views and you learn more from coming to the meetings than you ever think you could possibly convey.

Let me just say today that I'm here to address really one question and make a plea to you. GAP, as you may know, represents whistleblowers throughout the federal government and now in the private sector and also has a project which oversees the health, safety, and environmental policies and practices within the nuclear weapons complex.

I spent many years working for the Oil, Chemical, and Atomic Workers Union. We've had many interactions over the years in the past. In my new capacity, I'm continuing some of these activities, one of which included work with the Congress on the passage of a provision, Section 3173 of the Defense Authorization Act, FY '03 [Fiscal Year 2003], which amended the Atomic Energy Act to provide for the Department of Energy to convert its orders governing industrial and construction safety into enforceable regulation. Now as you know, these have not been enforceable regulations since the passage of the Atomic Energy Act.

Today, of course, the Office of Environment, Safety and Health, Office of Enforcement, is responsible for the Price-Anderson regulations at

10 CFR 835. This provision would add responsibility to that particular organization by adding industrial and construction safety to their enforcement regimen.

I would like to just briefly outline several key salient points within the legislation and offer several comments and, as I say, a plea to the Defense Board, which I will get out up front so you know what the task is before I tell you what the subject is. People always want to know: what does he really want to talk to the Chairman about?

What we want to talk to the Chairman about, and members of the Board and staff, is this: that this is a process, in this rulemaking, which has to be concluded (at least by statute) by the second of December this year, which we would be very grateful for your scrutiny, oversight, and careful consideration. The basis for this - I must say and at the risk of seeming over-gracious towards you - is that you all stepped in at a point in the process of this legislation that highlighted the problem.

DOE Order 440.1A, [Worker Protection Management for DOE Federal and Contractor Employees], which really is the core of DOE safety orders for industrial and construction safety was, shall we say, potentially under attack for elimination by certain individuals as part of the DOE order review process that was underway in an effort to eliminate redundant or needless regulation. And on March 29, 2002, Mr. Chairman, you directed a letter on the order review process which highlighted the fact that this should not happen, and we're grateful for you doing so because we think that reinforced certain staff perspectives within DOE. However, we thought it was important to legislate that point. It was just too important, at least from the experience of ourselves and other worker representatives in the nuclear weapons complex.

These regulations after being promulgated will become enforceable one year thereafter, which gives DOE a year to basically come into compliance with rules that they say they already are in compliance with. But we learned with the USEC [United States Enrichment Corporation] experience that it does take time to come into compliance with rules that you say you are in compliance with.

The second question is level of protection. As the statute and the accompanying report language, which is attached to my testimony, provides that Order 440.1A is that particular standard which incorporates, of course, the OSHA [Occupational

Safety and Health Administration] regulations, except where there are clearly recognizable hazards in the DOE complex, such as with explosive safety, beryllium, biohazards, and so forth.

The law provides the Secretary with flexibility in three areas, and I want to focus on this just briefly. One is to tailor the implementation of regulations to reflect activity and hazards within a particular work environment. The second is to deal with facilities that are in the D&D [deactivation and decommissioning] phase. Third is to achieve national security missions of the Energy Department in an efficient and timely manner. I don't know if that means "waiver" or not.

What we do know is that these were narrowly crafted areas for flexibility, basically to provide assurance that common sense would be effectuated in its implementation, so, for example, no sense in applying weapons explosives regulations when you are dealing with demolition and conventional explosives. For example, there is no reason to upgrade a facility for railing and guard rails and tagout lockout in a de-energized building that's going to be demolished. Lastly, of course, there's no need at any point to compromise national security missions.

Again, the question becomes, "Should there be a waiver process?"

Finally, deeming assessed fines or penalties up to $70,000 per day, and continuing violations constitute a separate violation. In addition, DOE is authorized and directed to put into all of its contracts a provision which would call for a graded reduction in work fees for violations proportionate to severity.

At the Department of Energy's urging, the conferees included what's called a "choice of penalties" section, a provision which provides that for any violation of these new regulations, the Secretary shall pursue either civil penalties or contract penalties, but not both. This was well articulated by the contracting community, including the current Under Secretary before he assumed that responsibility. It was no surprise to see that entered in the debate. In having vigorously opposed that provision with no success, I must confess here today, the "choice of penalty" provision I think is certainly open to whether or not this hamstrings DOE's ability both to control its contractors and assure adequate levels of safety. Let me just offer briefly some quick comments.

DR. MANSFIELD: May I ask just a question? Do you expect that the contracts that incorporate penalties would remain unrenegotiated in the face of regulation? That is, why should a contractor sign up for an extra penalty under the contract when he's already forced into regulation to accept the penalty?

MR. MILLER: Currently under 10 CFR Part 835, for example, both of those apply. You can have both a contract penalty for a nuclear safety violation and the same with security violations under 234(b). My view is why treat the industrial safety rules differently than you treat nuclear and security?

DR. MANSFIELD: My question was: will the contractor treat it differently and essentially negotiate not to have that?

MR. MILLER: Well, here's the question. Under all DOE M&O [management and operating] contracts, as I understand it, and in the M&I [management and integration] contracts, the primes, and I'm willing to stand corrected here, they specifically provide a boilerplate provision that says its regulations are promulgated, and the contractors must comply with future regulations. So it's up to DOE, I guess, at that point to determine whether they want their contractors to be customer-friendly or not.

This is an area where you all have done an excellent job of focusing on how DOE has dealt with the necessary and sufficient standards. The Defense Board has noted that DOE's field offices tend to lack expertise and sufficient staff to tailor necessary and sufficient safety requirements for each job.

Frankly, we are concerned about even worse than that, which is eliminating minimum safety requirements in favor of these vague performance-based approaches, which most people that I've talked to agree in reality is a reduced emphasis on safety. We have lots of competition between milestones and safety, not different than we've had at any other period in this self-regulatory system. Particularly, we just want to draw attention and compliment you on your focus as a Board on the Fernald situation and what was really an extraordinary level of accidents with Mactech and others out there due to inexperienced workers.

Secondly, I just want to flag for you just as a matter of process, DOE has not opened the door and said, "Come on in," like you've done here today and said, "Hey, how can we think about this statute constructively?" So our hope is that DNFSB may have better access than us mere members of the public, troublesome and burdensome ones to be tolerated, I suspect.

Next, we're concerned that the regulations may allow DOE to delegate authority to its field offices under this rulemaking process where they will establish the health and safety requirements. It means that basically the contractors will be writing their own health and safety requirements and telling DOE, "Here's what we're willing to be enforced against." We think that's probably the wrong approach, particularly where Order 440.1A has both very solid procedural provisions, overall management requirements in the contractor directive provisions, as well as incorporating the OSHA regulations with those exceptions that we talked about, beryllium explosives and so forth. In addition, DOE's beryllium rule, we point out, is not enforceable through fines and penalties, even though it's an excellent rule.

Two other points here is that we would like the Defense Board to review the staffing plan for the Office of Enforcement, so that it's going to be able to adequately oversee this expanded capacity. We don't know who else is competent to come in and do a management review to see if this is going to work and whether the self-reporting system, which is really the backbone of the existing Price-Anderson regimen is adequate and appropriate for industrial and construction safety violations.

I guess those are our thoughts. I'm sorry. I went on a little bit longer.

CHAIRMAN CONWAY: That's fine.

MR. MILLER: I welcome any questions you may have.

CHAIRMAN CONWAY: Very good. As always, we are very pleased to have you come before us and keep in communication with us. Since you made reference to a letter of March 29th, I will have that put into the record at this point so people will understand what you referred to. (See Attachment C, Letter of March 29, 2002.)

MR. MILLER: That will be terrific. Mr. Chairman, if you or your staff would like to get back to us to discuss what role or responsibilities you might assume, it appears to us at least that your statutory authorities would allow you to delve into this area. We would welcome the answer "Yes" to our request.

CHAIRMAN CONWAY: Okay. Also as I mentioned earlier, we will keep the record open until October 10th, if you want to add anything else in the meeting, if you think about it and want to put anything more in. Also, is there anyone present that would like to speak? I have at least one other individual who has asked some time to submit a statement for the record, which as I said, we will keep the record open until the 10th of October. Kent.

MR. FORTENBERRY: Yes. I wanted to take the opportunity before we close here. Certainly the NR folks subjecting themselves to our questions and whatnot, I appreciate. That was done from a success story. I want to particularly express my admiration of the folks here from the NRC allowing us to probe and question what was a major issue for you. So I really appreciate that. It shows frankness and your interest in understanding what has happened and how to deal with it. I appreciate that.

CHAIRMAN CONWAY: We thank you all for coming, and we will recess at this point. I'll make note that it's 12:00 noon. We'll recess at this point subject to the call of the Chair. As we mentioned, we will have additional hearings in the future, continuing to explore the subject matters that we discussed here today. Thank you again. Off the record.

(Whereupon, the above-entitled matter was concluded at 12:03 p.m.)

CERTIFICATE

This is to certify that the foregoing transcript in the matter of: Public Meeting

Before: Defense Nuclear Facilities Safety Board

Date: September 10, 2003

Place: Washington, D.C.

represents the full and complete proceedings of the aforementioned matter, as reported and reduced to typewriting.

Rebecca Davis

Rebecca Davis