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NUCLEAR REGULATORY COMMISSION

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IN THE MATTER OF:

POLICY SESSION 78-9

RECOMMENDATIONS ON COURSE OF ACTION FOR  
ESTABLISHING NUCLEAR FACILITY DECOMMISSIONING REQUIREMENTS

Place - Washington, D. C.

Date - Thursday, 16 February 1978

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Telephone:  
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ACE - FEDERAL REPORTERS, INC.

*Official Reporters*

444 North Capital Street  
Washington, D.C. 20001

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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

POLICY SESSION 78-9

RECOMMENDATIONS ON COURSE OF ACTION FOR  
ESTABLISHING NUCLEAR FACILITY DECOMMISSIONING REQUIREMENTS

Room 1130  
1717 H Street, N.W.  
Washington, D.C.

Thursday, February 16, 1978

The Commission met, pursuant to notice, at 9:50 a.m.

BEFORE:

DR. JOSEPH M. HENDRIE, Chairman

PETER A. BRADFORD, Commissioner

VICTOR GILINSKY, Commissioner

RICHARD T. KENNEDY, Commissioner

jwb

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

CHAIRMAN HENDRIE: One, two three. Why don't we go ahead.

We're meeting this morning on -- I guess the first item will be round 2 on decommissioning requirements.

Lee, I guess -- go ahead. I assume you will turn it over to Bob Bernero.

MR. GOSSICK: Right. We're here to provide some additional information that came out of the first briefing on this subject on the 23rd of January.

So, Bob, go right ahead.

MR. BERNERO: Mr. Chairman, Commissioners, we were with you three weeks ago to discuss decommissioning and you asked that we go back, sharpen our thoughts -- particularly with respect to the choice of doing a single comprehensive program, as we proposed; or trying to do something in a more timely fashion, by segmenting that program and at least starting out doing individual proceedings or rule makings, as we started, perhaps, with the PWR.

We had extensive discussions with your technical staff members, and with OPE since that briefing three weeks ago. And in sharpening our thoughts, we have prepared some notes which you have, in which I would like to review briefly the program we proposed before -- just to refresh your memory -- and then address some questions, the



jwb 1 specific questions that we have to confront about  
2 decommissioning and decommissioning policy.

3 I will go over what we are doing now, in order  
4 to get our thoughts more sharply focused on our needs and  
5 on the urgencies, and then address the choice of rule  
6 making: what are the factors, and what are the choices  
7 we have?

8 So, if we just review, firstly, the notes we  
9 had last time — could I have the first viewgraph, please?  
10 (Slide.)

11 I might add: There are two additional slide  
12 notes that I left at your places this morning. We'll  
13 address those as we come to them. They were prepared after  
14 the ones that were sent to you.

15 If you recall, the last time we said, on MBO A,  
16 this is the portrayal of those studies that are going on  
17 right now that are under contract. These are the technical  
18 basis studies being done by Battelle.

19 The important thing to note is that, by mid-'79  
20 we will have in hand both reactors and the principal fuel  
21 cycle facilities which bound the total problem, which will  
22 give us an address of the different types of nuclides and  
23 the different types of waste disposal that need to be  
24 addressed in a comprehensive policy.

25 Turning to NBO B, the next one, please.

jwb

(Slide.)

1  
2 This is the overall program, based on that set  
3 of information reports, and little more than a year from  
4 now it has these mid-'79 staff interim reports that would  
5 draw on the information reports and make public, tentatively,  
6 through a Nu Reg document, the tentative staff thinking on  
7 each of the principal issues — the financial assurance  
8 question, the radioactive residue question, and the  
9 generic applicability question — so that states, other  
10 agencies, the public can react to it, can comment on staff  
11 thinking even before we come out with an EIS.

12 The EIS would follow. The states, if you looked  
13 on this one down at the bottom, you could see represented  
14 state workshops so that we could carry through the  
15 important work of liaison with the states on the radioactive  
16 residue criteria, and on the financial assurance criteria.

17 May I have the next viewgraph, please?

(Slide.)

18  
19 MBO C was what we presented as the schedule for  
20 addressing the PIRG petition. Once again, I would just  
21 emphasize that, as shown, it presumes a rule developing  
22 from the treatment of that petition.

23 If, on the other hand, the determination is that  
24 the petition be denied, then of course it would come to an  
25 abrupt termination this summer, just in a few months.

jwb

1                   So, let's turn to the next viewgraph and look  
2 at the questions we're trying to confront.

3                   Are we dealing with decommissioning now? And,  
4 if so, how are we dealing with it? What are we doing?

5                   What are the weaknesses in our present policy?  
6 Let's point out these weaknesses and be candid in admitting  
7 them.

8                   Where is the urgency? And let's identify what  
9 is urgent, what isn't urgent, and then ask ourselves what  
10 will pace our address, and how should we proceed?

11                   May I have the next viewgraph, please?

12                   (Slide.)

13                   The existing criteria for decommissioning -- much  
14 of this you have heard before. On reactors, we have a  
15 number of regulations concerning financial assurance, the  
16 decommissioning plans. The key element in the criteria for  
17 reactors is that Reg. Guide 1.86. It's a very important  
18 thing in our existing policy on decommissioning, and I will  
19 speak to it in more detail in a moment.

20                   On the fuel cycle side, we don't have quite so  
21 much. We have Appendix "F" to Part 50 on Fuel Reprocessing  
22 Plants, which we've discussed before. There are financial  
23 criteria for financial qualifications: Regulations 50.33,  
24 70.23.

25                   We have a variety of criteria in regulatory guides

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1 such as 3.5 on uranium new applications, which address  
2 criteria for disposition or management of fuel cycle  
3 wastes.

4 And lastly, on the fuel cycle, we have residue  
5 limits that are virtually the same as the residue limits  
6 in Reg. Guide 1.86. They're handled as a branch position,  
7 though.

8 May I have the next slide, please?

9 (Slide.)

10 Now, this document -- Regulatory Guide 1.86 -- is  
11 the crux of the present treatment of decommissioning on  
12 reactors. We have, in print, the advice to the applicants  
13 in Regulatory Guide 1.86 that identifies four acceptable  
14 decommissioning modes: mothballing, entombment, dismantling,  
15 and conversion.

16 If you examine those modes for a while, you can  
17 see some problems. Mothballing is not "decommissioning";  
18 it's a holding action. It's a temporary action awaiting  
19 some decay, or some accumulation of funds, or some other  
20 proceeding before one goes into a final decommissioning.

21 Entombment, as read in Reg. Guide 1.86, implies  
22 that you would cast in concrete, or entomb in some fashion,  
23 that would hold the radioactivity safely until it had  
24 decayed away. The Reg. Guide does not address the difficult  
25 question of saying: What sort of radionuclides can be dealt



jwb

1 with in this way? Can you really take reactor residues  
2 and cast them up in concrete and leave them there,  
3 effectively, in perpetuity? So, there's a real question  
4 about the validity or viability of that decommissioning  
5 mode.

6 "Dismantling" is a reference and choice  
7 decommissioning mode which means: clean up all the residue  
8 to an acceptably low level so that you can release the site  
9 and dispose of it in repositories. That we clearly endorse  
10 as an acceptable mode.

11 "Conversion" is perhaps a facetious choice. It  
12 speaks to what you do at the site after it's released, and  
13 is not really a separate mode of decommissioning. It's an  
14 action subsequent to some decommissioning.

15 COMMISSIONER GILINSKY: What do you do if you  
16 decommission the residue?

17 MR. BERNERO: If you decommission the radioactive  
18 residue -- remove it to an acceptable level so you can release  
19 the site for some other use in an unrestricted fashion --  
20 then it's an academic point whether one converts the turbine  
21 to run off the fossil boiler or converts the site to a park --  
22 converts, or whatever.

23 If, on the other hand, you have entombed the  
24 radioactivity in some way to require surveillance, then you  
25 still have a monitoring of that site, or a custody of that

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1 site required. And once again, it's somewhat academic  
2 what you're doing on the site -- whether you're still  
3 generating power there, or have converted it into something  
4 else.

5 COMMISSIONER GILINSKY: "Conversion," that is  
6 not the decommissioning mode.

7 MR. BERNERO: No. Really, it's not a proper  
8 choice as a decommissioning mode.

9 So, what you see in Reg. Guide 1.86, we've got  
10 what is now, in retrospect, a poor choice of decommissioning  
11 modes offered.

12 The thinking in the industry, I might add, if  
13 one takes the Atomic Industrial Forum research into account,  
14 in their recent report on decommissioning all the thinking  
15 in the industry -- and ours is running in this way, too --  
16 is that dismantling is the mode of choice, and the only  
17 discussion is how long you should wait. What are the  
18 tradeoffs, the cost/benefit, of reducing dose rates by  
19 letting some radioactive decay take place -- reducing costs,  
20 manpower costs, at the same time you're accumulating custody  
21 costs and uncertainties the longer you wait.

22 So those are tradeoffs of "when," not "whether"  
23 you will dismantle. The choice really is when you will  
24 dismantle.

25 If you look in the AIF study, they use the term

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1 "entombment" as a variation of "mothballing." It's just a  
2 variation on a theme. It's a different way to padlock the  
3 door while you're waiting.

4 Now, Reg. Guide 1.86 also has some residue  
5 limits in it --

6 COMMISSIONER BRADFORD: Let me just ask about the  
7 dismantling. What volume of material -- stuff, metal,  
8 whatever -- are you talking about when you talk about  
9 "dismantling"?

10 MR. BERNERO: Right now, we're estimating that  
11 to dismantle a pressurized water reactor -- a large one,  
12 like Trojan -- is more than half a million cubic feet.  
13 And in our scrutiny of the report we're working on right  
14 now, we are suspicious that that number may be low.

15 So I would say that we're somewhere in the range  
16 right now of, say, half a million to a million cubic feet.

17 COMMISSIONER BRADFORD: That would be the  
18 low-level waste?

19 MR. BERNERO: Tentatively, that's all low-level  
20 waste. We're doing a subset calculation on the assumption  
21 that some of the activated products -- that is, the core,  
22 shrouds, and things like that that have activated niobium 94  
23 in it, since that's a very long halflife material and would  
24 have a dose rate at the surface on the order of R per hour,  
25 that one might have to send that to the high-level

jwb 1 repository, and that would add cost.

2 MR. MINOGUE: Your quantity is relatively small  
3 of that kind of material.

4 MR. BERNERO: But we're bringing in the delta  
5 cost that would accrue if you had to do that, and that can  
6 add up to a million or two million.

7 COMMISSIONER GILINSKY: You say that's low?  
8 Because it's on the surface?

9 MR. MINOGUE: Activation is throughout the  
10 material. It's just that there isn't that much stuff that's  
11 in high neutron flux.

12 COMMISSIONER KENNEDY: There's not that much  
13 material.

14 MR. MINOGUE: There's not that much material  
15 exposed to the direction of the neutron flux.

16 MR. BERNERO: It's the pieces immediately around  
17 the core assemblies. There's even a question, when you get  
18 out to the reactor vessel itself, to the pressure vessel  
19 itself, whether you'd have to do this.

20 COMMISSIONER GILINSKY: So it is basically on the  
21 surface?

22 MR. BERNERO: Where the flux is highest,  
23 immediately near the surface of the core assembly, and in the  
24 core structures -- any of the core structures.

25 MR. MINOGUE: It's not surface contamination that

jwb 1 you can remove.

2 COMMISSIONER GILINSKY: I understand.

3 MR. MINOGUE: The activation is higher toward  
4 the surface, but it's integral to the material. It's not  
5 readily removed.

6 It's not like taking off a layer of contamination.

7 COMMISSIONER BRADFORD: To give me a point of  
8 reference: How many thousand cubic feet is available, say  
9 at a site like Sheffield?

10 MR. BERNERO: I made a rough estimate. I was  
11 looking at the thing and saying: approximately how many  
12 yards, or acres of burial ground are we talking about? And  
13 I don't know what ultimate criteria will be on burial  
14 grounds, but if one assumes something like a 20-foot depth  
15 of burial of this waste, reasonably compacting it, in the  
16 numbers we're coming up with we're speaking of one, maybe  
17 two acres of land for a reactor decommissioning.

18 It's not an insurmountable land area involved,  
19 not an extremely high number.

20 COMMISSIONER BRADFORD: If you had a facility  
21 say the size of Sheffield, how many reactors could you put  
22 there?

23 MR. BERNERO: Off-hand, I don't know the acreage  
24 of the Sheffield facility. The only low-level burial grounds  
25 I visited --

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1 COMMISSIONER BRADFORD: Pick one that you  
2 visited.

3 MR. BERNERO: In Hanford, Washington, the burial  
4 ground up there. As I recall, that burial ground must be  
5 somewhere around 1.00 acres. And if you were dealing with  
6 1 or 2 acres per reactor, you'd have 50 or more reactors  
7 that go in there.

8 But the bulk of their business seems to be  
9 gloves, and hospital waste, and things like that. So I  
10 don't know if one can dedicate burial grounds to reactors,  
11 but at least this gives the scale of burial that we're  
12 dealing with.

13 Now these residue limits in Reg. Guide 1.86, we  
14 really need to appreciate what they are and what they are  
15 not. These have been used for years. These residue  
16 limits have been around for 15, maybe 20 years. They are  
17 surface contamination limits.

18 They are specific limits telling you how many  
19 counts per minute you can swipe off of the surface. They  
20 are good practice values. They're responsible. Health  
21 physicists have used them for years.

22 They are not established criteria. They are not  
23 something that has been tested in the public forum; that has  
24 gone through any kind of a rigorous test for validity on a  
25 valid basis.



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1           There's nothing in there for soil contamination;  
2           there's nothing in there for activated materials; no criteria  
3           there that say what to do with niobium 94 contaminated core  
4           pieces; and there's nothing for buried activity -- for how  
5           to deal with something that's buried.

6           May I have the next slide, please?

7           (Slide.)

8           So if you look at the evaluation of decommissioning  
9           in a reactor application, the whole thing is jaundiced by  
10          the existence of Reg. Guide 1.86 and the criteria we have  
11          out, with all their weaknesses.

12          The licensee looks to Reg. Guide 1.86. He  
13          identifies the tentative mode to decommission, calculates  
14          the cost, and submits it to the staff.

15          The staff looks at that. Typically, one gets  
16          either mothballing or dismantlement. In the cases I've seen  
17          and discussed recently, people are tending to use the AIF  
18          number, now. Previously, they were tending to use a  
19          mothballing number that was on the order of \$10 million, or  
20          something like that.

21          COMMISSIONER KENNEDY: What's the other number?

22          MR. BERNERO: The other number, if you use a  
23          relatively prompt dismantling, AIF comes out about \$20-odd  
24          million, \$21- or \$22- something on that order.

25          Well, the staff looks at the applicant's numbers

1 and as part of our financial qualifications finding, examines  
2 how that fits into his cash flow problems. And the staff, as  
3 part of the licensing, has to say that this applicant is  
4 financially competent to operate the reactor.

5 And as you've heard before, when you're looking at  
6 the scale of costs and expenditures associated with building and  
7 operating reactors in a power utility system, the cost of  
8 decommissioning appears rather smaller than scale. It does  
9 not get a highlight or emphasis. But it's considered.

10 The staff considers the cost in its NEPA cost-benefit  
11 analysis. In the supplementary information paper we sent up  
12 a little more than a week ago, we attached a 50-33 finding, a  
13 typical one, and the current standard analysis of cost benefit  
14 with respect to decommissioning that the staff uses in all its  
15 FES accounts.

16 The staff no longer does the FES cost-benefit with the  
17 applicant's number for decommissioning. We standardized on the  
18 AIS dismantling decommissioning number, in order to calculate a  
19 mills per kilowatt hour, to use our standard calculation.

20 COMMISSIONER GILINSKY: What is the significance of  
21 that when you get into the cost?

22 MR. BERNERO: It's fairly small. It's a real cost.  
23  
24  
25

jwb 1 It has to be assigned, and it has to be assigned and  
2 weighted. It comes out to be 10ths of a mil per  
3 kilowatt hour, or hundredths of a mil per kilowatt  
4 hour -- a relatively small number.

5 COMMISSIONER GILINSKY: At what point would it  
6 affect anything the staff does?

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1 MR. BERNERO: In the justification of coal  
2 versus nuclear.

3 MR. MINOGUE: It's part of the NEPA evaluation.

4 MR. BERNERO: We have to show that it's  
5 cost-beneficial to generate the electrical power by this  
6 nuclear plant rather than a hydro plant or a coal plant. And  
7 the principal argument for economic benefit is mills per  
8 kilowatt hour of delivered electricity. The commissioning is  
9 treated as a cost of generating the electricity; so that's  
10 how it gets in there.

11 But now the staff in looking at the decommissioning  
12 stops short of any specific requirement on funding assurance.  
13 At this point, we've looked at the commissioning in  
14 perspective, made a finding that the applicant has the  
15 financial integrity or power to handle costs of this  
16 magnitude, but then it is left to the state regulating bodies  
17 to handle this, to say this is the way you should accumulate  
18 those resources for decommissioning or this is the level of  
19 assurance you should have for the accumulation of those funds.

20 Let's have the next viewgraph.

21 (Slide.)

22 I've inserted -- and this is in one of the  
23 supplementary notes I left at your places -- an example of  
24 funding for reactor decommissioning, such as one of the states  
25 is doing.

1           A number of states are following this pattern.  
2   This one comes from New York State, which is a relatively  
3   experienced public service commission that is experienced in  
4   dealing with nuclear reactors in that State. Now, their  
5   approach is based on the principle that decommissioning costs  
6   should be borne by the customer served, and they approach it  
7   that the proper way to get the resources for the commissioner  
8   is to set up a cash sinking fund and get the maximum yield on  
9   that cash sinking fund to obtain the lowest cost to the  
10   consumer. Since, you know, the electricity user is paying for  
11   this, they want the most efficient way of accumulating the  
12   funds.

13           Now, that cash sinking fund is done in this way.  
14   They select a depreciation value, a negative salvage value  
15   which can be written off this decommissioning expense as a  
16   depreciation cost --

17           COMMISSIONER KENNEDY: Your net negative salvage.

18           MR. BERNERO: Your net negative salvage value.

19           So, what it does, it gives them a great amount to  
20   write off as depreciation expense.

21           Now, the conventional depreciation, which is  
22   depreciation of capital, they've already got in the ground,  
23   you know, they've already built, that is part of their rate  
24   base. They're entitled to a return on that investment, and  
25   they are entitled to get bonded indebtedness to put liens on

1 that investment. But this reserve for decommissioning,  
2 though the state allows them to bill the customer, they  
3 have to put that into a reserve that is not in a rate base.  
4 Therefore, the shareholder in the company gets no return on  
5 it. And also --

6 COMMISSIONER KENNEDY: It's in the rate base, but  
7 not in the --

8 MR. BERNERO: It's in the charge to the customer.

9 COMMISSIONER KENNEDY: Okay.

10 MR. BERNERO: But not in the rate base used to  
11 calculate rate return to the investor. And they are not  
12 allowed to bond against it.

13 MR. RATHBUN: Bob, isn't that treated as though  
14 it were the customer's money?

15 MR. BERNERO: No. In that sense, the investors  
16 can't get a return on it, and you can't bond against it. Yes,  
17 it's treated as customers' money, but what is done --

18 MR. RATHBUN: It's not a fully funded reserve,  
19 however?

20 MR. BERNERO: It is funded in the sense that those  
21 funds are put directly into the short-term cash flow of the  
22 company, and they may be in physical plant equipment. And  
23 this state, in particular, argues that this puts these funds  
24 into a position where they will earn the maximum return. It's  
25 basically the customers' money put in position of the greatest



1 leverage, and it's there under day-to-day, year-to-year  
2 scrutiny by the regulating body, accumulated so that at the  
3 time the decommissioning of the plant is needed it is a  
4 ready possibility for the utility to raise money directly  
5 on those resources that are not encumbered and the resources  
6 are, of course, there.

7           The State of New York argues that, by doing this,  
8 a typical rate of return and, consequently, interest leverage  
9 is about 15 percent rate of return; whereas, if you turned  
10 with the customers' money and said "I want to put that into  
11 a high-security bond or an escrow fund or something," you get  
12 7 or 8 percent, something like that.

13           So, you just double the leverage; you double the  
14 interest.

15           COMMISSIONER BRADFORD: Where does that 15 percent  
16 come from?

17           MR. BERNERO: That's the allowable rate of return  
18 on the short-term funds of the utility in New York, at least.

19           MR. RATHBUN: I think it's as though the customers'  
20 -- this money -- the customers' money is invested in the  
21 utility at their rate of return vis-a-vis in federal securities that  
22 earn 7-1/2 percent, something like that.

23           COMMISSIONER BRADFORD: Then, it's as though it were as-  
24 sumed to be a common stock investment.

25           MR. RATHBUN: It's whatever the weighted cost of

1 capital is.

2 COMMISSIONER BRADFORD: It wouldn't be anywhere near 15 percent.

3 MR. BERNERO: New York, on the short-term cash flow,  
4 says that the typical rate of return is about 15 percent, the  
5 allowable --

6 CHAIRMAN HENDRIE: It replaces the need to borrow  
7 money on which they would otherwise -- short-term rates and up  
8 being 15 percent.

9 MR. RATHBUN: I think it's to raise money, actually.

10 COMMISSIONER BRADFORD: Incremental growth capital?

11 MR. RATHBUN: It may be, because the customers will  
12 provide the capital to the utility to payments for decommission-  
13 ing before the utility just for New York. The utility will incur  
14 any cash outlay for the purpose -- if the utility's need to raise  
15 capital in the market is reduced by receipts of the money from  
16 customers, that reduction in cost would be passed on to the  
17 consumers, who will thus get a rate of return on their money of  
18 about 15 percent. The reason was that the cost of new money  
19 and related income taxes during this period was about twice the  
20 return of 7 1/2 percent that they would be likely to be earning  
21 through --

22 COMMISSIONER BRADFORD: Okay. So it's the income tax  
23 that does it.

24 MR. RATHBUN: I'm sure that has an impact.

25 COMMISSIONER BRADFORD: It must be. You're taking

1 a much lower rate of return, and you're getting the tax  
2 effect.

3 MR. RATHBUN: Yes, sir. I think that's part of it.

4 MR. BERNERO: But once again, if we go back and say  
5 what is our concern as NRC in this instance and in all other  
6 reactor instances, currently, we defer to the state or the  
7 other regulating body to see to a specific form of financial  
8 assurance. What the NRC does is merely look at the general  
9 financial capability of the company, subject to a review.  
10 We, of course, have a continuing review responsibility as  
11 the plant operates as time passes, so that we could, even 10  
12 years into the future, look at the plant and say, "You're  
13 getting kind of shaky. It doesn't look like you have enough  
14 money to decommission."

15 So that the real significance to us is, should we  
16 be getting into this specific assurance form, or should we  
17 leave that to the state?

18 Let's turn now to the next viewgraph and see what  
19 we do now on the fuel cycle currently. I use, for simplicity,  
20 the uranium mill application, where the treatment is the most  
21 developed.

22 (Slide.)

23 Because the bulk of the licensing work in fuel  
24 cycle is there, the applicant prepares a tailing stabilization  
25 and decommissioning plan. I've split the two, although they

1 are both really part of decommissioning.

2 There are criteria available in sources, if you  
3 know where to look, for how to prepare and what to project  
4 for these things. The interim criteria for tailing  
5 stabilization can be found in Reg. Guide 3.5, which tells  
6 you what to put in a uranium mill application license.

7 There are few criteria available for mill residues.  
8 By that, I mean for what to clean up a mill to, what soil  
9 levels, what surface contamination levels. We have a branch  
10 position, like Reg. Guide 1.86.

11 Did you have a question?

12 COMMISSIONER BRADFORD: No.

13 MR. BERNERO: The applicant, then, with these  
14 interim criteria, estimates the cost of decommissioning. He  
15 has a tentative decommissioning plan, and he proposes a surety  
16 arrangement and says, "I intend to see to the funds being  
17 available by such-and-so means."

18 Typically, on a mill that's a performance bond,  
19 we're talking somewhere in the range of \$2-4 million for the  
20 total cost.

21 The staff then reviews it and licenses that mill,  
22 based on the acceptability of the tentative plans for tailing  
23 stabilization and decommissioning, on the reality or realism  
24 of the estimated cost, and on the acceptability of the surety  
25 arrangement.

1           May I have the next viewgraph, please.

2           (Slide.)

3           What are the weaknesses in what we're doing now?

4           The first and most prominent weakness is we don't  
5 have recognized criteria for radioactive rescue. We've got  
6 some good practice numbers for surface contamination. We've  
7 got some questionable criteria for decommissioning modes in  
8 Reg. Guide 1.86.

9           But we don't have good radioactive residue criteria  
10 for soils, for surfaces, for burial, for activation products.  
11 And we don't have a clear policy on the permissible modes of  
12 decommissioning.

13           We've got to confront this question of is it  
14 acceptable to fix radioactivity in place and then walk away  
15 from it. The concept of a low-level burial ground or  
16 stabilized mill tailings or perhaps an entombed reactor, or  
17 should we as a matter of policy be requiring dismantling of  
18 virtually all cases.

19           We don't have a clear policy about timing. Is it  
20 reasonable, is it rational, for reactors to be shut down and  
21 then allowed to sit in mothballs for 100 years before one  
22 dismantles them.

23           We talk about institutional changes that are  
24 possible, then. We can be talking of quite a bit different  
25 society, perhaps.

1           We don't have a clear policy on financial  
2 assurance. We've got a dichotomy. On the reactor side, we  
3 look at financial integrity; on the fuel cycle side, we tend  
4 to look at a fixed or rigid assurance. So, we need some sort  
5 of coherent statement of policy there.

6           And lastly, a very important thing, I think, little  
7 is being done to see that plants are being designed to  
8 facilitate decommissioning. When you really focus on  
9 decommissioning, it brings the designers to work. They accept  
10 the costs. They focus on them, and they do something with  
11 them.

12           A good example: the uranium mills with the recent  
13 pressure on decommissioning. The mill designers have started  
14 to take a harder look at the tailings and how they accumulate.  
15 In many instances, they used to build the tailings dam out of  
16 tailings and accumulate tailings behind the tailings dam made  
17 of tailings. But then, when you go to decommission the thing,  
18 you now have to decommission the dam. So, that led to a  
19 generation of thought that said, "No, let's make an earthen  
20 dam and then put the tailings behind it."

21           Now, further thoughts on decommissioning are  
22 getting to still another generation, and that is: excavate  
23 and further simplify the decommissioning.

24           MR. MINOGUE: I'd like to add a comment in regard  
25 to decommissioning reactors.



1           Of course, the steps that are taken to reduce  
2 occupational exposure, to design to facilitate maintenance  
3 and to cut exposure in the course of maintenance also  
4 serve to facilitate decommissioning.

5           So, I think it's a little too strongly stated  
6 to imply that nothing is done in the design to facilitate  
7 decommissioning.

8           MR. BERNERO: Yes. I was intending things like  
9 making pieces more readily segmented —

10           COMMISSIONER KENNEDY: Specific design criteria  
11 aimed at this type of result.

12           MR. BERNERO: Casting bore holes in concrete so  
13 that you could, with a very small charge, spall off the  
14 contaminated piece.

15           May I have the next slide, please.

16           (Slide.)

17           So, if you look at the factors, we've got two  
18 questions to answer here: What do we need urgently? Where  
19 is the critical path in getting to a policy and rulemaking  
20 on decommissioning?

21           First of all, I think we have to recognize that  
22 responsibility for decommissioning is the urgent thing. It's  
23 not the act of decommissioning. What's urgently needed is  
24 the assignment and acceptance of the clear responsibility for  
25 what to do about decommissioning. The act of actually cutting

1 up the plans and hauling the pieces away is something that  
2 is in the future.

3 Now, when we go into this policy of rulemaking,  
4 as we said in the supplementary paper, there are four  
5 principal factors that have to be considered: the  
6 acceptability of a decommissioning mode; the residual  
7 contamination limits, whether they be in soil, on surfaces,  
8 in burial, or whatever; the timing of decommissioning; how  
9 long one should wait to minimize radiation exposures, how  
10 long one can wait in spite of the pressures to get the job  
11 done; and lastly, what are appropriate financial or surety  
12 arrangements.

13 There's a subset question that can tie the last  
14 two together. It's possible that we would want to build in  
15 inherent financial pressures of some sort that would promote  
16 the decommissioning of a plant to make it worthwhile to clean  
17 it up and clean it up promptly.

18 Now, the factors that will control the schedule  
19 of dealing with these four principal issues, we think, are,  
20 first of all, the residue limits.

21 This is a very complex thing, and it definitely  
22 involves the Environmental Protection Agency, and it involves  
23 all of the states in setting residue criteria that the EPA  
24 can endorse, that we are confident of and can endorse, and  
25 that all of the states or virtually all of the states will

1 accept.

2 We already have certain criteria in place. The  
3 State of California right now is furnishing the criteria for  
4 the decommissioning that DOE is doing at Santa Susanna, and  
5 they're using a criterion of no detectable radioactivity,  
6 which is a very tough one to live with, because, you know,  
7 it's like saying zero release. It only makes sense if you  
8 say no detectable measured in such-and-so way.

9 So, we project that the critical path is getting  
10 residue limits that are sound and acceptable.

11 And the second piecing item is getting a consensus  
12 of opinion on sound arrangements for financial assurance.

13 Now, this is not to say that we would use the same  
14 financial assurance policy right across the board, but perhaps  
15 we would at least think out and very clearly enunciate  
16 differences for different licensees and the bases for those  
17 differences.

18 COMMISSIONER BRADFORD: What's going on in that  
19 area now? Is it essentially the assumption that, if it's a  
20 utility and qualified to build the plant, it would be  
21 qualified to decommission it?

22 MR. BERNERO: We are actually making the finding  
23 in 50-33 as part of the satisfaction of that regulation. Our  
24 staff evaluates the total financial capability of the licensee  
25 or applicant and his total responsibilities, operation as well

1 as decommissioning, and makes the positive finding that he  
2 can afford to do any and all of it. And that is subject to  
3 re-review during the existence of the license.

4 But that's as far as we go. We do not, then,  
5 specify how he keeps his books, whether he accrues the funds  
6 in this way or that way. That, we leave to the state or other  
7 regulatory body.

8 MR. MINOGUE: Of course, there's a distinct  
9 difference in the financial situation between the fuel cycle  
10 companies and the reactors.

11 MR. BERNERO: In the fuel cycle companies, they've  
12 been pressing forward with decommissioning plans on people  
13 other than mill owners, the fuel fabricators, and they're  
14 getting more and more information and plans on that. And  
15 the question of financial assurance is being raised there.  
16 Big companies who own several plants or who are very large  
17 corporations are arguing that their liquid assets may be  
18 sufficient to be a basis of judgment, like 50-33.

19 So, if we look at individual rulemakings --

20 May I have the next slide, please.

21 (Slide.)

22 This is a slight variation of the argument we made  
23 before, that although individual rulemakings can give you  
24 rules tailored to the specific facility and, perhaps more  
25 important, get you something at the earliest opportunity, we

1 are still troubled that a piecemeal approach will not  
2 establish general policy, that it would be difficult to  
3 define a set of facilities.

4 If you go back and recall the schedule that's on  
5 NBOA, the first of your notes, really, one would define a  
6 set of just one facility, a PWR, probably, and then a general  
7 proceeding. It wouldn't be a subdivision into PWR, BWR fuel  
8 fabrication plant, or whatever. It would probably be an  
9 initial reactor rulemaking, followed by a general clean-up  
10 rulemaking, sort of an interim and then a final.

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1           That raises the question, will that be confusing  
2 to the public? Will that be confusing to the other agencies?  
3 Will that actually save time?

4           COMMISSIONER GILINSKY: The proposition is whether  
5 to separate out reactors.

6           MR. BERNERO: In the schedule we have, as we  
7 discussed before, the PWR comes out earliest.

8           COMMISSIONER GILINSKY: Right.

9           MR. BERNERO: That's very shortly.

10          Then the BWR and the other bases in the general  
11 plan come out next year.

12          COMMISSIONER GILINSKY: Yes.

13          MR. BERNERO: So that the choice would be going  
14 with the PWR now or perhaps using it as representative of  
15 reactors and then going with a final policy based on all of  
16 them next year.

17          I wouldn't propose the solution of four sets or  
18 10 sets — you know, one for every facility — but about the  
19 only segmentation I think that could be done rationally is  
20 using the PWR report as the basis for an interim rule making.

21          MR. MINOGUE: That might be applicable to both  
22 types.

23          COMMISSIONER GILINSKY: This was the question I  
24 raised last time. The PRW report is coming in fairly early.

25          MR. BERNERO: Fairly shortly, yes. To use it as



1 representative.

2 COMMISSIONER GILINSKY: My thought was that the  
3 principal decommissioning problem, which, as I see it, is  
4 the one that deals with reactors, is the one that we need  
5 to address rather quickly.

6 I was asking whether in fact we could do  
7 precisely that -- start with the PWR as representative of a  
8 certain class of reactors.

9 MR. BERNERO: We could reasonably take the PWR as  
10 representative of light water reactors.

11 We expect that the volume of waste with the BWR  
12 will be greater, at least AIF does. AIF has a substantially  
13 different figure. And there is some logic for that.

14 We're not certain about the occupational exposure,  
15 how that will go. But again, I would expect it to be in the  
16 same order of magnitude. At least we might prorate or  
17 estimate whatever influence that would have on policy.

18 There would be technical validity to using the PWR  
19 as a representative reactor. The real question would be,  
20 could we proceed and effectively with what amounts to a  
21 reactor policy enunciation and rule making in the full  
22 respect of decommissioning modes, residue limits, financial  
23 assurance, the works.

24 COMMISSIONER KENNEDY: Could I ask another  
25 question.

1 (A) there is no public health and safety issue  
2 here, at least certainly not an urgent one of that kind.

3 MR. BERNERO: It's a waste management.

4 COMMISSIONER KENNEDY: Number two, when is the  
5 first decommissioning we are talking about?

6 MR. BERNERO: Well, depending upon our policy,  
7 if we said — and I'm just going to hypothesize a number —  
8 if we said thou shalt dismantle a reactor 10 years after  
9 you shut it down as, say, an early extreme, then there are a  
10 number of reactors that should start decommissioning right  
11 now. They've been in moth balls for 10 years. So that now  
12 I would expect that we would probably, just to minimize  
13 occupational exposures, we'd probably go longer than that in  
14 years. The first decommissioning would probably be in the  
15 future even after we enunciate a policy in 1979.

16 MR. MINOGUE: In any event, there is no immediate  
17 public health issue.

18 CHAIRMAN HENDRIE: But get on to the punch line  
19 you're preparing to deliver. In view of the residual limits,  
20 the need to set those, the need to set general aspects of  
21 decommissioning modes, financial arrangements and so on, the  
22 clear need for state workshops —

23 MR. BERNERO: That we see as the critical path.

24 CHAIRMAN HENDRIE: — liaison working these details  
25 out with EPA and so on. Suppose you went ahead on the BWR.

1 Never mind all the other facilities. When would you get a  
2 rule in place?

3 MR. BERNERO: Well, we would be proposing the  
4 rule along with the policy statement in December '79, which  
5 is a year from this December.

6 COMMISSIONER GILINSKY: That is just the BWR?

7 MR. BERNERO: No, that's the total program.

8 Now, in advance of that there are two things that  
9 I think are worth some recurrent attention here that affect  
10 this trade-off of whether to do it separate or whether to do  
11 it total program. You may recall in the first briefing we  
12 discussed the PIRG petition which addresses this active  
13 financial assurance, or passive financial assurance, you  
14 might call it.

15 Should NRC continue to do what we do just looking  
16 at financial integrity or should we put our hand in the pot  
17 and require some sort of a surety bond held in escrow?

18 We propose to address that issue and to do that  
19 issue just a few months from now, and that is a significant  
20 part of policy to be enunciated.

21 Now, the other thing that I think is worth going  
22 into in a little more detail — may I have the next slide,  
23 please.

24 (Slide.)

25 This is the second of the two slides I put up at

1 your place.

2 The last time we were here I spoke of the need  
3 that NMSS had asked for clarification of existing regulations  
4 because they are seeking and obtaining decommissioning plans  
5 and information with very little basis in regulation on  
6 which to base their requests. And we prepared and are  
7 holding in abeyance, pending the outcome of this discussion  
8 here, a paper to give to you on a clarification of existing  
9 regulations with respect to decommissioning.

10 And basically this paper and regulation change  
11 would state how NRC, of course, holds the licensee responsible  
12 for decommissioning.

13 The reason for our clarifying the regulations is  
14 that right now, if you look for any evidence in the  
15 regulations for how NRC requires the information about  
16 decommissioning, you really need a guide to find it. You'll  
17 find it in Reg Guide 4.2. You'll find it in Reg Guide 3.5.  
18 You'll find it in the correspondence of individual licensing  
19 cases. But it's not standing out there clearly, publicly  
20 enunciated in the regulations.

21 If you look in part 51 — 51.20, to be specific —  
22 the Commission has said very explicitly what the reactor  
23 environmental report should treat. It should discuss this,  
24 that, and everything in detail. But it doesn't say a word  
25 about decommissioning.

1                   So what that clarification would be --

2                   COMMISSIONER GILINSKY: What report is this now?  
3                   The environmental report?

4                   MR. BENERO: Yes, this is the environmental  
5                   report on a reactor, Section 51.20 of the regulations. It  
6                   tells you what to address in that. And then Section 51.40  
7                   of that same part 51 says, for other major facilities, go  
8                   thou and do like a reactor. It refers to 51.20.

9                   COMMISSIONER GILINSKY: How do you get the data  
10                  for the cost-benefit analysis? Does that come from another  
11                  section of the environmental report?

12                  MR. BERNERO: Well, on decommissioning, that  
13                  section of the regulations is mute. Where you'll find the  
14                  decommissioning covered is in the supporting regulatory  
15                  guide. It is only stated explicitly in the supporting  
16                  regulatory guide, Reg. Guide 4.2, on the fuel cycle where you  
17                  do find such information in supporting regulatory guides, and  
18                  now it's doubly derivative, doubly obscure.

19                  Did we clearly expect this sort of information?  
20                  We clearly see this kind of responsibility. So what we would  
21                  propose in this subsequent clarification is a change to 51.20  
22                  that specifically applies to reactors, and by reference in  
23                  51.40, also applies to any other major facility, I think  
24                  big enough to require an environmental report. And that  
25                  section would say, we must have the tentative plans for

1 decommissioning, the tentative cost for decommissioning,  
2 and surety arrangements for funds. These are the criteria  
3 for decommissioning. We don't have any better ones to give  
4 right now, and we won't have any better criteria for  
5 residue.

6 CHAIRMAN HENDRIE: It's not clear to me that if  
7 you haven't provided any improved guidance to applicants,  
8 that that's necessarily very helpful.

9 Let me go back to the question I was trying to  
10 get an answer to before. The reason that we're here is to  
11 discuss whether or not we should go ahead with the  
12 decommissioning plan on a generic basis, or whether we should  
13 begin to split off parts of it and do, for instance, a  
14 decommissioning plan for pressurized water reactors.

15 Let me ask once again, if we were to start now to  
16 move ahead to do a separate decommissioning rule making for  
17 pressurized water reactors, in view of the need for the  
18 state workshops, a need which I believe will be there when  
19 there is doubt whether the matter dealt solely with PWRs or  
20 generically, the need for liaison with the EPA and the  
21 working out of the residue limits and so on, which I assume  
22 would be necessary for the individual proceedings as well  
23 as the generic ones, et cetera; when would we get the BWR  
24 rule making in place, or when would we get the proposed --  
25 where would the PWR triangle come out on the MBOB chart?

1 MR. BERNERO: It would come out almost the same  
2 position.

3 CHAIRMAN HENDRIE: Good. Just stop there. Say  
4 that again, please.

5 (Laughter.)

6 MR. BERNERO: Well, since the pacer —

7 CHAIRMAN HENDRIE: Just Say it again.

8 MR. BERNERO: It would come out at very nearly the  
9 same time.

10 CHAIRMAN HENDRIE: Plus or minus a month or two.  
11 Two months?

12 MR. BERNERO: At best, a few months.

13 CHAIRMAN HENDRIE: Three months?

14 I think that's the essential point that I'm trying  
15 to bring out here.

16 Now, what else do you want to tell me?

17 MR. MINOGUE: Well, to the extent that we might  
18 waffle one or several of these issues, you could conceivably  
19 do some kind of an interim rule making prior to that related  
20 to PWRs, as, for example, these surface contamination limits.  
21 That's not something we would recommend.

22 CHAIRMAN HENDRIE: I find that a totally  
23 unattractive proposition.

24 If the objection to the present situation is that  
25 the Commission's directions are fuzzy, I find the proposal to

1 to go off and create yet a second level of fuzz not a  
2 helpful one.

3 MR. MINOGUE: I'm not proposing that, Mr. Chairman.  
4 What I'm saying is that if we try to do something earlier, the  
5 only way we can do that and save a lot of time would be to  
6 fuzz one of these issues. I'm not recommending that.

7 CHAIRMAN HENDRIE: Okay. I think that draws  
8 rather clearly the issues then.

9 Commentary?

10 COMMISSIONER KENNEDY: What can we do in the  
11 meantime?

12 MR. BERNERO: Well, it may not be clear from MBOB,  
13 but there are two generations of liaison with the states and  
14 other agencies, and perhaps I should emphasize what they are.

15 (Slide.)

16 The first generation this year is liaison with the  
17 states and other agencies on the information in hand, namely,  
18 the PWR report, the fuel reprocessing report, and any pieces  
19 of the MOX report that become available.

20 Then the second generation of that liaison with  
21 the states requires us to deal with them on a level higher  
22 than what the contractor is saying. And the level higher  
23 than what the contractor is saying is this set of staff  
24 reports on the three critical issues, plus the subsequently  
25 available contractor reports, so that now the states are not



1 dealing with simple factual data from the contractor, but  
2 they are dealing with what the regulatory staff is reading  
3 into it, what conclusions we are starting to draw from it.

4 And it's that second generation that is being  
5 done and I believe turns out to be the critical path.

6 So we are actually doing something right now.  
7 We have already undertaken liaison with the states and with  
8 other agencies on this and are publishing all the materials  
9 we get as rapidly as possible and soliciting comment on it.

10 COMMISSIONER GILINSKY: Let me understand this.

11 You're saying there is basically nothing to be  
12 gained by going forward with the reactor part, specifically.

13 MR. BERNERO: Well, what we're saying is that if  
14 you elect to go forward with the PWR part, you have to go  
15 through the cycle with states, EPA, and the like. And there  
16 are extensive times involved in that, and there are two  
17 generations of that.

18 There are two basic approaches.

19 One is, you have to give the states something to  
20 see and to understand and react to, and the first thing we  
21 have available is what the contractor has generated. They  
22 made a fuel reprocessing plant report and the PWR report.

23 As we go over that with the states, the contractor  
24 is still working and the staff is working analyzing that  
25 information and drawing conclusions from it, delving into it

1 for whatever significance is there.

2 Then the next level of discussion with the states  
3 and with EPA is, what does that all mean to the staff? Does  
4 that lead us to believe that we can promulgate standards  
5 such as these, or policies such as these, that NRC will take  
6 whatever position we seek? That is the second generation  
7 of discussion we feel is vital to have while it's still  
8 tentative, before we get sort of cast in bronze with  
9 proposed policy statements, to discuss that with the states  
10 and with EPA and whatever other agencies are involved.

11 And then with that second generation of insight,  
12 then we go into the policy statement, EIS, and the works.

13 So really we are on that accelerated schedule  
14 with the present schedule. We are not waiting to do the  
15 staff work. If you look at MBOB, those lines are now --  
16 they are now to get the financial analysts working, to get  
17 the residual activity analysts working, working with the  
18 states and EPA. That's to do it now with the information at  
19 hand.

20 It's not as if we were proposing to get the whole  
21 set of information reports and then start to work. We already  
22 have proposed an overlapping schedule, and that's why the  
23 critical path still remains the degree and extent of liaison  
24 you have with states, EPA, FERC, the works.

25 CHAIRMAN HENDRIE: Your recommendation then is as

1 before —

2 MR. BERNERO: Yes, sir.

3 CHAIRMAN HENDRIE: — in the base paper, mainly  
4 to go forward on this broad-front schedule and push forward  
5 to get these things in place on the basis that it takes them  
6 all into account, and which schedule, you tell me, differs  
7 from that for a single thing like BWR's by —

8 MR. BERNERO: A few months, at best.

9 CHAIRMAN HENDRIE: — a couple months, at best.

10 MR. MINOGUE: Yes, sir.

11 CHAIRMAN HENDRIE: Further discussion?

12 COMMISSIONER BRADFORD: Is there any reason between  
13 now and then not to at least require in the applications that  
14 we are considering for individual facilities a statement of  
15 their current decommissioning plans and their finances?

16 MR. BERNERO: We do require it. We do require it  
17 in a rather obscure way.

18 COMMISSIONER BRADFORD: Why aren't we requiring it  
19 in a clear way?

20 MR. BERNERO: That's the issue, because — I'm  
21 jumping the gun because I haven't presented you with the  
22 paper and the discussion thereof, but this last note on  
23 clarification —

24 (Slide.)

25 — that's one of the principal merits of doing

1 that, is to be more explicit so that one can clearly say,  
2 look, our regulations require it; it's not buried in some  
3 Reg. Guide.

4 CHAIRMAN HENDRIE: There is that merit to it.  
5 It doesn't improve the guidance.

6 MR. BERNERO: No. It doesn't change the  
7 technical effect.

8 CHAIRMAN HENDRIE: It's similar to the argument  
9 that I keep having to make when Congressmen ask, couldn't  
10 the NRC implement a number of the things in the draft  
11 legislation on its own present authority? And the answer is  
12 yes, but it certainly would be nice to have the blessings of  
13 seeing it in the statute, having been considered by the  
14 Congress, which is precisely the same sort of situation,  
15 instead of having to dig it out, such as it is, from the  
16 present guidance. They would like to see it in the  
17 regulations that make it clear. People just won't argue  
18 about it.

19 So having argued their sort of argument, the other  
20 place, I must admit some sympathy for it.

21 COMMISSIONER BRADFORD: Do you also contemplate  
22 a little housecleaning on that one Reg. Guide that you  
23 indicated was deficient in several respects?

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1 MR. BERNERO: Reg Guide 1.86 is a natural victim  
2 of this policy development.

3 (Laughter.)

4 MR. BERNERO: I think it's out of date. It's at  
5 least obsolescent. I think it will be substantially revised  
6 in order that it will later reflect proper residual activity  
7 criteria and a much clearer definition of decommissioning  
8 modes and timing.

9 Now much of that may end up in regulation, I don't  
10 know right now how much will end up in regulation and how much  
11 in Reg Guide. But right now, what we have, as the Chairman  
12 put it, is fuzzy. And I think one of the biggest balls of  
13 fuzz is that Reg Guide.

14 COMMISSIONER BRADFORD: I take it you're not  
15 recommending, for example, to strike the word "conversion"  
16 from it now rather than waiting until 1979.

17 MR. BERNERO: I see no merit in trying to do any  
18 patch on it at this time. Once again, since the general  
19 trend in industry treatment, and certainly in staff treatment,  
20 is to look at the cost of decommissioning for prospective as a  
21 dismantling cost, the staff is tending to use latest available  
22 data on dismantling costs, and I don't think anyone would deny  
23 that that's the best option to use as a first estimate.

24 I think it becomes a moot point whether the Reg  
25 Guide says conversion or entombment, because no one's really

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1 going that way. No one's using it.

2 CHAIRMAN HENDRIE: Other discussion?

3 COMMISSIONER KENNEDY: I agreed with it the first  
4 time, and I haven't changed my mind.

5 CHAIRMAN HENDRIE: I'd propose, just to see if there  
6 is in fact a consensus, I'll ask the Commission if it would  
7 vote to approve the Staff's recommendations in the 78-13  
8 paper, supplemented by the proposals submitted today for the  
9 other tidying up, for which there will be a paper.

10 Agreed?

11 (Nods in the affirmative.)

12 CHAIRMAN HENDRIE: So ordered. Thank you very much.

13 (Whereupon, at 10:45 a.m., the hearing in the above-  
14 entitled matter was adjourned.)

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