UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
- - -
MEETING WITH CHAIRMAN OF NUCLEAR
SAFETY RESEARCH REVIEW COMMITTEE (NSRRC)
- - -
PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Wednesday, March 27, 1996

The Commission met in open session, pursuant to notice, at 10:30 a.m., Shirley A. Jackson, Chairman, presiding.

COMMISSIONERS PRESENT:
SHIRLEY A. JACKSON, Chairman of the Commission
KENNETH C. ROGERS, Commissioner
GRETA J. DICUS, Commissioner

STAFF PRESENT:
JOHN C. HOYLE, Secretary of the Commission
KAREN D. CYR, General Counsel
PRESENTERS:
E. THOMAS BOULETTE, Chairman, Nuclear Safety Research Review Committee
DAVID L. MORRISON, Director, Office of Nuclear Regulatory Research
JAMES MILHOAN, Deputy Executive Director for Nuclear Reactor Regulation, Regional Operations and Research

P R O C E E D I N G S

CHAIRMAN JACKSON: Good morning, ladies and gentlemen. I am pleased to welcome Dr. E. Thomas Boulette, Chairman of the Nuclear Safety Research Review Committee, Mr. Jim Milhoan, and Dr. David L. Morrison, Director of the Office of Nuclear Regulatory Research.

The Nuclear Safety Research Review Committee advises the Director of Nuclear Regulatory Research and through him the Commission on the quality and conduct of NRC research activities and gives recommendations concerning the overall management and direction of the nuclear safety research program.

Today's meeting will focus on the recent activities of the committee and the staff's response to the NSRRC review and comments.

The Commission appreciates the efforts made by this committee and its reviews of research programs that support important safety issues. Today's briefing will provide a broad overview of many of the programmatic activities of the Office of Research. These activities, as I understand it, include radionuclide transport in the environment, aging, human factors, and instrumentation and control, severe accidents, and thermal hydraulics.

I understand that copies of the committee's report to the Office of Director of Research are available at the

entrances to this room.

Do other Commissioners have any opening comments?

COMMISSIONER DICUS: No, thank you.

COMMISSIONER ROGERS: No.

CHAIRMAN JACKSON: Dr. Morrison, you may proceed, or Mr. Milhoan.

MR. MILHOAN: That's fine. I think you stated the purpose of the meeting, Madam Chairman. So I will ask Dave to go ahead and start our discussion.

MR. MORRISON: We are certainly pleased to meet with the Commission today. The previous meeting that the NSRRC had with the Commission was back in July. Ed Kintner was then Chairman of the NSRRC. He retired from the committee as well as the chairmanship. So Dr. Boulette has taken over.

Due to scheduling conflicts, we weren't able to schedule a meeting with you after our September meeting, but since the subject of both the September and the January meeting were so similar, this seemed to be a reasonable time to have a discussion with the Commission.

[Slide.]

MR. MORRISON: I have on the first viewgraph, or the second page in your handout, a brief overview of the NSRRC. Since this is your first time meeting with us, Commissioner Dicus, I thought you might like a little

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background. I won't go into it too much.

The committee was established in 1987. That was based upon a report that the National Academy of Sciences published in 1986. The broad subject of that report was revitalizing nuclear safety research. Robert Frosh from General Motors was the chairman of that committee and it was a rather distinguished committee.

The study had been requested at that time by the then Chairman Joe Palladino to take a look at the NRC research program and what is the future role of NRC's research program in the agency. So going back about ten years is the history of the committee.

Prior to the establishment of the NSRRC, the only oversight of the research activities was done by a subcommittee of the ACRS. Since the NSRRC has been formed, the ACRS has only been meeting with me and other people at the office occasionally. So it hasn't been a thorough review that they have been doing. They have more or less turned all the responsibilities over to the NSRRC.

The committee can have up to 12 members. We are one or two below that number now. These are individuals that have expertise in all the disciplines that are important to our program. It is generally a good balance between representatives from academia and representatives from industry. I think we are roughly half and half right

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now on the committee.

The committee generally schedules two full committee meetings per year, but to get into the details of the research program there are a number of subcommittees that are established on the various topical areas. The subcommittees meet perhaps once or twice a year to dig into the issues in more detail.

According to the regulations that the committee has put on itself, the subcommittee reports do not stand on their own until they are discussed and reviewed and accepted by the full committee. So there is sort of a check and balance in there.

I would like to turn to the two meetings in question, the September and January meetings. Both of these meetings were set up to respond to a letter that Mr. Sol Burstein sent to Dr. Boulette. When Sol retired from the committee he had a lot of good questions that needed to be answered, and in his own inimitable manner, he posed these rather forcefully to Dr. Boulette. We set up at least a September meeting to respond to those questions.

Also at the September meeting it was an opportunity to introduce three new members of the committee, Professor Bankoff, Mr. John Taylor, and Professor Christine Mitchell, to the research programs. We tried to provide a broad overview of the program at that meeting, addressing a

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number of the topics at a fairly high level. The result of that meeting was a greater interest on the committee of getting into the details of the research program.

At the September meeting we did not have the FY-1996 budget. It happened to be an open meeting, so everything that we were talking about was against the FY-1995 program that we had underway and the general changes that we were going to make in the current fiscal year.

At that meeting I raised the key issues that were

facing not only the agency but the Office of Research as well as the declining budgets, how we were going to plan and prioritize within these declining budgets, and the overall staff reduction goals that we had to meet over a five-year period. Those were sort of the general criteria that were laid out for the committee to take a view of our research program.

At the January meeting we had a closed meeting where we could get into the details on the plans for 1996 against the 1996 budget at that time as well as to look at some of the out years of where we would go. I think this was quite useful from the committee's standpoint as well as the staff's standpoint.

We also got into a greater detailed discussion of the research. Prior to that meeting we had broken down the eight areas which you mentioned, Chairman Jackson, in the

introduction into 50 research topics and addressed the topics in quite a bit of detail within the staff.

At the meeting there were in each of these eight areas two to four of these topics presented. So the committee had the opportunity to look at the details and the procedures that we were following and attempt to set priorities and look out into the future.

We also had the opportunity at the January meeting for Mr. Jim Taylor to address the committee and give his views of what directions he saw the agency would be going and how he viewed the research program within the agency's mission.

That is the general background of the two meetings. I was trying to, from my perspective, get the insights and recommendations from the people that are representative on the committee, and I think they have given us some sound advice. So I will turn it over to Tom Boulette to discuss the recommendations that the committee has made.

Tom

MR. BOULETTE: I should preamble my comments by saying most of the committee is new in membership. I was trying to reflect as Dave was talking in terms of who has been there more than a couple of years. There are only a couple of us. One of the issues, and we will probably

allude to it as we go through our comments, is a general understanding of what the role of the committee is. In fact, in Sol Burstein's letter to me six to nine months ago that was one of the leading questions: Should this committee exist? What's its role?

You may hear some confusing remarks relative to that because the membership is new. In fact, Dr. Morrison and myself have spoken a couple of times as to the views expressed by the some of the committee members in terms of are they talking about research and its role, or are they talking about the nuclear industry itself and who they are representing. Those things will come through my comments, I believe.

[Slide.]

MR. BOULETTE: We have enumerated the major comments on the last slide in the package, and I can walk through those rather briefly and invite questions or comments as we go.

One of the concerns that was expressed by many of the members, and it is focused principally because of the budgetary constraints that the agency is facing now, is the need for a long-term view in research. There is a concern that as we continue to squeeze the budgets and the resources available that will be the first thing to go. The members have expressed some real concern about that and in fact have

identified some examples of why they are concerned.

The steam generator tube degradation process at Maine Yankee was a good example of the need to continue to try to anticipate some issues that may be coming down and depending on the staff to identify those areas that may not have direct applicability right now but in the long-term view may serve the agency very well. We did debate that at some length, and in fact some of us even tried to quantify what we mean by a certain portion of the research should be focused on long-term views. Dr. Morrison has responded to that.

There is a question on exactly what is meant by risk-informed, performance-based regulation and how that might impact the research program. We have in fact made, I

think, some sort of a commitment to the committee members to have a fairly detailed presentation on that in the June meeting coming up on the 27th or 28th of June.

I am convinced that the membership around the table has very different opinions and definitions of that term. I happen to be the only member on the committee that is utility based at this point in time. My views are probably at odds with some of the professors. I don't know. At odds may be a strong statement, but clearly I think I may be seeing the world a bit differently than some of the others. On the other hand, I think there is very little

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unanimity on what that really means.

So I think it is important that we hear more about that and what the NRC means by that in some detail, and then we will be able to, I think, more formally and more deliberately try to address the research needs in that area.

COMMISSIONER ROGERS: Excuse me. Didn't one of you say today that the committee was roughly half and half something and something else? What is this balance that you referred to a little earlier if you are the only one that comes from the industry?

MR. MORRISON: I raised the point. Dr. Boulette is right. He is the only one that is active in one of the utilities that is operating nuclear power plants. We have John Taylor, for example, who just retired from EPRI, and I kind of put him in industry. We have Sumio Yukawa, who basically came from General Electric. Those are the people I put in the "industry" category.

MR. BOULETTE: Sol Burstein, for example, was a retired exec from the utility business. But there is nothing like being intimately involved on a day to day basis to color your view of what research ought to be and what the NRC should be about. That was the only point I was making. And many of the other members are from academia and laboratories.

Another issue that we did spend some time talking

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about, and I think I speak for the committee at large, probably unanimously, is a concern that we have in terms of the reduction of emphasis on high level waste, trying to separate my views as a utility person and trying to remain a bit objective about this. This is viewed on the part of many members of the committee as the issue facing the nuclear power industry, and clearly if there is to be some sort of solution to this, the NRC will more than likely have a major role in that whole process. So anything that impacts on the ongoing efforts in that area concerns the committee significantly.

CHAIRMAN JACKSON: We do have the Center for Nuclear Waste Regulatory Analysis in San Antonio. So I'm not sure I understand what you mean when you speak of reduction of high level waste.

MR. BOULETTE: I think we are talking principally of the in-house capabilities and the budgetary resources committed to that effort. It's our sense that some of those numbers are going to be decreasing this year and the next couple of years.

CHAIRMAN JACKSON: Resources devoted in research or resources devoted overall?

MR. BOULETTE: In research. We understand the commitment to the center, but we are concerned as to whether that is adequate or not.

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CHAIRMAN JACKSON: You are concerned as to its adequacy from the point of view of whether the Center is adequate or the support for the center is adequate?

MR. BOULETTE: Support for the center.

CHAIRMAN JACKSON: Thank you.

MR. BOULETTE: The next item is one that has been raised for a couple of meetings and in fact predates yourself, Dr. Jackson, and that is an issue that Ed Kintner was quite vocal about, the need as we see it to look at the human factors and I&C in a more integrated fashion. Ed was a champion of that. I know Commissioner Rogers has some interest in that whole area. We understand that there is a lot of research being done in both areas separately, and we are concerned as to whether there shouldn't be a more integrated approach to that.

There have been some changes in the program in the last several years that address our specific concern, but we will continue to delve into that to make sure that we are comfortable with where that is going.

Finally, some of the more traditional areas that have been on the plate for many years warrant some additional attention because of where the industry is going. Increasingly the industry is looking at longer and longer fuel cycles. We at Boston Edison, for example, have a program going with MIT right now looking at four-year cycles

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and longer, which calls for longer burnup, et cetera, and then some different phenomena occurring between fuel and cladding, et cetera. There is a need to maintain the expertise to be able to respond to some of those changes in the operating practices of the nuclear power plants.

We do share a concern, and we have expressed it a couple of times, as to the maintenance of the computer codes and the modeling that traditionally has been done by contractors at laboratories which will be shared by the staff at this point in time. That, in our view, requires a training program, a refocusing of the staff and its skills and competencies in a slightly different direction. Although that is clearly doable, it does pose another problem for Dr. Morrison to manage. We have expressed that concern also.

That pretty much summarizes where the committee is at. We do acknowledge that the subcommittees as they get into these various areas may raise more issues. We expect that to happen. We are very sensitive to the budgetary constraints and want to make sure that we serve Dr. Morrison appropriately by helping him to prioritize all of the task forces and task groups and task areas that he is trying to manage given the fact that like everybody else the dollars are going down.

CHAIRMAN JACKSON: Let me ask you a couple of

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questions. With respect to human factors and I&C, can you provide a little more specificity with what aspects or what areas you feel need more integration, what may be missing?

MR. BOULETTE: I think it was in our report. One of the suggestions we made to Dr. Morrison is probably a more deliberate approach to actually looking at a control room or a work station in a plant and looking at not only the hardware and the software present in that facility separate from the operators who interface that facility, but looking at the combination of the two. It is our view that some other industries do that very deliberately. The aviation industry, for example, does a lot of human factors and controls and instrumentation kinds of assessments. That is kind of the focus of our concern: Should there be a more deliberate focus on the actual interfacing of these two functional areas?

CHAIRMAN JACKSON: Do you feel that has implication for some of the backfitting that certain plants are doing with digital control systems?

MR. BOULETTE: That is part of the issue. I think another larger issue is implications on safety specifically, and there are probably quite a few questions that will come out of that endeavor, if we go down that road, that should be focused on and may shape the research program.

CHAIRMAN JACKSON: Down the road of?

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MR. BOULETTE: Of integration of these two functions and looking at them holistically.

CHAIRMAN JACKSON: The staff is working on a standard review plan having to do with digital controls. Do you feel that your concerns have implications for the development of that?

MR. BOULETTE: I think so, yes. Again, it's in the lines of the aging issue. You don't really know quite what you are going to get into until you really start to open those doors. We are concerned that the two doors have been opened separately and probably there should be a bit more focus on opening them together and seeing what issues may come out of that.

CHAIRMAN JACKSON: Is the committee giving any thought to how it might help define what some of the broad range of issues are, where that kind of integration is really necessary?

One can talk broadly about it, but in terms of designing an actual research program or creating priorities as well as having it inform other aspects of our regulatory program, such as the development of the standard review plan in this area, it is important to have a better sense of the whole human factors area, human-machine interaction, et cetera. It's a huge area. The question is, what are the

critical aspects of it from a safety and a regulatory
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viewpoint?

MR. BOULETTE: I will ask Steve to add to this, but one of the principal reasons that we got Christine on board on this committee is her strong expertise in that area. She has already expressed some concerns that, let alone the NRC and the research arm of the NRC, the nuclear industry itself, in her view, has not paid nearly as much attention to this integrated approach as other industries have. She has a broad based experience. That certainly makes her uncomfortable with the fact that there is not enough activity there.

I think they have appointed her as chairman of the Human Factors and I&C subcommittee. I suspect that is what she will be driving at over the next couple of months, to try to define more what those concerns are and what the possibilities are and the potentials are for how it may impact on the research program of the NRC.

CHAIRMAN JACKSON: Commissioner Rogers.

COMMISSIONER ROGERS: I have so many things I am interested in I don't think we have time to delve into them all. Just a couple of questions to begin with.

In your report on the September 25th and 26th meeting -- I think that is it -- there is a statement. Let's see if I can give you a page. I guess it is page 2, if you have that handy. Near the bottom. "Tom King
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provided a brief discussion on several areas within the PRA program. The Committee expressed some concerns as to the probability for adequately-defined key parameters for input to the process of methods developments. In addition, several sub-areas (organizational factors, equipment aging, and digital I&C) were viewed as having relatively low success probabilities given the projected monetary and timing budgets."

I wonder what the thinking there was about the relatively low success probabilities comment. I'm not sure where that came from, whether that is a committee view or whatever, but it is in your report. I think at the Commission level over the years we have had a great deal of uncertainty with respect to how valuable research in organizational factors might be. That has always been a big question, how to deal with that. That is a very big area. Lots of difficulties in measuring things, and so on and so forth.

On the other hand, equipment aging and digital I&C are prime areas, I would think, for research success probabilities. Maybe I&C has got some difficulties in reliability measurements and things of this sort because of the different nature of digital systems, but equipment aging certainly doesn't.

I was wondering if you could explain a little bit
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the thinking behind that paragraph.

MR. BOULETTE: Let me try, and again I will invite Dave to add to that since he is president of all of our meetings. I think we lumped these areas together for the same reason, and that is that there is a sense of vagueness to all the three areas in terms of what exactly are we focusing on. It relates to your question, Chairman Jackson, that until you really can define the problem, it gets very difficult to try to address a solution. In the area of digital I&C, I think one of the issues there is, relating back to our previous discussion, do you look at digital I&C in and of itself? Do you look at its interface with human factors?

There is a vagueness, it is my sense -- I think I am reflecting the committee's view -- to all three of those programs. For example, thermal hydraulics. I think there is a real good sense of what the issues are and what is going on. You have all of the equations, and what have you. So you have a sense of what you are doing. In these three areas it is sort of like roping some new baskets and some new research areas. That is a concern.

CHAIRMAN JACKSON: Is the vagueness there because the expertise is not there or there hasn't been sufficient time to formulate coherent programs? Or is it money? Those are different questions.
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MR. BOULETTE: I think it's the latter. I think it's the newness of the issues. It hasn't been too long that we have been talking about aging issues. It probably

started in the realm of Yankee Rowe, for example, as we got into licensing. I think that is really the issue. Many of the other research efforts that are underway are 20 and 25 and 30 years old. These are all relatively new.

CHAIRMAN JACKSON: How does money impact it? That is really what I am trying to understand.

MR. BOULETTE: I think the money part or the budgetary part forces you to try to focus quickly, to get to the more important issues, and when you do that, because the scope is so broad and so vague, you might focus in a slightly wrong direction. With unlimited funds you tackle them all. You hire up and off you go. That is the concern I think that has been reflected here. In the areas of aging, what subsets of the aging issue should you focus on? Because you can't tackle it all.

CHAIRMAN JACKSON: Dr. Morrison looks like he wants to say something.

MR. MORRISON: I would comment that there were three items mentioned, as you identified there, Commissioner Rogers, the organizational factors, equipment aging and digital I&C. Unfortunately that is kind of a mix of apples and oranges.

COMMISSIONER ROGERS: Is it ever.

MR. MORRISON: I think one of the concerns that we have had in the past, and that probably goes back several years now, is in the organizational factors area. Several approaches we have tried from a research standpoint to get our hands around the organizational factors have not yielded us anything.

The other side of the coin there is how far should NRC go looking into the organizational issues, which are really the purview of the industry. They are the ones that are staffing and managing the plants. So there is a dilemma that we kind of face. We haven't been terribly successful in the research to date, but I think we have a few things coming down the path now that look a little brighter than they did a couple years ago.

Timing is more the issue than money. I think we could find the money available. If there were a good idea out there to fund, we would reprogram money.

The equipment aging is more tied to, is the database really adequate? We know a lot about the equipment that is being replaced, and we assume that if you replace an active component that you almost go back to square one with regard to the reliability.

On the other hand, if you have an active component that has been there 30 years, do you still have the same

performance expectations?

I don't think we have a good handle on that. This is showing up now in what we are taking a look at, just beginning to talk about, structuring a program that looks at the aging of structures per se. They were built with quality design criteria in mind. Obviously they had good margins when they were originally built, but 30 or 40 years later, if you are subject to a different kind of stress or subject to a stress, say a seismic loading, do you still have that margin available? There is a database lacking there that you can really factor in, especially to an IPEEE, what the likely response would be.

The digital I&C area. The environment in which some of these systems have to operate is different in a nuclear power plant than you find in many of the other applications of digital I&C. Perhaps some in the chemical industry process controls have the same harsh environments of temperature, pressure, humidity, and that sort of thing, but in a nuclear power plant you have a lot different environments, plus the radiation and other effects in there that you don't normally have. The general reliability data is a good indicator of what is likely to happen, but I think we would feel more comfortable if we had additional data, and there just isn't enough information out there yet. There aren't enough of these digital backfits put into

plants to give us a warm feeling.

COMMISSIONER ROGERS: That is my understanding of the characterization of these areas that you have made, but I have a little trouble with the statement "having relatively low success probabilities." I would certainly accept a view that organizational factor research has a relatively low success probability under any circumstances, money or no money.

On the other hand, equipment aging is clearly very much on our plates and very important. It seems to me that it has got to have a relatively high success probability. We can't accept it as something having relatively low success probability, because that would tell us then that we shouldn't do anything in that area, and it seems to me we have to do something in that area.

It is just a question of what actions one should take based on the characterization of these three areas as having relatively low success probabilities. Even with limited funding one then has to focus, as you have said. There are important issues. I think that we have to be able to defend what we are doing as having some relatively good success probability. Otherwise I think we are really in trouble in devoting very scarce resources to anything that has a relatively low success probability.

I am just taking the words very literally. I

think that maybe some elaboration on your thinking there and what you pointed out, Dr. Morrison, that we really have to start to learn how to characterize these areas in some way that we can begin to make some progress, that is all part of the RES activities here at NRC.

MR. MORRISON: On the top of page 3 of my response to the committee's letter I address many of those same comments that you have just made. I think it says that we need to have considerably more discussion with the committee. That will probably happen through the subcommittee. I think there are some meetings scheduled in May for the various subcommittees. The Human Factors and I&C Subcommittee will get together and that is a good time to discuss this in more detail.

MR. BOULETTE: If I could add a comment. I don't believe that the subcommittee was implying that the initiatives in research in those areas would not be fruitful. It's a question of whether it addresses the entire scope of the problem. I think we are satisfied that the actions taken by Research in the defined areas, in these three areas are well done and well managed, and what have you. The question is, because of issues that are relatively new, and the timing, and what have you, is that scope broad enough to catch all of the issues?

COMMISSIONER ROGERS: I would hope in the future

maybe you will be able to clarify exactly what your concerns were there. I think that can be very helpful as we go back and look at these comments: What are we doing with them? How are we following them?

It does seem to me that the integration of human factors and digital I&C research is very important, but it suffers from the fact that classically these are not academically linked together. The folks that do human factors research and the people that do I&C digital research usually are in different parts of the university; they don't talk to each other. Yet we know this is where they have to come together. So there is that problem of bringing together human factors people and hardware people, if you want, in this area. Unfortunately, that is hampered, I think, by a kind of mindset of academic classification of areas of interest that doesn't link these two together.

MR. MORRISON: We are hoping that Professor Mitchell brings that kind of focus back to the committee. Professor Woods from Ohio State was on the committee earlier. We have had about a two-year gap without a good human factors/digital I&C person. Woods had that focus, and Christine Mitchell comes from sort of the same mold in that.

COMMISSIONER ROGERS: There are a few places that have recognized the importance of linking those two together, and it is very important, but I think there is a

hurdle to get over here in that the backgrounds of people that can contribute to this very often come from very different parts of the academic spectrum.

MR. BOULETTE: But we shouldn't miss the point. I think the point the committee was trying to make in this area was that in some other industries integration of these two functions seems to be taking place and being done well. So I wouldn't want to scapegoat on academia, to say that because of academia this is not happening. In the aviation industry it is working very well.

CHAIRMAN JACKSON: I agree with you, Dr. Boulette.

[Laughter.]

MR. BOULETTE: Thank you.

COMMISSIONER ROGERS: I'm happy to say it's academia. I spent 30 years there and I know where all the dirty linen is.

[Laughter.]

MR. BOULETTE: It is working in some places.

COMMISSIONER ROGERS: At any rate, I do think that is a bit of the problem.

You have used some words in your report that I wanted to understand a little bit better, and that was "regulator basis," where you felt there was a regulatory basis that exists or that didn't exist. I wasn't quite sure what you were saying when you used that term. It seemed to

me that one could interpret it in several different ways. I don't know if I can put my finger on the use of it here directly, but perhaps you know what I am talking about.

MR. BOULETTE: I don't, but I am scanning it quickly. One of the difficulties of being a chairman of a committee is that the report is written to reflect the views of everybody. It's a difficult position to be in, because as an individual I may not totally share that view.

COMMISSIONER ROGERS: It was a term that was used a couple of times in here. It seemed to me that it perhaps meant that we had some strength at NRC in this area, and that was what you meant by a regulatory basis. Or maybe you meant something totally different. I am sorry that I didn't highlight it here, because I thought it might be something that would be right on the top of your thinking. We may have to pass that over.

MR. BOULETTE: It is not generating any reaction on my part.

COMMISSIONER ROGERS: I'll have to go back at it later then, because I don't want to delay everything.

MR. BOULETTE: At the risk of going down the wrong alley, one of the things that has been expressed by this committee as well as previous committees is in fact the relationship between the various parts of the NRC in terms of communications and what have you.

MR. MORRISON: I found it. It is on the very last page of the handout. It is from the September meeting. It's the top of page 2. It's limited technical bases.

COMMISSIONER ROGERS: Yes, it was the September report in which you at the bottom of page 1 said, "Specifically, some areas have ongoing substantial R&D efforts by the industry and the DOE and have strong regulatory bases. Examples are severe accidents, containment performance, reactor aging, et cetera. The Committee recommends that opportunities to reduce efforts in these areas be further seriously explored."

That is really what I was trying to get at. What did you mean by "strong regulatory bases"? Did that mean that you have an effort ongoing here? We are the regulatory outfit. DOE is not and industry is not. Did you mean that there is enough going on combined in industry and DOE and NRC that these areas should be reduced? What is the message there? I just didn't understand it.

"The Committee recommends that opportunities to reduce efforts in these areas be further seriously explored." Are you advocating reduction, or are you saying watch out, don't reduce? What is the message there about those areas, severe accidents, containment performance, reactor aging?

MR. BOULETTE: Let me caveat this with I'll review

the question later, and if my recollection changes, I will address it at some further meeting.

COMMISSIONER ROGERS: Sure.

MR. BOULETTE: One of the concerns that we have expressed at several committee meetings is how effectively is the research arm of the NRC using the information that comes out of other agencies and other organizations, including industry, to form a base of technical data that could be used to reduce the need for further research.

COMMISSIONER ROGERS: You are talking about a sort of codification for regulatory purposes, a sort of database in some cases, a knowledge base that is identified, defined and structured. Is that what you are talking about?

MR. BOULETTE: It's along those lines. Is there enough effort on the part of NRC Research to look at other organizations, say in the geological investigations? Other entities are doing this worldwide as well as within this country. The concern, I believe, at least part of it, was

are we taking advantage of those other databases, these other resources effectively, and if we did, might that not reduce the pressure on the specific agency for conducting research?

COMMISSIONER ROGERS: I think there are some important thoughts here that maybe we need to explore further.

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I want to make sure I don't monopolize everything, but I've got a lot of things I want to hear about today. I'm happy to give up and go back, if we can.

CHAIRMAN JACKSON: We will pass the token back around.

Commissioner Dicus.

COMMISSIONER DICUS: Do you receive the reports and correspondence from the other advisory committees?

MR. BOULETTE: Such as ACRS?

COMMISSIONER DICUS: Yes.

MR. BOULETTE: Not on a routine basis. They are made available to us if we request them, or if Dave may see an issue that he thinks should come to our attention, or Jose or somebody like that, and we would get copies of them, yes.

COMMISSIONER DICUS: Some of those reports or correspondence will on occasion, I've observed, suggest either a research project or imply perhaps an area of research. I just wondered if you got them, if you had a mechanism in place to review those, and then what sort of review or comment or action you might take on them.

MR. BOULETTE: At the risk of putting Dave on the spot, I believe that he and his staff would be sensitive to that and as they run across these topics in his reports he would make them available to us. It has happened in the

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past.

MR. MORRISON: I think that is true. Very often these subjects are brought up, particularly at the subcommittee meeting. I am thinking right now about the thermal hydraulics area since that was one of the most recent reports that ACRS published on the AP-600 and the analyses we were doing in support of that. That happened to be a complimentary one that the program was moving in the right direction with the technical issues. The only question ACRS had was the timing, if we were going to be able to complete it.

I suspect if I go back six months to a year ago and look at an ACRS report in the thermal hydraulics area there would have been some real questions about the priorities and what was being done in the research program, and I think we have responded to that, and hence their turnaround.

I'm sure the committee probably looked at it back in the early days when the program was sort of stumbling a year or so ago trying to get their hands around the most important issues.

MR. BOULETTE: But there is no formal mechanism in place that has all the committee members receiving tons of reports. We sort of depend on Dave and his staff to make sure that these things are caught and we have a chance to

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review them and integrate them into our assessment of the research program of the NRC.

COMMISSIONER DICUS: If I heard you right, I think in one of your comments earlier on you mentioned that on the performance-based, risk-informed concept there seemed to be perhaps a difference of understanding or opinion between the reactor side of the house, the materials side of the house and your committee on what that meant. Did I hear you right? If so, what is the core difference? I was sort of curious about that.

MR. BOULETTE: When you are a licensee like myself and you undergo routine inspections, your views of risk-informed, performance-based regulations are certainly very different from Mike Golay's views, who is a professor at MIT. I think what I was trying to say there is it is very important for the committee to hear some sort of a consolidated presentation on this and get the NRC's views. We can argue it out.

I know that one of the concerns that Dave and I have is, where are these committee members coming from? Sometimes they sound like proponents for the nuclear power industry, and what we are really after is assessing the NRC's research program to see if it is focused properly and

it is done to the extent it should be done.

That is the only point I was trying to make, that

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we come from different places when we look at that statement and we interpret it differently, and as we do that, we may have different views as to what kind of research should be done and which way it should go.

Does that help to answer your questions?

COMMISSIONER DICUS: I was still curious about what a difference is, though. I don't think I got that answer.

CHAIRMAN JACKSON: Maybe you could put that on for an answer for the next time. Perhaps this can come after you have some input from the NRC.

MR. BOULETTE: As a part of the response, my focus is on performance-based. Mike Golay, whose background is PRA and those kind of things, his focus would be on risk-informed. I am sure that if we wrote a brief thesis on this statement it would be biased in those two directions because of where we are coming from.

CHAIRMAN JACKSON: I think the Commissioner is also interested in whether there is a difference of opinion between those who have operated in reactor space versus other nuclear licensees.

MR. BOULETTE: I believe the answer is yes, but we will amplify on that. It's a good question. We know that we have to dig into that area.

CHAIRMAN JACKSON: I have a follow-on question for

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you. This doesn't really relate to that. I note that the committee expressed some concerns over the longer term viability of the national laboratories. The question is, why did that come up specifically within the context of this committee?

MR. BOULETTE: I think probably because the majority of the members have either strong affiliations with those laboratories or have a history of having been there. I spent 12 years at national labs, and in spite of how objective you try to be when you look at the needs of an agency like the NRC and the research arm, it is still disturbing to me that some of the technology and some of the expertise that used to exist at Hanford Labs in Washington State is decaying away and dying.

Dave points out to me, and rightly so, that the impact of NRC research on the long-term viability of the labs is minimal, is very, very small. But I think the committee as a whole are concerned from a national standpoint that the expertise and the brain power and the creativity is decaying. And it is.

I am almost regretting that the comment was in the report, but it was something that was spoken to by several members and I felt compelled to put it in there.

CHAIRMAN JACKSON: I too may have a broader based public policy concern about maintaining various kinds of

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skills and levels of expertise in various parts of our economy and society. However, from where I sit here I have a parochial view in terms of asking you to address the question from the perspective of the relevance to NRC's regulatory needs and its interface with or impact on our ability to do the kind of research that we need to do. I think that is the kind of question your answer to which I think would be helpful not only to Dr. Morrison but to the Commission.

MR. MORRISON: I should step up and take blame for raising the issue with the committee, because I have great concern about the research program as some of the capabilities in the laboratory disappear, or if we, NRC, have to pay for the whole capability. That's an issue that I have under discussion with DOE right now.

One of the areas, for example, is if we need a hot cell, which we do, to look at steam generator tubes we pull from service or look at some of the irradiated vessel samples that we get. As long as DOE is using that facility, I only pay my share. If I have to pay for the whole facility, I probably won't be able to do that kind of work. It's just too expense to maintain a hot cell facility. And there are other things that get into that.

I think I was the one that probably raised the issue and then it got broadened in the discussion of what

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about the whole future of the labs. The committee members are certainly aware of what is happening to DOE's budget.

MR. BOULETTE: That is one side of the coin. As the resources diminish, support in these laboratories and the expertise disappears as well. The fast breeder program that we had back in the 1960s and early 1970s, even though there is still some activity going on there, it is pretty much gone. That was my beginning. You are hearing some frustration on the part of people who remember the good old days.

CHAIRMAN JACKSON: Those of us who live in the real world have to try to deal with these things.

I will pass the token back around. Commissioner Rogers.

COMMISSIONER ROGERS: Thank you.

I think that your comment that most of the committee members are new is something that needs some focus. It is my view that research at NRC plays a somewhat different role from research in most other organizations. To be most valuable to us, the committee has to really understand how research should be used at NRC and how it should be integrated into our total program.

I think that is going to take some time. You don't automatically come with that understanding when you come from industry or from academia or from a national lab.

How to sort out the features of research which are important for regulatory decision-making is a complicated business that comes from experience in working in the area.

I think one of the values that the committee brings is, of course, the external view and experience from outside of NRC. On the other hand, it has to try to understand how those views and areas of expertise can in fact be most useful to us here for regulatory decision-making purposes. That means you have to understand something about how regulation takes place and how it actually works. That is only going to come with time. I don't think there is a crash course in that.

I am just urging the committee to somehow try to educate itself in how we have to use the results of research and how they can be most effectively used and integrated into our regulatory decision-making, because that is why we have research here at NRC. I would urge you to try to take some steps in that direction. I don't know how, but I think Dr. Morrison can assist in this.

MR. BOULETTE: One of the things we might consider is rotation of these individuals. I haven't spoken to Dave about this, but I'm sure it occurs to him as well. When I look at the list of the membership, there are only two or three of us who have been on the committee for more than two years. In fact, probably a year and a half. I think that

is just the way it fell out, because we weren't conscious about that concern.

I think if we think about this in the future, rather than rotate out nine members at a time and bring in over the course of five or six months nine new members, we might be a bit more deliberate about it and make sure there is more continuity.

You are absolutely right. I've been in the commercial power business for 15 years. It was still a steep learning curve for me when I came on board the committee.

COMMISSIONER ROGERS: I think one of the things is your perception of how well we are integrating research activities into our regulatory decision-making. I think that your following that from the research end is very important and can be very useful to us. I would just urge you to think not only about the truly technical aspects of research at NRC but how it actually links and can serve a useful purpose here.

Many of us have research backgrounds and we understand research in the classical sense, but I certainly have come to the view that at NRC there is something more involved than what one normally thinks of as research in a national laboratory or in an industrial laboratory or in a university. It has a unique quality. With resources as

scarce as they are, I think we have to make sure that we are getting as much as we possibly can from our investment in what we call research in that respect.

MR. MORRISON: I have two brief comments. It has been my experience in being on the committee and observing it now that it takes an individual about two years to get up to speed on the committee. If they go to the full six years

that they are allowed, we have got four very productive years.

I tried something at this last January meeting, which is the first time in my recollection we even briefed that subject, which was what we do in the Office of Research in regulation development. All of the rules, reg guides and all of that sort of thing essentially get their origins within the Office of Research. That was a very difficult concept for the committee to understand. In fact there were some comments in the report from the committee on that. Mainly, why should that function be there?

It is there and I have to address it as part of my responsibilities, but it is a very integral one that fits into all the rest of the activities of the agency.

COMMISSIONER ROGERS: I think there is a general lack of understanding of why NRC should be doing research of any kind in this town. You don't have to go very far away from here to find that question asked. Why do you do

research? Do you do research? Why should you be doing research?

There is an assumption about what that word "research" means. For us it has a very special meaning and a very special importance that I think is not appreciated outside the agency. I think we have to understand it very well and be able to support and defend what we know to be the importance of research at NRC, and it means really understanding how it does support the regulatory efforts.

MR. BOULETTE: I think you may remember the Towers report that came out about a year ago.

COMMISSIONER ROGERS: I think I heard of it, yes.

MR. BOULETTE: One of the things that came out of that report was the strong lack of understanding on the part of the utility executives that even a research arm existed let alone what it might be doing. We have talked about that on the committee several times. In fact, we are inviting some industry representation to our next meeting not only to impress upon the committee the utilities' concerns but to try to indoctrinate the utility as to what happens at these meetings, what they are about. So it's a serious issue.

CHAIRMAN JACKSON: I want to thank Drs. Boulette and Morrison and Mr. Milhoan for a very informative briefing. As Commissioner Rogers has said, our research program must provide a strong, independent technical

capability for our regulatory programs. As such, the Commission appreciates what your committee does in this regard. I encourage you, Dr. Boulette and the committee, to continue to work with the staff to resolve issues but also to focus in on a number of the comments that Commissioner Rogers has made.

I also appreciate the timeliness of having this briefing now as opposed to a four to six month delay. It is consistent with my perspective about timeliness in all we do. We are trying to not have these undue delays between the committees' deliberations and meetings where we hear the results of those.

Do my fellow Commissioners have any further questions or comments before we close?

COMMISSIONER ROGERS: No, thank you.

COMMISSIONER DICUS: No.

CHAIRMAN JACKSON: We stand adjourned.

[Whereupon at 11:30 a.m. the meeting was adjourned.]