

ORIGINAL

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NUCLEAR REGULATORY COMMISSION**

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Develop a De Minimis Policy

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1 UNITED STATES OF AMERICA  
2 NUCLEAR REGULATORY COMMISSION

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4 PUBLIC MEETING

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6 Briefing on the Status of  
7 Efforts to Develop a De Minimis Policy

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9 1717 H Street, NW

10 Room 1130

11 Washington, D.C.

12 Monday, March 14, 1988

13 The Commission met in public session, pursuant to  
14 notice, at 2:00 p.m., the Honorable Lando W. Zech, Jr.,  
15 Chairman of the Commission, presiding.

16 COMMISSIONERS PRESENT:

17 Lando W. Zech, Jr., Chairman

18 Kenneth C. Rogers, Commissioner

19 Frederick M. Bernthal, Commissioner

20 Thomas M. Roberts, Commissioner

21 Kenneth M. Carr, Commissioner

22 STAFF SEATED AT COMMISSION TABLE:

23 S. Chilk, SECY

24 W. Parler, OGC

25 V. Stello, EDO

- 1 R. Bernero
- 2 T. Speis
- 3 W. Lahs
- 4 B. Morris
- 5 B. Alexander
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## P R O C E E D I N G S

1  
2 CHAIRMAN ZECH: Good afternoon, ladies and gentlemen.

3 The Commission will be briefed today by the Office of  
4 Research and Nuclear Material Safety and Safeguards.

5 The subject of the briefing is the status of their  
6 activities to define the potential use of de minimis and below  
7 regulatory concern concepts in the NRC's radiation protection  
8 policies and regulations.

9 The Commission has requested that the Staff develop a  
10 proposed policy statement that would identify the level of  
11 radiation risk below which government regulation becomes  
12 unwarranted.

13 This policy statement should be consistent with all  
14 existing government standards related to the protection of the  
15 public from radiation hazards. The Commission had previously  
16 requested that the Staff provide advice on how existing and  
17 proposed de minimis below regulatory concern and residual  
18 radioactivity standards are related.

19 Recently the Commission approved, with modifications,  
20 a proposed final rule on decommissioning of nuclear activities,  
21 nuclear facilities which will require that decommissioned  
22 facilities be decontaminated to an acceptable level.

23 I would be interested in hearing the status of  
24 activities to revise and update the agency's guidance in this  
25 area.

1           Lastly, there is interest in this subject by several  
2 government agencies, other domestic organizations, and a number  
3 of foreign organizations.

4           Time permitting, it would be worthwhile to have a  
5 brief summary of activities by other organizations in this  
6 area.

7           I would like to point out that this is an information  
8 meeting, and no formal Commission vote is anticipated this  
9 afternoon.

10           Do any of my fellow Commissioners have any opening  
11 comments to make? If not, Mr. Stello, you may proceed.

12           MR. STELLO: Well, thank you, Mr. Chairman.

13           Let me start by introducing those at the table with  
14 me here today. On my far right is Mr. Bernero from NMSS, the  
15 deputy of that office. To my immediate right is Mr. Speis, who  
16 is -- Dr. Speis, who is the deputy of our Office of Research.  
17 To my immediate left, Mr. Lahs, who will be making the  
18 presentation this morning from Research. And immediately to  
19 his left, Bill Morris from our Office of Research.

20           We do this afternoon want to tell you about our plans  
21 to bring together a symposium to discuss the complex questions  
22 related to issues of setting dose levels at a point where I  
23 think you would characterize them as de minimis or below  
24 regulatory concern.

25           We have been working hard to bring international

1 communities and various governments together to have a  
2 discussion in this very important area. And you have already  
3 correctly pointed out that there are others in the federal  
4 government of the United States who will participate with us in  
5 having this discussion.

6 You also are aware that we sent you a paper giving  
7 you an outline of the concepts involved a couple of weeks ago,  
8 and that paper is the basis upon which the briefing this  
9 afternoon will be based. And if I can, I will ask Mr. LaHS to  
10 proceed with the presentation.

11 CHAIRMAN ZECH: All right, thank you very much. You  
12 pay proceed.

13 MR. LAHS: As the Chairman has indicated, the purpose  
14 of my presentation today is really to initiate our direct  
15 response to your request made in the staff requirements memos  
16 dated back on February 5th and November 24th of last year.

17 In so doing, I am going to be presenting the status  
18 report, in which I am going to be discussing the below  
19 regulatory concern de minimis risk concepts and their potential  
20 uses in the development of radiation protection policies and  
21 regulations. I am going to be specifically focusing on the  
22 question which you raised on the efforts to use these concepts  
23 to try to develop a proposed Commission policy that would  
24 identify a level of radiation risk below which the government  
25 regulation becomes either limited or unwarranted.

1           In the November SRM, you also requested a near term  
2 status report. As Mr. Stello has indicated, we have submitted  
3 a Commission paper in response to your request, and my  
4 intention today is to discuss and elaborate on the major points  
5 raised in that paper.

6           As the next slide shows, please --

7           CHAIRMAN ZECH: Before you go to the next slide, are  
8 you going to talk to us about some of the criteria that you  
9 have used in making these judgments?

10          MR. LAHS: Yes. I am going to be mentioning it.

11          CHAIRMAN ZECH: All right. That's fine.

12          MR. LAHS: Could I have the next slide, please.

13          You got it backwards. There you go.

14          Okay, the topics I'd like to discuss, first of all,  
15 is the radiation protection framework and the terms and  
16 concepts associated with potential regulatory cut-offs.

17          Second, I would like to get into some discussion of  
18 some policy development considerations, and discuss these in  
19 light of current NRC, EPA, and international activities, and  
20 actually I would like to refer to current activities in  
21 discussing both these first two items, to give you some idea of  
22 the magnitude of some of the cut-off levels that are being  
23 proposed both nationally and internationally.

24          Third, a brief discussion of our plans for an  
25 international symposium which Vic Stello referred to.

1           And finally, a discussion of the preliminary resource  
2 estimates not only for development of the broad policy, which  
3 you asked for, but also some specific policies which are in the  
4 works.

5           CHAIRMAN ZECH: In the Commission paper that you  
6 provided, you talked about interagency working group.

7           MR. LAHS: Yes, sir.

8           CHAIRMAN ZECH: Can you tell us a little bit about  
9 what's going on in that group?

10          MR. LAHS: Essentially --

11          CHAIRMAN ZECH: As you go through?

12          MR. LAHS: Okay, yes.

13          CHAIRMAN ZECH: Or at the appropriate time. I'd just  
14 like to know. I think it's true that we do have an interagency  
15 working group, and I'd just like to hear what is taking place  
16 as far as that group is concerned.

17          MR. LAHS: Okay. Maybe that would be good to take  
18 up. There's a viewgraph here on authorities and people  
19 involved in setting the de minimis and below regulatory concern  
20 standards. Maybe if I could defer it to that time.

21          CHAIRMAN ZECH: That's fine, as long as you cover it.  
22 I think it's important we have that going on, and I would like  
23 to hear about it, and I think my fellow Commissioners would be  
24 interested in that, too. All right, let's go.

25          MR. LAHS: Starting with the first topic on the

1 slide. That first topic -- you know, at first it looks like  
2 it's fairly unimportant, but because of the wide differences in  
3 interpretations given to terms, especially those terms  
4 associated with regulatory cut-off concepts and specifically  
5 the term de minimis. I think I can assure you that an  
6 appreciation of the radiation protection framework and a  
7 consistent and common definition of the de minimis and below  
8 regulatory concern concepts is really vital to coherent  
9 discussion and understanding of policy options which you may  
10 have.

11 The current framework for radiation protection  
12 consists of three fundamental principles:

13 The first of these is whether particular usage of  
14 radioactive material is justified. That is, whether there is  
15 some benefit to be gained by use of radioactive materials.

16 Can I have the next slide, please.

17 The second principle involves dose limits which  
18 essentially establish the boundary between allowable and  
19 unacceptable exposures to individuals. These limits are  
20 contained in 10 CFR Part 20 and provide the adequate protection  
21 required for public health and safety.

22 Within that range of potential acceptable exposures  
23 -- in other words, below the line on this figure, exposures are  
24 further limited by application of the third principle, the  
25 ALARA principle, as low as reasonably achievable.

1           Also, though, within that region below these basic  
2 dose limits are other limits imposed by both NRC and EPA which  
3 further restrict dose levels for some licensees such as nuclear  
4 power plants and nuclear fuel cycle facilities.

5           Examples here are things like the EPA's uranium fuel  
6 cycle standard and the Clean Air Act and even our own Appendix  
7 I.

8           At the lower end of the ALARA region of doses, as  
9 we're getting now into the middle of the figure, the concept of  
10 regulatory cut-offs comes into play. The first one we run into  
11 is what we have called below regulatory concern or BRC. BRC,  
12 in our minds, connotes a level of risk or dose that may be  
13 considered small from a regulatory standpoint. Individual and  
14 collective doses essentially that warrant only limited  
15 government attention, taking into account the cost of further  
16 regulation and the likelihood that such regulation would  
17 significantly alter the resulting doses.

18           If certain specific BRC source or exposures -- I'm  
19 sorry, if a source of exposure could be considered as a  
20 candidate for reduced regulatory requirements, if certain  
21 specific BRC conditions are met, and the best way to describe  
22 this is to think of examples with regard to disposal of certain  
23 low level waste streams. You had a policy statement which you  
24 issued back in August '86, which was followed by an advanced  
25 notice in December of that year, addressing the issue of

1 disposal of certain low level radioactively contaminated waste  
2 streams.

3 And in those documents, you suggested that those  
4 waste streams might be disposed of at sites other than low  
5 level waste sites, if the individual doses associated with  
6 disposal were no more than a few millirem per year.

7 Now it turns out that EPA is developing generally  
8 applicable environmental standards for land disposal of low  
9 level radioactive waste which includes a 4 millirem per year  
10 individual dose criterion for the BRC waste streams.

11 Internationally, both EPA and ourselves are not too  
12 far out of step because, for example, the Atomic Energy Board  
13 of Canada, in also dealing with waste streams that they would  
14 like to designate as being below regulatory concerns, are  
15 suggesting a 5 millirem per year number.

16 This BRC approach that I mentioned in terms of waste  
17 streams --

18 CHAIRMAN ZECH: Excuse me. Have any other countries  
19 put a number on it like that, do you know?

20 MR. LAHS: Let's see, the United Kingdom, I believe,  
21 has a number of, I believe it's 5 millirem per year, and then  
22 to account for multiple sources, I believe they divide by 10  
23 and get down to a half millirem per year. So they're all in  
24 the same ball park.

25 CHAIRMAN ZECH: So something around 5 or below?

1 MR. LAHS: Yes, for the waste streams.

2 CHAIRMAN ZECH: For the waste stream. All right.

3 Thank you.

4 MR. LAHS: But the point is the BRC approach can also  
5 be considered to respond, for example, to your request on March  
6 2nd directing the Staff to develop interim guidance for  
7 residual levels of radioactive contamination on lands or  
8 structures which could be released for unrestricted use  
9 following decommissioning. Now I am going to get into a little  
10 more detail on that effort in the resource part of my  
11 presentation.

12 Finally, at the bottom of the figure is the region of  
13 dose levels that would be low enough for the assumed risk to be  
14 considered as trivial by the individual, and that's what we  
15 have designated to be the de minimis or negligible individual  
16 risk level.

17 As a concept, the negligible risk level can be  
18 considered one in which no regulatory activity is required. To  
19 give you some feeling again for what others consider a de  
20 minimis risk, the National Council on Radiation Protection uses  
21 the phrase annual negligible individual risk level, and refers  
22 to this as the boundary below which the risk is dismissed from  
23 consideration.

24 Nationally, the Food and Drug Administration and the  
25 Environmental Protection Agency define a de minimis risk as

1 risk of one cancer per 100,000 to 1 million lifetimes. Now  
2 that translates into an annual fatality risk which generally we  
3 tend to deal with here on the order of about 10 to the minus  
4 7th or 10 to the minus 8th. So we're talking about small  
5 numbers.

6 Okay, I should mention, to give you again a feeling  
7 for the numbers, that when we talk about the Part 20 limits, we  
8 are talking about the upper limits, we are talking about  
9 individual doses in roughly the 100 millirem per year range.  
10 The supplementary standards are generally in the 25 millirem  
11 per year range, except for Appendix I, which is down 10 or 5,  
12 depending on what interpretation you want to make.

13 COMMISSIONER BERNTHAL: As a matter of curiosity,  
14 when other agencies, EPA or whoever, arrive at these  
15 spectacularly low numbers, do they assume a linear hypothesis  
16 as well? Because they certainly don't test large populations  
17 for reaction to substances at that level.

18 MR. LAHS: I believe when they are talking about the  
19 toxic substances, I don't believe -- and the Food and Drug  
20 Administration has an applicable linear hypothesis. With EPA,  
21 I believe they do use it, but I might stand corrected on that,  
22 if anybody knows anything.

23 COMMISSIONER BERNTHAL: I can't see how else they  
24 would do it, quite frankly.

25 MR. ALEXANDER: Yes, the EPA's radiation standards

1 are based on the linear --

2 COMMISSIONER BERNTHAL: No, I'm not talking about  
3 radiation. I am talking about all the other stuff --

4 MR. PARLER: Mr. Chairman?

5 CHAIRMAN ZECH: Yes.

6 MR. PARLER: Could someone identify the gentleman?

7 CHAIRMAN ZECH: Yes, please, thank you. Would you  
8 identify yourself, please, for the reporter?

9 MR. ALEXANDER: R.E. Alexander, Office of Research.

10 CHAIRMAN ZECH: Thank you.

11 COMMISSIONER BERNTHAL: Yes, my question was not  
12 about radiation, although I assume that yours was a more  
13 generic issue, when you're talking about FDA things, for  
14 example. What do they do about things like toxic substances?

15 MR. LAHS: The number I referred --

16 COMMISSIONER BERNTHAL: Are they in your hypothesis?

17 MR. LAHS: The -- I believe that's correct, because  
18 the number I was referring to was a -- came from a Superfund  
19 determination and some number that applies to toxic waste, not  
20 necessarily radioactivity. But I'd like to double-check that  
21 for you.

22 COMMISSIONER BERNTHAL: The number I don't -- it is  
23 whatever you say it is, but I'm curious as to how they arrived  
24 at that policy.

25 CHAIRMAN ZECH: What's the top of your chart, basic

1 regulatory dose limit? Can you talk about that for just a  
2 minute? And then below that somewhere, I guess, could you talk  
3 about what do we get living here in the Washington, D.C. area?  
4 What do they get living in different parts of the country?  
5 Just to put some perspective on the numbers.

6 MR. LAHS: As I mentioned, the basic regulatory  
7 standard in Part 20 is essentially, or will become 100, roughly  
8 100 MR per year to the individual, year in and year out, with I  
9 believe a maximum of 500 -- and again, Bob Alexander can  
10 correct me if I'm a little off on the numbers. Background in  
11 Washington, I would suspect is, if you count radon, is probably  
12 on the order of something a little less than 200, and the  
13 background over the country I guess varies from 100 to 300 MR  
14 per year, plus or minus 20 percent or so.

15 CHAIRMAN ZECH: Good.

16 MR. ALEXANDER: I didn't hear the upper range you  
17 gave.

18 CHAIRMAN ZECH: I said to 500.

19 MR. ALEXANDER: Yes.

20 CHAIRMAN ZECH: 100 to 500 throughout our country,  
21 depending on where you live?

22 MR. LAHS: Yes.

23 CHAIRMAN ZECH: Where is the highest radiation levels  
24 in our country, just as far as the --

25 COMMISSIONER BERNTHAL: In your basement.

1 [Laughter.]

2 MR. LAHS: In terms of cities, I would suspect it's  
3 something like Denver.

4 CHAIRMAN ZECH: Yes. Why?

5 MR. LAHS: Because of the --

6 CHAIRMAN ZECH: The altitude, I guess, right?

7 MR. LAHS: Yes.

8 CHAIRMAN ZECH: I imagine. Is that right?

9 MR. LAHS: Yes.

10 CHAIRMAN ZECH: Okay. All right, that's fine.

11 MR. LAHS: Okay. Let me --

12 COMMISSIONER BERNTHAL: Let me just make the point  
13 here that the canonical number for average radiation dose is  
14 simply -- was recently nearly doubled from the single influence  
15 of radon, as you know. It's up to 300 or something like that.

16 MR. STELLO: I just asked Bob, and he just told me  
17 the number was -- average in the country now, including radon,  
18 is 300 millirem per year average.

19 CHAIRMAN ZECH: Including radon?

20 MR. STELLO: Yes.

21 MR. LAHS: 200 roughly, from radon.

22 CHAIRMAN ZECH: What kind of a dose would you get if  
23 you flew an airplane from New York to Los Angeles?

24 MR. LAHS: I think it's a few millirem, but I'm not  
25 sure. I'd have to double-check. You mean --

1 CHAIRMAN ZECH: Just say one trip.

2 MR. ALEXANDER: 5 millirem.

3 CHAIRMAN ZECH: 5 millirem. So if you did a number  
4 of trips a year, it would be five times how many number of  
5 trips you made a year; right?

6 MR. LAHS: That's right.

7 CHAIRMAN ZECH: It would add to your yearly dose. Do  
8 the airlines keep track of their pilots and attendants? Do you  
9 know?

10 MR. LAHS: I don't believe so, no.

11 CHAIRMAN ZECH: Is there any concern about that?

12 MR. ALEXANDER: Yes, they are investigating now the  
13 necessity for monitoring the radiation doses of the flight  
14 crews and establishing a criteria, occupational dose criteria  
15 for them. But those have not yet been adopted or enforced.

16 CHAIRMAN ZECH: All right.

17 MR. STELLO: One other interesting number -- I have  
18 asked Mr. Alexander to join us at the table -- if I remember  
19 right, the average exposure at our nuclear plants is averaging  
20 I think it's on the order of half a millirem per year, living  
21 in the vicinity of a nuclear plant now? The average?

22 MR. ALEXANDER: Oh, no, for the people who live  
23 within 50 miles of a nuclear power plant, the average annual  
24 radiation dose is 7 microrem per year.

25 COMMISSIONER BERNTHAL: What about 10 miles?

1           MR. ALEXANDER: I'm sorry, Commissioner, the only  
2 number I have in mind right now is the average out to 50 miles.  
3 I don't know what it is to 10 miles.

4           COMMISSIONER BERNTHAL: It seems like that's probably  
5 a more pertinent number, for a variety of reasons.

6           MR. LAHS: If I could go on then, before we leave  
7 this framework slide, I would like to make one last point  
8 regarding what we called in the Commission paper de facto BRC  
9 levels that are currently in NRC regulations. I think a brief  
10 discussion of these exemptions may illustrate a consistency in  
11 the release standards that may not be immediately obvious,  
12 because the exemptions are often specified in terms of  
13 radionuclide quantity concentrations, and the relationship to  
14 individual or population dose is not always specifically called  
15 out.

16           Examples of these de facto levels include things like  
17 exempt quantities and concentrations of various materials --  
18 materials in various consumer and industrial products which  
19 show up in Part 30, exempt concentrations of tritium and  
20 carbon-14 in animal carcasses and scintillation fluids requiring  
21 disposal which appear in Part 20, and exempt quantities of  
22 soluble or dispersable radioactive material for release into  
23 sanitary sewer systems which also appears in Part 20.

24           The part I am trying to make here is that it was  
25 often possible for these exemptions and a lot of exemptions on

1 consumer products to be based on practical requirements or  
2 needs for the radioactive material associated with a specific  
3 source or practice.

4 As a result, the estimated individual doses which  
5 could potentially be associated with exposure to some of these  
6 practices and sources can be in the microrem range. A  
7 magnitude of individual dose that we have just got done  
8 discussing, which we probably can justifiably argue is in the  
9 negligible risk area.

10 So what's happened in a sense is that you've made --  
11 at least in my mind you're making BRC determinations, but  
12 because of the practicality of the situation, many times in our  
13 regulation that shows up as a limit which is really a  
14 negligible individual risk level, in my mind.

15 These exemptions were promulgated by previous  
16 Commissions, not because they were always entirely risk-free,  
17 but because either as I mentioned before, the degree of risk  
18 was too small to justify the burden of additional regulatory  
19 constraints, or else little, if anything, would be gained in  
20 terms of risk reduction by the addition of regulatory controls.

21 There's another important point. You may also be  
22 aware that limited regulatory controls are often associated  
23 with some of these BRC levels. Something the name "below  
24 regulatory concern" doesn't necessarily imply, especially to  
25 people not familiar with the concept.

1           For example, when we were talking about disposal of  
2 the waste streams, where you can dispose of those waste streams  
3 is going to be limited, probably to sanitary landfills or to  
4 incineration.

5           Licensees may be required to perform radiological  
6 surveys, maintain exposure records, and be subject to NRC  
7 inspections for compliance.

8           In summary, then, the risk associated with specific  
9 BRC levels may -- and I want to emphasize may -- be what most  
10 people would consider trivial. But once the conditions for  
11 definition of BRC levels are defined and incorporated into  
12 practice, through either license conditions or into our  
13 regulations, additional measures taken by the licensees or the  
14 public to further reduce risk would be essentially entirely  
15 voluntary.

16           CHAIRMAN ZECH: When those decisions were made, are  
17 you aware, was there any attempt at consistency? Was there any  
18 attempt to bring them together? Any attempt to look at all of  
19 them as a whole, rather than each one individually?

20           MR. LAHS: I think the one thing they had in common  
21 was that they all had justification of practice, was a major  
22 factor. As far as -- like I say, you could look at something  
23 like allowable amounts of material say in a smoke detector, and  
24 people have done calculations in looking at what individual  
25 exposures could result from americium-241. You might come up

1 with the number of 9 microrem, and people have actually figured  
2 out population doses from smoke detectors. From some other  
3 consumer product, it could be something much higher or lower.  
4 And the reason being because the standards were essentially set  
5 in most cases based on essentially what was needed.

6 In other words, there was not a consistency in dose  
7 level, although there was a consistency in establishing the  
8 levels in the regulations, because it was based on the --

9 CHAIRMAN ZECH: But a determination had to be made  
10 that it was certainly not a health hazard or hazardous to the  
11 human being --

12 MR. LAHS: Yes.

13 CHAIRMAN ZECH: Is that -- I'm sure that --

14 MR. LAHS: Well, obviously when we're talking  
15 microrems or --

16 CHAIRMAN ZECH: Yes, but I mean below that, as far as  
17 you know, apparently there was not any attempt to look at the  
18 whole of these various specific items?

19 MR. LAHS: I believe that's correct. Bob, do you  
20 have anything -- Bob Bernero?

21 MR. BERNERO: No.

22 MR. LAHS: Okay. I think that's right.

23 CHAIRMAN ZECH: All right. Fine. Thank you.

24 MR. STELLO: The answer is they were not.

25 CHAIRMAN ZECH: All right, proceed. Thank you.

1 MR. LAHS: Okay, at this point I'd like to discuss  
2 some technically oriented policy development considerations on  
3 the next slide, please.

4 We just got done discussing that from the Staff's  
5 viewpoint, there are at least two different types of low level  
6 regulatory cut-offs, one which we call below regulatory  
7 concern, and one which we call negligible risk, or de minimis  
8 risk.

9 Okay, the first item coming down, and it says if BRC  
10 cut-offs are to be established, one of the first questions we'd  
11 have to address is whether generic or source or activity-  
12 specific cut-offs should be developed.

13 Now if we go the generic route, you say, well, how  
14 could I defend such a number? Well, you might do just what you  
15 were doing earlier. You'd say, well, maybe you could defend  
16 the number based on some small fraction of background, some  
17 small fraction of variation background; the number of flights  
18 you take across the country in a year. In other words, you  
19 have to use those sort of comparative arguments to justify a  
20 generic number.

21 The latter approach, by being -- because of the fact  
22 that it is source-specific, would definitely allow the  
23 possibility of using value impact or cost risk aversion  
24 arguments which implies at least a qualitative consideration of  
25 potential population doses associated with individual practices

1 or activities. And it's that approach, in fact, which EPA is  
2 using in trying to come up with their number for the disposal  
3 of waste streams.

4 The second bullet. One should also consider how to  
5 characterize cut-off levels. We've mentioned you could  
6 characterize them in terms of risk, individual dose, population  
7 dose, quantities, concentrations, or combinations of those  
8 parameters. The reason that's important is that for any  
9 regulatory cut-off policy to be useful, it has to be  
10 implementable. This suggests that even if cut-offs can be  
11 defined in terms of individual or population doses, somewhere  
12 along the line, these doses have to be translated into  
13 measurables. I mean if you're decommissioning this room, you  
14 have to translate that into what's going to be allowed on the  
15 surface of these walls, or what the concentration is going to  
16 be on the particular waste stream that you're going to allow to  
17 go into the landfill.

18 This then brings up the, I guess, familiar regulatory  
19 issue of consistent modeling. That is the regulatory agency  
20 then has to assure itself that a consistent and proper level of  
21 realism or conservatism is used in translating these measurable  
22 levels of radioactivity into estimates of individual or  
23 population doses.

24 Okay, the third consideration applies probably to the  
25 development of either BRC or negligible risk levels, and

1 relates to how one deals with the issue of potential exposures  
2 to multiple sources, and again you can again think about  
3 dispose of the waste streams, that if I tell you that disposal  
4 of a particular waste stream should not lead to an individual  
5 dose greater than 4 MR per year, and it's going to go to a  
6 certain particular landfill. The question, though, is how do  
7 we assure ourselves that more than one waste stream is not  
8 coming into that landfill, or from exposure to consumer  
9 products. Somewhere along the line we have to make a judgment  
10 how many consumer products an individual can be exposed to.

11           The fourth item really again is tied into whether  
12 we're going to be doing source-specific or generic  
13 determinations in terms of BRC levels, because if we do the  
14 source specific, it will bring population dose into the  
15 derivation of those levels, and implies that we'd be doing some  
16 sort of a cost-risk trade-off. So you get into what again is  
17 the appropriate number to convert a manrem into dollars.

18           Finally, the fifth consideration arises if the BRC  
19 levels or in fact de minimis levels are converted into fatality  
20 or cancer risks. Here if these sorts of determinations or  
21 conversions are made, the Commission essentially would be  
22 establishing, or maybe a better word would be reinforcing what  
23 is really probably a questionable practice of extrapolating the  
24 use of risk coefficients down to dose levels, where their use  
25 is really naturally supported by other data.

1           And then finally the last item is mentioned because  
2 of the choice of negligible risk level, as we have already  
3 mentioned it, in our minds, anyway, as more of a subjective  
4 judgment which is going to be somewhat difficult, I think, to  
5 quantify.

6           COMMISSIONER CARR: Why do you call those  
7 technically?

8           MR. LAHS: Well, the next viewgraph.

9           COMMISSIONER CARR: Well, but you said that last one  
10 is subjective down there. There's nothing technical about that  
11 last bullet you just explained.

12           MR. LAHS: Well, I guess that's a matter of  
13 interpretation. I guess you're right. It could come over into  
14 the next chart in terms of the -- I guess I see it as -- it's a  
15 judgment, we're saying, by the individual, but it becomes a  
16 technical issue in the sense that the Staff then has to somehow  
17 make a judgment on what most reasonable individuals would  
18 consider an individual risk level.

19           Okay. The next viewgraph is an attempt to identify  
20 the major authorities and regulations which are likely to have  
21 a significant impact on the development of regulatory cut-off  
22 policies, and the point which I've made before, and which is  
23 reemphasized here, is that there are really a number of  
24 significant players in the regulatory cut-off game, and many  
25 have already established or are establishing collective dose or

1 individual risk cut-offs for their specific purposes, and as a  
2 result, if we in the Commission are going to establish and  
3 implement a Commission BRC negligible risk policy, the logic of  
4 that policy and the levels which are set will have to be  
5 understood, defended, or put into context in light of these  
6 other cut-off levels, and radiation protection policies, mainly  
7 those put out by EPA.

8 CHAIRMAN ZECH: What standard did EPA apply when they  
9 established the radiation level in the Safe Drinking Water Act  
10 and the Clean Air Act?

11 MR. LAHS: That essentially is a 4 millirem per year  
12 value.

13 CHAIRMAN ZECH: 4 millirem per year, that's what they  
14 used.

15 MR. LAHS: For the individual dose limit.

16 CHAIRMAN ZECH: And they considered that then --

17 MR. LAHS: Before treatment, that's right.

18 CHAIRMAN ZECH: Before treatment, safe drinking water  
19 levels, and for air also?

20 MR. LAHS: For air, I believe it's 25 millirem per  
21 year.

22 COMMISSIONER BERNTHAL: Yes, I think the question  
23 then is how did they decide on those numbers?

24 MR. BERNERO: May I interject, Bill? One of the  
25 difficulties we have is the EPA standards are fragmented, and

1 they are subject to change, and we are in active dialogue with  
2 EPA right now because their -- what we call the fuel cycle  
3 standard, where they chose 25 for the fuel cycle, they are  
4 looking at low level waste standards now, and they may go down  
5 to something more like 4 millirem per year for that, and that  
6 has sort of a domino effect, because if you judge that to be  
7 appropriately at 4, they may reconsider these others.

8 They had a big hearing back in the mid '70s, the same  
9 time we had an Appendix I hearing, and it looked at the  
10 technology of the fuel cycle, what the different doses were  
11 from. It looked at epidemiology by what biological effects  
12 could be inferred, but basically did a long risk-benefit, cost-  
13 benefit sort of analysis in choosing those standards. And now,  
14 you know, they are always subject to that revision.

15 CHAIRMAN ZECH: And we are working with them closely  
16 now on this?

17 MR. BERNERO: Yes, we are. We have direct dealings  
18 with EPA on a regular basis, and also through what is called  
19 the CIRRPC Committee, the interagency committee.

20 CHAIRMAN ZECH: Okay, thank you.

21 COMMISSIONER CARR: I don't understand why we've got  
22 more of a problem than they had.

23 MR. LAHS: Well, in fact, they had the same problem,  
24 and that's one of the reasons --

25 COMMISSIONER CARR: Only they solved theirs.

1 MR. LAHS: They haven't yet, but for example, in  
2 terms of the BRC waste streams, the -- I believe they would  
3 have -- and this may be putting some words in their mouth, I  
4 believe they could have justified a somewhat higher number, but  
5 they chose the 4 millirem per year value --

6 COMMISSIONER CARR: For whatever the reason, they  
7 picked one.

8 MR. LAHS: Yes. Oh, that's correct. Then you're  
9 correct. I see what you're saying.

10 COMMISSIONER BERNTHAL: Bob just referred to the key,  
11 though, and that's a "long cost-benefit or risk-benefit  
12 analysis." What did they use for that analysis? I mean there  
13 really is a figure of merit hidden somewhere in that, which  
14 presumably is expressed in terms similar to the ones that we  
15 use here. What did they use?

16 MR. LAHS: Right. They traded off the savings in not  
17 having to send waste streams to the low level waste sites  
18 against increased -- in this case it would be increased  
19 different levels of population exposure.

20 COMMISSIONER BERNTHAL: Yes, but what was the  
21 population exposure criterion? Was it -- how many dollars per  
22 rem avoided, or whatever, million dollars per human life, or  
23 however you want to express it?

24 MR. LAHS: I believe they used the same numbers we  
25 did, about \$1000 per manrem, but again I'd like to check that

1 out for you and come back to you.

2 CHAIRMAN ZECH: All right, let's proceed.

3 MR. ALEXANDER: That's the one point I think that  
4 Senator Bernthal --

5 [Laughter.]

6 MR. ALEXANDER: -- Commissioner Bernthal --

7 COMMISSIONER BERNTHAL: I'm not sure whether that's a  
8 promotion.

9 [Laughter.]

10 MR. ALEXANDER: Promotion was intended, Commissioner.

11 The point I wanted to make was that neither the EPA  
12 nor the NRC has the benefit of recommendations from the NCRP or  
13 the ICRP in making these decisions. Agencies like ours  
14 normally have such recommendations for setting the upper limits  
15 on exposure, but when you get to the low levels of trying to  
16 decide where to discontinue regulation, we're on our own.

17 COMMISSIONER CARR: That ought to make it easier to  
18 work.

19 CHAIRMAN ZECH: All right, let's proceed.

20 MR. LAHS: All right. Then I'd like to, I guess, now  
21 discuss some more, I guess, nuts and bolts type items. The  
22 first having to do with Staff efforts relative to the  
23 international symposium's regulatory authorities on the use of  
24 these regulatory cut-off concepts; and second, complete the  
25 presentation of the Staff's reviews regarding preliminary

1 resource estimates associated with the development of various  
2 regulatory cut-off policies.

3 On the former, the Staff has initiated efforts to  
4 convene a symposium because of the obvious international  
5 implications of the Commission's desire to identify this level  
6 of radiation risk below which government regulation becomes  
7 limited or unwarranted.

8 We had initially planned for a meeting on September  
9 20th to 22nd of this year, but it appears there's a conflict  
10 overseas, so it may have to be delayed either one week or into,  
11 I believe it's the second week of October, so that's still  
12 being worked out, to be held here in Washington. The meeting  
13 will be held by us in cooperation with the Nuclear Energy  
14 Agency. Letters have already been exchanged. In fact, George  
15 sent a letter to Klaus Stadte, and we have received a favorable  
16 reply late last month.

17 Dick Cunningham of NMSS will be attending a joint  
18 committee of Radiation Protection and Public Health, a CNSI  
19 Bureau meeting tomorrow, and is carrying with him NRC's  
20 suggestions for a symposium agenda.

21 As you can get from this briefing, we are still in  
22 the process of developing an NRC position which could serve as  
23 the focal point for symposium discussion.

24 On the help side, we have a contract with the Oak  
25 Ridge Associated Universities to provide us technical

1 assistance to both formulate and conduct and summarize the  
2 symposium.

3 COMMISSIONER CARR: Now Research has got the lead on  
4 this, haven't they?

5 MR. LAHS: Yes.

6 COMMISSIONER CARR: And have they got the lead in the  
7 symposium, too?

8 MR. LAHS: Yes. I thought the first question had to  
9 do with the symposium. You were talking about the policy  
10 statement?

11 COMMISSIONER CARR: I guess I'm talking about all of  
12 it, but they aren't IREP to the symposium?

13 MR. LAHS: Well, I think the representation at the  
14 symposium will be -- you know, will be somebody pretty high  
15 level, so it might be Vic Stello or could be somebody high up  
16 in NMSS or --

17 MR. STELLO: If you're asking who's responsible for  
18 --

19 COMMISSIONER CARR: I'm asking why we don't send the  
20 guy who's got the responsibility to take charge of the program  
21 and march off.

22 MR. STELLO: Research is doing that. The reason Dick  
23 Cunningham is over there for a different purpose, he is the  
24 chairman of a particular long-standing committee on radiation  
25 protection, the international committee, and he is going to

1 introduce this subject to that committee, which he is a  
2 standing member of.

3 COMMISSIONER BERNTHAL: I guess I'm -- it always is  
4 deflating to see how long it's going to take to do anything  
5 around here, but I'm just looking at the proposed schedules  
6 here. Is there really so little in the record or in the  
7 Commission's various utterances over the years with, one hopes,  
8 supporting data to deal with various problems? Do we not have  
9 some long standing sense around here of starting out from the  
10 fundamental here, which really is the kind of thing we're  
11 speaking about a few minutes ago, the value, like it or not,  
12 that you attach to a human life? Do we have to start all over  
13 from scratch again in this area, or --

14 MR. LAHS: No, I don't think we're starting over from  
15 scratch. Let me get into this, and I can tell you what's gone  
16 through our thinking in coming up with these schedules and the  
17 resources and, as you know, the problem -- some of these  
18 problems have been on the books for like 10 years, I guess.

19 MR. PARLER: About 28, sir.

20 COMMISSIONER BERNTHAL: Yes. As long as the General  
21 Counsel's been here.

22 [Laughter.]

23 COMMISSIONER CARR: Could I ask one question? What  
24 do we hope to get out of that symposium?

25 MR. LAHS: Well, I guess the best we could hope to

1 get out of the symposium, if we got a general consensus  
2 internationally on the need to develop both below regulatory  
3 concern and negligible risk levels --

4 COMMISSIONER CARR: Oh, you can get that, surely, the  
5 need -- I mean, what I would hope is somebody go over there  
6 with a straw man and get an agreement on what to come out with.

7 MR. LAHS: Well, when you say that, I think you'll  
8 find that the -- overseas, from the material that I've read,  
9 anyway, that everything they are doing in terms of what they  
10 call unfortunately setting de minimis risk levels is really  
11 what we call below regulatory concern. The reason I say that  
12 is because justification of practice is always a presumption,  
13 when they are talking about this subject.

14 Here we are going to be talking about the possibility  
15 where justification of practice is -- I don't say there is  
16 none, but certainly it's questionable or very hard to quantify.  
17 I'm thinking along things like some of the consumer products.

18 COMMISSIONER BERNTHAL: Well, maybe we can agree  
19 fairly quickly that de minimis is the wrong word to use; that  
20 there is no point at which risk is zero. I think that's an  
21 easy assumption to start out from, and we can then start  
22 talking about below regulatory concern with some rational basis  
23 for it, and Lord knows we've been -- we've been ad-hoccing  
24 rational bases for various actions for years around here. And  
25 I guess I am just surprised that we sort of start all over

1 again reinventing the wheel, in fact.

2 MR. SPEIS: I think at this symposium we will discuss  
3 substantial questions like the form and the framework of these  
4 levels. So we will have our positions and put them on the  
5 table, and hopefully we can get some consensus. So that's the  
6 objective, basically, you know. They are not going to dictate  
7 to us, but we will do our homework and put on the table what we  
8 think makes sense, and you know, with a good dialogue with our  
9 counterparts in the other parts of the world, come up to some  
10 understanding.

11 COMMISSIONER BERNTHAL: And this symposium will  
12 happen next fall, you say?

13 MR. SPEIS: Yes. You know, in the summer, it's very  
14 difficult to get all these people from all of the countries  
15 together in Europe.

16 COMMISSIONER BERNTHAL: What would be wrong with this  
17 agency consulting with the ACRS, perhaps consulting with our  
18 own expert staff, with other agencies, and at least taking the  
19 step of putting an advanced notice out on the street in the  
20 meantime? Anything wrong with that?

21 MR. LAHS: Well, a lot of that is being done. I mean  
22 -- and let me tell you the formulation just of this information  
23 paper, there was considerable involvement with NMSS and NRR and  
24 Research.

25 MR. STELLO: Let me suggest that one of the things

1 that I hope we will be able to do is to provide for the  
2 Commission for endorsement of carrying to that particular  
3 meeting, just as Commissioner Carr said, a straw man proposal  
4 to raise as a possible mechanism to establish some numbers  
5 finally, and framework. I hope that we can have that.

6 COMMISSIONER BERNTHAL: Yes, I think that's a good  
7 idea, except that I would hope the proposal is a little better  
8 than a straw man. I mean it should reflect the fundamental  
9 precepts we have used around here for years, and that's why I  
10 sort of wonder whether why you can't proceed from that thesis  
11 to a fairly -- an advanced notice of proposed rulemaking, for  
12 example, should not be a straw man. One hopes that one puts  
13 something on the street that reflects a reasoned judgment in  
14 the agency, and I would think by now that we have already had  
15 such a thing.

16 MR. STELLO: Well, we realize we already have \$1000  
17 per manrem.

18 COMMISSIONER BERNTHAL: I know.

19 MR. STELLO: As a requirement now. How that can be  
20 used to produce a number to suggest here is where you will  
21 establish below regulatory concern in all of the areas that we  
22 are responsible for regulating, is not easy.

23 COMMISSIONER BERNTHAL: Well, no, that doesn't  
24 translate immediately, I agree, but --

25 MR. LAHS: Well, look up there, you have an advanced

1 notice of proposed rule out on the waste streams, for example,  
2 so you have already issued --

3 CHAIRMAN ZECH: That's out already.

4 MR. LAHS: Right. Something is already out on the  
5 specific source. I guess one of the bigger questions is, is  
6 that the way you want to continue, or you know, do you --

7 CHAIRMAN ZECH: It might be interesting for the  
8 Commission to receive any comments you have received on that  
9 advanced notice in a summary form. It might be very helpful  
10 for us to see what's come in so far.

11 COMMISSIONER BERNTHAL: But I have no problem at all  
12 dropping the concept of de minimis. I was told when I was in  
13 Italy that it was improper Latin, anyway, so we ought to just  
14 forget about it. I think really what we are talking about here  
15 is below regulatory concern. I'm not interested in arguing  
16 whether something is -- can or cannot in principle be a de  
17 minimis level.

18 MR. LAHS: Okay. But the following question is would  
19 you match up something like a consumer product, like the  
20 gemstone issue against the NRC level? Or are you thinking of  
21 lower levels?

22 COMMISSIONER BERNTHAL: I think so, yes.

23 MR. LAHS: Okay. Well, that's --

24 COMMISSIONER BERNTHAL: And get away from this  
25 frivolous concern standard, which is a separate issue, but

1 frivolous application, I guess, for frivolous use, which is an  
2 impossible standard.

3 COMMISSIONER CARR: The line here we have got now  
4 drawn at 5 MR?

5 MR. LAHS: It's supposed to be 5, something in that  
6 area.

7 COMMISSIONER CARR: What's wrong with that? That's a  
8 good line. I'll buy that.

9 MR. LAHS: I'll look forward to your comment on that.

10 COMMISSIONER CARR: Well, I mean, what's left, you  
11 know? I mean --

12 MR. LAHS: Those are the numbers that are being  
13 considered, that's right.

14 MR. ALEXANDER: Commissioner, we want to be careful.  
15 For example, if you take the Commission's safety goals and  
16 translate that into a generic BRC level, it comes out about 15  
17 or 16 millirems per year. So if that would be a preferable,  
18 more reasonable number to use, one providing further distance  
19 from the negligible level, we'd like the opportunity to study  
20 that and make a presentation to you to that effect.

21 COMMISSIONER CARR: I don't understand what you just  
22 said.

23 MR. ALEXANDER: I just said -- what I'm saying is  
24 that a level higher than 5 millirems per year might be a more  
25 reasonable number --

1           COMMISSIONER CARR: Okay, pick it out. I mean what's  
2 -- what are we -- how long is it going to take us to decide  
3 that number?

4           COMMISSIONER BERNTHAL: Three years.

5           COMMISSIONER CARR: Well, it's taken more than that.  
6 I got papers here that go back to when, you know.

7           MR. MORRIS: I think that one of the things that we  
8 are recognizing here is that we won't be doing this, the  
9 Commission will not be making this decision in a vacuum. EPA  
10 will be making decisions about comparable levels of --

11           COMMISSIONER CARR: Well, they made theirs in a  
12 vacuum.

13           MR. MORRIS: And foreign nations will be making other  
14 decisions, having other positions, and it was our intent to  
15 bring as much of that information to light on this issue as we  
16 can through the mechanism of the international symposium, and  
17 recognizing what the EPA is going to be doing as it tries to  
18 deal with a court decision on how to use -- whether or not and  
19 in what circumstances it may use cost-benefit analysis in  
20 establishing standards. So the point that we make is that  
21 there's a lot of dynamics that are going on.

22           We would agree that we could, in principle, set forth  
23 a standard such as what you just mentioned.

24           COMMISSIONER CARR: Some number.

25           MR. MORRIS: And that would be the thing that we

1 would propose to do in our document that we prepare before the  
2 international symposium. So we will get that for you.

3 And the other thing I would point out is there are a  
4 number of activities going on in terms of specific BRC levels,  
5 the work we will be doing on BRC waste streams for reactors,  
6 and we have intended also to develop a BRC level for  
7 decommissioned lands and structures.

8 CHAIRMAN ZECH: Will you talk about decommissioning a  
9 little bit? You haven't talked about that, I don't think, and  
10 that might relate to what we're talking about now because, you  
11 know, the residual activity matter in decommissioning has been  
12 considered --

13 MR. LAHS: That will be the third item down here on  
14 this last slide.

15 CHAIRMAN ZECH: All right.

16 COMMISSIONER CARR: Well, I don't get the warm  
17 feeling that we are going to get through. I mean, all those  
18 words you gave me -- all the things you can think about that we  
19 have still got to do, and what we have got to consider --

20 MR. MORRIS: Think of it in terms of two different  
21 kinds of things that are going on. One is a set of specific  
22 activities that we are engaged in to deal with specific waste  
23 streams or specific activities.

24 COMMISSIONER CARR: That's only one option. You  
25 don't have to go that way.

1 MR. MORRIS: That's correct. We could --

2 COMMISSIONER CARR: Okay.

3 MR. MORRIS: -- could back out of that and try to  
4 come up with a generic policy.

5 COMMISSIONER BERNTHAL: That's right, and I think  
6 that's what the Commission was asking for, is it not? I  
7 thought that was the general gist of the SRM that we wrote on  
8 this gemstone thing.

9 MR. MORRIS: But remember Bill's point earlier, that  
10 having a policy on what dose level you want to reach, 5  
11 millirem, does not provide you with a measurable quantity that  
12 you can use in practice very easily, such as the contamination  
13 levels for land or for structures. Those levels have to be  
14 evolved from the models that you build for decommissioning, and  
15 for the --

16 CHAIRMAN ZECH: But as far as the gems were concerned  
17 --

18 COMMISSIONER CARR: When you say not measurable, do  
19 you mean not measurable by what? Instrumentation?

20 MR. MORRIS: No, contamination levels of lands or  
21 structures could be measured by instrumentation. Dose levels  
22 that individuals would encounter would be the result of not  
23 only those contamination levels, but a model for how the  
24 population would be receiving that dose. So setting the dose  
25 level doesn't get the agency to where it eventually is going to

1 have to go in terms of determining measurable quantities.

2 CHAIRMAN ZECH: No, but when you provided us the  
3 gemstone business, I think, as I recall, you provided us a  
4 paper that showed the anticipated radiation levels expected  
5 from those, and you provided them in picocuries or something,  
6 but if you could do that for that particular item, I think what  
7 the Commission is trying to get at is -- and that was useful,  
8 but we're trying to come up with a number that we can all agree  
9 that will be below regulatory concerns, and if you could do it  
10 for the gemstones issue, if you can do it for decommissioning  
11 certain things, if you can do it for other things, then we're  
12 wondering what's the big problem.

13 MR. LAHS: Well, as you're saying, for multiple  
14 exposures, for example, from more than one source becomes a  
15 problem; how are you going to handle that.

16 CHAIRMAN ZECH: All right, fine.

17 COMMISSIONER CARR: I'm not sure --

18 MR. LAHS: What Bill was trying to mention was, for  
19 example, even though I tell you that this room is contaminated  
20 and I'm going to allow you to decontaminate this room to a  
21 level which I will say will not lead to a maximum individual  
22 dose greater than -- let's take the number 10 millirem per  
23 year. Whether you go generic or source-specific, somebody  
24 along the line has got to translate that into what am I going  
25 to allow in terms of curies per centimeter or per meter squared

1 on that wall.

2 COMMISSIONER BERNTHAL: But that's --

3 COMMISSIONER CARR: That's simple. Are you going to  
4 allow that person in there 24 hours a day, 365 days a year?

5 MR. LAHS: That's the sort of modeling you have --

6 COMMISSIONER CARR: Then it's easy to figure out the  
7 number.

8 COMMISSIONER BERNTHAL: I guess I think that we  
9 should not get hung up on problems that are secondary, or  
10 problems of implementation. It is the same problem that we --  
11 as you know, you have gone through more than we, I would say,  
12 with respect to the extraordinary nuclear currents criteria,  
13 measurement vs. dose, and that kind of stuff. Of course, in  
14 every individual case you're going to have modeling problems.  
15 There will be a specific set of difficulties in applying a  
16 generic standard for every single case, but that's always going  
17 to be there. It just seems to me that starting with a generic  
18 standard is already going to be of tremendous regulatory  
19 assistance to us, in separating the wheat from the chaff. Then  
20 at least you only have to prove that you're meeting the  
21 standard instead of sort of ad hoc'ing it case by case, as we  
22 go along, like we've been doing for 27 years, is it?

23 MR. PARLER: A long time, yes, sir, since the early  
24 '60s.

25 COMMISSIONER CARR: That's all I have.

1 CHAIRMAN ZECH: All right. All right, proceed.

2 MR. STELLO: I'm not sure Commissioner Carr got an  
3 answer to the question. Let me see if I've got the question,  
4 because I think it deserves one.

5 Are you looking for when will the Staff provide you  
6 with a recommended number that can be used to characterize it  
7 as below regulatory concern --

8 COMMISSIONER CARR: De minimis is below that. You  
9 can forget de minimis. Just give me the BRC number, and I  
10 don't have to worry about anything else.

11 MR. STELLO: The answer to the question is we want to  
12 have that number that will have the backing, in a preliminary  
13 sense, as a reasonable basis, along with a lot of other baggage  
14 with it, to carry into the meeting that we are going to go to  
15 this fall. So the answer to your question is it will be before  
16 this fall. That's what we are hoping to have to take into the  
17 meeting with us. That means that's going to be what we think  
18 is -- again characterize it as a preliminary view of the  
19 Commission, because it will have to make a final decision some  
20 time later. That will require us to work with DOE, with EPA,  
21 as partners.

22 COMMISSIONER CARR: Yes, I guess that's what I don't  
23 understand. If we don't have to depend on them for any  
24 numbers, and the international community is only going to  
25 listen and critique and kibitz --

1 MR. STELLO: Oh, no, they're coming --

2 COMMISSIONER CARR: -- why can't we just do it  
3 ourselves?

4 MR. STELLO: I don't think you practically can  
5 because there is dual responsibilities of regulating --

6 COMMISSIONER CARR: Well, EPA did it.

7 MR. STELLO: Well, yes, we're dealing with Part 20 as  
8 well, but I think when you finally settle down, I think you're  
9 going to have to have a particular policy that will guide all  
10 of the agencies that have responsibilities for this activity in  
11 the country.

12 COMMISSIONER CARR: Well, who's the lead agency?

13 MR. STELLO: I think we think we are, and that we're  
14 going to --

15 COMMISSIONER BERNTHAL: Well, maybe we ought to lead.

16 COMMISSIONER ROBERTS: You might get some argument  
17 from other people.

18 COMMISSIONER CARR: I thought EPA was the lead  
19 agency.

20 MR. STELLO: Well, we're taking the lead in trying to  
21 get the answers, how's that.

22 COMMISSIONER ROGERS: If you have a set of  
23 expectations or a position as you go into that symposium, have  
24 you asked yourself precisely what it is that would change that  
25 as a result of the symposium, what kinds of things would happen

1 at the symposium that would lead you to change those numbers or  
2 assessments or positions, and try to come in some way at what  
3 the issues are? The thing I have trouble with in this  
4 presentation, and the whole problem is, I don't quite  
5 understand what the issues are. It seems to me that they're  
6 not very clear and transparently obvious to me what it is that  
7 you don't know, what it is you have to find out, and what  
8 decisions have to really be made. And if that could all be  
9 sorted out some way so that one can see where the uncertainties  
10 are or what decisions have to be resolved, either through  
11 further study or just somebody makes a decision, it's not  
12 clear.

13 I mean, after all, I hope we are not going to come  
14 out of that symposium with a result that simply is determined  
15 by how many people voted one way versus voted another way, and  
16 if that's the case, then you know, why do it that way.

17 So I'm just really uncomfortable with what I don't  
18 understand to be the issues that are an impediment to your  
19 coming to something right now. Is it a lack of data, a lack of  
20 understanding, a lack of agreement on some principles that you  
21 can't establish or haven't been able to establish one way or  
22 the other by some scientific means or what? What is it? What  
23 is it that is holding up grabbing ahold of this thing and  
24 moving ahead with it? What has changed over the last 28 years  
25 that have taken us from a state of ignorance to a state of less

1 ignorance where we are today? And where are we? I don't see  
2 it in a framework that I can understand at the moment.

3 MR. LAHS: Well, again, I think the big issue is here  
4 is your -- you're a regulatory agency and you're trying to set  
5 a threshold below which you're saying you're not going to be  
6 concerned any more. That in itself is quite a task. And, in  
7 fact, like I say, if you look at the international -- what the  
8 international people are doing, you might not be too happy with  
9 the members there. They're talking about 1 millirem per year.  
10 The question is --

11 COMMISSIONER ROGERS: Well, happy or unhappy with the  
12 numbers, that's a different question. The question is what  
13 kind of principles are going to guide you? Are you guided by  
14 whether people are happy or unhappy with the numbers, or are we  
15 guided by something that we think is a little more solid?

16 MR. LAHS: Okay. Well, we said if you're going  
17 generically, you're going to have to make your arguments based  
18 on comparisons with things like background, comparisons with  
19 variations in background. So somebody is going to have to pick  
20 the numbers, like you did in the safety goal, a tenth of a  
21 percent. Now was that the right number? I mean those are the  
22 things you have been arguing about.

23 COMMISSIONER BERNTHAL: Well, but I think  
24 Commissioner Rogers' point is a very good one, that you aren't  
25 going to arrive at the answer by taking a vote, and --

1 MR. LAHS: No, I don't think we intend to take a  
2 vote.

3 COMMISSIONER BERNTHAL: The international community  
4 may well these days be driven by considerations that are not  
5 grounded purely in the science.

6 MR. ALEXANDER: I think I might be able to shed a  
7 little bit of light on Commissioner Rogers' question, and also  
8 on Commissioner Zech's question, by giving you a very brief  
9 report on the interagency committee's work toward establishing  
10 criteria for decommissioning facilities and structures.

11 The EPA considers itself to be the responsible agency  
12 for establishing environmental radioactivity criteria. I  
13 believe most of us agree with that. So they have formed, more  
14 than two years ago, an interagency committee to arrive at  
15 radiological criteria for walking away from these facilities,  
16 leaving them safe.

17 We worked -- I was the, or am the NRC representative  
18 on that committee. We worked for about a year pretty hard, and  
19 were, I think, making a lot of progress, and now it's been  
20 about 15 months since that committee has met. So with that  
21 sort of priority being established by the EPA, who is the  
22 recognized agency for establishing radioactivity criteria  
23 levels, I think -- I'm not making an excuse for our staff, but  
24 the fact is that there isn't any government agency in  
25 Washington right now really pushing this issue.

1 COMMISSIONER BERNTHAL: What about us?

2 MR. STELLO: Except us.

3 MR. ALEXANDER: We're here.

4 COMMISSIONER BERNTHAL: No, really, I'm not being  
5 facetious. I really think that on this subject in particular,  
6 certainly it was true five years ago -- well, let me go back a  
7 few more years, perhaps, but up until very recently, most  
8 people looked to the NRC for leadership and guidance, and I  
9 think that is still substantially true, in this area. And so  
10 it just seems to me that whether or not we end up being a  
11 little bit out of sync with the rest of the world 10 years  
12 later when they're finally able to arrive at some consensus  
13 doesn't really matter all that much.

14 What may matter a lot more is that this agency take a  
15 leadership role because I suspect that that may itself mean a  
16 great deal to what the rest of the world finally decides in  
17 this area.

18 MR. ALEXANDER: Well, my experience, which is rather  
19 long, is that in the area of health physics, once anyone with  
20 any authority at all adopts a number of any kind, from then on,  
21 that's the stone tablet number that is used throughout the  
22 world.

23 COMMISSIONER BERNTHAL: Well, I think there is some  
24 truth in that, but that doesn't mean that you should shrink  
25 from chiseling something in the stone until everybody agrees on

1 what should be done, or we'll be waiting another 28 years if we  
2 do that.

3 COMMISSIONER CARR: I think what he is saying is we  
4 ought to go ahead and be Moses and chisel it in stone and get  
5 it over with.

6 [Laughter.]

7 CHAIRMAN ZECH: I think one thing we haven't talked  
8 about very much, that I'm aware of, and I think my colleagues  
9 are, too, is there's a great deal of thought also that's  
10 complicating the problem -- I'm sure it's complicated it for  
11 the Staff -- on the whole subject of low level radiation and  
12 how dangerous is it. That's been discussed, I think, for many,  
13 many years, maybe as long as this whole subject has been  
14 discussed, and I guess there's not really a consensus amongst  
15 the scientists, as far as I know.

16 Would anybody care to comment on that, very briefly?

17 MR. ALEXANDER: I'd like to.

18 CHAIRMAN ZECH: Please.

19 MR. ALEXANDER: Back in the '50s -- and I was around  
20 then, too -- when we were originally establishing our criteria  
21 in order to allow progress to take place in applications of  
22 nuclear energy, this linear nonthreshold hypothesis was  
23 adopted. And it has been a very useful hypothesis, allowing us  
24 to set levels for which we felt workers could be exposed  
25 safely, and through which the public could be protected

1       adequately while we proceeded toward what we thought would be  
2       best for people around the world.

3               Now we are working at a much lower level of radiation  
4       exposure where the statistics completely break down, so that  
5       the data base substantiating risk at levels like 5 millirems  
6       per year, 25 millirems per year, is very weak. So one of the  
7       difficulties that I think Commissioner Rogers was searching for  
8       is in using the linear nonthreshold, this great line, down to  
9       zero in establishing below regulatory concern levels, brings us  
10      face to face with making a probabilistic determination, much as  
11      you did in setting the safety goals, saying let's back up this  
12      line from zero to some reasonable point and say that below this  
13      point, people should be allowed to govern themselves, and we'll  
14      step out of the picture.

15              When you start trying to determine a probability,  
16      then everyone becomes an expert, and it is very difficult to  
17      arrive, Commissioner, at a scientific consensus to come to a  
18      group of people like yourselves and say this is the consensus  
19      of opinion in the scientific community, that the probability  
20      should be X, and that the annual dose associated with that  
21      probability is Y. We are simply not at that point.

22              COMMISSIONER BERNTHAL: Do you think we ever will be?  
23      I mean I don't think there's any basis to believe that we will  
24      ever be at a consensus on that issue, at least not in our  
25      lifetime.

1           COMMISSIONER CARR: The point is --

2           CHAIRMAN ZECH: And the point is, when we get there,  
3 what we want to do is to find a level that would be at least  
4 reasonable, and so something that we could approach in a very  
5 conservative manner. What we are saying, if you don't have the  
6 exact answer, perhaps there is something that common sense  
7 would dictate would be a conservative approach that would be  
8 acceptable.

9           So even if you can't come up with the exact answer, I  
10 think what we are trying to say is -- and I appreciate, I  
11 really do, that this has gone on for many, many years, and we  
12 don't expect you to solve it at the table today; I don't think  
13 any of us expect you to do that. But we do feel perhaps that  
14 if you can't come to the exact answer and we don't see that  
15 we're going to get the exact answer any time soon, perhaps we  
16 know enough now, as you have just pointed out, in the low level  
17 field, perhaps we know enough now to put a band on something  
18 that we feel very comfortable with.

19           MR. ALEXANDER: Some of us feel that this decision is  
20 a policy decision.

21           CHAIRMAN ZECH: Well, that's what we're here for.

22           MR. ALEXANDER: A probability decision is a policy  
23 decision.

24           CHAIRMAN ZECH: But that's what we're here for. But  
25 on the other hand, we base our policy decisions on our best

1 judgment, all the analysis we can assemble from various peer  
2 groups, as well as our own staff, and so we want to make sure  
3 that the policy decision we make is a good one.

4 On the other hand, it is a policy decision. Some  
5 time it just has to be made. That's what we're here for. And  
6 we are willing to accept that responsibility. We are just  
7 asking you to give us, you know, your best analysis, your best  
8 recommendations, and we will make the decision.

9 MR. ALEXANDER: I believe you have already gone  
10 through the deliberations.

11 COMMISSIONER BERNTHAL: So do I.

12 MR. ALEXANDER: When you set the safety goal  
13 applicable to effluents, you made that policy decision. That  
14 was a very big decision. Comes out at about 15 millirem per  
15 year.

16 CHAIRMAN ZECH: And then you will have to tell us  
17 perhaps whether there's any reason for us in the things we're  
18 talking about to go anything less than that.

19 COMMISSIONER BERNTHAL: Let me give an example of a  
20 certain amount of leadership and courage, I guess, that was  
21 simply required and the EPA stepped up to it, and made a  
22 decision, they made a decision which did not hold up over the  
23 long run, as well as I would hope a conservative decision that  
24 we might make might hold up over the long run, and that was  
25 with respect to lead.

1           They set certain tolerance limits for lead, I guess  
2           in the blood, some years ago, because everybody knew that lead  
3           had certain hazards. It was not so clear whether there was a  
4           de minimis level for sure, let alone one below regulatory  
5           concern, and in fact they have now had to go back and are  
6           seriously considering lowering that limit, as I understand it,  
7           because of the latest epidemiological results.

8           So it just seems to me that it's better to begin and  
9           to step out and make your best effort, and I'm relatively  
10          confident that we have a far better data base on radiation and  
11          its effects than they had to start out with on lead. It's  
12          better to make a beginning and be conservative enough so you're  
13          not put in the position of having to lower it, but perhaps can  
14          relax it later on. That's clearly the better way to be in a  
15          position to go.

16          CHAIRMAN ZECH: Could we have a response, and then  
17          Commissioner Carr has a --

18          MR. ALEXANDER: Can I answer Commissioner Carr's  
19          question with regard to where the statistics break down?

20          CHAIRMAN ZECH: All right, go ahead.

21          MR. ALEXANDER: It will just take a moment. The  
22          National Academy of Sciences provided risk coefficients for us  
23          to use for doses greater than 10 rems, or for annual doses  
24          greater than 1 rem per year. In their report they simply said  
25          with regard to your question that -- this is not a direct

1 quote, but paraphrasing -- we do not know whether there are  
2 radiation risks at doses less than 100 millirems per year or  
3 not. So to my mind, that's where the statistics break down,  
4 and I have become concerned about public exposures when they  
5 reach that level.

6 COMMISSIONER CARR: At 100 millirem?

7 MR. ALEXANDER: Yes.

8 COMMISSIONER CARR: So if you want to be  
9 conservative, you could take an order of magnitude and say 10  
10 millirem, we could pick the number.

11 MR. ALEXANDER: Yes.

12 COMMISSIONER CARR: Which isn't far from 15 which,  
13 you know, is close to the safety goal.

14 MR. ALEXANDER: We did --

15 COMMISSIONER CARR: That will be about as good data  
16 as we will get for quite a few years.

17 MR. ALEXANDER: We don't actually measure at that  
18 level. We just calculate. So those are essentially the same  
19 numbers.

20 COMMISSIONER CARR: That's all.

21 MR. STELLO: Mr. Chairman, I think this meeting has  
22 suggested that you want something very soon. I hope that the  
23 process that we are about, we can continue it. But we will  
24 provide you with a paper with a number and a proposed rationale  
25 as best we know it to you, and I will commit to a date as soon

1 as I have some time to raise that question.

2 CHAIRMAN ZECH: All right. Fine.

3 MR. STELLO: We will do it.

4 CHAIRMAN ZECH: Other questions, my fellow  
5 Commissioners? Commissioner Roberts?

6 COMMISSIONER ROBERTS: No.

7 CHAIRMAN ZECH: Commissioner Bernthal?

8 COMMISSIONER BERNTHAL: Is the Staff finished? I  
9 thought they had another --

10 MR. STELLO: I just decided that in light of this  
11 discussion, there was no point in going any further.

12 CHAIRMAN ZECH: Well, we looked at the last slide. I  
13 hope I didn't cut you off, but please --

14 MR. STELLO: I think we went through it far enough  
15 that I think we got the message, and I think I propose that we  
16 stop here, go back and give you a date, we'll commit to  
17 providing you with this --

18 CHAIRMAN ZECH: Theimy, does that make you happy? I  
19 don't know if you're smiling at that. It's hard to tell.

20 MR. SPEIS: No, I still think it's very important --

21 CHAIRMAN ZECH: You heard what he said, of course.

22 MR. SPEIS: I think I have told you before, Mr.  
23 Chairman, he is my boss.

24 CHAIRMAN ZECH: Yes, I know that.

25 [Laughter.]

1           MR. STELLO: Mr. Chairman, that isn't fair. He is  
2 the one who told me it's time, let's commit to do it, and  
3 that's -- I'm repeating what he said.

4           CHAIRMAN ZECH: Okay.

5           MR. SPEIS: I think I have said enough.

6           CHAIRMAN ZECH: All right.

7           [Laughter.]

8           COMMISSIONER BERNTHAL: You didn't say anything.

9           COMMISSIONER CARR: Besides, just look at all the FTE  
10 you can save.

11          CHAIRMAN ZECH: Commissioner Bernthal, did you have  
12 anything further?

13          COMMISSIONER BERNTHAL: Well, I don't have anything  
14 -- I have lots, but I think that the point of this briefing was  
15 the Staff's report, and I believe that what you have heard here  
16 is that we also wanted to get to that second part of the  
17 Commission's SRM. We asked for a status report/options paper.  
18 You clearly aren't ready yet with an options paper, and that's  
19 what you have now committed to do.

20          I think I will just save my comments on the issue  
21 which really brought all of this up, and that was the gemstone  
22 question. There is also a serious regulatory policy issue,  
23 this business of frivolous application that we need to address  
24 there. Suffice it to say that one person's frivolity can turn  
25 out to be someone's reason for being, and I feel we ought to

1 get away from that kind of standard.

2 I know of few other agencies in the government -- and  
3 I'll probably be contradicted here by some knowledgeable person  
4 -- that would try to apply that kind of standard to the  
5 government regulation and interference with individuals' lives.

6 So I may put out a short memorandum on that gemstone  
7 subject, and Staff's response which contained what seemed to be  
8 a differing professional opinion, and I want to compliment you,  
9 Vic, and the Staff for the straightforward and open way that  
10 that was handled. It was slightly less than the usual DPO  
11 approach in channels, but nevertheless it was clear that  
12 somebody disagreed with what we did, and that's fine, and I  
13 enjoy reading that kind of disagreement; it could have an  
14 influence on us.

15 CHAIRMAN ZECH: Commissioner Carr? Commissioner  
16 Rogers?

17 COMMISSIONER ROGERS: Well, just that it does seem to  
18 me that as the Chairman has pointed out, there's probably  
19 really a policy issue here that's going to decide this, and  
20 that you're not -- it isn't simply a matter of some data and  
21 some calculations and there's the answer, or it would have been  
22 done a long time ago. And so I think that we do have to, as  
23 Commissioner Bernthal has said, step up to the problem and make  
24 a decision. I would like, though, to try to see that the  
25 issues are as clear and the options as clear as possible before

1 we try to do that, so that we really do understand what it is  
2 we are deciding upon, and where the pitfalls are, and what the  
3 options really do consist of.

4           Once you have that, then if you make a decision, you  
5 know exactly what you are deciding, not on something that you  
6 really didn't quite see its implications at the time. So all  
7 that thinking is the thing that has to be done before the  
8 options are considered seriously by us.

9           CHAIRMAN ZECH: Well, let me just say that I think  
10 this has been a very valuable meeting today, it's been very  
11 helpful. I think it's important that you continue working with  
12 the interagency group that's working in our country. I do  
13 think -- and I think you have heard the Commission certainly  
14 support a leadership role in this area for the NRC. We  
15 recognize that EPA has a valuable role to play, too, but I do  
16 think you should work with that interagency group to continue  
17 to develop a national solution to the problem.

18           I am fully aware, too, of the importance of  
19 international groups. Some of them are vitally interested in  
20 what we do. Others take a different viewpoint, and maybe would  
21 seem to not necessarily support what we have in mind.

22           On the other hand, I do think it's important that you  
23 come to the Commission with your paper before you go to the  
24 international meeting, so that you will go with Commission  
25 views in hand, and I think that that will give us all a better

1 feeling of leadership in this role.

2 Between now and then, of course, you have got to get  
3 as much coordination in our own country as you can with EPA and  
4 others. So it is an important issue. It's been going on for  
5 many years. I think all of us recognize the public health and  
6 safety impact it could have.

7 We also recognize our responsibility as policymakers  
8 in this regard to make the very best decision for the citizens  
9 of our country that we can. I think you see a willingness on  
10 the part of the Commission to step up to the plate and be ready  
11 to take on the responsibilities we have talked about today.

12 So what we do need from the Staff, though, is your  
13 continuing analysis, support, integrity, using outside input as  
14 you can, to help us make the best possible decision that we  
15 can.

16 It seems to me that your last slide here, with a  
17 question mark, doesn't leave any of us too comfortable, and  
18 some of the other dates are kind of off into the future, but  
19 again, we recognize that it's not an easy issue. An awful lot  
20 of hard work has gone into this by a lot of people.

21 We have learned more in recent years about the  
22 radiation and perhaps we can make a good decision a bit sooner  
23 than we thought we could. In any case, the Commission stands  
24 ready to receive your thoughts and your recommendations, and we  
25 will look forward to that as you work with the interagency

1 group and prior to your going to the international meeting.

2 With that, we will stand adjourned.

3 Thank you very much.

4 [Whereupon, at 3:19 o'clock p.m., the meeting was  
5 adjourned.]

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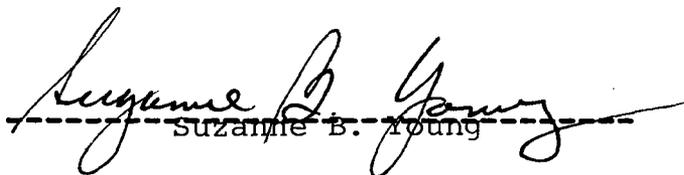
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REPORTER'S CERTIFICATE

This is to certify that the attached events of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: Briefing on the Status of Efforts to Develop a De Minimis Policy  
PLACE OF MEETING: Washington, D.C.  
DATE OF MEETING: Monday, March 14, 1988

were held as herein appears, and that this is the original transcript thereof for the file of the Commission taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing events.

  
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Suzanne B. Young

Ann Riley & Associates, Ltd.

# **STATUS REPORT**

## **REGULATORY CUTOFFS**

**APPLICATION OF BELOW REGULATORY CONCERN & DE MINIMIS CONCEPTS**

**COMMISSION BRIEFING - MARCH 14, 1988**

**"REGULATORY CUTOFF" CONCEPTS  
-THEIR POTENTIAL USE IN THE DEVELOPMENT OF  
RADIATION PROTECTION POLICIES & REGULATIONS**

**BACKGROUND**

**RESPOND TO COMMISSION REQUESTS TO ADDRESS ISSUES SPECIFIED  
IN SRMs OF FEBRUARY 5 & NOVEMBER 24, 1987**

**ADVISE ON HOW EXISTING & PROPOSED DE MINIMIS, BELOW REGULATORY CONCERN  
& RESIDUAL RADIOACTIVITY RELEASE STANDARDS ARE RELATED & HOW  
CONSISTENT RELEASE STANDARDS ARE ACHIEVED**

**DEVELOP COMMISSION POLICY STATEMENT THAT WOULD IDENTIFY A LEVEL OF  
RADIATION RISK BELOW WHICH GOVERNMENT REGULATION BECOMES UNWARRANTED**

**NEAR-TERM ACTION**

**STATUS REPORT/OPTIONS PAPER REQUESTED**

**MAJOR TOPICS FOR DISCUSSION**

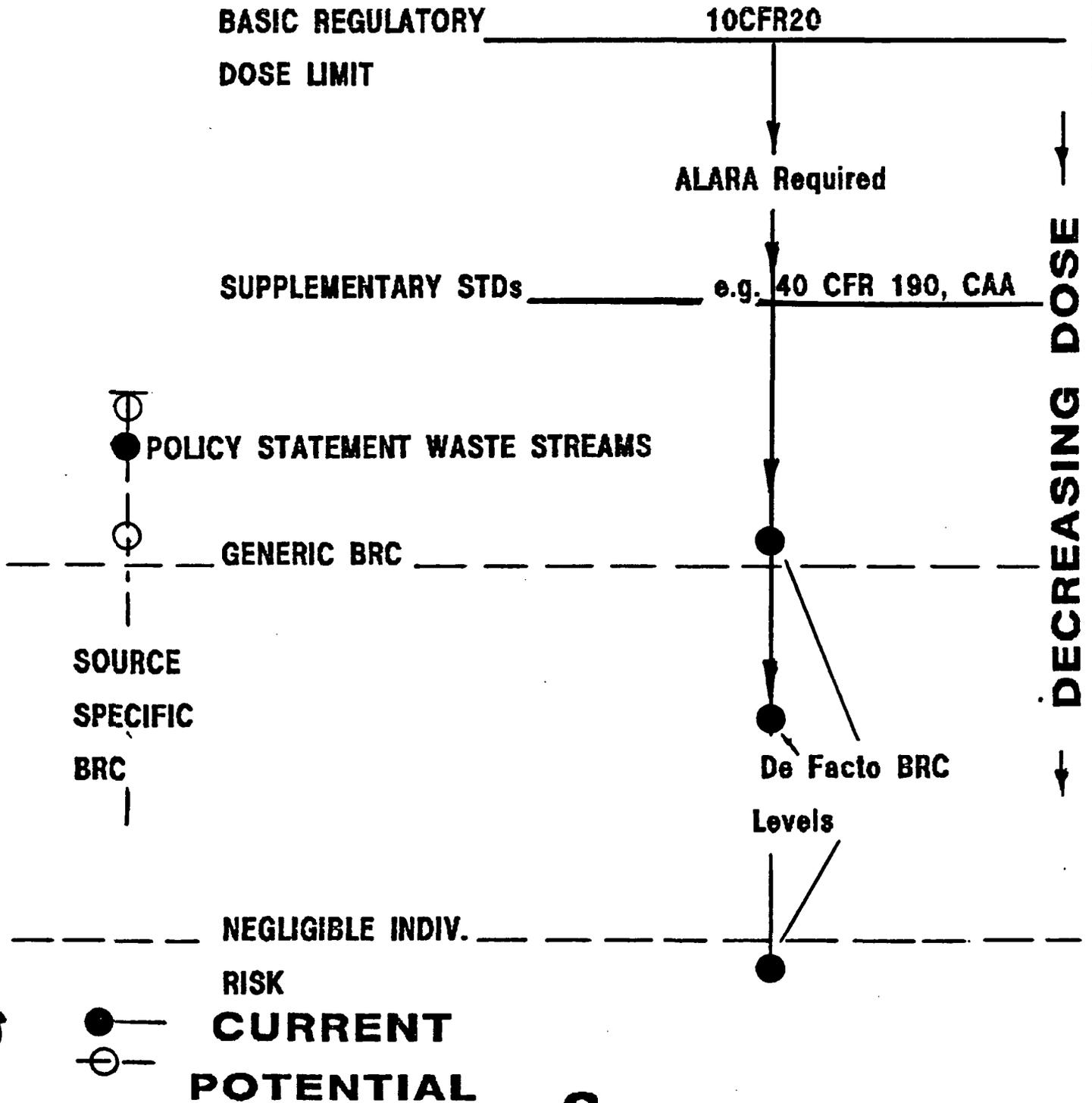
**RADIATION PROTECTION FRAMEWORK & THE TERMS & CONCEPTS ASSOCIATED WITH REGULATORY CUTOFFS**

**POLICY DEVELOPMENT CONSIDERATIONS- IN LIGHT OF CURRENT NRC, EPA & INTERNATIONAL ACTIVITIES**

**PLANS FOR INTERNATIONAL SYMPOSIUM**

**PRELIMINARY RESOURCE ESTIMATES FOR BROAD & SPECIFIC POLICIES**

# RADIATION PROTECTION FRAMEWORK



# **POLICY DEVELOPMENT CONSIDERATIONS**

**"SOURCE SPECIFIC" VS "GENERIC" BRC LEVELS**

**CHARACTERIZATION OF CUTOFF LEVELS**

**CHARACTERIZATION OF SOURCES ON A NATIONAL BASIS**

**ROLE OF COST/ RISK TRADEOFFS**

**CONVERSION OF BRC DOSE LEVELS TO RISK**

**DIFFICULTIES IN ESTABLISHING "NEGLIGIBLE RISK" LEVELS**

**MAJOR AUTHORITIES & REGULATIONS IMPACTING**  
**REGULATORY CUTOFF POLICIES**

**EPA**

**GENERALLY APPLICABLE ENVIRONMENTAL RADIATION STANDARDS (AEA)**  
**SAFE DRINKING WATER ACT**  
**CLEAN AIR ACT**

**NRC**

**EXEMPTION AUTHORITY (ATOMIC ENERGY ACT SECTIONS 57d, 62& 81)**  
**LOW-LEVEL RADIOACTIVE WASTE POLICY AMENDMENTS ACT OF 1985**

## PRELIMINARY RESOURCE ESTIMATES

<u>TASK</u>	<u>RESOURCES</u>	<u>SCHEDULE</u>
Broad Policy Statement on BRC/ De minimis	4-5 FTEs	1 1/2-2yr
Review & Initiate Rulemakings Waste Stream Petitions	7-9 FTEs	3- ? yrs
Generic BRC Rulemaking Activity Waste Stream Disposal	2-3 FTEs	2-3 yrs
Policy Statement- Acceptable Residual Radioactivity Levels (LANDS & STRUCTURES)	3FTEs	2 yrs