

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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NUCLEAR WASTE (ACNW)

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NUCLEAR REGULATORY COMMISSION

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PERIODIC MEETING WITH ADVISORY
COMMITTEE ON NUCLEAR WASTE (ACNW)

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Tuesday, December 21, 1993

The Commission met in open session,
pursuant to notice, at 10:03 a.m., Ivan Selin,
Chairman, presiding.

COMMISSIONERS PRESENT:

IVAN SELIN, Chairman of the Commission
KENNETH C. ROGERS, Commissioner
FORREST J. REMICK, Commissioner
E. GAIL de PLANQUE, Commissioner

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STAFF SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

MARTIN MALSCH, Deputy General Counsel

DADE MOELLER, Chairman, ACNW

MARTIN STEINDLER, ACNW

PAUL POMEROY, ACNW

WILLIAM HINZE, ACNW

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

10:03 a.m.

1
2
3 CHAIRMAN SELIN: Good morning, ladies and
4 gentlemen.

5 The Commission is here to receive a
6 briefing, our periodic briefing from the Advisory
7 Committee on Nuclear Waste. We welcome Doctor Moeller
8 and the other members of the Committee.

9 I'd like to take this opportunity to
10 comment on Doctor Moeller's service and numerous
11 contributions both the Advisory Committee on Reactor
12 Safeguards and to the Advisory Committee on Nuclear
13 Waste, as this is his last meeting. Over the last 20
14 years -- that's quite a bit of service. Your efforts
15 as a member, Vice Chairman and Chairman of the ACRS
16 and as the first Chairman of the ACNW have greatly
17 enhanced the NRC regulatory program.

18 Today we look forward to hearing from the
19 Committee on the revised program plan so that it may
20 better address the Commission's need for independent
21 technical advice in the area of nuclear waste
22 disposal. This is quite an important meeting. I
23 think it will have implications for our work and, of
24 course, for the Committee's work for a long time to
25 come.

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1 Commissioners? Commissioner de Planque?

2 Doctor Moeller?

3 DOCTOR MOELLER: Thank you, sir.

4 In response to your request, the
5 Committee, as you well know, has reviewed our mission
6 and done an in-depth assessment of where we're headed
7 and so forth and what we have tried to do and we thank
8 you for your help in pursuing it as to better focus on
9 the issues and to develop a plan through which we can
10 better anticipate your needs and be ready with advice,
11 useful advice for you in a timely manner.

12 I must say, speaking for myself and
13 perhaps for the other Committee members, that it has
14 been a somewhat painful experience, but nonetheless
15 it's been a very beneficial exercise and it certainly
16 was timely and we agree that it was fully needed.

17 Let me begin on behalf of the Committee to
18 thank you for your help and particularly Commissioners
19 Rogers and de Planque for your time and talents and
20 efforts in guiding us through this process.

21 Let me also thank you for the commentary
22 on our white paper which was sent to us by Secretary
23 Chilk. We concur with your comments and we plan to
24 respond to each of your suggestions. In mentioning a
25 couple of them, we fully realize that we need to

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1 clarify what it is that we meant in several of the
2 statements, and that is we're not planning to assess
3 the capabilities of the NRC staff or their
4 performance, but rather our goal will be to identify
5 gaps in their technical expertise or experience and so
6 forth. So, we fully concur.

7 We also agree that when we have
8 disagreements with the staff, we'll meet with them,
9 both formally and informally, and attempt to resolve
10 those disagreements. We won't be running to you with
11 them.

12 We also recognize, as you have said I
13 believe in your response, that the white paper or the
14 program plan is a living document and we plan to
15 revise it, periodically update it and so forth.

16 Now, since there may be people in the
17 audience here today who are not familiar with what it
18 is that we've done, I thought I would briefly say that
19 our first objective was to establish a system for
20 identifying issues of importance. In order to do
21 that, we set up some criteria which we submitted to
22 you in our report. Of course, not stated among the
23 criteria, but implicit among them is that obviously it
24 must be a matter of importance to nuclear waste,
25 either high level or low level.

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1 But beyond that, we want to focus and use
2 as our criteria for identifying the issues to look at
3 those that will be important to you as Commissioners
4 and that relate to a major technical or policy issue
5 on which you'll be asked to render a decision.
6 Secondly, we will try to keep aware of and be alert to
7 issues that are pending Commission review or items
8 which may be not on your agenda right at the moment
9 but all of us know are coming up sooner or later.
10 Particularly in that category, we want to look at
11 items that require a lot of review and evaluation and
12 thinking in order to formulate some real beneficial
13 recommendations.

14 Our third criterion was the issue could
15 relate to an omission or a shortcoming in the
16 regulatory process. So, we plan to look at that and
17 we'll keep in mind as we move along your principles of
18 good regulation, that hopefully items or issues that
19 we identify will help to make the regulatory process
20 more open or clear or efficient and so forth.

21 Having identified issues, then we'll move
22 on to setting priorities on them and we are making
23 progress in that realm. Our priorities would be
24 directed to issues that have a direct relation to the
25 protection of the public health and safety. Just to

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1 digress for a moment, certainly the Academy, the
2 National Academy of Sciences' Report will fall into
3 that category because the way in which they express
4 the limits for the public will have a direct bearing
5 on public health and safety.

6 Number two, issues that are pending
7 Commission review. Since I cited an example for the
8 first one, I'll cite one here. That would be
9 Commissioner Remick's questions directed to us about
10 what is the meaning or definition of important to
11 safety. Then the third category would be issues on --
12 these would be ones that we would give priority to,
13 would be an issue on which we have specific talents to
14 address that issue and to handle it. Really, we feel
15 or believe that we have something to contribute.

16 Today we will be reviewing with you
17 through the words of my fellow Committee members,
18 we'll be reviewing with you what we consider to be
19 some of the more important issues that we will be
20 addressing over the next coming months and we will say
21 that each of these issues has been identified or we're
22 assigning priority to it in accordance with the
23 criteria that I have just mentioned.

24 At the same time that I say that each of
25 the members will be commenting, there will be some

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1 overlap obviously in their comments because issues
2 aren't that separable.

3 So, let me begin and let's -- well, if you
4 have questions, we'll quickly take them. But let me
5 begin then by asking Doctor Steindler to comment and
6 he'll begin the discussion with comments on risk
7 assessment and management.

8 Martin?

9 DOCTOR STEINDLER: Yes. It's fairly clear
10 that risk and risk management is the fundamental
11 aspect of the work of the NRC. So, there are easy
12 ways to identify significant issues in that area
13 because evaluation of their impact is certainly one
14 way to do that.

15 We have, as you know from the document,
16 identified several areas that are focused on risk and
17 risk assessment and risk management. Let me just
18 identify a few of those. Dade has already mentioned
19 the National Academy Committee, which was set up by
20 Section 801 of the Energy Policy Act. They are
21 currently -- we have interacted with them once before,
22 a couple times before, and we continue to interact
23 with them and follow what they're doing. They are
24 beginning to focus in on the real meat of the issues
25 before them, namely to devise a set of recommendations

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1 for the EPA on high-level waste disposal standards.
2 That will have clear impact, one assumes, on our Part
3 60 and we will then have to look to see what portion
4 of Part 60 is going to be subject to at least
5 modification because of the changes that the EPA is
6 planning to put into place.

7 The schedule, of course, is a little bit
8 uncertain. It's not clear when the National Academy
9 is going to be finished and it's certainly not clear
10 when the EPA will begin to treat the advice that they
11 are getting from the National Academy.

12 Another issue that we've looked at and
13 we're planning to look at a little harder on risk
14 assessment or risk management deals with the question
15 of residual contamination following decommissioning of
16 NRC-licensed facilities. This activity is currently
17 under study by the staff and we will try and continue
18 to keep track of what the staff is doing and
19 eventually review the outcomes of their deliberations.

20 As was mentioned, there is a question of
21 what constitutes issues important to safety and design
22 basis events for Part 60 facilities, an issue that may
23 or may not represent a timely activity as far as the
24 Commission is concerned. But we intend to look at
25 that if the Commission continues to work on it.

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1 Let me raise a couple of other items that
2 were not directly part of the document that have
3 recently been elevated to a significant point. One of
4 them is the multi-purpose container or multi-purpose
5 cask for spent fuel which has been raised by the
6 Department of Energy as a potential item that impacts
7 both near-term as well as repository type of work. In
8 connection with that, we're also looking at the issue
9 of burn-up credit for spent fuel and what needs to be
10 done or what can be done in the area of identifying
11 what the uncertainties are, what the risks are. That
12 includes some discussions of the behavior of poisons
13 in the array that the multi-purpose container is going
14 to be using.

15 Lately, a number of items under the
16 heading of very low level activity have arisen under
17 the heading of radioactive scrap that has been
18 discovered, as well as a comment that Bob Bernero has
19 made from time to time to other people dealing with
20 radioactive sewage sludge. The issue of how to deal
21 with that on a risk basis is one that eventually is
22 going to have to be looked at to some extent to see
23 whether or not that constitutes an issue that is
24 termed low-level waste or something else.

25 At any rate, those are some of the issues.

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1 We've been concerned that the advent of not being able
2 to ship, for example, low-level waste from New York to
3 Barnwell or any other facility might require, as was
4 noted in a publication, that the low-level waste
5 generators in various states are going to have to
6 store on-site some of their low-level waste. The
7 question of whether or not the agreement state program
8 is able to assure that the program set up by those
9 states will be able to identify concerns and identify
10 the risk, if any, manage that process, that issue is
11 likely to come before the Commission at some time. At
12 least we believe it will, and we intend to collect
13 some information on what we can from the various
14 states that are involved.

15 There are other issues that one can
16 mention, but let me quit here and turn it back to you.

17 DOCTOR MOELLER: Okay. Let me move ahead
18 then and call upon Doctor Pomeroy, who will briefly
19 summarize our thinking on facility evaluations.

20 DOCTOR POMEROY: I'd like to talk this
21 morning about two specific areas, namely site
22 characterization and performance assessment. Let me
23 turn first to site characterization.

24 Before I begin that, I'd like to stress
25 that the Committee is not reviewing or providing

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1 oversight to the DOE program. As you're well aware,
2 there are other people who do that very well. What we
3 intend to do rather is to review their program through
4 the NRC staff with the final goal of ensuring the
5 availability of high quality data in a timely manner
6 that will permit an evaluation of the proposed Yucca
7 Mountain site or any other proposed site.

8 In particular, we are going to look at the
9 adequacy of the data generated during the excavation
10 process of the experimental study facility and the
11 surface-based testing data and how that data applies
12 to licensing review process. We're going to continue
13 to maintain close liaison with the NRC staff on site
14 characterization issues and review and evaluate the
15 guidance that they generate in this area for DOE.

16 But one of our principal emphases in the
17 next six to eight months, however, in this area is
18 going to be on issues that relate to the subsystem
19 requirement on groundwater travel time. As you know,
20 last week we held an initial working group on the
21 hydrology and hydrogeology in the unsaturated zone.
22 Doctor Hinze chaired that particular working group and
23 would be glad to report to you in greater detail on it
24 if you'd like to hear that. We have several future
25 working groups in this same area planned, one of them

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1 on hydrogeologic modeling, a second one on age dating
2 of groundwater, and a third one associated with
3 hydrology in the saturated zone. That particular
4 workshop is already contemplated by the NWTRB and we
5 plan to attend and participate, if not try to
6 cosponsor that particular working group meeting so
7 that both of us can achieve the goals that we feel
8 that we have to. Our goals clearly differ from the
9 NWTRB, but where our interests coincide, and they do
10 happen to in this particular case, since we would have
11 to have a similar working group if they didn't, then
12 we feel that it's efficient and profitable perhaps to
13 both groups to cosponsor such a meeting.

14 I will just mention that we in the high-
15 level area, as far as site characterization is
16 concerned, we plan to keep abreast of the MRS
17 developments as they occur.

18 Let me turn to performance assessment
19 briefly. We're particularly concerned with issues
20 regarding the NRC staff's program in achieving
21 capability in both high-level waste and low-level
22 waste facility evaluations through the application of
23 performance assessment. As you know, in the high-
24 level waste arena, we're concerned not only with
25 reviewing the guidance that the staff issues in regard

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1 to performance assessment, but also to review the
2 capabilities of the staff with regard to reviewing any
3 potential license application.

4 In the low-level waste area, we want to
5 ensure that appropriate guidance is issued to the
6 agreement states by the low-level waste performance
7 assessment people and also to study the capabilities
8 of the whole program to review license applications
9 from non-agreement states. As you know, there are a
10 few of those that might potentially file an
11 application.

12 Let me turn to high-level waste
13 performance assessment first. Our principal question
14 is, I guess, resulting from an earlier request from
15 Commissioner Rogers to continue to evaluate whether
16 the staff has the capability and appropriate
17 resources, and by that I don't mean just personnel but
18 hardware, software, time and data. Not only to
19 evaluate the PA work of external parties, but also to
20 conduct independent and sometimes confirmatory
21 performance assessment analyses in selected areas
22 where there are going to be great uncertainties.

23 We plan one at least working group and
24 probably more during the next year to evaluate that
25 capability. Tentatively the first one of these is

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1 going to be in May, to evaluate the NRC's current
2 capability, including what they've done in iterative
3 performance assessment, the phase 2 iterative
4 performance assessment and their phase 2 1/2 study on
5 expert elicitation

6 We plan at some point to have another
7 working group on the use of models in performance
8 assessment which we think may be critical to the
9 successful use of performance assessment. We also
10 plan an other working group on the use of natural
11 analogs. We may have another continuing go around
12 with questions of methodologies that are used in
13 performance assessment, particularly expert judgment,
14 which I'm sure you probably all have heard enough
15 about.

16 In the low-level waste arena, we're trying
17 to focus sharply on the staff's development and use of
18 performance assessment in this area. We plan one
19 working group tentatively in February of next year on
20 essentially the development of the in-house
21 performance assessment capability and the guidance,
22 including the branch technical position that the low-
23 level waste performance assessment people are
24 currently preparing. Our other areas of concern
25 include the availability of resources for that group,

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1 the same kind of resources I mentioned in high-level
2 waste, and we're particularly concerned that an
3 effective strategy be developed for ensuring the
4 effective use particularly by the Agreement States of
5 performance assessment.

6 I think I'll stop there and turn it back
7 to you, Dade.

8 DOCTOR MOELLER: Okay. We have --

9 CHAIRMAN SELIN: Keep talking until
10 somebody interrupts.

11 DOCTOR MOELLER: All right. We have one
12 more and then if you don't mind we'll go through with
13 it and then open the discussion at your convenience.

14 Bill Hinze will be talking about
15 regulatory efficacy and efficiency.

16 MR. HINZE: Thank you, Dade.

17 Obviously, as Dade has pointed out,
18 there's considerable overlap with these previous two
19 themes. This particular theme, of course, deals with
20 the plans that we have for the review and the
21 evaluation of the NRC rules and regulations that deal
22 with the management and disposal of radioactive waste.

23 It has been -- this theme has been the
24 subject of many letters from the Committee to the
25 Commission over the past several years. Many of these

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1 have been directed as a result of the revisions by EPA
2 of 191 as a result of the remand by the courts. Many
3 of these letters have discussed the need for -- the
4 concern about the stringency of the 191 standard and
5 the need to use an individual risk-based dose as a
6 standard on the critical group.

7 That, of course, brings us to the comments
8 that both Dade and Marty have made regarding our
9 involvement in the National Academy of Science Yucca
10 Mountain Committee. I think I can say for the entire
11 Committee that we're pleased that you have urged us to
12 focus even more than we are on this because this is a
13 critical issue to all of us and particularly to
14 looking at the appropriate nexus, if you will, between
15 the revised 191 directed to Yucca Mountain and the
16 requirements of 60.

17 An example of perhaps one way that we
18 might be able to help. If the standard in 191, in the
19 revised 191 ends up based upon the dose to individuals
20 from radiation released to the accessible environment,
21 we should be in a position to provide some guidance
22 and appropriate plans and wording on how to avoid
23 attaining these goals without the dilution and the
24 dispersion of the radionuclides, an important factor
25 that we will have to consider.

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1 We also are interested in the agreement
2 state compatibility issue. This is certainly key to
3 all of us in the low-level waste area and one where we
4 trust, given the opportunity, we can be of some
5 service to the Commission. Perhaps we can be of
6 assistance in developing indicators of performance as
7 we have suggested in the past and looking at the whole
8 problem of compatibility. In any event, our
9 preliminary review of this topic which we have
10 recently not spent a great deal of time on is that it
11 is a contentious issue but it requires an easily
12 applied policy which is both adequate for the health
13 and safety of the nation, but is also flexible. We
14 look forward as we receive more materials and we can
15 interact with the staff, the state programs and with
16 you on this issue.

17 Another item that we mentioned in the
18 program plan is the systematic regulatory analysis
19 which is being carried out by the staff and the
20 center. Certainly this is a key element in preparing
21 for the licensing of a high-level waste repository
22 under CFR 60. We have been involved in reviewing this
23 analysis in the past and the important work in
24 identifying the key technical and regulatory
25 uncertainties. We do look forward to reviewing and

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1 evaluating the progress of this analysis and
2 particularly its interface with LARP, with the license
3 application review plan, the standard format and
4 content guide and the reaction of the staff to the
5 details of the DOE's annotated outline.

6 We also, as we mentioned in the program
7 plan, want to consider the application of the SRA
8 analysis procedure to the low-level waste program.
9 This may lead to, among other things, further
10 consideration of the qualitative, less prescriptive
11 requirements for groundwater protection in CFR 61.
12 This has been a long-time concern to the Committee,
13 the groundwater protection requirements, and this
14 derives in part from our review of the decommissioning
15 of the Pathfinder Nuclear Reactor in South Dakota and
16 our concern for the groundwater protection at that
17 site.

18 We are also concerned about the
19 consistency of the groundwater protection requirements
20 of 61, 60, as well as the uranium mill tailings
21 problems. Review and evaluation of this problem may
22 suggest that there may be a need for some guidance,
23 perhaps in the form of rulemaking, to make Part 60
24 more compatible with other similar regulatory codes.
25 These are some of the key issues that we will be

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1 working on. Whether they'll be settled in the next
2 six months is open to question, but they will
3 certainly be, with your agreement, a subject of our
4 considerable attention.

5 Thank you, Dade.

6 DOCTOR MOELLER: We're open to questions
7 and discussion.

8 CHAIRMAN SELIN: I'm particularly
9 interested in hearing the comments of those of my
10 colleagues who spent much more time on this than I am.
11 But I would just caution you that everything you've
12 talked about is relevant, but they all take a lot of
13 time and effort. I would hope that you would be
14 cautious, I was going to say realistic, but even
15 cautious about what can be accomplished and undertake
16 those activities that would lead to answers in a
17 reasonable amount of time rather than get started on
18 too many things and then not be able to do them.

19 The other comment is sometime during the
20 discussion this morning, what's really new since the
21 Committee started is the Southwest Research Center and
22 the sense from DOE. They haven't acknowledged this
23 explicitly, but it's pretty clear that their schedules
24 are very different from what they had been when we had
25 started. In fact, the Commission is sort of up in the

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1 air on what this means for our own program given the
2 quite large difference in time scale.

3 Somehow in the discussion this morning, it
4 would be helpful for me if your remarks would
5 specifically address those two influences.

6 But let me turn to Commissioner Rogers at
7 this point.

8 COMMISSIONER ROGERS: Well, just in
9 general, I think that the activities that led to the
10 white paper were very important. You recognized that,
11 Doctor Moeller, and I think that what has come forth
12 in the white paper is a very important document and
13 the one that's really been very helpful to focus the
14 efforts of the Committee. It's, of course, a question
15 of just how within that the actual priorities of work
16 ultimately shake out. But I've found it to be very
17 helpful to see that written down and I know the
18 process that led to it is always a strenuous one and
19 I know that you went through that. I really
20 compliment you for carrying it out and bringing this
21 to us before the end of this calendar year, which was
22 a very timely occasion for the product to appear. So,
23 I'll compliment you on it.

24 I'd like to just raise a couple of points
25 about details since we're here together on this.

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1 Doctor Steindler, you talked about the
2 multi-purpose cask opportunity and the issues there.
3 Yesterday we had a fine presentation on the DOE
4 program, high-level waste program by Doctor Dreyfus.
5 Out of that came a little observation that the design
6 of the repository is shifting in some important ways
7 because their use of rails to transport materials in
8 and out has given them the opportunity to carry
9 heavier casks than had originally been thought of. I
10 was really surprised to hear when I asked them how
11 much heavier, they said about five times. So, they're
12 talking about 100 ton casks instead of 20 ton casks.

13 I wonder if you have thought a little bit
14 or are going to think a little bit about what some of
15 the implications of that might be. I don't know. We
16 didn't get a chance to discuss it in any way, but
17 those are very, very large casks and I wonder how
18 they're going to be handled in some of the plants.
19 Some of the reactor sites, I don't think, can handle
20 100 ton casks. That was a problem with 20 ton casks,
21 that every reactor could not handle 20 ton casks. So,
22 there are going to be some, maybe a larger number,
23 that won't be able to handle 100 ton casks.

24 So, it's just an observation that might
25 have importance with respect to the overall system

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1 design. It's very important to note the practicality
2 of some of them possibilities that are emerging and I
3 just don't -- I'm not asking for an answer on it, but
4 I think that it's something that might be well to
5 follow a little bit anyhow, not to get too bogged down
6 in it.

7 DOCTOR STEINDLER: Let me make at least a
8 couple comments. There is little question that the
9 use of very large containers will involve a
10 significant shift in several aspects of the repository
11 which impinge on the regulations. To work backwards,
12 it seems unlikely that 100 ton casks is going to be
13 emplaced either vertically in a particular bore hole
14 or, for that matter, horizontally in a bore hole. So,
15 I think they're looking at a very different design
16 philosophy.

17 That, in turn, brings to the fore a number
18 of important questions that impinge on geology and
19 geosciences, namely the aerial heat load from
20 concentrated sources. That also impinges on the whole
21 question of not only burn-up credit but also
22 criticality control over the long haul. So, there are
23 some new issues, some of which are not really directly
24 touched on or explicitly touched on in Part 60 that
25 arise.

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1 The other issue, of course, is how do you
2 get there. I think that simply implies that the
3 reactors may ship five fuel elements at a crack to a
4 central facility on site for repackaging into whatever
5 the final disposal containers are, which implies that
6 there's going to be significant activity there.

7 So, I think you're correct that that
8 simple -- what appeared to be a simple shift has a
9 number of significant implications and we've begun to
10 fuss about them at least among ourselves.

11 COMMISSIONER ROGERS: From the overall
12 system?

13 DOCTOR STEINDLER: From the overall
14 system, how it runs. That's right.

15 COMMISSIONER ROGERS: Which leads me to
16 the area of subsystem tradeoffs. You did mention that
17 in your white paper. I don't think you mentioned it
18 today in any way. It seems to me that that's a very
19 important area for us to follow very carefully because
20 there are many, many ramifications of the whole
21 concept of subsystem tradeoffs and I've heard some
22 reports of papers presented at meetings and so on and
23 so forth that sort of indicate that those tradeoffs
24 really don't make any sense in the very, very long
25 run. But the long run could be quite a long run, like

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1 millions of years.

2 But nevertheless, I think that the whole
3 notion of subsystem tradeoffs is something that really
4 needs to be looked at from not only just the life of
5 the repository as such, but maybe even beyond the life
6 of the repository because there are other questions
7 that start to emerge about whether it's meaningful to
8 make those tradeoffs just to satisfy the initial
9 licensing conditions.

10 DOCTOR STEINDLER: We, in various ways,
11 are looking hard at assembling either a half day
12 session or if necessary or desirable a working group
13 on just that issue. We've tried at least internally
14 in the Committee to organize this in some sort of
15 fashion from the general to the specific and that's
16 proven to be an interesting exercise. But I agree
17 that that's an important issue. It really is at the
18 heart of either defense in depth or nested barriers or
19 whatever concept you care to use for that kind of
20 regulation.

21 MR. HINZE: I think too that there may be
22 some guidance here that will be provided by the NAS
23 Committee that may be helpful.

24 COMMISSIONER ROGERS: Yes. Yes.
25 Undoubtedly.

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1 MR. HINZE: That's going to be very
2 important as we see the change in 191 and what has to
3 happen to 60.

4 COMMISSIONER ROGERS: The general subject
5 of performance assessment is one that I think is
6 terribly important and it's one that I'm not so sure
7 that we have paid enough attention to in terms of
8 resources directed in that area, both in-house and at
9 the center itself. The center, I think, has a
10 performance assessment capability and some very good
11 people, but this is a large area and when all is said
12 and done it's really central to the whole analysis of
13 whatever is being presented. The whole notion of
14 iterative performance assessments seems to be
15 something that we're talking much more about because
16 as one starts to actually get into performance
17 assessment, then it has to be an iterative process.

18 I just encourage you to look at our own
19 capabilities and the center capabilities from the
20 standpoint of resources directed in that, whether you
21 believe those are adequate or not.

22 MR. HINZE: Commissioner Rogers, may I
23 interject there that Paul mentioned our working group
24 last week.

25 COMMISSIONER ROGERS: Yes.

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1 MR. HINZE: I was very heartened to see
2 that for the first time really that DOE is using some
3 of their modeling to design their site
4 characterization program and that's what it's all
5 about. That was one of the pluses that we saw at that
6 working group.

7 COMMISSIONER ROGERS: Very good.

8 Doctor Pomeroy, I think you talked a
9 little bit about some of the working groups that
10 you're planning to establish.

11 DOCTOR POMEROY: Yes, sir.

12 COMMISSIONER ROGERS: And I was just
13 curious as to the necessity for separate working
14 groups on -- I know I wrote it down here, but I can't
15 seem to read my own writing. But separate working
16 groups on modeling and on analogs, natural analogs.
17 I wonder whether those could be combined into one.
18 They certainly are related to each other. You can't
19 really analyze the natural analogue without having a
20 model and the models looked for validation to things
21 like the natural analog. So, I wonder why you decide
22 that two separate working groups is a better way to go
23 than to combine those in one?

24 DOCTOR POMEROY: I indicated that we
25 separated them, but in fact we may or may not do that,

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1 depending on the nature of what happens. There are a
2 number of things to be concerned about in natural
3 analogs, as you're probably well aware. We're
4 particularly -- one of the things that we're concerned
5 about is that natural analogs up to this point in time
6 have been primarily chemical in nature. There are
7 analogs which are chemically valid, but which aren't
8 in rocks that have the same physical characteristics,
9 for example. So, one has to derive any conclusions
10 very carefully from those. We're looking to see
11 whether there are any possibilities of analogs that
12 might be broader than simply chemical analogs.

13 I'm certainly in full agreement with you
14 that natural analogs may provide the necessary
15 information to plug into models. I'm a little
16 concerned that models are being developed and, as Bill
17 says, there are certainly nice features of what's
18 happening right now. But they're also a proliferation
19 of types of models. There are models at the process
20 level, which is what he's referring to. There are
21 other intermediate level and higher level abstracted
22 models which may or may not end up being used to
23 demonstrate compliance, which have some more severe
24 problems.

25 I was just not sure at this point in time

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1 whether we could fit all of the model problems into a
2 single day working group, which is normally our limit.
3 It's not a matter of -- it's more an artificial
4 distinction.

5 COMMISSIONER ROGERS: I see, yes.

6 I don't want to use up all of our time
7 here because I have a number of little observations.
8 But some of those we can share at another time. But
9 I am a little bit concerned about the general effort
10 under program architecture that you referred to in the
11 white paper in the sense that it does look to me like
12 an area that one could get very bogged down in. I
13 share the Chairman's concern expressed very early a
14 few moments ago that you have to focus your efforts
15 and you have to avoid spending a lot of time on a lot
16 of different things. While the program architecture
17 is very important, how deeply you get into that is --
18 I mean it's a lifetime activity.

19 So, I just would also express a little
20 concern that your priorities be such that you can
21 manage with the resources that look like they're going
22 to be available to the Committee to work with.

23 But let me just stop there and turn it
24 over to my colleagues. But I just feel that we're
25 making very good progress here together.

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1 DOCTOR POMEROY: Fine. We'd very much
2 like to go over the specific details with you at some
3 informal way, if that would be possible.

4 CHAIRMAN SELIN: Commissioner Remick?

5 COMMISSIONER REMICK: First let me say
6 that I found the white paper extremely interesting.
7 I agree, I think it's timely. It's important that you
8 did it. I'm not sure though that it has accomplished
9 the task of focusing the Committee. I think you've
10 laid out a potpourri of issues that are certainly
11 issues before the agency. But I share the views
12 expressed by the Chairman, expressed very politely, on
13 the necessity for you to focus and utilize limited
14 resources.

15 A number of the things you talked about
16 are definitely issues that the agency is going to have
17 to face and by that certainly the staff, the staff use
18 of the center. It's going to involve Commission
19 attention. But I wonder how do you draw the line
20 between an issue that is an NRC staff issue that you
21 follow versus one that you independently explore
22 independent of the efforts of the staff? I don't see
23 how you're making that distinction. As I heard the
24 presentations, particularly in Marty's cases, these
25 were undertakings of the Committee and I don't see how

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1 a committee of four with limited resources can
2 possibly independently undertake these things versus
3 a larger staff making sure that they're exploring
4 these activities, looking over their shoulder,
5 reviewing what they're doing from a quality
6 standpoint. But I honestly don't see how with your
7 resources you're going to be able to undertake all of
8 these.

9 In our many interactions, I've tried to
10 emphasize the importance of this Committee to me is a
11 greater oversight in the geologic repository, the
12 ologies that traditionally the agency hasn't had the
13 greatest strengths, and I'm not belittling our
14 expertise in that area or certainly at the center, but
15 it's an area in which particularly when environmental
16 impact statements aren't as popular as they were a
17 decade ago or not as needed, that we have the
18 strengths in the various ologies associated with a
19 geologic repository.

20 So, my words of caution are that, and
21 shared by, I think, Commissioner Rogers in his
22 statement and the Chairman so far, that you're looking
23 at -- or talking about looking at many, many issues.
24 I think you need to focus on a few of those and I
25 think you have to give careful thought to what is

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1 something that you are sure that the staff is working
2 on because you see it as an important issue versus
3 undertaking it independent on your own with -- whether
4 it's working groups or whatever. I see that in the
5 face of limited resources, limited committee and so
6 forth, that you're going to have a problem.

7 I am pleased that you are going to address
8 the question of important to safety particularly from
9 the standpoint of -- I'm not sure I understand the
10 philosophy in the existing Part 60 on important to
11 safety, the full implications of the philosophy of the
12 DOE request for rulemaking in that area and the
13 staff's proposed response to that, all the various
14 implications of those.

15 So, I'm pleased that it is something that
16 you are looking at. I'm trying to understand at the
17 moment these various things with any help in that area
18 and that's specifically, of course, related to the
19 geologic repository.

20 But with those comments, I won't go into
21 detail. It's more or less words of caution that I'm
22 afraid you're spreading yourself too thin and
23 therefore perhaps you won't serve the purpose at least
24 this particular Commission is hoping that you will
25 accomplish.

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1 CHAIRMAN SELIN: Commissioner de Planque?

2 COMMISSIONER de PLANQUE: I didn't know if
3 you wanted to comment on that.

4 DOCTOR MOELLER: Well, briefly, let me
5 comment. You're correct in that in the main the
6 Committee will be reviewing positions of the staff and
7 what they're doing on a particular issue. We have
8 found though in several instances where we do not
9 believe the staff is adequately addressing or
10 acknowledging the existence of a given issue. In
11 those cases, we have discussed perhaps following the
12 model of the ACRS on the safety goals of developing
13 some sort of a position paper which we then would
14 share with the staff to try to let that serve as a
15 stimulus.

16 Now, I may be wrong, but I would hope you
17 could certainly outline the problem, a problem as we
18 saw it, without even having a working group meeting.
19 Maybe just assign it to one member of the Committee
20 and then share his draft with the others and come up
21 with something to then share with the staff as a
22 stimulus, as I say, for that particular issue.

23 DOCTOR STEINDLER: There's another
24 somewhat more simplistic approach and that is you can
25 ask three questions. Will the subject that we're

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1 talking about come before the Commission? Has the
2 subject come before the Commission and the Commission
3 has kicked it back saying, "Comment on it?" Or in the
4 third item, relatively rare, should the subject come
5 before the Commission but it has not either yet or it
6 doesn't look like it's on the horizon? As we've gone
7 over in the last month or two, specific agenda,
8 potential agenda items, those are the kind of
9 questions we keep asking sometimes to the annoyance of
10 the speakers as to whether or not the thing fits. If
11 the answer doesn't come up with something reasonable,
12 they normally get a very low priority. This is one of
13 the methods that we're using to try and overcome just
14 exactly the point that you raised, because we can't
15 possibly take on all the subjects that are potential.

16 COMMISSIONER de PLANQUE: Okay. I wanted
17 to commend you for all the work that you've done in
18 preparing the white paper. I know sometimes a paper
19 comes up that's so many pages and it looks nice and
20 there's no idea of how much work went on behind it.
21 I know in this case that you put a lot of effort into
22 organizing the materials and you gave a lot of thought
23 to the content of what went in here.

24 I guess I still have the same reaction
25 that it's going to be difficult to focus on what you

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1 can manage given the time and resources available.

2 I'm interested in the three questions you
3 just raised, Mr. Steindler, because I think they're
4 probably fairly significant in determining how you
5 pick and choose from what indeed are important issues
6 to the waste community at large.

7 I wanted to ask a question in that regard.
8 Are you comfortable that you're getting the right
9 information in order to be able to get answers to
10 those three questions? Are you getting the right
11 flow of, let's say, administrative information to know
12 what's going to come to the Commission, what might be
13 on our plate? Some of this should come automatically
14 and I don't know if you're getting that in a timely
15 and efficient way. Perhaps you can comment.

16 DOCTOR STEINDLER: Well, I don't know who
17 wants to comment. My view is --

18 COMMISSIONER de PLANQUE: Sometimes you
19 don't know what information you're not getting if
20 you're not getting it. I realize that's a problem.

21 DOCTOR STEINDLER: I guess my conclusion
22 to the question is that the answer is no, we're not
23 getting sufficient information in a timely fashion.
24 But I have to add that we've begun the process of
25 alleviating that. Both John Larkins as well as we are

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1 working with the appropriate people in the NRC staff
2 to try and get that problem solved.

3 COMMISSIONER de PLANQUE: Okay.

4 DOCTOR STEINDLER: So, I think we
5 understand the problem. Those of us who are
6 volunteers in this business are not completely versed
7 with the system that you all operate and operate with,
8 but we think we're going to make progress on that.

9 COMMISSIONER de PLANQUE: Okay. I would
10 just offer to you the option of having dialogues with
11 us to make sure that there is no miscommunication in
12 this regard or that the communication is as full as it
13 can be.

14 DOCTOR STEINDLER: It's our intent to take
15 you up on that.

16 COMMISSIONER de PLANQUE: Okay. I know
17 when we had some earlier discussions there were some
18 issues that the Commission had been considering quite
19 heavily and spending a lot of time on and you were not
20 aware of that. That's the kind of situation I think
21 we need to correct. Commissioner Remick was very
22 right in saying that some of us have just had Part 60
23 come to the top of our in box and it's now a hot issue
24 among two of us anyway who have just taken a recent
25 look at that. It is a critical one.

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1 But in general, I would just like to
2 commend you for the work that you've done and hope
3 that we can get things focused so your work is to the
4 benefit of the Commission and the staff.

5 CHAIRMAN SELIN: This is a big step in the
6 right direction, there's no question about it. I
7 think the potential for tightly focused attack on
8 those issues that are facing the Commission, it's
9 there. You've heard us all say the same point in one
10 way or another. We're not concerned that you'll miss
11 something so much as we are that you'll undertake so
12 many things that you won't have the chance to pick
13 those and go into those in sufficient depth to follow-
14 up on that.

15 Of course what you say about monitoring
16 and being cognizant of a lot of activities where you
17 don't necessarily, but your stamp is key to these
18 points.

19 But I have to tell you, when I was in
20 business I had two projects come before me, each of
21 which looked as if it would take six person months to
22 do. One required a technical guy in the lead and a
23 business analyst in the second and the other one
24 required a business fellow in the lead and a technical
25 guy in the second. So, I took two fellows, one an MBA

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1 and one an engineer, and I said to the engineer,
2 "You're the project manager for the first one," and
3 the MBA, "You're the project manager for the second
4 one. You'll be each other's staff." It still took
5 them six months to get the job done. Having four
6 people and mixing them up into four working groups, it
7 didn't really save much time. The work is that it is
8 and we'll just have to do what it takes.

9 Thank you very much. But before we let
10 you get out, Doctor Moeller, we have a small sign.
11 The Commission, by a vote of three to one --

12 We'd like to commend you for your enormous
13 amount of sacrifice and the contribution that you've
14 made to the Commission in many of its guises, and we'd
15 like to award you with a plaque as a token of our
16 appreciation.

17 DOCTOR MOELLER: Let me offer a couple
18 words of response. I very much appreciate this. It's
19 a surprise, obviously, and deeply appreciated, and I'm
20 sure -- and I look forward to reading the letter.

21 I hope that I and my fellow members have
22 been able to contribute to the work of the Commission.
23 I know that I've gained far more than I've given.
24 It's been one of the most exciting experiences in my
25 life. I'll certainly look back at it with fond

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1 memories.

2 We do have a problem, as you say, of
3 focusing. One of the reasons is that by serving on a
4 committee such as this you interact with the full
5 range of NRC staff members. We interact with you. We
6 interact with EPA and DOE and USGS and so forth. You
7 just find so many things going on that indeed it is
8 difficult to focus and thank you for insisting that we
9 do.

10 I would like to offer another comment in
11 that certainly one pride to me has been the
12 professionalism and the evenhandedness of this
13 Committee. Several of the members mentioned that we
14 were in Nevada last week and on our first day there,
15 on a Monday, Senator Thomas Hickey, the state senator
16 there who chairs their legislative committee on rad.
17 waste, he and several other legislators, joint members
18 of his committee, asked us to have lunch with them.
19 In the course of the conversations with him, he said
20 that he has always enjoyed working with this
21 Committee. And, incidentally, let's throw a
22 compliment to Doctor Philip Justice and his coworker
23 there. Senator Hickey said that any time he had a
24 question and needed unbiased factual background
25 information, he knew he could go to your people out

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1 there in Nevada and get exactly what he needed and he
2 knew it would be fair and equitable and a correct
3 statement.

4 I would like to think that we fit in that
5 same mold and I'll close by mentioning that after we
6 toured the Yucca Mountain proposed facility last week,
7 we had a young lady from DOE who was our guide and the
8 coordinator of the tour and everything. As she bid
9 goodbye to us, she said that the ACNW was her
10 favorite -- was DOE's favorite committee. Now, she
11 had several other choices, so that makes us feel good.
12 Again, she said because she knew that while we might
13 be tough, we would be gentlemanly about it and we
14 would be fair and it would be professionally done.

15 So, the ACNW is DOE's favorite committee.
16 I hope that in time and over the long run it will be
17 your favorite committee. And although I'm leaving, I
18 must say it will always be my favorite committee.

19 CHAIRMAN SELIN: Thank you very much,
20 Doctor Moeller.

21 (Whereupon, at 11:02 a.m., the above-
22 entitled matter was concluded.)
23
24
25

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DATE OF MEETING: DECEMBER 21, 1993

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON NUCLEAR WASTE
WASHINGTON, D.C. 20555

November 10, 1993

The Honorable Ivan Selin
Chairman
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Selin:

SUBJECT: THE ADVISORY COMMITTEE ON NUCLEAR WASTE PROGRAM PLAN

During the past few months, the Advisory Committee on Nuclear Waste (ACNW) has been carefully reconsidering its activities and operations in order to better address the Commission's need for independent technical advice in the area of nuclear waste disposal. In response to the Commission's revisions of the ACNW Charter, as well as guidance provided in subsequent meetings with individual Commissioners, their technical assistants, and the NRC staff, the ACNW has prepared a revised Program Plan, which is enclosed.

This Plan consists of three parts:

Part 1: Overview and Operational Plan

This part addresses the overall mission of the ACNW, lists the criteria used for identifying key technical issues, and lists the criteria used for setting priorities for these issues. This part of the plan is general and long range.

Part 2: Nuclear Waste Program Issues

This part addresses the technical issues on which the ACNW will provide advice to the Commission during the coming year. The criteria in Part 1 were used to establish these issues. As the regulatory environment changes, this part will be revised to reflect the Commission's changing needs.

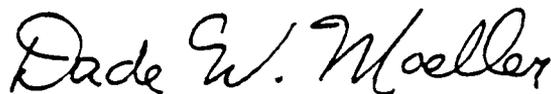
Part 3: Resources

This part addresses the resources needed to implement the operation and activities of the ACNW, as established in the first two parts of the Program Plan. The issues presented in this part of the plan are believed to be important to the work of the Commission.

The three parts of the plan were prepared with assumptions that include retention of the current support level for the ACNW. The loss of specialized staff in any of the key technical areas pertaining to high- or low-level radioactive waste would seriously impair the ability of the Committee to provide the advice required by the Commission in that subject area.

We trust that this plan will address the needs of the Commission, and we look forward to your comments.

Sincerely,

A handwritten signature in cursive script that reads "Dade W. Moeller".

Dade W. Moeller
Chairman

Enclosure: As stated

cc w/encl: Commissioner Rogers
Commissioner Remick
Commissioner de Planque

PROGRAM PLAN

PART 1: OVERVIEW AND OPERATIONAL PLAN

INTRODUCTION

A. Background

The disposal of radioactive wastes represents a major challenge to society. Industry, State and local agencies, and the public depend on the U.S. Nuclear Regulatory Commission (NRC), the agency assigned responsibility for the regulation of such wastes, to provide guidance and leadership. Recognizing the associated complexities, the NRC established the Advisory Committee on Nuclear Waste (ACNW) in June 1988 to provide independent advice and technical support to the Commission on critical waste management issues.

The ACNW provides an independent review of high-level and low-level nuclear waste disposal facilities and related matters under the NRC's purview. The revised Charter of the ACNW (Appendix) focuses the ACNW efforts on nuclear waste disposal facilities licensed under Parts 60 and 61 of Title 10 of the Code of Federal Regulations (CFR). Within this scope, ACNW's role is to provide the Commission independent, technical advice on subjects that are directly pertinent to Commission concerns and that relate to the Commission's regulatory functions under Parts 60 and 61 or such other subjects as the Commission may designate.

The scope of ACNW's work includes detailed technical studies on subjects pertinent to nuclear waste disposal facilities and licensing as well as assessments of the capabilities and performance of the NRC staff as they relate to the regulatory and licensing responsibilities of the NRC. On the basis of the Commission's needs, the ACNW also examines and comments on the activities of other Federal agencies, States, Indian tribes, and other groups.

In performing its work, the ACNW reviews, evaluates, and reports to the Commission on topics it identifies within the scope of its Charter and other areas referred to it by the Commission. In addition, the ACNW identifies emerging issues and alerts the Commission to the need for review, as appropriate. It also has the responsibility to propose topics to the Commission for ACNW review that are outside the Charter but are important to public health and safety or topics that could affect the Commission's ability to conduct effective regulatory programs. One of the most important mandates assigned to the ACNW is to anticipate and be ready to provide the Commission advice on key emerging regulatory issues before the Commission needs to make a decision. Interactive communication with the Commissioners and their

technical assistants is particularly important in meeting the goals of the committee.

Experience has shown that the contributions resulting from ACNW's activities include insights and advice, not only on technical issues, but also on the underlying regulatory and policy matters. Examples include considerations of the impact of standards and regulations such as the U.S. Environmental Protection Agency (EPA) *Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes*, as codified in 40 CFR Part 191.

As appropriate, the ACNW also convenes working group meetings to address, in some depth, specific issues pertaining to radioactive wastes. The purposes of these meetings are to develop background information and to generate a record on technical issues for use by the ACNW, the Commission, and other interested parties.

The ACNW relies on highly qualified members and specialized consultants. It currently consists of four part-time members, each of whom is appointed by the Commission. The ACNW is supported by a cadre of consultants with an array of technical expertise. The results of the reviews of specific topics are submitted in reports to the Commission.

B. Purpose of the Plan

The purpose of the *Overview and Operational Plan* is to describe the mission and scope of the ACNW, as well as the way the ACNW operates and interacts with the Commission, the NRC staff, and other participants in this process. This part of the Program Plan describes ACNW's general protocols for operations and specific topics the ACNW will review.

The *Program Plan*, which includes the *Overview and Operational Plan* (Part 1) and an identification of *Nuclear Waste Program Issues* (Part 2), is being prepared to document ACNW's interpretation and implementation of the revised Charter and Commission direction. Part 3 contains resource requirements to support this *Program Plan*.

MISSION AND OBJECTIVES OF THE ACNW

A. Mission Statement

The mission of the ACNW is to provide the Commission independent technical advice on matters associated with the disposal of nuclear waste in support of the Commission's mission to ensure adequate protection for public health and safety, the common defense and security, and the environment, in the use of nuclear materials.

ACNW's mission is largely technical in nature, and the ACNW focuses its deliberations and advice on technical matters. However, most issues of technical importance that come before the Commission will also have policy implications. In its mission, the ACNW concentrates on technical issues while being mindful of the policy issues, and it deals with policy questions only through their technical aspects.

B. Role of the ACNW

ACNW's role is both reactive and proactive. It is reactive in that it reviews and critiques products and activities generated by the NRC staff and others. It is proactive in that it establishes its own priority on topics it reviews and may assume a leadership role in exploring a topic, before the NRC staff has performed an analysis and established its position.

Because of its technical competence, stature, and independence, the ACNW serves a unique role. For example, it can call on experts from other agencies and organizations for exchanges of information under less formal conditions than can the Commission or its staff.

The ACNW provides a forum where individuals with differing technical points of view can receive independent consideration of their positions. It performs a useful role in providing important links for the Commission and the NRC staff to the technical community. ACNW members also have involvements outside the regulatory community that serve to bring diverse points of view into ACNW's deliberations.

ACNW also interacts with organizations other than the Commission and the NRC staff, often serving as a catalyst for improving communications. Members of the public who attend ACNW meetings are invited to offer comments, as appropriate. Through this process, the ACNW has promoted exchanges of information. Its meetings have served as one of the primary forums for detailed and comprehensive discussions of key radioactive waste disposal issues.

C. Scope and Focus of the ACNW

The ACNW examines and reports to the Commission on a wide range of issues. These include those referred to it by the Commission, as well as issues that the ACNW has independently identified and brought to the attention of the Commission. Issues within ACNW's scope may fall into one or more of the following categories: (1) licensing activities for facilities within the ACNW's purview; (2) selected prelicensing activities for high- and low-level waste disposal facilities; and (3) rules, policy matters, and regulatory guidance.

PROTOCOLS FOR OPERATION AND COMMUNICATION

A. Communication and Products of the ACNW

The primary method for communicating advice to the Commission is through technical reports sent to the Commission Chairman. Such reports contain background information that identifies the applicability of the topic to the Commission's concerns, describes the methodology used during ACNW's review of the topic, identifies the conclusions reached by the ACNW in terms comparable to the objective of the review, and specifies the recommendations resulting from the investigation.

Periodic meetings are scheduled between the ACNW and the Commissioners in open session to discuss matters of mutual interest. In addition, ACNW members interact with individual Commissioners and their technical assistants to ensure that their concerns are adequately taken into account in the planning of ACNW activities. The ACNW may also communicate by letter report with the NRC staff if such communication is warranted.

The ACNW submits to the Commission, for comment, an agenda outlining planned or proposed topics for review and their priority and a schedule (see Part 2 of this Program Plan). The ACNW staff interacts with the Commission staff concerning ACNW reports sent to the Commission, and attends meetings on waste issues convened by the Commissioners' technical assistants. The ACNW staff meets frequently with the NRC staff (and management) to share information and discuss issues of concern and to plan schedules for staff interactions with the ACNW.

ACNW members and staff also attend meetings held by other organizations such as the U.S. Department of Energy (DOE), the National Academy of Sciences (NAS), the Nuclear Waste Technical Review Board (NWTRB), and the U.S. Geological Survey (USGS). In its pursuit of detailed information on selected topics, ACNW members may also meet with members or staff from these organizations, as well as representatives of the State of Nevada, local governments, industrial entities, and other participants in this process. Such meetings are for information gathering only.

In its operating procedure, the ACNW conducts open meetings during which issues are reviewed and deliberated, as stipulated under the Federal Advisory Committees Act (FACA). These meetings of the ACNW and its working groups are designed to investigate, review, and evaluate information, data, and other analyses pertinent to critical issues in nuclear waste disposal. The meetings generate a record for use by the Commission and others. This record, which is submitted to the Commission and to the NRC staff, serves as a supplement to ACNW's written reports.

B. Selection of Topics

Criteria for Identifying Key Issues

One or more of the criteria listed below are used to identify issues in nuclear waste management that warrant attention by the ACNW. In identifying key issues, the ACNW is particularly mindful of the NRC's Principles of Good Regulation^{*}, including the guidelines that good regulation must be clear, efficient, independent, open, and reliable.

- (1) Importance - The issue is important from the standpoint of the Commissioners, and it relates to a major technical or policy issue on which they will likely be asked to render a decision.
- (2) Timeliness - The issue relates to a forthcoming Commission consideration. Issues that are pending Commission review receive high priority. A portion of ACNW's effort will be directed to issues that have relatively long lead times (i.e., 1 to 3 years) to ensure the development of adequate background data prior to the need for providing advice to the Commission.
- (3) Adequacy - The issue relates to an omission or a shortcoming in the regulatory process or the capability of the NRC staff.

Criteria for Setting Priorities

To ensure that its limited resources are applied effectively and that its efforts are properly focused, the ACNW assigns priorities to the issues identified under the criteria described above. The criteria for assigning priorities to issues for review are as follows:

- (1) Risk Significance - The foremost criterion for determining priority issues for attention by the ACNW is that the issues have a direct relationship to the protection of public health and safety or the environment.
- (2) Timeliness - Topics that are pending Commission review will receive top priority. In addition, issues for which the NRC staff has indicated a strong need for rapid response from the ACNW would also receive priority attention.

^{*}January 17, 1991 Memorandum from Kenneth Carr to All NRC Employees, "Principles of Good Regulation."

- (3) Appropriateness - Also to be considered is whether the ACNW has the resources, technical skills, and time to act in satisfactory detail on an issue. Without the necessary capability, a successful review may not result. When an issue falls into this category but, nonetheless, is considered important, the ACNW will attempt to redirect it to another forum where effective resolution can be pursued.

C. Formal Meetings and Working Groups

The ACNW uses a variety of protocols in arriving at the conclusions and recommendations to be forwarded to the Commission. Direct interaction with the NRC staff in formal meetings of the ACNW is expected to be the major mechanism by which the ACNW will conduct its business. These interactions will focus on technical matters and their underlying policy bases. In addition, the ACNW will convene working group meetings that are focused on the details of technical topics directly related to the goals and mission of the Commission. At these meetings, the ACNW will seek to include participation by the NRC staff and, as appropriate, by the DOE staff and its contractors, by representatives of States and Indian tribes, and by other relevant experts on the subject of interest. Finally, ACNW members will attend meetings and visit facilities as needed to obtain the background information needed for a comprehensive evaluation of the selected topics.

D. Members' Qualifications

Fundamental qualifications for ACNW membership in order of importance are: (1) professional stature in the nuclear waste technical and regulatory community; (2) high technical competence in a relevant field; (3) breadth of experience including ability to consider numerous, varied, and multifaceted issues; and (4) interpersonal skills including ability to work well as an ACNW member.

PART 2: NUCLEAR WASTE PROGRAM ISSUES

KEY ISSUES IN NUCLEAR WASTE MANAGEMENT

The ACNW uses a number of sources for identifying the key issues pertaining to high-level and low-level radioactive waste (HLW and LLW). These issues correspond to the perceived present and future needs of the Commission. Communications between the staffs of the ACNW and of the Commission, the NRC Office of the Secretary, and the NRC staff provide the primary means of maintaining a viable, mutually acceptable list of key waste management issues to be included in ACNW activities.

In accord with its protocol, the ACNW has identified a number of key issues for consideration during the next year. In selecting these issues, the ACNW has been careful to concentrate on activities that fall within the regulatory responsibilities of the NRC.

The five program areas that have been identified are (1) Risk Assessment and Management, (2) Facility Evaluations, (3) Regulatory Efficacy and Regulatory Sufficiency, (4) Technical Assistance and Research, and (5) Program Architecture. These program areas are discussed in more detail below.

(1) Risk Assessment and Management

The recent Executive order^{*} requiring Federal agencies to compare the risks a regulation is intended to address - against other risks within that agency's jurisdiction - is not yet clear. The ACNW anticipates that the Commission will need to address a system for coordinated risk management. One consequence may be the requirement that radioactive wastes be classified on the basis of their associated risks. The ACNW plans to investigate this issue and provide advice to the Commission.

A second consequence could be the necessity to evaluate tradeoffs among various barriers to radionuclide migration in the proposed HLW repository on the basis of their relative importance in mitigating risks. This could be of immediate concern because the acceptability of such alternative performance standards must be evaluated and confirmed before the repository design is finalized.

Another important issue that could result from a coordinated risk

^{*}Executive Order 12866. "Regulatory Planning and Review."
58 Fed. Reg. 51735 (1993).

management effort is the impact that requirements for risk-based evaluations could have with respect to risk criteria for decommissioning NRC-licensed facilities and the development of associated regulations for decommissioning and decontamination. The ACNW anticipates that one or more of these topics will become priority issues, particularly with respect to the broad application of risk-based standards and regulations. The ACNW expects to address these topics. The key issues within this category are the following:

- Subsystem Tradeoffs for the HLW Repository

Although the NRC staff has stated that each of the subsystem requirements in the NRC's regulations on *Disposal of High-Level Radioactive Wastes in Geologic Repositories* in 10 CFR Part 60 must be met individually, the regulations also imply that tradeoffs may be acceptable and that it is the total disposal system that must meet the performance requirements. This is a subject that needs to be resolved before the final design for the proposed HLW repository is completed. It is also an issue that could readily come before the Commission for a decision involving the clarification of the principle of defense in depth. The matter could become a candidate for rulemaking. The ACNW plans to meet with NRC and DOE staffs to study this issue and to submit its recommendations to the Commission.

- Risk Criteria for Decommissioning NRC-Licensed Facilities

One of the key items within this issue is what is an acceptable long-term level of risk for the public and how does that risk compare to that associated with natural background radiation. This issue is closely related to other matters that the ACNW has been and will be addressing. For this reason, the ACNW is in a position to provide technical advice on this matter both to the NRC staff and the Commission.

- Risk-Based Radioactive Waste Standards

The ACNW will maintain cognizance of the National Academy of Sciences (NAS) study on the use of health-based (risk-based) standards for the proposed repository at Yucca Mountain. In addition, the development of a waste classification scheme based on risk may be required. If this proves true, the Commission may need advice on the full range of advantages and disadvantages of the development of such standards; for example, how will they maintain the protection of the health and safety of the public?

Although many groups have attempted to develop risk-based standards and to have them incorporated into regulations, to date these efforts have not been successful. Currently, the background information necessary to evaluate this issue is not

readily available. Before the NRC considers undertaking such an effort, the Commission needs to be provided with a summary of how and why these earlier efforts failed, the wisdom of initiating work in this area, the efforts that will be required, and the benefits to be gained. This is the type of information that the ACNW plans to develop.

(2) Facility Evaluations

Sound regulatory policies related to the performance of disposal facilities for both high- and low-level nuclear wastes are paramount to maintaining the public health and safety. However, these policies are difficult to define because of the complexity of the numerous technical, scientific, and health issues that are involved and the need to integrate these issues into applicable regulations. Thus, it is appropriate that ACNW's Charter directs the ACNW to focus on issues relating to nuclear waste facilities. During past years, concerns regarding policies for evaluating the potential performance of disposal facilities have taken a substantial amount of ACNW's time and resources. The ACNW anticipates that this situation will continue into the foreseeable future.

A large share of the past effort of the ACNW has been devoted to (a) the advice the NRC staff gives to the Commission, (b) the guidance the NRC staff gives to DOE on issues related to evaluating the proposed HLW repository at Yucca Mountain, Nevada, and (c) the identification of important concerns that neither the NRC staff nor DOE has considered. These efforts will continue.

The ACNW has also increasingly become involved in generic concerns pertaining to the evaluation of LLW disposal facilities. Although both HLW and LLW disposal facilities will continue to be of primary importance, the ACNW envisions that LLW disposal facilities will demand an increasing amount of its attention in the near term, as congressionally mandated deadlines approach.

The ACNW will continue to review the progress and performance of DOE in its site characterization activities to obtain adequate, high-quality data and to conduct appropriate analyses that will permit the evaluation of Yucca Mountain within the framework of NRC regulations and U.S. Environmental Protection Agency (EPA) standards. Emphasis will be placed by the ACNW on the Exploratory Studies Facility (ESF) to evaluate the utility of the ESF-generated information to the NRC for the licensing review process. The ACNW will continue to maintain close liaison with the NRC staff on these issues and to review and evaluate the guidance that the NRC staff develops for DOE. However, the ACNW intends to place its principal emphasis on issues that are part of the subsystem requirement of ground-water travel time (GWTT) at an HLW repository and the NRC staff's progress in achieving capability in both HLW and LLW facility evaluations through

application of performance assessments. In the HLW area, such a capability is needed to review the DOE license application for the proposed repository. In the LLW area, such a capability is needed to review license applications for disposal facilities to be sited in non-Agreement States and to provide guidance to Agreement States. Furthermore, the ACNW will continue monitoring the development of offsite interim spent nuclear fuel storage facilities.

- Ground-Water Travel Time

Demonstrating compliance with the GWTT subsystem requirement in 10 CFR Part 60 will be a key licensing issue for the proposed site. The NRC expects DOE to characterize the hydrogeology of the geologic setting, to use models to estimate the GWTT, and to quantify the uncertainties associated with hydrologic variability and parameter estimation.

The GWTT requirement will be difficult to demonstrate because of the complex hydrologic regime at the proposed site, which consists of unsaturated, fractured tuff. In addition, general concerns have been raised regarding the extent of the disturbed zone and the ability to demonstrate the fastest path. This has brought into question the viability of this subsystem performance objective. The NRC staff is examining sources of uncertainty associated with GWTT, and rulemaking or guidance is pending.

Working group meetings will focus on specific aspects of the movement of ground water in the subsurface of Yucca Mountain (e.g., unsaturated flow, modeling, and age dating of ground water). These meetings will be supplemented by discussions during full Committee meetings to identify and explore issues and to develop comments and conclusions pertaining to the Yucca Mountain characterization study and the more generic issues that are involved in the NRC regulations.

- Performance Assessment for HLW Disposal Facilities

Performance assessment (PA) is another key issue that will be the subject of continuing study by the ACNW in the near term. ACNW attention to this subject is important for several reasons: (a) the Commission, through its staff, must provide guidance to appropriate parties in the use of PA and (b) PA will play a key role in the evaluation of the acceptability of DOE's license application for the proposed HLW repository (and of partial or complete PAs submitted by other stakeholders). As part of this effort, the ACNW plans to determine whether the NRC staff has both the capability and the appropriate resources (including personnel, hardware, software, time, and data) not only to evaluate the PA work of external groups but also to conduct independent analyses in selected areas such as

volcanology and climatology, where the residual uncertainties will be large. ACNW working groups will be convened to evaluate (a) the NRC's capabilities and resources, b) the use of models in PA including verification and validation of those models, (c) the staff's use of natural analogs as a complement to PA, and (d) the application of methodologies such as expert elicitation.

- Performance Assessment for LLW Disposal Facilities

The ACNW will also be attentive to the NRC staff's application of PA to the evaluation of LLW disposal facilities. Previously, the ACNW submitted comments to the Commission on several aspects of this program that continue to be important. The ACNW concerns, sharply focused on the NRC staff's development and use of PA, include (a) the development of "in-house" PA capability, (b) the timeliness of guidance to the Agreement States, (c) the availability of resources to the NRC staff, and (d) the development of a strategy for ensuring effective use of PA at all prospective LLW disposal facilities. Finally, the ACNW will focus on the NRC staff's role in ensuring not only the adequacy and quality of the PA, but also the auditability by the staff of the execution and use of PA at the State level.

- (3) Regulatory Efficacy and Regulatory Sufficiency

This category includes reviews and evaluations of the adequacy of NRC rules and regulations governing the management and disposal of radioactive wastes. In the HLW area, this includes ongoing reviews of the development of the EPA standards, such as the NAS study, and the nexus between these standards and the NRC regulations. In the LLW area, this includes ongoing evaluations of the application of NRC regulations to disposal practices other than shallow-land burial and the transfer, by the NRC, of regulatory information and associated regulatory capabilities to the Agreement States. Of major concern are uncertainties in both the HLW and LLW regulations that make the determination of compliance difficult.

The two priority issues identified within this category are (a) evaluation of the systematic regulatory analysis and (b) compatibility of Agreement State regulations.

- Systematic Regulatory Analysis

The key issue related to the program on systematic regulatory analysis (SRA) is the evaluation of anticipated future products and activities. One factor that brings this to the forefront is the realization that approximately 20 percent of the effort of the NRC HLW staff is directed to this task. Of particular importance is the interface of this work with other components

of the regulatory program, including the License Application Review Plan and the Standard Format and Content Guide. With so much effort being directed to these activities, such an evaluation would appear to be appropriate and timely. The ACNW also wants to evaluate the usefulness of applying this process to the LLW program and to share its conclusions and recommendations with the Commission.

- Agreement State Compatibility

The key issue within this category is the development of criteria for the evaluation of regulatory programs for LLW disposal facilities, with emphasis on how the NRC staff distinguishes an acceptable from an unacceptable program. A defensible rationale needs to be developed on which to base such decisions. The Commission is currently involved in this issue. A related subject is the adequacy of the existing 10 CFR Part 61 regulation in terms of ground-water protection. For some time, the ACNW has had concerns in this area; these concerns have been increased by the recent challenge by EPA of this aspect of the NRC regulations. This issue may well come before the Commission for action.

(4) Technical Assistance and Research

The NRC conducts research programs on both HLW and LLW disposal. The ACNW is involved in the research program as part of the general inquiry concerning the relevance of the activities in technical assistance and research to the mission and capabilities of the NRC staff. This involvement encompasses the activities of the NRC staff, the Center for Nuclear Waste Regulatory Analyses (CNWRA), and NRC contractors.

The ACNW intends to review the general strategy documents and approaches of the Office of Nuclear Regulatory Research (RES) and technical assistance programs as they bear on the relevance to the specific needs of the Office of Nuclear Material Safety and Safeguards (NMSS). A key objective will be to evaluate these programs in terms of their relevance to the enhancement of the capabilities of the NRC staff to conduct independent evaluations of DOE's conclusions and supporting documentation. To the extent necessary, the ACNW will also evaluate the quality of the research results as they may bear on the future needs of the NRC staff. Finally, the ACNW plans to review the efficacy of the transfer of technical capabilities from the CNWRA to the NMSS staff to ensure that the latter group will be fully qualified to lead the evaluation of DOE's license application.

For some time, the ACNW has been concerned about the NRC research program in the HLW area. This was exemplified by ACNW's criticism of the "strategic plan" developed by the RES staff for use in program guidance. This concern includes the success of

the RES staff's efforts to keep abreast of relevant research being conducted in foreign countries, as well as within DOE, and coordination of the RES program with related programs being conducted through technical assistance. Furthermore, the ACNW is concerned about the apparent absence of a current integrated program plan for research on LLW disposal, particularly as it relates to the mission of the NRC. As a result, the ACNW will continue to review and evaluate the NRC HLW and LLW research programs.

(5) Program Architecture

This category includes activities of both the HLW and LLW divisions of NMSS, as well as aspects of the NRC programs that define the organization, planning, strategies, and schedules. There is some overlap of this topic, as designated by the ACNW, with the SRA as defined by CNWRA for HLW.

The ACNW intends to review the operational plans for the HLW and LLW divisions. The focus of the review will be to determine the adequacy of the planned programs in reaching the required goals of the NRC. Included in the review will be evaluation (a) of the ability of the staff to manage programs of significant size and complexity, (b) of the timeliness of planned schedules in light of the Commission's needs for information to make decisions and to ensure that the planning indicates appropriate emphasis, and (c) of the allocation of effort and resources to issues that are likely to be important to the Commission.

SUMMARY

The ACNW has identified the following priority issues for consideration during the next year. In the main, it will review, evaluate, and keep abreast of each of these issues from the standpoint of relevant decisions to be made by the Commission. A major part of these activities will, of necessity, be to monitor the activities of the NRC staff as they pertain to each of these issues.

(1) Risk Assessment and Management

- tradeoffs between natural and engineered barriers
- development of a risk basis for establishing regulations for nuclear facility cleanup
- development of a waste classification system based on risk

(2) Facility Evaluations

- site characterization input into the quantitative evaluation process (e.g., ESF data and analyses)

- development by the NRC staff of reliable techniques for independently evaluating ground-water travel time in an unsaturated fractured medium
 - NRC staff capabilities for performance assessments for HLW and LLW disposal facilities
 - evaluation of the NRC's use and validation of models
 - application of data from natural analogs
- (3) Regulatory Efficacy and Regulatory Sufficiency
- adequacy of the nexus between the revised EPA standards for the proposed Yucca Mountain repository and the NRC regulations (10 CFR Part 60)
 - efforts on the systematic regulatory analysis with possible extension of the application to the evaluation of NRC regulations for LLW (10 CFR Part 61)
 - compatibility of LLW regulations of the Agreement States with NRC requirements, including the identification and application of indicators of performance and other types of technical and regulatory guidance for the individual States
- (4) Technical Assistance and Research
- continuing evaluations of the NRC HLW research program, with specific attention to the coordination of HLW research and related technical assistance
 - need for and relevance of the program for LLW research to the mission of the NRC
- (5) Program Architecture
- progress on the development of strategic plans for addressing HLW and LLW regulatory needs
 - operational plans being developed for guidance of the HLW and LLW divisions of NMSS

PART 3: RESOURCES

REMOVED TO ALLOW FOR PUBLIC RELEASE OF REMAINDER OF DOCUMENT