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NUCLEAR REGULATORY COMMISSION

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COMMISSION MEETING

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BRIEFING ON OFFICE OF NUCLEAR REGULATORY RESEARCH

PROGRAMS AND PERFORMANCE

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ROCKVILLE, MARYLAND

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THURSDAY

MAY 10, 2001

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The Commission met in the Commission Meeting Room of 1 White Flint at 10:30 a.m., Richard A. Meserve, Chair, presiding.

PRESENT

- Richard A. Meserve Chair
- Nils J. Diaz Commissioner
- Greta J. Dicus Commissioner
- Edward McGaffigan, Jr. Commissioner
- Jeffrey S. Merrifield Commissioner
- Andrew Bates Acting Secretary
- Karen D. Cyr, Esq. General Counsel

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1 ALSO PRESENT:

2	Dr. Dana Powers	ACRS
3	Dr. Graham Wallis	ACRS
4	Dr. Kenneth Rogers	Expert Panel Chair
5	Harold Ray	Southern California Edison
6	John Gaertner	EPRI
7	Dr. Edwin Lyman	Nuclear Control Institute
8	Shane Johnson	DOE
9	Dr. Thomas Murley	
10	Dr. William Travers	EDO
11	Dr. Carl Paperiello	Deputy EDO
12	Ashok Thadani	Director, RES
13	Thomas King	Director, DRAA
14	Farouk Eltawila	Acting Director, DSARE
15	Roy Zimmerman	Deputy Director, RES
16	Michael Mayfield	Director, DET

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

(10:27 a.m.)

CHAIRMAN MESERVE: On behalf of the Commission, I would like to welcome you to today's briefing concerning the NRC's research program. As I think everyone in the room knows, over the past decade and longer, there has been a decline in the funds that are allocated to research in current dollars. In constant dollars of course the sages have been even more remarkable.

As a result of these trends, when I first came to the Commission I was concerned about the capability of the NRC to conduct its necessary research, and have discussed with my colleagues, which I think a view they share, of making sure that our research activities are appropriate in scale and appropriately focused.

It has also become apparent to us that there is some confusion in the licensee community about what we do, why we do research and what research we do do. So it is with particular pleasure that I endorse the thought, my colleagues endorse the thought that there would be some studies that would be undertaken by independent panel of experts as has been chaired by Dr. Rogers.

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1 We also have had the benefit of a study
2 that has been conducted and is periodically conducted
3 by the ACRS.

4 So our first panel this morning, we will
5 hear from the ACRS and from Dr. Rogers and various
6 members of his panel about their very helpful reports.

7 Let me say it is particularly fortunate
8 for us as it's proven that these reports are quite
9 complementary in the sense that the Rogers' effort --
10 if I may refer to it as that, I realize that there are
11 individual contributions from each of you -- but that
12 that effort takes the broad strategic view of the
13 overall activity and sets it in the general context of
14 the Commission's activities, whereas the ACRS report
15 is programmatic in its focus and looks at the details
16 of what we are doing. Together, they give us a
17 comprehensive overview of the activities.

18 We have also had the benefit of a study
19 that was submitted by the National Laboratories, and
20 which we also appreciate. The National Laboratories'
21 report will be discussed by Dr. Thadani with the
22 second panel when the NRC staff will come to speak to
23 us.

24 Before we proceed, I would like to take
25 this opportunity to offer thanks to all of you for

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1 your efforts. I have been astonished at the tireless
2 effort that the ACRS has put in. I have remarked on
3 that in the past, and we appreciate their efforts
4 here. We also very much appreciate the time and
5 effort that has been put in by Dr. Rogers and by all
6 of the members of the panel. We recognize that this
7 intrudes on your schedules. It was done as a
8 voluntary activity without compensation. We very much
9 appreciate your willingness to serve and your
10 dedication to the task. Just an extraordinary effort.
11 I would like to thank you very much for your
12 activities.

13 I think it is also appropriate on this
14 occasion to recognize and offer my congratulations to
15 Dr. Rogers, who I understand has been elected a Fellow
16 of the American Nuclear Society. I know that is a
17 richly-deserved honor.

18 With that, why don't we proceed. I think
19 that the schedule would have us proceed with the ACRS
20 first with Dr. Powers and Dr. Wallis.

21 DR. POWERS: Thank you, Mr. Chairman,
22 Commissioners.

23 The ACRS has submitted to you its annual
24 report on the NRC research program. As the Chairman
25 indicated, if Commissioner Rogers' group looked at the

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1 30,000 foot level, we looked at the mud.

2 (Laughter.)

3 Our objectives in preparing the report
4 this year were two-fold. We hoped to be able to
5 identify some exciting new areas and directions for
6 the research program that would allow the Agency to be
7 better prepared for meeting future challenges. We
8 also set out to examine the ongoing research program.

9 What I have to say is that we were not
10 terribly successful at identifying any startling new
11 directions for the research program. What we found
12 instead was that the NRC research staff is acutely
13 aware of the kinds of challenges that it will face as
14 new changes take place both within the Agency and
15 within the industry.

16 I have listed some of these challenges on
17 the slide. I don't know whether I have slides or not.
18 If we go to the next slide, please. I think these are
19 familiar to you. What we found was that the NRC
20 research staff has within the constraints of its
21 limited resources, been trying to address all of these
22 new or future foreseen issues, and make
23 accommodations, and sometimes very imaginative
24 accommodations to their programs, to if not address
25 explicitly the issue, to prepare itself to address

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1 those issues.

2 As a result, the ACRS was really only able
3 to make some suggestions on some new research topics
4 which are listed on the next slide. The first of
5 these is the issue of synergisms. We know that quite
6 a number of activities are taking place within the
7 Agency as it moves toward a more risk-informed
8 regulatory basis. At the same time, quite a number of
9 changes are taking place within the industry,
10 especially as they look to license renewal and the use
11 of fuel at higher burn-ups. The ACRS has raised the
12 question.

13 As we look at these, and we do tend to
14 look at them as individual actions, are there any
15 synergisms. We have new particular evidence, perhaps
16 plausibility arguments, but new particular evidence
17 that there are synergisms. We simply think it's an
18 area that the research program should be looking at to
19 assure that these can be treated as they are in
20 somewhat of an independent fashion.

21 As we move in toward the use of more risk-
22 informed regulations and the use of integrated
23 decisionmaking, as we put reliance on expert panels at
24 the licensees' operations, to make decisions
25 concerning the maintenance and quality assurance of

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1 systems components and structures within the reactors,
2 we are making decisions in the face of both
3 uncertainty and at the same time, floods of
4 information.

5 The ACRS wonders if it is not time for the
6 Agency to give some careful thought to more formalized
7 decision making, using some of the progress that has
8 been made in the decision making area.

9 Finally, we suggested that as interest
10 grows and the possibility of having new innovative
11 reactor designs, the Agency may want to complement its
12 existing options 2 and options 3 for risk-informing
13 regulations to begin what's called the "clean sheet"
14 approach, particularly for advanced reactors. By that
15 we mean a reexamination of what the regulations would
16 look like, given that you had an abundance of risk
17 information which was not available at the time the
18 current regulations were formulated.

19 Perhaps the more important impact of this
20 year's ACRS study of the research program was the
21 examination of the ongoing research work. Much of
22 this work has been initiated based on requests from
23 the user organizations, the so-called user need
24 letters.

25 ACRS was able to look upon the work then

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1 as there being prima facie evidence there was a line
2 organization need for the work. Questions that it
3 bore in mind as it examined the individual programs
4 are listed on this slide. I have to acknowledge the
5 substantial amount of help we have derived from
6 Commissioner Merrifield's speech in formulating some
7 of these questions.

8 Is the research needed by the Agency for
9 an independent review of a licensee proposal or other
10 regulatory action or would it be better done by the
11 licensees themselves? Has the research progressed to
12 a point that it is adequate for regulatory decisions?
13 Does the work need to be modified to better meet
14 Agency needs?

15 We examined the research in 13 areas that
16 I have listed on the next slide. We developed a
17 relatively lengthy report that addressed each one of
18 these areas. I can't go into the individual findings
19 in any detail. I simply want to call to your
20 attention some highlights of our findings on the
21 research program.

22 The first point that I wanted to make is
23 we found quite a number of the programs both well
24 organized and well conducted. On this next slide I
25 have listed three that were particularly good: the

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1 thermal hydraulics program, in which they are looking
2 at code and consolidation and improving the thermal
3 hydraulics analytic tools we have available, is
4 especially important as we tend to move toward more
5 realistic analyses and away from deliberately
6 conservative analyses of thermal hydraulic phenomena.
7 Dr. O'Twielen and his staff I think have done an
8 outstanding job in what is an enormously technically
9 challenging area.

10 The fuel research program we found to be
11 very well organized and technically strong. Dr. Myer
12 and his team have done amazing things in this field,
13 taking what would ordinarily be a fairly parochial
14 fuel study designed to confirm some regulatory
15 decisions and turning it into an international
16 cooperative effort that's leveraged both with
17 cooperation with the industry and cooperation with
18 several of the laboratories outside the United States.

19 We did note that some of the findings of
20 this research program suggested may need additional
21 resources in order to provide the kind of information
22 the Agency will need to make regulatory decisions.

23 Finally, I note the environmentally
24 assisted cracking. This is a particularly good
25 example of an area where the NRC needs to maintain a

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1 core competency. The predominant responsibility for
2 corrosion in nuclear plants of course belongs with the
3 industry, but the NRC needs to maintain a level of
4 competency so that they are able to understand the
5 kinds of proposals the industry needs with respect to
6 corrosion. We felt that this program had struck the
7 proper balance between independent research and
8 maintaining an awareness of what the industry was
9 doing.

10 We found several examples of what I would
11 call outstanding research organizations. One of the
12 most striking is the work that the research
13 organization is doing in the area of pressurized
14 thermal shock. This is, to my mind, one of the best
15 examples I have ever seen of matrixing in research.
16 Three of NRC's core competencies, thermal hydraulics,
17 probabilistic fracture mechanics and PRA, have been
18 brought together to focus on an area that is going to
19 be of interest both to the industry and to the public.

20 We found also some excellent examples of
21 research planning. On this next slide, I list three
22 that are particularly good because they have detailed
23 documentation that are available to you to examine.

24 The research in fire of course, as we are
25 now getting the results from the IPEEE program, we can

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1 see that fire may be coming a more important issue for
2 us to examine on a regulatory basis. We have a
3 particularly strong research program being developed
4 in the area of fire.

5 Professor Diaz I think will be the first
6 to tell you that the Agency will need a strong
7 understanding of digital I&C as we move into the area
8 of advanced reactors. We have a particularly good
9 research plan in those areas.

10 Finally, I would like to point out the
11 work by the organization for analysis and evaluation
12 of operational data. This used to be an independent
13 part of the NRC organization. It's been folded into
14 research. This was an area of concern to the ACRS
15 because we felt it important that an independent in
16 this evaluation of operational data would be
17 important. I am happy to report to you that the
18 analysis and evaluation of operational data is
19 proceeding much as it has in the past. Some very
20 excellent work, and it has fine plans which should
21 well take it out to the year 2005 to carry out.

22 Finally, I would like to point out the
23 issue of legacy data. There is an effort to preserve
24 legacy data in the criticality area. This is not the
25 only area where the NRC has either sponsored or

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1 participated in important research efforts. In the
2 past, these are experimental efforts that are not
3 likely to be reproduced in the near future. It may
4 well be important for the Agency to take steps to
5 preserve these experimental data, particularly in the
6 area of thermal hydraulics and severe accidents, as
7 well as criticality work.

8 ACRS in its report was able to identify a
9 couple of areas, several areas where some
10 strengthening in the research program was possible.
11 Two I would like to highlight. They are presented on
12 this final slide.

13 We found the tactics for conducting
14 research within the Agency to be very good. We did
15 feel that the strategies could be strengthened. An
16 example of this has to do with probabilistic risk
17 assessment, the questions of what depth and what
18 breadth we want to have for our probabilistic
19 research, probabilistic risk analysis efforts.

20 But perhaps more important, is how do we
21 want to disseminate probabilistic risk assessment
22 capabilities. Is it to remain an area of a
23 specialist, either in the research organization or the
24 line organization? Or do we envisage eventually
25 having probabilistic risk assessment capabilities to

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1 be a routine tool available to any part of the
2 organization or in the regions?

3 The other area of strengthening we think
4 is in the area of human factors and human reliability.
5 A persuasive case can be made the human factor is
6 going to be one of the most important parts of reactor
7 safety in the future. We think there is a need for
8 superior coordination between the human factor
9 research and human reliability analysis. More
10 importantly, we think that it is important for the
11 Agency to better define what we want to accomplish in
12 these areas of human factors and human reliability.

13 Well this has only been a brief discussion
14 of the report we have provided on the research
15 organization. I would certainly be happy to elaborate
16 on any of the points it makes, either at this forum or
17 any other forum.

18 CHAIRMAN MESERVE: Thank you, Dr. Powers.

19 We'll return to your report after we have
20 had a briefing from Dr. Rogers. Then we will open it
21 up for all of you for questioning from the Commission.

22 Dr. Rogers, as I indicated, was the panel
23 chairman. There were a variety of other members that
24 participated. He is joined today by Mr. Harold Ray,
25 who is the Executive Vice President for Southern

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1 California Edison, Mr. John Gaertner from EPRI, Dr.
2 Edwin Lyman from the Nuclear Control Institute, Mr.
3 Shane Johnson from the Department of Energy, and Dr.
4 Thomas Murley, who is a former NRC employee, which we
5 view as his highest accomplishment. I am just teasing
6 Tom.

7 (Laughter.)

8 Ken, would you like to proceed?

9 DR. ROGERS: Good morning, Chairman
10 Meserve and Commissioners. It is indeed a pleasure to
11 be here to report to you on the results of our panel
12 on the role and direction of nuclear regulatory
13 research convened last summer by Dr. Travers and Mr.
14 Thadani, and which I was honored to chair.

15 Together with me at the table are five
16 other members of the panel of experts, and there are
17 other members of the panel in the audience as well.

18 I will summarize the most common views of
19 the panelists, after which each of the five members of
20 the panel will have an opportunity to speak to you on
21 the most important points in their individual
22 contributions to our report. Their comments are
23 limited to three minutes each, I hope.

24 Following our individual presentations, we
25 will be pleased to respond to your questions and

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1 comments.

2 As you all know very well, the nuclear
3 industry is currently involved in important and far-
4 reaching changes that are creating new issues and new
5 challenges for the Nuclear Regulatory Commission. In
6 response, the Agency is currently involved in an
7 internal evaluation to determine how it can meet these
8 challenges, and at the same time, pursue its
9 objectives.

10 An essential part of this effort is a
11 thorough review of the activities of the Office of
12 Nuclear Regulatory Research, RES. I will use the term
13 RES in my presentation to distinguish it from the more
14 generic term, research.

15 Since it was established by Congress in
16 1975, RES has contributed significantly to NRC's
17 independent capability for developing and analyzing
18 technical information in support of the licensing and
19 regulatory process. As a supplement to internal
20 planning, input from stakeholders was sought on the
21 role and future direction of RES.

22 A 17-member panel of experts chaired by
23 myself and representing industry, academia,
24 government, and public interest groups, was assembled
25 and asked to present their views and comments on the

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1 vision, mission, role, and general direction of
2 regulatory research, and to provide insight and
3 guidance for future activities. A list of the
4 members, all of whom serve voluntarily and without
5 compensation, is included in Volume I of our report,
6 and is shown on the first slide.

7 The work on this report was divided into
8 two phases. The panel was convened for two meetings
9 for each phase. The objective of phase I was to
10 broadly examine the mission and role of RES. Based on
11 the information from the written submissions and
12 discussions during the meetings, several conclusions
13 and recommendations widely shared by many panel
14 members became apparent. These issues were restated
15 in the form of policy recommendations to the
16 Commission.

17 For the phase II effort, the panel was
18 asked for their individual suggestions and comments as
19 to how these recommendations could be implemented.
20 Since this panel was not established under the Federal
21 Advisory Committee Act, no attempt was made to develop
22 a consensus report. Instead, each member was
23 encouraged to present his or her own individual
24 viewpoints and recommendations.

25 In his opening address to the panel,

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1 Chairman Meserve offered three questions for
2 consideration. Are we spending enough on research?
3 Are we doing the right research? Are we doing
4 research with the right people? Preliminary responses
5 were developed in phase I. However, the panel
6 requested and was given additional information so as
7 to be able to provide more substantive answers.

8 The individual final responses to the
9 Chairman's questions are included in Volume II of our
10 report. I will summarize them in my presentation.

11 I should strongly emphasize that the
12 material included in our report represents the unique
13 viewpoints of individual panel members based on their
14 experience and understanding of research as it is
15 conducted by the NRC. Their views are included in
16 their entirety, without modification, in our report.

17 Volume I is a compilation written by a
18 non-member of the panel employed by the NRC. It
19 summarizes the positions, conclusions, and
20 recommendations which appeared to be most widely
21 shared by the panelists. Our very brief presentations
22 to you today cannot do justice to the thoughtful,
23 constructive, and detailed comments in the individual
24 submissions of the panel members. We hope that those
25 will be considered carefully because there is much

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1 value in them. The panel members were all interested
2 and faithful contributors to the final report.

3 I will now turn to the Chairman's three
4 questions. In a sense, they deal with immediate
5 issues, more operational rather than policy in nature.
6 Not surprisingly, the spread of panel members' views
7 on these issues was somewhat broader than on their
8 policy recommendations.

9 First, is NRC spending enough on research?
10 There was a great deal of discussion on how to get at
11 an answer to this question. Simply looking at the
12 very large reductions in the RES budget over the years
13 was not a credible way to get at an answer.
14 Institutional comparisons of the percentage of the
15 total NRC budget devoted to research wasn't really
16 much better.

17 By focusing on the prioritization criteria
18 used by RES in allocating their budget and considering
19 those projects which could not be funded, it was
20 concluded that research in general and anticipatory
21 research specifically are substantially under-funded.
22 The shortfall appears to be in the range of four to 12
23 million dollars per year.

24 The 10 to 20 percent of the RES budget
25 allocated to emerging issues did not appear to be

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1 adequate. Concern was also expressed that RES's
2 budget has been insufficient to maintain its technical
3 core capabilities. It was suggested that RES increase
4 its technical capability and expand its contract to
5 services and facilities, but of course this would
6 require additional funding.

7 Is NRC doing the right research? Not
8 enough anticipatory research is being done, and not
9 enough work in the materials and waste areas.

10 The strong emphasis on research directed
11 to user needs can result in significant gaps in
12 technological currency that cannot presently be
13 filled.

14 RES should be doing more work on the
15 utilization of PRA results and on developing improved
16 PRA methods and data.

17 The Advisory Committee on Nuclear Waste
18 should present a list of unfunded projects they feel
19 should have been done.

20 The special research skills normally found
21 in RES are required to review the waste management
22 programs and to verify the credibility of the work
23 being done under NMSS. The present systemic processes
24 for prioritizing research projects needs greater
25 coordination between NRR and NMSS.

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1 A larger percentage of NRC's research
2 should be funded out of general funds appropriated by
3 Congress.

4 Is NRC doing research with the right
5 people? The original intent of Congress was that NRC
6 would use DOE's national labs so as to benefit from
7 DOE's budget for research. It has been increasingly
8 difficult for NRC to rely entirely on the national
9 laboratories for its research needs.

10 NRC should find ways to make it easier to
11 contract with the most qualified organizations, even
12 if they are not national labs, while maintaining of
13 course its necessary independence. University teams
14 are particularly well-suited for anticipatory
15 research, and should be used when possible.

16 The Commission should continue to find new
17 ways to use DOE labs and resources through additional
18 collaborative arrangements with DOE. In-house RES
19 resources can become insular and isolated in the
20 absence of some kind of systematic cross-training
21 experiences.

22 RES should be required to reassess the
23 unfunded, but needed research efforts, and to develop
24 a statement of required competencies and funds
25 required to carry them out.

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1 Periodic reviews of NRC's overall research
2 programs by a broad-based group of experts should be
3 conducted every two or three years.

4 I will turn now to policy recommendations
5 for Commission consideration and how they might be
6 implemented. Time and slide limitations, how much one
7 can get on a slide, make it difficult to provide the
8 kind of elaboration that's in our report, so I have to
9 refer you to the report itself for more complete
10 information.

11 The first recommendation is that the
12 Commissioners endorse the following policy positions:
13 first, the NRC must maintain as a used and useful arm
14 of its organization, a reliable, respected Office of
15 Nuclear Regulatory Research, RES, and must support
16 this office with the necessary people and resources so
17 it is an unassailable source of technical information
18 and support for regulatory actions.

19 The language we have chosen, used and
20 useful, reliable, respected, and unassailable resource
21 of technical information, really summarize the views
22 of most of the panelists. These words are there to
23 convey the sense of fundamental importance of RES to
24 the work of the Commission that underpin the
25 legislative creation of the office by Congress, and

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1 that persist today.

2 To carry out its responsibilities, the
3 funding for research in general at NRC, and for RES in
4 particular, will have to be increased. The core
5 capabilities and resources available to RES, people,
6 analytical tools, and access to facilities, must be
7 carefully monitored and maintain at the highest
8 possible level of excellence.

9 The Commission should charge RES with
10 monitoring the Agency's state of readiness to meet
11 future challenges as a result of new technologies,
12 reactor design advances, safety issues, and
13 independent industry initiatives, and reporting its
14 findings to the Commission on a periodic basis.

15 Research, RES, must support the activities
16 of other program offices, which in turn should be
17 required to coordinate their activities with RES, at
18 least to the extent of planning new work, establishing
19 objectives of technical studies, and assessing the
20 validity of data and analyses.

21 At the same time, RES should be allowed to
22 initiate anticipatory technical studies without
23 approval by program offices, but with their cognizance
24 and input wherever possible.

25 RES must be able to do and be seen as able

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1 to do independent verification of data which NRC will
2 rely on for regulatory action.

3 RES must institute and maintain a
4 comprehensive and effective communications program to
5 make available their plans and activities.

6 The Commission -- these are our
7 recommendations -- the Commission should require RES
8 to develop a new provision for strategic oversight of
9 its anticipatory research that has various inputs,
10 including the program offices, for identification and
11 prioritization of projects, but choices of
12 anticipatory projects must lie with the Director of
13 Research.

14 The Commission should encourage RES to
15 extend its activities beyond narrow technical studies
16 and task RES to identify new systems-wide issues that
17 could have significant safety implications. Examples
18 are the positive or negative synergistic results of
19 current and/or new regulations or new industry
20 initiatives, and the impact of regulatory attention on
21 the licensees' safety culture.

22 Communication of what it does, why it does
23 it, and what the results have been of RES research
24 programs must have a higher priority and command
25 greater resources.

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1 RES must continue to grow its cooperative
2 efforts with other organizations, including but not
3 necessarily limited to EPRI, DOE, industry, academia,
4 public interest groups, and international
5 organizations.

6 RES must seek out and wherever possible,
7 utilize facilities, equipment, and resources available
8 from these entities and maximize the use of technical
9 data and results already developed. RES, in
10 cooperation with and supported by the Commission, must
11 establish procedures to accomplish this while fully
12 retaining the decisionmaking independence of RES.

13 We think the Commission should ask RES to
14 identify impediments to the expansion of cooperative
15 research with the international community, and with
16 suitable domestic organizations, and to propose to the
17 Commission strategies for encouraging cooperative
18 research without compromising NRC's regulatory
19 decisionmaking independence.

20 The base of contractors used by RES should
21 be expanded to include more non-governmental
22 organizations, and innovative ways should be developed
23 to avoid the present significant delays in the
24 contracting process.

25 A clear and understandable definition of

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1 what research includes and does not include at the NRC
2 and its value to the safety of the Nation's nuclear
3 program, must be established by the Commission and
4 accepted internally by the program offices and staff
5 personnel, and effectively conveyed to all
6 stakeholders.

7 Continuing efforts must be made through
8 research the process to eliminate unnecessary
9 regulatory burdens on stakeholders, while at the same
10 time, focusing on areas that will benefit them through
11 safer and more efficient operations.

12 Charges to licensees for research costs
13 should be on the basis of identifiable value to the
14 efficient and effective regulation of those licensees.

15 We recommend that the Commission establish
16 a clear, concise definition of research as it's
17 conducted at NRC, with clear distinctions among
18 anticipatory and confirmatory research, and technical
19 assistance.

20 Interpretation of the word "realistic" in
21 the context of research should be clarified.

22 Adjustments to the fee structure should be
23 considered by the Commission so that licensee fees go
24 to regulatory activities related to those licensees,
25 but not to support NRC work solely related to new

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1 technologies unconnected to current licensees'
2 operations.

3 This concludes my presentation. However,
4 the other panel members are here to speak on features
5 of their own submissions. After that, we will be
6 pleased to answer questions. We can now hear from Mr.
7 Harold Ray.

8 MR. RAY: Thank you very much, Ken.

9 Chairman Meserve and Commissioners, I
10 would like to begin by saying that Panel Chairman
11 Rogers has done an absolutely outstanding job in the
12 work that he has done for us and for you. I couldn't
13 continue without making that statement. It is a
14 diverse group, well represents all the various
15 stakeholders, I believe, involved. Was not an easy
16 chore. Ken did it extremely well.

17 Because it is a broadly balanced group, I
18 am going to take my two-and-a-half minutes remaining
19 to be rather parochial and speak from just the
20 viewpoint of a power reactor licensee. I am sure you
21 won't attribute to me such a narrow point of view, but
22 it will be the one that I reflect to you here.

23 That is, that it is not feasible for the
24 licensee fee-based funding, a point that Dr. Rogers
25 just ended on, which must be directed to the

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1 regulatory needs of those licensees to also support
2 either the competencies required for continued U.S.
3 leadership in nuclear safety generally or to provide
4 the regulatory foundation necessary to support the
5 application of new nuclear technology.

6 I believe it is the case that the
7 significant decline in NRC research funding, which was
8 described to the panel and has been referred to here,
9 and which I generally deplore, that that decline is a
10 direct consequence of the reliance on user fees
11 imposed on current licensees. It is likely to
12 continue unless research is either made more directly
13 relevant to the current licensees or better yet, an
14 alternative source of funding is provided. There is
15 a step that's of course been taken in that direction
16 already.

17 But the notion that there is such a thing
18 as a domestic nuclear industry which could itself
19 support all areas of needed NRC research through fees
20 is simply no longer true, if indeed it ever was true.

21 Now with regard to the research which can
22 clearly be supported by licensee fees, much has been
23 accomplished. To improve the efficiency and
24 effectiveness of power reactor regulation recently, by
25 the acceptance of the principle that regulatory

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1 requirements should be informed by risk significance.
2 I don't know why I have a hard time saying that.

3 However, much more needs to be done in
4 this regard, especially since it is impossible to base
5 decisions concerning high consequence, low probability
6 events on subjective experience. I would like to
7 underscore that as I'm sure all the Commissioners do
8 appreciate the importance of that point. So much of
9 what we do is based on our own experience, and only
10 through the disciplined processes of research can we
11 transcend that experience and get to the real facts
12 that are essential.

13 The field is wide open and ripe to harvest
14 relative to the quantification of risk significance,
15 and as important is the need to evaluate the role of
16 uncertainty in the use of risk-informed regulation.

17 Finally, I believe finding the proper
18 balance between deterministic and risk-informed
19 methods is an appropriate area where research could
20 also make an important contribution.

21 I am among those who advocate an increase
22 in the resources available to research itself to
23 pursue emerging issues at the direction of this
24 Commission. I received the impression during our work
25 that research office is too much in the mode of merely

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1 contracting for and overseeing work requested by so-
2 called users, and that it was not sufficiently
3 accountable for performing and for defending the value
4 of the results from work which it itself has
5 initiated. Thank you.

6 DR. ROGERS: Mr. Shane Johnson.

7 MR. JOHNSON: Mr. Chairman, Commissioners,
8 my name is Shane Johnson. I am the Associate Director
9 for Technology and International Cooperation for the
10 Department of Energy's Office of Nuclear Energy
11 Science and Technology. I am here today in place of
12 Bill Magwood, the Director of the Office of Nuclear
13 Energy, who served as a member of the expert panel.
14 Mr. Magwood was unable to be here today, as he is
15 testifying before Congress on our Fiscal Year 2002
16 budget request. So I hope you will excuse his absence
17 and understand his need to be elsewhere at this time.

18 My remarks today represent the views of
19 the Office of Nuclear Energy. It is a legitimate
20 responsibility of Government to develop and maintain
21 in-house technical expertise to guide the development
22 and implementation of the regulations governing the
23 commercial application of nuclear energy technologies.
24 Likewise, it is incumbent on the Government to
25 maintain technical cognizance of advances in those

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1 nuclear technologies which are under consideration for
2 possible future commercialization.

3 To this end, Government-sponsored nuclear
4 energy research to address outstanding technical
5 issues that may possibly affect the safe application
6 of nuclear technology is good public policy, providing
7 benefits to the public at large as well as to
8 industry.

9 With all the recent talk on possible new
10 plant orders in the United States in the not too
11 distant future, we believe this is an appropriate time
12 for NRC to reexamine its concept of independence and
13 its policy toward cooperative research. It is our
14 belief that a fundamental change is needed in the way
15 NRC views independence and verification.

16 Much has changed in the U.S. nuclear
17 industry over the past three decades. The technology
18 is now better understood by the designers, the
19 operators, and the regulators. As such, the need to
20 conduct separate, independent research has become less
21 important than to ensure the appropriateness of the
22 research being conducted.

23 Independent or confirmatory research does
24 not make the best use of the Agency's finite human and
25 financial resources. The Agency needs to pursue all

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1 opportunities to leverage its scarce research funds by
2 teaming with industry, other Government agencies, and
3 the international research community in cooperative
4 research activities.

5 It is our view that an informed
6 determination needs to be made regarding the extent to
7 which NRC can responsibly rely on research done by
8 others to meet its needs without compromising its
9 independence as a regulator. Once such a
10 determination is made, the Agency can be much more
11 effective in identifying and managing the human and
12 financial resources necessary to meet its regulatory
13 responsibilities.

14 It is vital that the U.S. nuclear energy
15 research community work together more closely to
16 ensure that clean, safe, and economical nuclear power
17 maintains its place in our Nation's electric
18 generation infrastructure. Working with industry and
19 other Government agencies would allow NRC to leverage
20 those scarce funding resources to address issues of
21 common concern. We encourage NRC to review its
22 policies on confirmatory and collaborative research.

23 DR. ROGERS: Mr. Gaertner.

24 MR. GAERTNER: My name is John Gaertner,
25 Electric Power Research Institute. My presentation

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1 will highlight items from the written comments of Ted
2 Marston, Chief Nuclear Officer of EPRI, and also a
3 member of this expert panel. I think you will hear
4 corroboration of many of the same ideas that you have
5 heard already.

6 As you know, NRC research and EPRI have a
7 successful memorandum of understanding for cooperative
8 research that has been in effect since 1997 and has
9 been recently renewed. There has been research in six
10 technical areas, and we hold regular meetings to
11 discuss potential new areas for cooperation. This
12 experience provides a unique perspective for our
13 comments, which follow.

14 First, I emphasize the need to assure that
15 RES has necessary funding and core competencies to
16 respond to emerging challenges of this industry.
17 These challenges include: a new regulatory framework
18 for new plants; safety implications of new reactor
19 types; enhanced I&C and information technology; a
20 risk-informed regulatory environment; more use of
21 realistic analysis; and burden reduction for
22 licensees.

23 Second, I note the need to clarify the
24 requirements for RES independence. Independence must
25 not unduly restrict opportunities for increased

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1 collaboration. Independence must not unduly affect
2 contractor selection. For example, we have observed
3 that the national laboratories may not have
4 contemporary knowledge of operational plant issues,
5 and may not have the same incentive to bring closure
6 to issues that others may.

7 Independence of RES to select and perform
8 anticipatory research should not prevent oversight by
9 NRR, which we believe can enhance the RES role to
10 anticipate and to, as they say, poke and probe.

11 Third, I stress the need to improve RES
12 communications with stakeholders outside of NRC. One
13 such opportunity would be a thorough periodic review
14 of RES programs by an outside advisory group, which
15 was recommended by Dr. Rogers. And also summaries of
16 research projects, including the purpose, results, and
17 a perspective for their applicability would be useful.

18 Finally, I recognize the benefits of an
19 RES funding scheme that represents a balance between
20 user fees and funding from other sources.

21 Progress on these items, we believe, would
22 result in more industry support for RES research and
23 a more effective regulatory process. Thank you.

24 DR. LYMAN: My name is Edwin Lyman. Since
25 1995, I've been Scientific Director of the Nuclear

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1 Control Institute. And I'd like to thank the
2 Commission and Dr. Rogers for the privilege of serving
3 on the expert panel and the opportunity today to
4 present NCI's views on the future of NRC safety
5 research.

6 NCI is a public interest organization, and
7 our role is usually the fly in the ointment, and I
8 hope I don't disappoint you in that regard today.

9 NCI President Paul Leventhal, as a U.S.
10 Senate Aide, helped to draft the Energy Reorganization
11 Act of 1974, which separated the regulatory and
12 promotional functions of the Atomic Energy Commission.
13 Paul asked me to stress that the drafters of the
14 original Senate-passed bill wanted to ensure that the
15 NRC maintain a safety research capability that was
16 independent of ERDA, DOE's predecessor agency, and
17 which had a broad research mandate.

18 The legislation that emerged from
19 conference established an Office of Nuclear Regulatory
20 Research, RES, but one that was restricted to
21 confirmatory assessment of the adequacy of NRC
22 regulations. However, a confirmatory assessment was
23 rejected three years later by Congress, which amended
24 the ERA to provide for research authority on the
25 development of newer improved safety systems. The

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1 addition of this anticipatory research gave RES a
2 mandate closer to the original intent of the Senate
3 version of the ERA.

4 This historical perspective is noteworthy
5 today because of the independence that is so
6 fundamental, in our view, to the RES mission.
7 Independence not only from DOE and licensees but also
8 from other NRC program offices has been put at risk by
9 the severe cuts in the RES budget over the last decade
10 and what we see as an excessive focus on linking
11 research goals to specific programmatic objectives.
12 These developments have also adversely affected the
13 ability of RES to carry out the important anticipatory
14 research function, which Congress specifically
15 assigned to it in 1977.

16 At a time when many stakeholders and the
17 public perceive that industry influence over NRC
18 regulatory activities is increasing, when formal
19 public participation is being restricted, and when
20 there is growing pressure from Capitol Hill for NRC to
21 expedite license renewals and licensing of new nuclear
22 plants, the preservation of a robust and independent
23 RES is more critical than ever.

24 NCI believes that most of the research
25 projects pursued by RES are sensible and technically

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1 justified and favors funding for many of the worthy
2 projects that RES would like to pursue but remain
3 unfunded. Thus, we do support efforts to restore the
4 budget of RES to a level at which it can effectively
5 perform its statutory function. But, on the other
6 hand, there also should be a renewed effort by NRC
7 management to ensure that research sponsored by RES is
8 conducted in an objective manner and that the results
9 of the research are freely distributed to the public
10 without spin.

11 I'd like to briefly mention a few examples
12 that illustrate to us the importance of maintaining
13 independent NRC research and testing capability where
14 necessary. One example involves the NRC licensing of
15 advanced cladding types, like M-5 and Zerlo, which are
16 now in use in U.S. reactors. Recently, information
17 came to the attention of RES suggesting that similar
18 alloys would become embrittled in a loss of coolant
19 accident much more rapidly than Zircalloy.

20 And this is now an issue, I think, of
21 great uncertainty. There's some data provided by the
22 vendors of these alloys, which indicate it may not be
23 a problem, but additional safety issues are being
24 revealed. And to this end, RES has asked the vendors
25 for samples of both unirradiated cladding material and

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1 irradiated fuel rods for their fuel testing program at
2 Argon, which Dr. Powers has praised.

3 Unfortunately, at the last public meeting
4 in February 2001, the vendors were not enthusiastic
5 about honoring this request. In our view, this kind
6 of testing is essential for restoring public
7 confidence in the use of advanced alloys like these,
8 and should also become a routine part of fuel
9 qualification for new fuel types.

10 A related issue involves NRC's research
11 program to support licensing of MOX fuel in Duke
12 Powers, Catawba, and McGuire Reactors. Again, RES is
13 interested in obtaining samples of irradiated MOX lead
14 test assemblies from the McGuire lead test assembly
15 radiation that's planned. But to date, I believe the
16 DOE is not being very cooperative in this request,
17 which we think is a mistake, because the only lead
18 test assembly qualification that's being planned is at
19 Oak Ridge under DOE auspices, and we think there's a
20 conflict of interest because of DOE's having
21 investment in the MOX Program. So we hope that the
22 Commission will support the RES request to DOE and
23 also to NRR to obtain samples of MOX fuel for its own
24 testing program.

25 On the question of licensing advanced

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1 reactors, NCI doesn't support large budget increases
2 for NRC anticipatory research on especially innovative
3 reactor types. I think there are difficult policy
4 issues associated with greatly increased public
5 funding for licensing and the question of where the
6 borderline is between activities necessary for
7 licensing and those associated with development and
8 therefore promotion.

9 Finally, one cannot understate the
10 importance of RES public confidence in its
11 independence and objectivity. Unfortunately, there
12 still is a long way to go to gain this confidence. It
13 appears there's a tendency on the part of some RES
14 staff to recast research findings that do not support
15 prior NRC decisions in a more favorable light.

16 The example I'm familiar with is the issue
17 of ice condenser containment vulnerability during
18 severe accidents. NCI is particularly concerned with
19 this problem because of the plan to use MOX fuel in
20 the Catawba and McGuire Plants, which are ice
21 condensers, since, according to our estimates, the
22 laden cancer severe accident risk to the public will
23 increase by 25 percent once MOX fuel is loaded in
24 these reactors.

25 A thorough and fair assessment of

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1 containment performance must be an essential
2 prerequisite for NRC approval of MOX using these
3 plants. However, the discouraging experiences of Dr.
4 Kenneth Bergeron, a researcher who recently retired
5 from Sandia National Laboratories, provides evidence
6 of ongoing interference by NRC management and RES-
7 sponsored projects in which he has participated,
8 including a study of ice condenser containment safety.

9 Dr. Bergeron was a co-author of the study
10 that analyzed responsive ice condenser containments to
11 severe accident pressure loads. He has spoken of the
12 chilling effect that budget cuts for severe accident
13 research have had on the objectivity of contracted
14 research. Dr. Bergeron gave me permission to quote
15 him directly, and I quote, "In the case of the ice
16 condenser report, I personally resisted pressure to
17 whitewash the issues for four years. I think the IC
18 report underestimates the safety issues substantially.
19 Time and time again, the project staff were asked to
20 look into issues in greater detail if there seemed a
21 possibility that they would reveal a rosier picture.
22 And time and time again, other issues that might yield
23 evidence of additional problems were glossed over.

24 Clearly, any perception that managerial
25 bias influences the outcome of NRC-sponsored research

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1 is very damaging to RES as well as the Commission and
2 renewed and vigilant efforts must be made to ensure
3 that RES is insulated from political and budgetary
4 pressure. Otherwise, it will lose its regard by the
5 public as a credible source of safety information.

6 In summary, we see a big part of the
7 problem is the requirement that RES activities conform
8 to the NRC performance goal of reducing unnecessary
9 regulatory burden. A fundamental goal of safety
10 research is to reduce uncertainties and provide a more
11 precise determination of safety margin, but the
12 results of such efforts may uncover margins that are
13 unacceptably small as well as unnecessarily large. To
14 regain public confidence in NRC's objectivity, RES
15 must demonstrate that it's willing to deliver bad news
16 as well as good and the other NRC offices must be
17 willing to respond promptly and appropriately to RES
18 findings.

19 Thank you for your attention.

20 DR. ROGERS: Dr. Murley?

21 DR. MURLEY: Thank you, Ken. Mr.
22 Chairman, Commissioners, it's good to be back at the
23 table after many years. I should mention that by way
24 of reintroducing myself, I was a Senior Manager in
25 research, in the Office of Research, back in the late

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1 '70s, as well as the Regional Administrator and
2 Director of NRR. So some of these issues seem like
3 deja vu to me, because we debated them back in the
4 '70s, as you can imagine.

5 But the landscape with regard to research
6 and its justification are totally different today.
7 And so I commend the Agency for undertaking this
8 review and of the role research. I endorse Ken
9 Rogers' summary and recommendations. I think they
10 captured very well the conclusions that most of us
11 reached.

12 I found no fundamental problems in the way
13 research conceived, planned, authorized, carried out,
14 and used today in NRC. The existence of the Research
15 Effectiveness Review Board I think is quite a good
16 initiative. My sense is that it's being done today
17 better than I remember it being done in the Agency.
18 So I'm going to focus my few remarks on some policy
19 recommendations for the Commission itself, because I
20 think what we can best do for the Agency is to focus
21 on these higher level issues.

22 The first recommendation I would make
23 independently is I think there is a need for the
24 commissioners to support research, to publicly support
25 research and its role. Today, it's, as I mentioned,

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1 quite a bit different than it was in the '70s or '80s
2 or even in the '90s, the need for it. The needs are
3 different, but the fundamental need for an effective
4 Office of Research is just as important today.

5 Allied with that, I think the Commission
6 needs to continue to seek relaxation of the
7 requirement to have research funding covered by fees.
8 And I commend you for working with Congress to get
9 that relaxation that you have done. I think that's
10 very important. Because my sense is that the industry
11 leaders in general will not see the benefit -- it's a
12 diffuse benefit -- of research to their activities.
13 And as a result, it will be hard for them to justify
14 to their shareholders spending money for research that
15 may or may not benefit them directly.

16 And the final recommendation that I would
17 make is that the research staff should have the
18 flexibility to plan and carry out exploratory research
19 on a fairly substantial level. I would say probably
20 20 percent of their budget is a rule of thumb. And as
21 Ken Rogers said, this should largely be left to the
22 expertise of the research staff themselves, talking in
23 consultation with the directors of the other offices,
24 of course.

25 Since we started our activities last

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1 summer, the nuclear landscape in this country has
2 changed substantially. It's clear that there is real
3 interest in new plants and probably new designs. And
4 NRC will be, if it's not already, the chokepoint for
5 certifying and building any new design reactors. So
6 it's very important, I think, that there be some
7 exploratory work that starts to flush out the issues
8 and define the problems with these new designs.

9 I think I'll stop there. That concludes
10 my remarks.

11 CHAIRMAN MESERVE: I'd like to thank you
12 all for very helpful presentations. I'm sure we all
13 have questions. I think it's Jeffrey Merrifield's
14 turn to go first.

15 COMMISSIONER MERRIFIELD: Thank you.
16 Thank you very much, Mr. Chairman. I'd like to add my
17 thanks to yours to all of the very impressive work
18 done, both by the Committee as well as ACRS.

19 First starting with the Committee, I do
20 think Commissioner Rogers and the other members have
21 provided us with a good 50,000-foot level view of some
22 of the things we need to be doing.

23 DR. ROGERS: Going up was 30.

24 (Laughter.)

25 COMMISSIONER MERRIFIELD: Well, we try to

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1 fly high around here. But a high level view of what
2 we need to be thinking about and where we need to be
3 going.

4 In relation to Dana Powers and the members
5 of ACRS, I do want to give a significant compliment
6 for a significant amount of work that you did as well.
7 You mentioned a little bit about getting down in the
8 mud. The fact of the matter is that that is indeed
9 where the Commission has to be when it comes to budget
10 time. And for my part, the work that you did will be
11 very useful in that respect, I think, as we go forward
12 in our planning for the fiscal year coming up.

13 I want to explore a little bit. The
14 effort that was undertaken, Commissioner Rogers, by
15 your panel looked at a lot of what were seen as
16 unfunded areas or unfunded needs and core
17 competencies. I was reminded a little bit of a
18 discussion that I frequently have with my wife. We
19 call it our "what if" game. And the "what if" game
20 involves our house and the things we would like to do
21 to our house if we had additional monies -- new
22 windows, new air conditioning systems and what not.
23 At the end of the game, we always recognize that
24 Congress has control over my salary, and in the end
25 they haven't raised that very much recently.

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1 As I look through the recommendations, I
2 was noted by the comments made by Andrew Wheeler,
3 who's a staff member for the Senate Committee on
4 Environmental Works, the authorizing committee for our
5 Agency. And I quote, "On the question of funding for
6 research, it is unfortunate but levels for funding are
7 not likely to increase in the future," unquote. So
8 we're confronted with the hard fiscal realities here.

9 So I ask a little different question. The
10 Chairman had three questions that he presented to you,
11 and I think the Committee did its best to try to
12 answer those. And I have to two that I'd like to
13 focus on today and would like to get the answers of
14 the members, including the folks from ACRS.

15 First one is, is research effectively
16 managing its resources, both human resources and
17 capital resources? We give them \$40 million. Are
18 they managing that effectively? Secondly, is research
19 effectively overseeing the services provided by our
20 outside contracts, being either the labs or others?

21 One final preface I want to make, I've
22 said repeatedly, going to Tom Murley's point, that I
23 am a strong supporter of research. I also said that
24 I'm willing to go ask Congress for more money if we
25 can identify areas in particular that we need to fund.

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1 But the fact of the matter is we need to operate
2 within the budget limitations and be able to justify
3 what we're doing. Some of that involves adding
4 things; some of that is, Dana Powers has pointed out,
5 involves sunseting some things. I would like to
6 focus on how we are doing relative to the money we
7 have now and managing that and managing our
8 contractors? And I'd like to have you comment,
9 please.

10 DR. ROGERS: Well, that's the kind of
11 detailed problem or question that we were wrestling
12 with a bit, but we found that, one, we really didn't
13 have enough information to be able to make a
14 definitive judgment of that, nor did we have the time
15 to do it, because it's really an auditing function in
16 many ways. But I do think that what we tried to do,
17 and certainly what I tried to do, was to look at
18 processes. One can look at a process, whether it's
19 there or not and whether it's being followed or not.

20 And I think my own view, and that's how I
21 came to the conclusion that research was underfunded,
22 was that it seemed to me that RES had established a
23 very systematic method for prioritization of its
24 research projects, and that that method involved a
25 number of different considerations and certainly a

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1 very important consideration was the advancement of
2 the objectives that the Commission itself had set for
3 the entire Commission. And that it really worked very
4 hard to see that its selection of research topics fit
5 into this prioritization scheme. And it seemed to me
6 that it was a reasonable scheme. The only problem is
7 that it did seem to automatically exclude or relegate
8 to a lower priority any kind of anticipatory research.
9 It just automatically always came down at the bottom.
10 And that seemed to be a problem.

11 But in terms of actually managing on a
12 day-by-day basis the use of contracts or not, I don't
13 think we had enough exposure to those processes to be
14 able to make a judgment. We did not detect anything
15 that we saw troublesome except for the general
16 comments that you've heard from some of the panelists
17 here today that the use of the very best resources
18 should be primary even if they're not at national
19 labs, while the original intent was to try to get most
20 of the research through the national laboratories.
21 But I would say that I don't think we had enough
22 information to be able to answer your questions in the
23 kind of detail that, really, they deserve.

24 COMMISSIONER MERRIFIELD: That's a fair
25 point. Do you think -- you know, obviously, we put a

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1 lot of focus on the other program offices -- NMSS and
2 NRR -- in terms of their trying to find efficiencies
3 in the way that they do business to be more effective
4 and useful with the money we have available. Is there
5 any reason why the Commission should not be using the
6 same focus on research?

7 DR. ROGERS: Well, I think the same
8 general criteria, but perhaps how they're applied
9 might have to be different for research. There is a
10 different culture in the research organization from
11 the culture in a line organization, and it should be
12 different; it should be different. Research has to be
13 able to take a longer-term view on some questions than
14 would really be appropriate for a line organization
15 that has to come up with a decision tomorrow. There's
16 a licensee waiting for a decision. That's got to be
17 dealt with.

18 Now, that isn't to say that there should
19 not be active supervision of research progress, but if
20 RES is going to look into questions from time to time
21 that really have not been very well defined yet, and
22 it is looking into them that's going to provide the
23 definition, the criteria for judging progress there is
24 going to be different from the criteria for judging
25 progress and making regulatory decisions with respect

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1 to a line organization.

2 COMMISSIONER MERRIFIELD: That's true, but
3 shouldn't there nonetheless still be a feedback
4 mechanism for a periodic review of research results to
5 make sure that there's a reason for continuing --

6 DR. ROGERS: Oh, absolutely. And I think
7 our panel has called for that. I think one of my
8 statements was that every two or three years there
9 ought to be a thorough going review. And if you look
10 at some of the individual contributions, particularly
11 John Ahearne's contribution, he was very explicit in
12 asking for a thorough review of all research projects
13 right now.

14 My own feeling is that while that is
15 appropriate, I wouldn't want -- one of the reasons we
16 didn't adopt it as a general view of the entire is
17 there has been a very hard review within research of
18 its projects. Maybe more is needed. I wouldn't say
19 that we could say that not more is needed, but on the
20 other hand there has been a pretty hard look at every
21 single research project -- prioritizing it, justifying
22 it, seeing how it fits into the Commission's
23 priorities game.

24 COMMISSIONER MERRIFIELD: Okay. That gets
25 me to Dr. Powers. You did in fact do some of that

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1 vetting in terms of looking at areas that we might
2 consider for sunseting. Can you describe a little
3 bit the process you used to identify these projects
4 and comment on the vigor of that process?

5 DR. POWERS:: The individual research
6 areas were broken up among the various members and
7 their level of expertise to examine in comparison to
8 the three questions that I showed you. Is the
9 research properly done by -- necessary for NRC's
10 independent examination of issues or an area that you
11 can get the information from the licensees or the
12 industry's work and simply review it? Has the
13 research progressed far enough that you can make
14 regulatory decisions? Does research need to be
15 modified to better meet the needs?

16 Examining those three questions individual
17 members make proposals on which areas they thought
18 needed to be in hands for, as you called, sunset. And
19 those were examined by the other members and either
20 protested or accepted. And I will comment that we did
21 find areas where the NRC research had gone to great
22 lengths to leverage and expand its resource base by
23 cooperation with other agencies, areas where it's very
24 well organized.

25 And in that regard, I think the Research

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1 Effectiveness Review Board has the potential of
2 providing a good incremental oversight, episodic
3 oversight of research programs to answer the same
4 three questions. Whether it's going on now or not is
5 something that the ACRS should not look at the
6 effectiveness of that Review Board, but it certainly
7 could afford that function.

8 I think that there is a problem with the
9 user need process segmenting up the research into fine
10 of categories and not allowing research management to
11 weld together issues into a more integrated approach
12 that may not fit an individual user exactly but would
13 affect a lot users.

14 So we go on to say that quantitative
15 research management techniques is a hard job to do,
16 and the ACRS did not try to identify metrics for
17 examination individual programs with respect to
18 productivity and resource usefulness. That is a
19 management function that we definitely did not try to
20 explore.

21 COMMISSIONER MERRIFIELD: One final
22 question, then I'll stop. Mr. Ray, obviously, you're
23 in charge of an organization that has to manage a lot
24 of resources and try to utilize them effectively. Our
25 Office of NRR and NMSS have both gone through a

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1 process of having Arthur Anderson come in and
2 reevaluate their processes for the work that they do.
3 Both have established work management centers to
4 appropriately utilize the resources available to
5 those. Those are not efforts that we have undertaken
6 yet in research, although there may be some
7 consideration of doing so. What is your assessment,
8 although it wasn't necessarily -- or it wasn't the
9 focus of the panel? Is there some benefit, do you
10 think, to doing that in the research area as well?

11 MR. RAY: Surely there is, Commissioner
12 Merrifield. In any organization, my experience would
13 say that that kind of an assessment can always be
14 helpful to both the management of the organization and
15 to its stakeholders, including this Commission here.

16 But one of the things that will quickly
17 emerge from that, in my judgment, is the issue in
18 which RES is, in such a large measure, responding to
19 needed defined by others. And so, therefore, the kind
20 of an assessment that you suggested would perhaps look
21 at how well they respond to those needs. It might
22 also, however, look at the more 50,000-foot questions
23 of should they be spending as much time as they are
24 responding to defined tasks given to them by others or
25 should they be defining tasks in greater proportion on

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1 their own?

2 I think that, ultimately, would come back
3 to the Commission here for some judgment. I don't
4 think a management expert could tell you what the
5 right answer is here. But in so far as process is
6 concerned and managing an organization and using its
7 resources well, any of us can benefit from that sort
8 of thing, and I do believe research could as well.

9 COMMISSIONER MERRIFIELD: Thank you, Mr.
10 Chairman. I just want to make one comment just so
11 that people don't take it the wrong way. I do in fact
12 support research, and I think when we identify issues
13 and we need to seek additional funding from Congress
14 we should. I think the message we've been getting
15 from Congress, however, are that we need to make sure
16 that we are asking only for what we need and that we
17 can defend what we in fact ask for. And I think one
18 of the things, for my part, I've been trying to probe
19 today is can we adequately demonstrate that we are
20 managing the resources available to us now before we
21 go seeking an additional \$4 million to \$12 million, as
22 perhaps suggested by the expert panel?

23 CHAIRMAN MESERVE: Thank you. Dr. Powers,
24 one of the areas that you emphasize both in your
25 report and in your slides is the possibility of

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1 synergisms between power uprights, extended burn-up of
2 fuels and license renewal, and each might have the
3 effect of consuming safety margins, and there could be
4 some interactions between them, and suggest research
5 in both PRAs and I think in phenomenological models;
6 at least in your report you discuss that. We're in
7 the middle of process and dealing with license
8 renewals and power uprights and extended fuel burn-up,
9 and I think that we'd all benefit from your insights
10 as to how big a program you would envision to deal
11 with this and with what urgency.

12 DR. POWERS:: I think that you're speaking
13 of a program that is a matrix program, because you
14 have expertise established in each of the areas
15 already. It would be patterned much after what you're
16 doing in the PTS. I'm not sure that I see a
17 monumental effort here. I think the information is
18 largely available, and it's a matter of collecting it
19 together, identifying plausible mechanisms of
20 synergism, and seeing if there are ways to test those
21 plausible mechanisms of synergism.

22 The urgency I think is not high, because
23 though you're in the process of license renewal, those
24 renewals don't take effect for several years. And I
25 think the minimum is seven, and certainly it could be

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1 as long as 20 years before the license renewal.
2 Similarly, high burn-up fuel, well, obviously, it
3 takes a while for fuel to get to high burn-up, and you
4 do have limits on the burn-up you can get to. So it
5 could be well established at a modest level using the
6 expertise you have, and it might go on for some period
7 of time. I certainly don't think a three-year effort
8 would be out of line. I think five years would be
9 excessive.

10 CHAIRMAN MESERVE: Okay. Good. Thank
11 you.

12 DR. WALLIS: I think our concern is more
13 with the power uprights than the license renewal. As
14 you continue to increase power, eventually you come up
15 against some limits, and I think we have a little
16 nervousness about what those limits might be.

17 CHAIRMAN MESERVE: Do you share Dr.
18 Powers' view on the urgency of addressing that issue?

19 DR. WALLIS: Well, I think license renewal
20 has turned out to be much less a struggle than we
21 thought it might be. But I think someone should be
22 looking at problems we get into when all these things
23 come together with power uprights of an order of
24 magnitude we haven't handled before.

25 CHAIRMAN MESERVE: Dr. Rogers and fellow

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1 panelists on that effort, there's a wide range of
2 questions I'm sure all of us could ask, and we're
3 going to have a problem focusing. One of the things
4 that you emphasize is that you believe that there is
5 an imbalance today between confirmatory and
6 anticipatory research and that suggested that the ten
7 percent or so that is there today is inadequate. And
8 I think that Mr. Murley, in his comments, suggested
9 maybe 20 percent would be right.

10 I'd be interested in whether the panel had
11 reached a common view as to what the appropriate
12 balance is and whether you have any insights for us on
13 how you go about figuring out what you should do.
14 It's very easy, I think, in the case of the
15 confirmatory research where you have user needs that
16 are coming forward that you can sort out what is
17 pressing on you when you have, basically, because
18 there's a demand for the information. It's a much
19 harder problem to look over the horizon and to see the
20 issues that are going to be coming that you have not
21 -- that your users aren't demanding of you.

22 I think we, in the pressurized thermal
23 shock area, we did have the foresight to be able to
24 get the research underway in a timely fashion before
25 the user need emerged. It turned out to be essential

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1 that we had that information. And I guess I'm asking
2 whether there is any views you have as to how one
3 establishes an appropriately accurate crystal ball
4 that enables you to sort out what is coming that your
5 users aren't demanding of you?

6 DR. ROGERS: Well, let me just try to
7 answer that in a couple of different ways. I think
8 that we did suggest that the anticipatory research
9 really should be -- the topics for anticipatory
10 research really should be developed by a broad-based
11 panel of experts, not just in-house but widely -- a
12 wide spectrum of expertise. They should be experts,
13 technical experts, as much as possible in that, but
14 that that is a different process than probably has
15 been followed exactly today. That this probably needs
16 a review in its own right of what is the process, the
17 best process for prioritizing anticipatory research
18 done by NRC. And there's certainly, I think, no fixed
19 percentage that one can come up with a priori.

20 I believe that once you start that
21 prioritization process and really thrash it out and
22 see what seems to be the absolute top needs, then you
23 try to get your price tag and see how close you can
24 come to affording it. But I don't think that -- I
25 think one can throw out a number like ten or 20

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1 percent, but it's just I think that really is just an
2 indication that some priority has to be -- some
3 absolute priority has to be set for doing some
4 anticipatory research. Nobody knows exactly what that
5 percentage should be.

6 I think one of the problems is that with
7 the present prioritization system, which is largely
8 driven by user needs but not entirely so, it still
9 turns out that when research has to impose on a
10 selection of the topics the objectives of the overall
11 Commission, then that tends -- it just always tends to
12 drive these things down to the bottom. I mean that's
13 just, operationally, that's the way it's happened.

14 But I would say this: That we really, I
15 think, are arguing for the broadest kind of input on
16 some of these decisions from the best technical
17 experts in the world. And to try to go at it from
18 that point of view, that I don't think that any of us
19 are really equipped to give you a list or a
20 percentage, and I don't know that a collection of
21 experts could do it either until they sat down and
22 started to really thrash it out. There may be some
23 blood on the floor before the final result comes out.

24 But I do think that -- my emphasis in this
25 entire process has been the technical quality that

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1 goes into all judgments that NRC is involved with.
2 That's got to be, in my view, the highest priority to
3 make sure that always you're calling on the very best
4 technical knowledge with inside and outside of NRC.
5 And that it is not limited by some arbitrary
6 requirement of going in a particular direction. So I
7 think it's hard to give a detailed answer to your
8 question, but I would suggest a new process for that.

9 The other thing is that all of us who have
10 had responsibility for bottom lines or organizations
11 have found that, particularly in certain areas, when
12 you prioritize your list of things to do, there is
13 always things at the bottom of that list that are
14 always there. They never go away. They never, ever
15 go away. The top changes, but the bottom starts to
16 stay the same. And some of those things really have
17 to be done. They just have to be done. But they
18 never get up to the top. And how do you deal with
19 that?

20 Well, various organizations have different
21 ways of dealing with it, but one way that I always
22 used was that we're just going to do a certain number
23 of these every year, even though they're not -- they
24 have to have some priority to get on the list at all,
25 but they don't get high enough to actually make the

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1 cut, and then there they are year after year, and
2 they're still there because they're important. And so
3 there's a -- some kind of a judgment, it seems to me,
4 has to be made at a high level that says there is
5 going to be a certain amount of anticipatory research
6 done. You're going to have to figure out how you set
7 that level. It may not be fixed; it may go up and
8 down from year to year, but it's got to come out of
9 a process that uses the best available technical
10 judgment in the world.

11 DR. MURLEY: Mr. Chairman, in addition to
12 the fuels and advanced cladding and digital INC issues
13 that have been mentioned, I think there's one area
14 that's very clear that research could start doing some
15 anticipatory work now. And that is what are the
16 safety issues with these advanced designs that are
17 being talked about? Apparently industry is serious in
18 this, and I don't think the NRC staff really knows
19 very much at all about how these, for example, the
20 pebble bed reactor, what are the reactivity
21 coefficients? What are the thermal hydraulic aspects
22 of these reactors?

23 And I can just give an anecdote in my own
24 experience. We began to hear from the AECL in Canada
25 in the late '80 and early '90s that they may be

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1 wanting to certify the CANDU Reactor. I could not
2 justify -- on such a speculation, I could not justify
3 the staff resources in NRR, but I did ask the Director
4 of Research at the time to start undertaking a small
5 program to understand what a CANDU is and how it
6 behaves, which he did, and that saved us a lot of
7 time, actually, in getting ahead of understanding the
8 issues, asking the right questions.

9 So I think that is an area that very
10 clearly can be done by the research staff now.

11 CHAIRMAN MESERVE: Let me just say that
12 that is an activity that is now underway, but it's
13 come to us really as a result of a user need that
14 they're now talking about against reactors, and we are
15 obviously scrambling to respond to that in an
16 effective way.

17 Let me raise another issue that -- and
18 then as my -- lots of things we could discuss. One of
19 the points I think you made is the need for improved
20 communication. I think that part of the story here is
21 the need for communication outside the NRC about what
22 we do, why we do it, how we go about it. And I wonder
23 if you have any concrete suggestions as far as how
24 exactly we should go about doing that? What should we
25 do differently from what we're doing today?

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1 DR. ROGERS: Well, I'll try a little bit
2 of that, but let me preface my remarks by saying the
3 first thing that happened in our first panel meeting
4 was that most of the panelists revealed a very
5 rudimentary or elementary or non-knowledge of what
6 research NRC does and why it does it. Now that
7 changed during the course of our meetings, because as
8 more information came in. But many of the panelists
9 said, "You know, I really don't know what research NRC
10 does or why they do it. I assume it's good. I know
11 about one thing, but I don't know the whole program.
12 I don't know where it's come from, where it goes to,
13 how you pick projects, what are the priorities, what
14 is the process that leads to the selection of a
15 research topic, how do you find out whatever came out
16 of it and how it was used?"

17 And so, you know, that very first
18 recommendation that we made with respect to what the
19 Commission ought to endorse, used and useful is a very
20 significant statement. That's there for a very good
21 reason. Research at NRC should be used and useful.
22 Well, you've got to have a process for finding out
23 whether it's used and finding out whether it's useful.
24 And if is -- and then you have to tell your
25 stakeholders about it.

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1 Now, all research will not be useful, all
2 research will not be used, but most of it should be.
3 And I think that a very systematic way of conveying
4 the process that NRC uses in a readable,
5 understandable way to basically an interested layman,
6 layperson, should be constructed, that's, let's say,
7 suitable for understanding by at least a science
8 writer for a newspaper. And I think that that's
9 something that research itself cannot do, simply
10 cannot do.

11 Researchers are very poor, as are most
12 technical people, at really selling their product.
13 And this has to -- it requires some real help from
14 your public information, public relations arm who do
15 a very good job. But to sit down and find, one, how
16 to put it in a meaningful way and to determine what
17 your target audience is -- you're not going to be
18 educating the man or woman on the street. You have a
19 target audience that ought to know about these things.

20 So I do think that some kind of an annual
21 report that is more general but indicates how research
22 has actually been used. How did we come to the
23 decision to do it? And it's very interesting how some
24 of these projects actually got started. I mean just
25 -- Dr. Murley's talked about the CANDU thing. Bob

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1 Budnite's talked about the PTS -- how research on PTS
2 originated, in some ways against the views that it
3 wasn't needed at the time. But it started.

4 And then you follow how it evolved and how
5 it was used. And there will be instances where it
6 just didn't go anywhere; that's research. I mean
7 let's be realistic about it. There will be things
8 that -- and you try to avoid those. But there will be
9 success stories, and I think that the users have to be
10 involved with this this. They have to contribute to
11 how the work has actually been used and what the
12 impact of that is. I mean that's a separate
13 statement. It's used, but then what is the actual
14 impact after it was used?

15 So there's a full story from genesis to
16 exodus that should be told here in a way not for every
17 single project necessarily but in a way that's
18 understandable, that gives a picture of a process in
19 an organization that understands the value of what
20 it's funding.

21 CHAIRMAN MESERVE: That's helpful.
22 Commissioner Dicus?

23 COMMISSIONER DICUS: Thank you, Mr.
24 Chairman. Just a couple of questions, really, looking
25 at the time. One of the issues that the NRC is facing

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1 has been brought up to us by Congress, by the Senate,
2 is staffing and how are we going to maintain staffing,
3 what are we going to do with staffing, and so forth?
4 One of the things that I didn't hear you get into very
5 much, either the expert panel or the ACRS, is are we
6 properly staffed in research to do the jobs that
7 you're recommending that we do, because you've made
8 several recommendations? Are we properly staffed? Do
9 we need to relook at staffing? I'd like some feedback
10 on that from both the ACRS as well as from the panel.

11 MR. CYR: Let ACRS go first on this one.

12 DR. POWERS:: I think that my general view
13 is that the Commission is blessed with an
14 extraordinary staff. But as you move to rely more and
15 more on your research organizations to have the
16 technical competence rather than having the competence
17 in the contractors, you are having a problem. And I
18 think we've seen it over the last year in spades, that
19 as you ask technically competent people to serve more
20 bureaucratic functions at the expense of technical
21 work, you lose them. And I think that happened -- is
22 happening in the Agency. When your managers bring in
23 technically strong people, you lose them because they
24 find lots of bureaucratic work that they have to do,
25 and the find, quite frankly, that their most important

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1 product is view graphs to justify their programs.

2 So I think that whereas I would give your
3 staff high marks, existing staff, I think you're
4 acutely aware, like all organizations, are going
5 through an aging of your staff. That's a national
6 problem. In my own laboratory, we are actually
7 slightly worse than the national average. We spend a
8 lot of time worrying about that.

9 But you are bringing in some young and
10 energetic people, and I would caution you, as we
11 speak, to more and more justifications and
12 publications and things like that. If you overburden
13 these people doing that kind of work, you cannot
14 retain those high-powered, technically competent
15 individuals. You'll have the same problem with your
16 contractors, be they in the national laboratories,
17 universities or industrial firms, that if they are
18 more and more bogged down into the justification,
19 communicating with the public and the like, they'll
20 find your work is not attractive to do.

21 COMMISSIONER DICUS: Okay.

22 DR. ROGERS: Well, I think that we are
23 seeing the effect of a decaying infrastructure for all
24 nuclear technology in the United States. We know that
25 the source of technical expertise sources are drying

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1 up. So that some way has to be found to replenish the
2 expertise within NRC. My guess is that there's a
3 number of different things -- there's no single way to
4 do that, but there are a number of different ways that
5 can all help.

6 It's always been my experience that the
7 way to get good people is to have good people. If you
8 don't have good people, you won't get good people.
9 And the young, bright, energetic folks want to see
10 that they have an opportunity to work with somebody
11 they can learn from. And NRC has a number of very
12 fine people of that type. I don't think they have
13 probably been given enough opportunity -- and I'm
14 going on soft ground now, because I haven't really
15 probed it that much -- what I guess is that they
16 haven't been given enough opportunity to act as, I'll
17 say, mentors in a certain sense to bring along young
18 people in a systematic way where you identify where
19 you are going to need expertise, you have a really
20 first rate person, maybe only one, but then you make
21 sure that that person has an opportunity to be as a
22 mentor, a teacher for younger people who can begin to
23 absorb that knowledge and take over.

24 And the danger is the one that Dr. Powers
25 talked about, that these people get loaded down, both

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1 the top-notch person and the younger person are loaded
2 down. There just doesn't seem to be a time or
3 opportunity for it. And I would say that it is -- in
4 my view, it is possible to work with a nucleus of a
5 few very outstanding people and start to grow that out
6 on the basis of younger people.

7 You did have a core competencies study
8 done. I referred to that in my part of that report.
9 And I think that it was on the right track, but it
10 stopped at the wrong point. It stopped at a point
11 where it looked as if the only next step was to hire
12 a lot of people, and that simply wasn't feasible,
13 simply wasn't feasible. On the other hand, the
14 general approach that was taken -- I read over those
15 SECY papers, and I was really quite favorably
16 impressed with the detailed look and attempt to come
17 to grips with what are we talking about in the way of
18 core competencies? They defined two types of core
19 competencies and how to meet those. I think that that
20 approach should be revisited and forced into a really
21 minimal set that's not 20 people or 20 categories, and
22 then see where you can go from that.

23 I have written on this subject. I have
24 spoken to some of you, maybe all of you, on some of my
25 ideas on how to do that, and they're not necessarily

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1 the only way to go. But I do think that, in my view,
2 the most important responsibility that the Commission
3 has is to make sure that its staff is the very best it
4 can possibly be. That's where it all starts. All
5 these other things can be dealt with in some way --
6 where your priorities are, what you -- but if you
7 don't have the right good people, then you will waste
8 time, you will waste money, and you will not get
9 really good results.

10 So that when all is said and done that is
11 the key. And NRC is a technical organization; it's a
12 knowledge-based organization. And one must never
13 forget that. It is a regulatory body, but it operates
14 on knowledge, and if it doesn't have good knowledge,
15 its results will be mediocre.

16 COMMISSIONER DICUS: Are we proceeding to
17 do that? Do you see any concerns?

18 DR. ROGERS: Well, I don't think there's
19 a program in place -- you mean to become mediocre or
20 --

21 (Laughter.)

22 COMMISSIONER DICUS: No, to not become
23 mediocre.

24 DR. ROGERS: Or not become mediocre. I
25 think there's -- you see, I think there's a lot of

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1 talk about it, hand wringing -- "We're losing our good
2 people. How do we get them," and so on and so forth.
3 I think that this just needs a -- I think it needs a
4 champion in the form of a single person to be given
5 responsibility or a single organization to do that.
6 And that's why one of the recommendations that we made
7 was that RES be given the responsibility of looking at
8 the capability of the entire organization from a
9 technical, purely technical point of view. Now, you
10 may not want to accept that, but at least it's a way
11 to go.

12 But, you see, when everybody has a
13 responsibility, nobody has a responsibility. When
14 everybody is responsible for technical quality, nobody
15 is responsible totally for it. It can be good or bad,
16 and there can be cracks. My own personal view is that
17 somebody needs to be named as a champion for that.

18 COMMISSIONER DICUS: Okay. Thank you. I
19 have more questions, but I think in light of the time,
20 I'm going to pass. Thank you, Mr. Chairman.

21 CHAIRMAN MESERVE: Appreciate that.
22 Commissioner Diaz.

23 COMMISSIONER DIAZ: Thank you, Mr.
24 Chairman. I want to add my appreciation to all the
25 members of the panel at ACRS for their efforts. I

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1 think this is a very, very good effort, and we thank
2 you for it.

3 Let me go to, first, to the 80,000-foot
4 level.

5 PARTICIPANT: Pretty soon you're going to
6 be in space.

7 COMMISSIONER DIAZ: Well, you've got to
8 remember that I was in space before I came here.

9 You know, we've been talking of the Office
10 of Nuclear Regulatory Research, which we call it RES
11 because if not it spells out NRR. Start from there.
12 And let me say a few of the phrases that I've been
13 hearing: core technical competency, user needs,
14 differentiation between different uses and research,
15 independent technical opinions, cross fertilization,
16 learning from each other, knowledge-based
17 organization, being independent even inside the NRC,
18 have good value adjustment, competition between
19 anticipatory and confirmatory research. It all gets
20 put in this, you know, RES.

21 And I really believe -- and I'm going to
22 ask Dr. Powers and Dr. Rogers to make a quick comment
23 on this -- there's so much in a title. When somebody
24 in Congress or in industry looks at research, what
25 they see is somebody like I used to be, running in a

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1 lab and doing things. And in reality, this research
2 organization is quite complex, and it has multiple,
3 multiple functions.

4 Amongst one of them, one of the most
5 important ones, is the issue of nuclear safety
6 assessment, not per se a research function, because
7 it's a knowledge-based function. You have to look at
8 what is being done, and you have to make a
9 determination, do we need to do something else. It
10 might be that the result of the safety assessment
11 might be a research program, but it's not necessarily
12 so from the very beginning. In other words, something
13 arises in the licensees or the Commission, and all of
14 a sudden somebody else comes and says, "Let's do a
15 research program on it." No.

16 First thing that happens is there is an
17 evaluation process. There is an assessment process.
18 There is something that takes place that takes
19 precedent which is knowledge-based and requires core
20 competency. It requires that people know what they're
21 doing. And that function, okay, could end up in
22 research, but it could be terminated right there. But
23 people don't seem to realize that these functions are
24 interrelated with the first function. The very first
25 function of a researcher, by the way, is to make an

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1 assessment, do I do research or not?

2 And so a quick comment: Should this
3 Agency be better served is the Office of Research will
4 be called the Office of Nuclear Safety Assessment and
5 Research? Dr. Powers? Dr. Rogers?

6 DR. ROGERS: Dr. Powers can deal with it
7 first. I can deal with it, but I'd rather hear what
8 he has to say first.

9 (Laughter.)

10 DR. POWERS:: Be well served. In the
11 matter of optics and how it seemed to the outside
12 world, I have no competence to judge that. What I
13 will tell you is that in our report we certainly said
14 that the Office of Research, in addition to the user
15 need effort, needs to have its own ability to go out
16 and assess the operations taking place in the line
17 organizations, and from that deduce research that it
18 ought to undertake. In other words, this assessment
19 function, yes, they need to do it. As you know very
20 well, that is indeed the first step to doing any
21 research.

22 And what is missing right now in this user
23 need process is a complementary process where the
24 Office of Research goes and looks at the Line
25 organization and says, "In the longer-term, longer

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1 than the line organization could," just because when
2 you're up to your waste in alligators, it's hard to
3 remember you're trying to drain the swamp. It's hard
4 for any line organization to see what it needs, and
5 long-term can provide that outside assessment, and
6 from that identify longer-term research that he should
7 take those.

8 COMMISSIONER DIAZ: If there are some.

9 DR. POWERS:: If there is. And I think
10 it's particularly in the digital electronic area you
11 and I have discussed this, where it may be easier for
12 somebody from the outside like a research organization
13 still familiar with the regulatory requirements to
14 look and do this kind of assessment.

15 So in answer to the question, I can't
16 judge on the optics and the name, but the functions,
17 yes, it should be part of the research organization.
18 I think that it speaks to the same sort of thing that
19 Commissioner Rogers and his panel spoke to, that they
20 should be able to identify their own anticipatory
21 research and look ahead.

22 COMMISSIONER DIAZ: Let me -- before you
23 answer, let me just add that the issue is to have
24 proper separation but cross fertilization of
25 functions, which is an issue that I think is vitally

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1 important. Separation because on budget when they're
2 made, we need to know what people are doing. Cross
3 fertilization because I agree with you that the
4 competency of our staff will actually -- it's a
5 positive feedback loop that will make things better.
6 I'm sorry, go ahead now.

7 DR. ROGERS: Yes. Well, just this: That
8 one of the reasons for our recommendation that the
9 Commission define what research is and what it is not
10 at NRC is really what you're saying, you're really
11 getting at.

12 COMMISSIONER DIAZ: Yes, sir.

13 DR. ROGERS: And, you know, during the
14 course of wrestling with questions about what research
15 is at NRC and what it is over the years, now I've
16 often said to myself, you know, it might be a good
17 idea to just not call it research, because research
18 carries with it so much baggage in people's minds of
19 somebody in a white coat and a slide rule in the
20 pocket staring at the stars. It's the wrong image of
21 what that office is supposed to do at NRC. Its work
22 has to relate to regulatory issues -- regulatory
23 issues, the technical aspect of regulatory issues,
24 which is not anything under the sun but regulatory
25 issues.

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1 Assessment, yes, should certainly be part
2 of that, in my view, not only because it's the first
3 step towards doing more in the way of something that
4 looks a little bit like conventional research, but
5 that ought to be what RES does, in my view. But the
6 assessment is a very fundamental part of what they
7 should do. And, of course, the folding of AEOD into
8 that, while some of us had some worries about what
9 that might lead to, it certainly seemed to me to be
10 the right step, because that's where your work should
11 begin with an assessment. And if that's someplace
12 else -- see, I'm a little concerned about your
13 separation of functions, because I think they are so
14 closely related and should be so closely related in
15 terms of an RES function that the assessment should be
16 just part of their culture.

17 COMMISSIONER DIAZ: Oh, it is, but I was
18 trying to make sure that they are given credit for
19 that independent safety assessment, which sometimes is
20 not. It seems like it disappears. And, you know, in
21 budgetary space that counts, and so I was trying to
22 make sure that we provide the proper credit.

23 DR. ROGERS: You see, the question that
24 Commissioner Dicus asked about, communication, is part
25 of this problem, that we're not communicating to the

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1 outside world and, quite frankly, not entirely
2 successfully within the organization itself of what
3 this is all about. Because it really comes down to
4 some very hard fundamental thinking about functions
5 and relationships.

6 COMMISSIONER DIAZ: Thank you, sir. Let
7 me just make a quick comment. The Chairman brought
8 the issue of synergism. I get concerned with the use
9 of the English word having been very poor of the
10 English language. The word "synergisms" create a
11 connotation that one drives the other. I think that
12 sometimes in the research program that might be true.
13 But the word "interdependence" from the safety point
14 would be a better word than synergism. I'm not trying
15 to correct your English, because, you know, I don't
16 know enough English to do that, but that's okay.

17 In slide 6 and 7 of the ACRS, there's an
18 interesting issue. You point out lot of significant
19 areas in slide number 6. And on slide number 7, you
20 pick out some that are well organized and well
21 conducted programs. I was trying to generalize what
22 the difference between well organized and well
23 conducted programs and the others are, although I know
24 you've selected these things. And let me tell you
25 what I see as what they are, and then maybe you can

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1 correct me.

2 Well organized and well conducted, to me,
3 in this Agency is that there is a strong connectivity
4 between the research program, the associated safety
5 issues, and the regulatory fabric. There is a real
6 connection in there in between all of these things,
7 okay, whether the regulations are existing or they're
8 to be proposed. And they are supported by the
9 technical basis that is, of course, indispensable to
10 do that.

11 So if we have this connectivity, which I
12 agree that it's in these programs, shouldn't that
13 always be the common denominator in between all of
14 these research programs, strong connectivity between
15 the program in itself, the associated safety issues
16 that really identify what they are, and what is the
17 regulations that actually represent or will represent
18 this?

19 DR. POWERS:: And to that I would add
20 regulatory efficiency and effectiveness. And in our
21 own thinking on the subject of well organized, if they
22 had taken proper advantage of the ability to cooperate
23 with industry or international organizations as well.
24 Conduct means the technical act of carrying out the
25 research itself, which is somewhat independent of

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1 those organizational factors, that's right.

2 COMMISSIONER DIAZ: Thank you. I have
3 also more questions, but I'm going to stop right here.
4 I think the issue of independent research versus
5 comparative research, some say that needs to be
6 analyzed, and the reason is that information
7 technology has actually changed the way that we can do
8 these things, and it provides a basis for our
9 oversight to ensure that things are being done right.
10 It is no longer like somebody did something in the
11 corner we didn't know how it was done. So the
12 openness that this Agency requires is fundamental to
13 be able to conduct comparative research. Thank you,
14 Mr. Chairman.

15 CHAIRMAN MESERVE: Commissioner
16 McGaffigan?

17 COMMISSIONER McGAFFIGAN: I'll join
18 everyone else in thanking the two panels and then get
19 right to questions. Maybe I'll start at 80,000 feet
20 or whatever.

21 You know, I spent a lot of my career
22 working on defense issues where this Agency's budget
23 is a rounding error, and where if we worked at this
24 level and the Congress at the \$40 million, \$50 million
25 level, we were accused of micromanagement for daring

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1 to look at that fine a detail. So that's one
2 perspective. Our budget is a rounding error at the
3 moment in terms of NIH's annual budget increase; not
4 their total budget, which is \$23 billion but their
5 increase, which is about \$3 billion, we're a rounding
6 error.

7 So I do resonate with something Dr. Powers
8 said and fear, that if we have people down in the
9 research office whose main product is to justify their
10 programs, we are micromanaging, and we have to worry
11 about that. I think that the ACRS does a good job.
12 I think it's done a particularly good job this year,
13 but I think it does a good job every year in its
14 research report. And we used to send them to the
15 Congress. Congress appropriately isn't asking for
16 them any longer. But I think the process of going
17 through that and having the interaction with the staff
18 on that is about as intense a process at this level of
19 detail as we should expect. I mean that's my personal
20 view. And when we add additional folks, I'm glad you
21 guys stayed at 30,000 feet or whatever number of feet
22 we're claiming you are, because I don't think we have
23 to replicate what ACRS does, and I think we should be
24 proud of what ACRS does and what the staff does.

25 In terms of getting money for this

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1 program, I think that our budget this year has an
2 increase for research, the budget's that pending
3 before the Congress. And we recognize, Mr. Murley,
4 that we need more, because we do have to do some of
5 the things that you suggested with regard to advanced
6 reactors. And we're just going to have to see how
7 Congress reacts.

8 But the reason we had to make all those
9 cuts, including when Ken Rogers was here, is that the
10 immediate has to be done well or else you do not have
11 any chance of getting increases. We had to do license
12 transfers well and license renewal well and the
13 revised oversight process well in order to get some
14 credibility with our congressional overseers from
15 which we could build a base and which perhaps we can
16 go back and start trying to make the research program
17 more whole. And I support that, and I support getting
18 as much of it off the fee base as possible.

19 There's a provision in Senator Domenici's
20 bill that would give us some money off the fee base
21 for at least the research related to advanced
22 reactors. Otherwise, Mr. Ray, we're going to be -- if
23 it's research on first-of-a-kind education, as it was
24 for Westinghouse or Combustion Engineering or
25 whatever, it's going to be in your annual fee if it

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1 isn't specifically related to one of the applications.
2 And I think that that's a policy we've always had and
3 we'll continue, but it's one where it isn't good
4 public policy, in my view. I expressed that last year
5 to the Congress when we were asked a question about
6 funding research. I believe it belongs off the fee
7 base, but I'm very realistic.

8 When you look at the Congress at the
9 moment, the budget that they've put together, getting
10 additional resources for anything that isn't education
11 or defense or health research is going to be very,
12 very, very difficult.

13 I was going to ask -- finally get to a
14 question. That took about three minutes. Dr. Powers,
15 we've talked in private; I'm trying to tease you in
16 public. The quality of NRC's research, if you compare
17 it with the research supported by other federal
18 agencies, where would you place our research budget
19 today?

20 DR. POWERS:: Research budget or research
21 activities?

22 COMMISSIONER MCGAFFIGAN: Research
23 activities, the quality of the research activities
24 carried out pursuant to the budget.

25 DR. POWERS:: I can only speak with my

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1 experience on the research. I would say that you tend
2 to be relatively applied and relatively incomplete in
3 the -- for instance, your experimental and analytic
4 investigations, you don't tend to complete the story
5 relative to other government research.

6 COMMISSIONER MCGAFFIGAN: To complete the
7 story sometimes costs about --

8 DR. POWERS:: That's right. Sometimes 90
9 percent of the funds comes to the last ten percent of
10 the results, and so I think that's consistent with
11 your strategy in many cases. In many cases, as
12 Commissioner Merrifield, I think you yourself pointed
13 out, that there's a point where you have done enough
14 research to make regulatory decisions, which are
15 always made under a certain amount of uncertainty.

16 But I was asked to compare it to other
17 government funding agencies. I would say that would
18 be the hallmark of it. Within that incompleteness, I
19 think that the technical standards that you establish
20 for the research are quite high. I think the quality
21 assurances, the paperwork, and what not like that tend
22 to be a little bit lower.

23 COMMISSIONER MCGAFFIGAN: Okay. The issue
24 of proprietary -- one of the things that keeps coming
25 up, and Dr. Wallis is sitting by your side -- but in

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1 PRA space and thermohydraulic code space and the data
2 that Mr. Lyman was talking about with regard to the
3 quality -- whether there are any issues with the new
4 cladding materials, we are constantly dealing in
5 pretty much a proprietary basis, our staff dealing
6 with an industry submission. And ACRS is about the
7 only institution we have to help us ensure that things
8 are going well. And it's a public confidence issue --
9 Mr. Lyman raised it; Mr. Lochbaum has previously
10 raised it on PRA -- because it's invisible for the
11 most part.

12 Do you have any thoughts as to anything
13 more we could do to tackle this issue of proprietary
14 research results or proprietary submissions that we
15 have to go over in which we made fairly profound
16 decisions?

17 DR. POWERS:: The biggest problem you face
18 is not so much the alloys and what not, which have a
19 way of becoming public even if they start proprietary.
20 Your biggest area of difficulty is actually in the
21 PRAs themselves and getting those -- when you're
22 making decisions on probabilistic risk analyses that
23 are done by the licensee in a proprietary analysis,
24 how do you make that -- I mean how do you give public
25 disclosure to that?

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1 And do I have any insights to help you on
2 that? No. We passed the problem up to you.

3 COMMISSIONER MCGAFFIGAN: Thank you.

4 DR. POWERS:: We said you have to find a
5 way to do this. Remember our letter.

6 DR. WALLIS: This is Dr. Wallis. I
7 suggest you challenge the industry. If the industry
8 thinks this is a mature technology, then the
9 characteristic of mature technologies is they tend to
10 be open, and everybody knows it's mature, because it's
11 there; you can see it. If you have to sort of conceal
12 parts of it, maybe it's because you're not too
13 certain. That may mean that research is needed, and
14 it's not so mature as you thought. So maybe you could
15 challenge industry. If it's really mature, then --

16 COMMISSIONER MCGAFFIGAN: One corollary I
17 get from this is it's really critical that we maintain
18 a very high quality in-house staff, because if we are
19 trying to go over -- we can't -- I guess we could rely
20 on a contractor. I mean we can try to burn as much of
21 the year that you all will give us as possible to
22 oversee and provide a double check, but if we don't
23 have the staff capable of seeing the errors in some of
24 these applications we get, then we could get off into
25 some pretty dicey situations.

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1 DR. POWERS:: And I'll agree with you on
2 that and simply, again, point out that in comparison
3 to many federal agencies, your staff is second to
4 none. In my experience, you have a staff commensurate
5 in many respects to the staff of DARPA.

6 COMMISSIONER McGAFFIGAN: Of DARPA. I
7 appreciate that. That's a good --

8 DR. POWERS:: That's a good comparison.

9 COMMISSIONER McGAFFIGAN: -- good
10 comparison, right. I have a lot of experience with
11 DARPA, and I think it's a compliment to our staff that
12 you'd put them in the same boat.

13 I'm going to ask a really parochial
14 question, then quit. In the section on radiation
15 health effects, and I think it's an area where we
16 don't have enough in-house capability. We tend to
17 fund this, we send money out, but our best expert in
18 this area is probably Carl Pepperella, and he's not in
19 the Research Office, although he oversees it, and he
20 does it in his spare time on his home computer on the
21 weekends.

22 But you, in passing in that section,
23 mentioned that ACRS is surprised that are not efforts
24 focused on determining if NRC should upgrade its
25 radiation protection standards from ICRP-30 to ICRP-

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1 60. In fact, we've been sort of doing it bit by bit
2 in various rules. And I think there's a paper
3 forthcoming later this month that's going to present
4 the ICRP-60 issue to us a policy matter. And I just
5 say that in passing. I think in that radiation health
6 effects area, though, more broadly, that it is so
7 central to what we do and it's so central to public
8 dialogue on the safety of nuclear power, that having
9 a larger capability in that area in-house would be
10 very useful.

11 CHAIRMAN MESERVE: Good. I'd like to
12 thank the entirety of the panel for their helpful
13 contributions. We've gone a little over time. I
14 think that just reflects the importance that we all
15 attribute to the subject.

16 So why don't we -- in light of the time,
17 why don't we take a three-minute break and then we'll
18 have the second panel, which will consist of members
19 of the staff. Thank you very much again.

20 (Whereupon, the foregoing matter went off
21 the record at 12:25 p.m. and went back on
22 the record at 12:30 p.m.)

23 CHAIRMAN MESERVE: Dr. Travers, you may
24 proceed.

25 DR. TRAVERS: Thank you, Mr. Chairman, and

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1 good afternoon to you and the Commissioners. I
2 couldn't help but think as I noticed the air
3 conditioner begin to work that it's not very typical
4 that the Commission turns down the heat when the staff
5 comes to the table.

6 (Laughter.)

7 But we'll take that as a temporary
8 condition. But we are glad to be here this morning to
9 discuss the Agency's regulatory research program and
10 specifically following on the presentation and
11 discussion with this morning's first panel.

12 We'd like to provide you with some initial
13 reaction to the three reports recently provided by the
14 expert panel headed by Dr. Rogers, the ACRS and the
15 DOE National Laboratories.

16 We asked these three groups to provide
17 views and perspectives on the role and the future
18 direction of our research program. In order to assist
19 us, actually, and ensuring that we make vigilant focus
20 on our safety mission for current projects and
21 on-going programs, as well as providing assurance that
22 the Agency is well positioned to meet future
23 challenges. I believe Dr. Rogers and Dr. Murley both
24 mentioned the importance of these future challenges
25 and we certainly agree.

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1 As you have already heard and read, the
2 individual reports have provided an excellent and
3 insightful compilation of use.

4 I want to add my thanks to the thanks of
5 all of the Commissioners, really, for the considerable
6 effort that went into the work of these panels. As
7 Chairman Meserve indicated, I think the work has been
8 significant and certainly impressive.

9 Of course, we plan to use these
10 independent reviews in our on-going assessments of the
11 research program as valuable input.

12 Now, I'd like to very quickly identify the
13 staff members at the table and then turn it over to
14 Ashok who is going to continue with the briefing.

15 Mike Mayfield, who is Director of the
16 Division of Engineering Technology; Roy Zimmerman who
17 is next to him is Deputy Director of the Office of
18 Research. Roy has recently assumed that position; Dr.
19 Carl Paperiello, of course, is my deputy for Research
20 Materials State Tribal Programs; of course, Ashok
21 Thadani is the Director of the Office of Nuclear
22 Regulatory Research. Tom King is the Director of the
23 Division of Risk Analysis and Applications and Farouk
24 Eltawila is the Acting Director of the Division of
25 Systems Analysis and Regulatory Effectiveness.

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1 And with that, let me turn it over to
2 Ashok.

3 MR. THADANI: Thank you, Bill. Good
4 afternoon. I want to acknowledge the effort of my
5 colleagues at the table and all these assessments that
6 have been performed to date. And I also want to
7 acknowledge many people who are not at the table from
8 the Office of Research as well as from NRR, NMSS and
9 Region 1, our members who have participated and some
10 of the effort that went into these assessments.

11 I also want to particularly thank Margaret
12 Faruline for her significant effort in going forward
13 with these assessments.

14 May I have the first vu-graph, please?

15 [Slide change.]

16 MR. THADANI: Dr. Travers noted the
17 reasons for seeking independent input regarding
18 research programs. I also do appreciate the efforts
19 of the ACRS, the expert panel and the DOE lab
20 representatives for providing very valuable insights
21 and recommendations to us.

22 The expert panel composed of distinguished
23 members and the panel of the NRC voluntarily evaluated
24 and commented on the role and direction of the nuclear
25 safety research at the NRC.

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1 The ACRS focused more attention on
2 detailed technical evaluations, considering both
3 research needs for future as well as our on-going
4 activities.

5 The DOE labs' assessment of needed
6 research was really in response to my request in
7 recognition of their expertise in nuclear technology.
8 We are studying these comments and recommendations
9 carefully and I'm prepared to share our very
10 preliminary views regarding these important
11 assessments.

12 My briefing is divided in two major parts.
13 The first part is to discuss what appears to us to be
14 common themes amongst the expert panel as well as the
15 ACRS recommendations. And then there's some
16 additional specific recommendations coming from
17 various groups that have looked at research program.

18 Next vu-graph.

19 [Slide change.]

20 MR. THADANI: Both as I noted, the ACRS
21 and the expert panel has raised significant number of
22 issues and they are common in terms of the focus.
23 Regarding core competency research conducted an
24 evaluation in 1998 and again more recently to look at
25 our current status in terms of available capability

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1 and needed capability. We are working with human
2 resources to bridge gap between our needs and
3 availability. There are some gaps and they deserve
4 attention.

5 In terms of future challenges, as was
6 noted earlier, we are mapping strategy and developing
7 what I would call prudent planning to put NRC in a
8 position to deal with future challenges on advanced
9 reactors. Recently SECY paper on pebble bed marginal
10 reactor and two memoranda to the Commission reflect
11 our plans based on current understanding of the
12 industry plans.

13 As noted in one of the memoranda, we are
14 forming a small core group in research and since the
15 pace of the activity seems to be accelerating.

16 Regarding synergistic or interdependencies
17 issue, in fact, that is exactly what it is. These are
18 interactions coming about because of various changes
19 that are made. We have proposed in our current
20 proposal to the PRC a modest effort to start looking
21 at some of these issues.

22 There are the recommendations about
23 improving and expanding PRA use. As you know, we are
24 continuing to focus attention on enhancing methods
25 where we believe enhanced methods are needed. We are

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1 focusing also on risk-informing some of the most
2 important regulations in concert with the priorities
3 discussed with others.

4 Now some of the recommendations suggest
5 that we go beyond our current planned activities in
6 this area. Yet, another recommendation is to enhance
7 our communications by both the ACRS and the expert
8 panel.

9 We are focusing attention on this issue.
10 We have been working on developing plans. As you have
11 heard, we've been working on the Research
12 Effectiveness Review Board. We've conducted meetings
13 with our colleagues from NRR and NMSS to be sensitive
14 to their pressures.

15 We have established external websites. We
16 have increased the number of public workshops that we
17 conduct and we're always interested in getting
18 external views. In fact, the formation of the expert
19 panel was driven by this need to make sure we hear
20 from external stakeholders.

21 Water reactor safety meeting which will be
22 called nuclear safety research conference to ensure
23 that the focus is beyond reactors is another forum
24 that we're making a number of changes to get
25 additional insights from external stakeholders to

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1 reach out to them.

2 I do recognize, to address many of these
3 areas, will be influenced by the issues of available
4 resources and so on.

5 Next chart, please.

6 [Slide change.]

7 MR. THADANI: I should note that we are in
8 general agreement with many of the recommendations
9 that have been made by these groups. In terms of the
10 infrastructure, you heard me mention to you some of
11 the concerns and we're working to try to correct the
12 potential problems. They relate to two key areas.
13 Key expertise. We are, as I indicated, we have
14 developed fairly good list of what we call critical
15 capability that's needed. We've identified what the
16 gaps are. We are working to fill those gaps and to
17 also focus attention on hiring at perhaps lower levels
18 and people who could be mentored by our senior staff.
19 Obviously, age is a real issue, particularly for the
20 Office of Research.

21 The other issue has to do with facilities,
22 the potential or actual shut down of some test
23 facilities. We are attempting to leverage by going to
24 international community and utilizing some of the
25 information that they have in order to fill some of

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1 these gaps.

2 In terms of anticipatory research, a
3 number of areas have been identified by the ACRS, the
4 DOE labs and so on. Currently, we have applied our
5 prioritization approach that Dr. Rogers briefly
6 touched upon and consistent with the available
7 resources, high priority efforts are what we follow.
8 And that we tend to focus on short term support
9 activities that do get extra attention from us. We
10 particularly pay attention to high and medium priority
11 user needs and that does lead to continuing challenge
12 in terms of what long-term efforts we can initiate.

13 In terms of cooperative research, we are
14 continuing to seek increased opportunities for
15 cooperative research. We have increased our research
16 cooperation with Electric Power Research Institute,
17 with the Department of Energy. We have expanded the
18 agreement with Electric Power Research Institute, and
19 in fact, we plan to sign yet another agreement with
20 EPRI next week to conduct some cooperative work in the
21 area of fire research.

22 As I have mentioned before in previous
23 briefing, we have significantly increased the number
24 of cooperative agreements we have at the international
25 community as well.

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1 In terms of the contractor base, we have
2 increased the use of the hybrid, I guess,
3 organizations and university and in fact, just by way
4 of numbers, just recently we have increased commercial
5 work by \$2.3 million from the previous year. So we're
6 moving in that direction as well.

7 Next slide.

8 [Slide change.]

9 MR. THADANI: The Chairman did raise three
10 questions at that first expert panel meeting and
11 perhaps we can provide some preliminary thoughts on
12 that.

13 In terms of level of funding, you've heard
14 that many of the projects are funded, I believe, at
15 the right level. Other projects are either unfunded
16 or underfunded. Underfunded usually means stretching
17 out the effort.

18 And not funded are largely areas which do
19 tend to require longer lead effort.

20 Are we doing the right research? Perhaps
21 we can come back to this issue again, but other than
22 some of the limitations that have been discussed
23 regarding the anticipatory research function, and
24 within the available resources, I believe the focus of
25 research is appropriate. As I said, high and medium

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1 priority user needs are addressed and I would look
2 upon the recent ACRS report as confirming that view.
3 By and large, the work supports the focus of the
4 office.

5 In terms of the right performers, we made
6 a tremendous investment over the years to build up
7 certain level of expertise in different places and the
8 mix of national laboratories and private contractors
9 and universities is, in fact, being used currently.

10 I think the performers are, by and large,
11 right, but there is a continuing challenge regarding
12 the test facilities and some changes in core
13 competencies not only here, but perhaps at some
14 national labs as well.

15 Next chart, please.

16 [Slide change.]

17 MR. THADANI: The scope of the assessment
18 by the ACRS was not only future needs, but particular
19 attention was paid to the on-going research programs.
20 By and large, we're in agreement with the
21 recommendations of the ACRS. Three areas. They have
22 suggested additional research is appropriate in
23 certain areas they identified earlier in the briefing.

24 Our constraints are the availability for
25 resources and in some cases, the Commission direction

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1 has really guided our focus or lack of focus in some
2 instances, if you will.

3 They have made recommendations for closure
4 of certain activities. We agree with most of those
5 recommendations and we don't agree with some. We plan
6 to bring to orderly closure areas that we agree with,
7 having to do with common cause value and so on. There
8 are several areas where we agree with the ACRS.

9 Some of these we had planned to sunset,
10 but we have accelerated that plan in view of the
11 recommendations coming from the Advisory Committee.

12 We will also consider areas for additional
13 research identified by the ACRS as part of our PBPM
14 process and next year's proposals, because our
15 proposals for this year are in with the program review
16 committee.

17 And we certainly would be looking forward
18 to the guidance and the direction from the Commission
19 on some of these matters as well.

20 Next chart, please.

21 [Slide change.]

22 MR. THADANI: Now in view of the DOE's
23 labs tremendous experience in nuclear technology and
24 safety, I made an informal request at the October 1999
25 Water Reactor Safety Meeting for the DOE labs to

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1 provide their views regarding areas requiring nuclear
2 safety research.

3 Each year I do meet with the labs during
4 the Water Reactor Safety meeting. It provides a good
5 forum for us to discuss issues. And in my view, they
6 have made several very good suggestions for research
7 focus.

8 Generally, their recommendations are more
9 specific in terms of the research activities to be
10 considered and prioritized. Many recommendations will
11 likely be captured under our proposed plans regarding
12 new reactor concepts. Other recommendations will be
13 prioritized again as part of our next year's PBPM
14 process.

15 Next chart, please.

16 [Slide change.]

17 MR. THADANI: Some summary key points
18 would be, I think, all three reports offer valuable
19 comments and recommendations. We are studying the
20 reports in more detail. We will consider all
21 pertinent and technical comments and recommendations.
22 We will also consult with NRR and NMSS to ensure that
23 their views and their insights are considered before
24 we proceed further.

25 I do want to note that some of the

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1 existing programs do address a number of the
2 recommendations that have been made. An issue of core
3 expertise we're working on. We're working on issues
4 related to risk-informed initiatives and activities.
5 We have made plans as reflected in some of the papers,
6 the Commission, on how we might want to deal with the
7 advanced reactor concepts. We have a number of
8 initiatives to conserve resources. Much of our focus
9 is on cooperative agreements, as I've indicated to you
10 before. We are focusing very closely on competing
11 efforts, sunseting efforts or deferring what we think
12 we can reasonably defer our activities based on their
13 needs.

14 We have instituted a number of processes
15 to improve ourselves and these are reflected in our
16 operating plan, research operating plan, as well as a
17 memo that I issued to all research staff. The
18 motivation there was to enhance our communication,
19 both internal and external, to ensure accountability
20 and timeliness of our products and to improve
21 articulation of the value of research and how really
22 it adds to certain decision making.

23 As I said, we will evaluate the
24 recommendations from these assessments against NRC's
25 performance goals. Ultimately, it's clear to me that

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1 it will be difficult to address many of the
2 recommendations with the current constraints that we
3 have as we're looking, very much looking forward to
4 Commission guidance and direction on some of these
5 issues.

6 Thank you.

7 DR. TRAVERS: That concludes our
8 presentation, Mr. Chairman.

9 CHAIRMAN MESERVE: Thank you very much.
10 It's very helpful and I'd like to compliment research
11 in that some of these activities were ones that were
12 undertaken at research's initiative and they've opened
13 themselves for critical analysis by outsiders. I
14 think that that's something that would be encouraged
15 and welcome and appreciated by the Commission.

16 In light of the time and in light of the
17 fact that this is a matter that you are going to be
18 conducting continued activities and will have extended
19 interactions with you on these issues, I'm sure, in
20 the budget process and no doubt in other contexts, I
21 have no questions at this time.

22 Commissioner Dicus?

23 COMMISSIONER DICUS: I'm going to follow
24 suit and pass on questions at this time.

25 COMMISSIONER DIAZ: I guess the stage has

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1 been set.

2 (Laughter.)

3 I'll pass.

4 COMMISSIONER MCGAFFIGAN: I think there's
5 something in the air conditioning.

6 CHAIRMAN MESERVE: Ed, we can turn the air
7 conditioning off.

8 COMMISSIONER MCGAFFIGAN: Let me just ask
9 one question. You heard compliments from the previous
10 panel, but there are a couple of things you heard
11 that, as I said, my comments earlier, it bothers me.
12 How true is it that for some of your staff, Mr.
13 Thadani, that -- how much of their time is taken up in
14 reviews with the likes of us and you and God knows who
15 else, justifying their programs so that they can go
16 back to the desk and can actually work on it?

17 MR. THADANI: It's more time than I like.

18 COMMISSIONER MCGAFFIGAN: Anything that
19 you all can do to allow people to actually do their
20 jobs without micromanagement from everybody above them,
21 I think that's part of good management. They have to
22 be managed to some degree. But I think managing every
23 \$50,000 thing that they do gets to be pretty
24 ridiculous.

25 DR. TRAVERS: I just want to add that it's

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1 not just information that Commissioners want. It's a
2 host of information that's part of the federal system,
3 hearings, a host of things that drive the equation and
4 direction of some of this being problematic.

5 COMMISSIONER MCGAFFIGAN: We may need to
6 push back in terms of allowing people to do their job.

7 You said you agreed with most of ACRS's
8 recommendation for closure, but some you did not and
9 I didn't get a sense of on the "some" what they were
10 and why you want to continue programs that they
11 believe are ready to be closed.

12 I think that's something you can give us
13 more in detail for later. But if you want to give me
14 an example right now, to whet my appetite, I'd be
15 interested.

16 MR. THADANI: Certainly, and in fact, let
17 me as Tom King to give you --

18 COMMISSIONER MCGAFFIGAN: That's like what
19 Powers did with us. He passed the proprietary --

20 MR. THADANI: I have the issues, but I
21 think as the key owner of the issue, I want him to
22 address it.

23 MR. KING: There was one particular one
24 that stood out in my area, had to do with radionuclide
25 transport codes. AS I recall, the recommendation was

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1 decommissioning at those levels that are associated
2 with that, represent low risk to the public, why are
3 we putting so much resources into developing
4 analytical tools in that area.

5 We disagree with that. We think it's an
6 important area. It's important for compliance with
7 the license termination rule and that's one we want to
8 push back on.

9 COMMISSIONER McGAFFIGAN: That comes from
10 the AC&W part of this overall report? Does the ACRS
11 report consult with AC&W --

12 MR. KING: This was in the ACRS report.
13 I don't recall it being in the AC&W part.

14 MR. THADANI: It was not in the AC&W.

15 COMMISSIONER McGAFFIGAN: Okay, that may
16 be a good one.

17 COMMISSIONER DIAZ: Could we get the stuff
18 to send to the Commission, which areas that you
19 disagree? That certainly would be a good --

20 COMMISSIONER McGAFFIGAN: Okay, areas you
21 disagree and a brief explanation as to why. It helps
22 you because it will help you in the budget process.
23 I assume Dr. Travers and his colleagues probably
24 already asked you that question as you're putting the
25 2003 budget, but it probably would be useful to have.

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1 In that particular case, I just happened
2 to talk to Carl Paperiello this morning about the
3 importance of radionuclide transport in certain
4 decommissioning and other applications and it may well
5 be that it's one where we should be increasing rather
6 than decreasing resources.

7 That was pretty light and the air
8 conditioning didn't go down very far or up very far.
9 I'll turn it over to Commissioner Merrifield.

10 COMMISSIONER MERRIFIELD: Thank you, Mr.
11 Chairman. I agree with Commissioner McGaffigan that
12 we should not overly focus or micromanage what you
13 folks are doing. They should be trying to be the most
14 productive they can be. Similarly, however, we should
15 have no greater or lesser scrutiny on your programs
16 than we do of the other program offices in the Agency.

17 I will discuss with you privately -- I
18 would be interested in your insights on how we may
19 increase our productivity through appropriate use of
20 consultants like Arthur Anderson and others, but my
21 question is this. The expert reports indicates that
22 you presented their panel with a list of unfunded
23 research projects that totaled in the range of between
24 \$4 and \$12 million per year. I'm not familiar with
25 this particular list. I'm interested in knowing why

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1 you didn't include these needs in your budget that you
2 proposed to the Commission.

3 I'd like to get a little better
4 understanding of the basis for the list, the scrutiny
5 that it got from Agency management and whether the
6 research activities you included on there are
7 consistent and linked to the Agency's strategic and
8 performance goals?

9 MR. THADANI: Yes, I'd be happy to
10 address. If you don't mind, I would like to make a
11 comment and it has to do with Arthur Anderson. We did
12 work with Arthur Anderson some time ago and we have
13 looked at the issues of efficiencies and
14 effectiveness. I'd be delighted to talk to you about
15 those.

16 In terms of areas that are unfunded, by
17 and large, the process that we work under, assumptions
18 are laid out up front of our offices to come in with
19 their proposed budget. Typically, the guidances, not
20 to be unreasonable in terms of what you come back
21 with, stay with them pretty much what the allocation
22 has been.

23 We go through our priorities. We end up
24 with usually a pretty long list of efforts. Our
25 prioritization methods are driven by the Agency's

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1 performance goals and in fact, we're probably -- I'd
2 say we're very quantitative in a way in assessing
3 relative importance of our work.

4 And we always find ourselves in a
5 situation where there are a number of areas which I
6 judge, at the end not to go forward with in light of
7 some of the boundaries and constraints. I don't want
8 to go in with what would be viewed clearly as
9 unrealistic expectations on my part.

10 I'm responsible for not going forward with
11 some of the initiatives. Occasionally I'll go in with
12 some areas that might go beyond the allocated budget,
13 but the experience tells me it doesn't always work, so
14 there's no sense in my going further than that.

15 COMMISSIONER MERRIFIELD: Thank you, Mr.
16 Chairman.

17 CHAIRMAN MESERVE: I'd like to thank you
18 for -- both panels -- for a very helpful discussion.
19 This is an enormously important area to the Agency and
20 this has been very illuminating for us. The reports
21 will be very helpful as well. With that, we're
22 adjourned.

23 (Whereupon, at 12:57 p.m., the meeting was
24 concluded.)

25

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