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Spent Nuclear Fuel Reprocessing Facilities

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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WORKSHOP ON DEVELOPMENT OF REGULATIONS FOR
SPENT NUCLEAR FUEL REPROCESSING FACILITIES

+ + + + +

Tuesday, October 19, 2010

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Sheraton Albuquerque, Uptown Hotel

2600 Louisiana Blvd., NE

Albuquerque, New Mexico

9:00 a.m.

BEFORE: CHIP CAMERON, Facilitator

NRC STAFF:

MARISSA BAILEY

JOSE CUADRADO

JACK GUTTMAN

TOM HILTZ

MIRIAM JUCKETT

LAWRENCE KOKAJKO

JACK DAVIS

JACK PARROTT

PHIL REED

WENDY REED

PIERRE SAVEROT

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1 OTHER ATTENDEES :

2 JANICE ARNOLD-JONES

3 SVEN BADER

4 BEATRICE BRAILSFORD

5 JIM BRESEE

6 ANNE CLARK

7 BISWAGIT DASGUPTA

8 MIKE EHINGER

9 AMY GLOVA

10 DON HANCOCK

11 GEORGE HELLSTROM

12 ROBERT HOGG

13 SIMON HSIUNG

14 JIM LIEBERMAN

15 ROD McCULLUM

16 TOM PHAM

17 JAMES ROSS

18 DAN STOUT

19 REX STRONG

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<u>ITEM</u>	<u>PAGE</u>
Welcome, Explanation of Workshop Goals, Ground Rules, Introductions, and Agenda Overview	4
NRC Presentation: "Background/Overview of NRC's Responsibilities for the Regulation of Spent Nuclear Fuel Reprocessing Facilities" Opportunity for Questions	25
Facilitated Discussion #1:	47
Alternatives for a Regulatory/Licensing Framework for Reprocessing Facilities Opportunity for Questions	
Facilitated Discussion #2:	106
Alternatives for Safety and Risk Assessment Requirements for Reprocessing Facilities Opportunity for Questions	
Facilitated Discussion #3:	173
Alternatives for Establishing Design and Operational Requirements for Reprocessing Facilities Opportunity for Questions	
Wrap-up	211
Adjourn	

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P R O C E E D I N G S

(9:00 a.m.)

1
2
3 MR. CAMERON: Good morning, everybody.
4 Welcome to the Nuclear Regulatory Commission workshop
5 on a reprocessing rulemaking that the NRC has embarked
6 on. And around the table I would just ask if we could
7 keep the acronyms down, there's a lot involved in this
8 area, but one that we will use will be NRC.

9 My name is Chip Cameron and it's a
10 pleasure to serve as your facilitator for this meeting
11 over the next two days, and I'm going to be assisted
12 by Miriam Juckett, who is back there, and she's from
13 the Southwest Research Center in San Antonio, Texas.

14 And I just want to address some meeting
15 process issues before we get into the substantive
16 discussions today, and what I'd like to do is tell you
17 about the format that we're going to be using, tell
18 you about some simple ground rules to just help us
19 have a productive meeting, go around the table for
20 some introductions, and then I'd like to walk through
21 the agenda with you to make sure that we all
22 understand the agenda and answer any questions about
23 the agenda.

24 In terms of the format, we're using a
25 roundtable format and usually the roundtable is in the

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1 shape of a U. Well, we have a V today, but it is a
2 roundtable concept as opposed to a big town hall
3 meeting and the idea behind having a roundtable is for
4 all of you to be able to talk to one another about the
5 issues rather than people just talking to the NRC
6 staff. And we have representatives of the interests
7 who might be affected by a reprocessing rulemaking or
8 concern about a reprocessing rulemaking and
9 reprocessing issues.

10 And the NRC staff also is here at the
11 table to serve as a resource for you, to answer any
12 questions that you have, perhaps to share a little bit
13 about their thinking about what directions they might
14 go with this particular rulemaking. So we want to
15 hear not only each of your opinions and perspectives
16 on the issues but we'd like to get your reaction to
17 what you hear from others around the table.

18 And this is a modest attempt to develop a
19 richer type of data for the NRC to use in developing
20 its rulemaking, and it's also an attempt to provide
21 all of you with some more information about the
22 issues. The NRC is also taking written comments on
23 the issues, and I believe that the date, Jose, is
24 November 4 for the submission of written comments. So
25 you may hear things around the table that will help

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1 you to formulate your comments.

2 And the focus is with you folks at the
3 table for the discussion but we're also going to be
4 going out to anybody in the public periodically to
5 hear what questions or comments you might have about
6 what you hear at the table and on the issues.

7 In terms of ground rules, they're very,
8 very simple. If you want to speak, could you please
9 just put your name tent up like that and then I'll
10 know that you want to talk and you won't have to worry
11 about jumping into the conversation or continually
12 having your hand up. And I would ask that only one
13 person speak at a time, not only so we can give that
14 person our full attention, but also so that our court
15 reporter, our stenographer, who is Carol Dawley back
16 here, so that she can get what I call a clean
17 transcript of the meeting, she'll know who's talking
18 if we only have one person at a time talking.

19 And I should tell you this now, when you
20 do speak you have to not only push the button on the
21 microphone but you have to hold it down which I guess
22 is some sort of devious way to keep comments short.

23 (General laughter.)

24 MR. CAMERON: But at any rate, you have to
25 keep holding that button down.

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1 And I just would encourage all of you to
2 participate fully. There are going to be a lot of
3 different views around the table, but this should be a
4 learning experience for all of us. And we have two
5 full days, I think we have a lot of time, so whatever
6 questions, whatever discussion you want to have, let's
7 take advantage of the opportunity.

8 And I'm going to be here to help you form
9 discussion threads, so I may not take the cards and
10 name tents in the order they're turned up so that we
11 can follow a discussion rather than having a lot of
12 unrelated monologues. I am going to keep the famous
13 parking lot for issues that might come up that don't
14 fit squarely into the agenda item that we're
15 addressing and we'll come back and get those.

16 And let's go around the table for
17 introductions, and if you could introduce yourself and
18 give us your affiliation and perhaps one or two
19 sentences on any concerns that you have about this
20 issue or what you'd like to see accomplished over
21 these next two days of the meeting. And then after
22 that we'll go to agenda check and questions on that.

23 Anne, do you mind if I start with you, and
24 we can test that button theory.

25 MS. CLARK: Well, it's kind of nice that

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1 we're sitting down because otherwise I'd be too short
2 for the microphone. But anyway, my name is Anne
3 deLain Clark. I am the coordinator of the New Mexico
4 Radioactive Waste Consultation Task Force which is a
5 task force made up of the heads of seven different
6 state agencies, so I work for the State of New Mexico.

7 I'm headquartered in the Energy, Minerals and Natural
8 Resources Department because my cabinet secretary,
9 currently Jim Noel, is the chair of the task force.

10 My role is mostly as a policy analyst and
11 advisor to my cabinet secretary and to the governor,
12 and we do most of our broader work through the Western
13 Governors Association, and I'm the co-chair of the
14 Western Governors Association Technical Advisory Group
15 on Waste Isolation Pilot Plant Transportation. And I
16 may have gotten that in the wrong order, but it's
17 something like that.

18 Anyway, I have great concerns about --
19 well, transportation is my primary expertise in terms
20 of policy issues, and the WGA, the Western Governors
21 Association, put together a comprehensive manual on
22 transportation protocols for transporting waste to
23 WIPP. So that's where my program mostly focuses but I
24 do also cover other areas as well as they come up.

25 And one of the big concerns I have in

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1 terms of reprocessing is what are we going to do with
2 not just the radioactive waste that comes out of
3 reprocessing but the chemical waste that will come out
4 of reprocessing. And I'm not sure that NRC has the
5 purview over all of that, but I certainly think it
6 needs to be discussed and included in consideration.

7 Thank you.

8 MR. CAMERON: Thank you very much, Anne.
9 Robert.

10 MR. HOGG: Thanks, Chip. I also would be
11 standing behind somebody or not visible, so I feel for
12 you, Anne.

13 I'm Robert Hogg. I'm with Babcock Wilcox,
14 been there for 12 years, prior to that on the staff at
15 NRC. I've been working for the last couple of years
16 with the NEW Task Force back in the fuel cycle trying
17 to help them bring some experience and semblance of
18 what can be done and should be done in the areas of
19 risk assessment for the back end of the fuel cycle.
20 Experience working with criticality, safety, risk
21 analysis, PRA as well as waste issues and performance
22 assessment for waste.

23 MR. LIEBERMAN: I'm Jim Lieberman with
24 Talisman International. I'm here today as a
25 consultant to Energy Solutions. I'm also a former NRC

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1 staffer. I've worked with the Nuclear Energy
2 Institute in developing their white paper proposing a
3 framework for reprocessing, and my goal today is to
4 help NRC get the information they need to make
5 whatever decision they think is appropriate.

6 MR. HILTZ: Good morning, everyone. My
7 name is Tom Hiltz. I'm branch chief at the Nuclear
8 Regulatory Commission in the Office of Nuclear
9 Material Safety and Safeguards. My branch has been
10 responsible for about the last two years in working
11 towards developing a framework, a revised framework to
12 license a potential commercial reprocessing facility.

13 I'd like to continue to build on our
14 dialogue in Rockville that we had to help inform the
15 staff thinking with regard to the regulatory basis
16 that might support a potential rulemaking. I think
17 that the questions that we've outlined in the meeting
18 notice might be helpful for us, and it's also my hope
19 and goal that the staff here will be more open in some
20 of our thinking and share some of our thinking too to
21 help stimulate additional discussion that may be
22 helpful for us as we move down the road. Thanks.

23 MR. CAMERON: Thank you, Tom. Phil.

24 MR. REED: My name is Phil Reed. I'm a
25 radio-chemist within the Division of Risk Analysis

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1 within the Office of Nuclear Regulatory Research.
2 I've worked with reprocessing issues for several
3 years, and I'm also a member of the working group
4 that's developing the technical basis document for
5 regulation.

6 And my purpose here this morning and the
7 next two days is to make sure that we discuss most of
8 the issues for which we're writing this regulation.
9 We want to make sure that there are no holes left and
10 we want to make sure that we have adequate discussion
11 on at least the major issues to be included in the
12 regulation.

13 MS. REED: Good morning. My name is Wendy
14 Reed. I'm a radio-chemist in the Office of Nuclear
15 Regulatory Research at the NRC. I'm also a member of
16 the working group that's been tasked with developing
17 the regulatory basis document for reprocessing
18 regulations.

19 I'm looking forward to hearing people's views and
20 concerns, with the hope that that will help inform the
21 work that we are doing. Thank you.

22 MR. BRESEE: Good morning. I'm Jim
23 Bresee. I'm with the Office of Nuclear Energy,
24 Department of Energy. My background is chemical
25 engineering. My office is responsible for the

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1 development of alternative fuel cycles for possible
2 future application in the U.S. and elsewhere. Our
3 responsibilities extend over all aspects of these
4 advanced cycles with a special emphasis on the wastes
5 that result, the waste characteristics and their long-
6 term issues associated with management.

7 MR. STOUT: I'm Dan Stout with the
8 Tennessee Valley Authority. TVA is very committed to
9 nuclear energy; we have six operating reactors; we
10 have one under construction that's expected to go
11 operational in 2012; we're making progress on
12 development of a site for another reactor. And TVA is
13 also supportive of closing the fuel cycle and supports
14 the efforts that are ongoing by the NRC and by NEI on
15 recycling regulatory framework development.

16 Prior to that I have personal experience at the
17 Department of Energy where I was director of Nuclear
18 Fuel Recycling. Thanks.

19 MR. McCULLUM: Hello. I'm Rod McCullum,
20 Nuclear Energy Institute. About a year ago I took on
21 leadership of the Recycling Task Force at NEI and
22 inherited the good work of a lot of the experts you
23 see sitting around the room today, trying to keep the
24 effort moving forward. As my member company
25 representative just said, there is a lot of support

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1 for these technologies in the industry. There are a
2 lot of decisions that lay ahead of us in terms of
3 when, how, what, where. We're going to pursue these
4 technologies.

5 One of the critical elements that need to
6 be in place before those decisions can be made is the
7 regulatory framework, and we really appreciate NRC
8 having these workshops. This is the second workshop.

9 We did one of these in Maryland a couple of weeks ago
10 and had a lot of really good discussions, we had a lot
11 of good participation from stakeholders, and it's good
12 to see that we're getting some new stakeholder faces
13 involved here as well.

14 I know before I got involved in this at
15 NEI, I was leading the industry efforts with respect
16 to the entire Yucca Mountain regulatory framework, all
17 the way up to the licensing process, and I won't
18 digress into why that got interrupted, but I will say
19 working with NRC to develop a regulatory framework,
20 I've been there and I've done that. I think in the
21 Yucca Mountain case you got a lot of public
22 stakeholder input very early in that process, and then
23 put in place a really strong framework. Again, I
24 won't digress into what's happened to Yucca Mountain,
25 but I don't think I'd put the blame on the regulatory

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1 framework.

2 So looking forward to continuing down an
3 equally as productive path here.

4 MR. CAMERON: Thanks, Rod, and I think you
5 have some company in terms of Yucca Mountain refugees
6 here today -- if I can use that term.

7 (General laughter.)

8 MR. CAMERON: At any rate, Jose.

9 MR. CUADRADO: Good morning, everyone. My
10 name is Jose Cuadrado. I'm a project manager and part
11 of Tom's staff at the Office of Nuclear Material
12 Safety and Safeguards. I'd like to welcome everybody
13 today to this workshop. I'm part of the group staff
14 that put together this set of workshops and all the
15 logistical arrangements and all the technical issues
16 that are going to be discussed here today.

17 I'd like to take this opportunity to
18 welcome members of the public and the panelists and
19 thank them for participating, and I invite you to be
20 as open and up front as possible in discussing these
21 issues. The NRC certainly looks forward to all your
22 input. Our commitment to openness, I think, shows by
23 putting this format, so hopefully you'll take this
24 opportunity to let us know what you think.

25 MR. STRONG: Rex Strong, United Kingdom.

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1 I've spent 30 years working at a site which includes
2 reprocessing of spent nuclear fuel waste management,
3 nuclear fuel manufacturing and a variety of
4 activities. So I've spent that time in and around
5 environment of safety, security and quality, and I'm
6 very happy to be invited to come along today and
7 tomorrow, so I look forward to see how this pans out.

8 MR. CAMERON: And thank you very much,
9 Rex, for joining us.

10 MS. BAILEY: I'm Marissa Bailey. I'm
11 deputy director in the Division of Fuel Cycle Safety
12 and Safeguards in the Office of Nuclear Material
13 Safety and Safeguards. My division has had lead
14 responsibility as far as developing the regulatory
15 framework for reprocessing over the last three years,
16 and since I'll be giving the overview, I guess I'll
17 just stop right here for now.

18 MR. CAMERON: Okay. Thanks, Marissa.
19 Sven.

20 MR. BADER: I'm Sven Bader from AREVA
21 Federal Services. I'm in Charlotte. My prior
22 experience has been primarily on the Mocked Fuel
23 Fabrication Facility -- which will be called the M-
24 Triple-F probably henceforth -- as a safety engineer.
25 Obviously, AREVA also has operating facilities around

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1 the world in France and in Japan -- well, the Japanese
2 facility is not AREVA's but AREVA helped build it --
3 and I hope to provide some insights into some of the
4 problems or issues we have here. And my focus here is
5 to get some regulatory stability so that we can design
6 some facility for the United States.

7 MR. CAMERON: Thanks, Sven. Don.

8 MR. HANCOCK: Good morning. I'm Don
9 Hancock from Southwest Research and Information Center
10 here in Albuquerque, so I want to welcome everybody to
11 Albuquerque. All the businesses that you patronize
12 will especially appreciate your being here, so I
13 encourage you to do that and enjoy our beautiful city.

14 I was going to say, but since it's already
15 been pointed out, there is another Southwest Research
16 in the room. People at my organization called
17 Southwest Research Institute in San Antonio the other
18 Southwest Research. We're Southwest Research and
19 Information Center in Albuquerque. We're a private
20 nonprofit that work on a variety of issues, primarily
21 providing technical assistance to communities about
22 issues of concern to them.

23 And in New Mexico one of the major issues
24 of concern to communities is the fact that over 40
25 percent of the uranium that has ever been mined in the

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1 United States has come from this state, so we continue
2 to have a lot of concern and issues with uranium
3 issues in the state, and my organization has been
4 heavily involved in that. A couple of people in the
5 room that work on the waste isolation pilot plant,
6 also are where I've been involved in that issue for
7 the last 35 years.

8 So I have lots of concerns about
9 reprocessing, about the continuing legacy of
10 reprocessing in this country, and in my view, we need
11 to address the past problems of reprocessing as we're
12 talking about any new reprocessing facilities.

13 MR. CAMERON: Thanks, Don.

14 MS. BRAILSFORD: Thank you. My name is
15 Beatrice Brailsford. I'm with the Snake River
16 Alliance, Idaho's nuclear watchdog and advocate for
17 clean energy since 1979. The alliance was founded by
18 a small group of people who met on a park bench in
19 Boise, Idaho after they read in their local newspaper
20 that the Idaho National Laboratory routinely injected
21 hazardous and radioactive waste into the Snake River
22 Aquifer which is a sole source aquifer for nearly
23 300,000 people.

24 The injection well at the Idaho National
25 Laboratory came right out of the chemical reprocessing

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1 plant at INL. That plant has since closed, though the
2 cleanup of its waste will extend for decades more. In
3 the meantime, the Idaho National Laboratory also has a
4 pyroprocessing program, the proliferable portion of
5 the integral fast reactor program that is still going
6 on.

7 My concerns about reprocessing focus very
8 strongly about the waste that it produces and the
9 contamination that it has caused not only in my home
10 state but around the world. I think it is undeniably
11 the most proliferable technology in the nuclear
12 endeavor, and particularly as we are looking for
13 reasonable responses to climate change. Looking at
14 technologies that are so incredibly expensive that
15 they slow any response down to zero I think has to be
16 looked at with a good deal of skepticism. Thank you.

17 MR. CAMERON: Thank you, Beatrice. Thank
18 you, all. I think we have a sterling group around the
19 table, and again, I just encourage discussion on all
20 of the issues.

21 I just want to go over the agenda with
22 you, and let me first address an overarching issue. I
23 know there are lots of policy issues on reprocessing
24 and some of the issues that we've already heard about
25 in terms of the cost of reprocessing, and these are

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1 important issues. They are perhaps beyond the NRC's
2 ken, so to speak, and what we're doing here today is
3 focusing on what the NRC's regulatory and licensing
4 framework should be if there is an application for a
5 reprocessing facility. But given that, many of the
6 larger policy issues of economics proliferation have
7 implications for the NRC regulatory framework, so if
8 there are concerns related to that, let's get them out
9 on the table too.

10 Secondly, there's many complicated issues
11 involved in building the reprocessing framework and in
12 trying to keep straight what the many components of a
13 regulatory framework might be, and we'll be talking
14 about those today in terms of basic design criteria,
15 sometimes called general design criteria, the
16 integrated safety analysis that might inform the
17 process. Then there's the famous IROFS, items relied
18 on for safety, and then there's tech specs.

19 And there's a relationship among all of
20 these and we're going to be talking about all of that
21 but we're going to try to simplify it a little bit by
22 having not only Marissa's opening presentation and
23 then we'll have some questions afer that or time for
24 questions, but also for each agenda item we're going
25 to have a tee up by the NRC staff to give you an idea

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1 of what the context is for that particular discussion.

2 And I'm hoping that most of you are
3 familiar with the original Federal Register notice
4 that the NRC published on all the issues, many of them
5 called gaps in the regulations, and there are many
6 issues there. We're trying to focus on the major
7 issues during these two days, and a lot of the
8 important but perhaps more mundane or straightforward
9 issues can be addressed in written comments.

10 We're going to start out with looking at
11 the regulatory framework, what are the alternatives
12 for establishing a regulatory framework for
13 reprocessing, and you're going to see that there are
14 three choices that are laid out by the staff using 10
15 CFR Part 50, Part 70 or a new regulation. Should it
16 be technology-neutral and I know we're going to have
17 lots of discussion about that, and we want to, I
18 think, get some discussion of what is technology-
19 neutral, does it make sense. And then there's also
20 one-step licensing, a potential one-step licensing
21 process.

22 And I just want to draw your attention to
23 the third dash under possible questions under the 9:45
24 a.m. discussion, and that should be what should be the
25 minimum level of facility design information necessary

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1 for the licensing of reprocessing.

2 You'll set that later on today at 3:15
3 there's a discussion for alternatives for establishing
4 design and operational requirements for reprocessing
5 facilities. I guess my caution with that dash is that
6 we don't want to weigh down the first topic with
7 getting off on design considerations, and it may be
8 better to wait until we get to the design and
9 operational. But it's just a caution. I mean, there
10 may be relevant things that we would say on that in
11 our first discussion.

12 And after that discussion we'll go out and
13 see if there's any comments from the public, and then
14 we're going to head to the second topic, and that's
15 going to be at one o'clock and that's alternatives for
16 safety and risk assessment requirements. And we're
17 going to have a tee up by the NRC, but also -- there's
18 a reason we usually don't have presentations by people
19 around the table other than the NRC staff, but the
20 Nuclear Energy Institute, NEI, has just completed a
21 paper, actually, on the whole subject of the use of
22 integrated safety assessment and the use of
23 probabilistic risk assessments, and that's going to be
24 a major part of the discussion we want to have at one
25 o'clock today -- Rod McCullum from NEI is going to do

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1 a very short presentation for us this afternoon on
2 their paper to sort of also tee up that particular
3 discussion.

4 And you're going to see the lead question
5 there is should the NRC have a safety risk goal or
6 limit, and I think that from sitting around and
7 listening to all of you before and reading about this,
8 one of the critical questions in my mind is that is a
9 safety goal needed as opposed to a safety envelope.

10 And I'm hoping that this NEI white paper
11 on reprocessing was on the website. This is the so-
12 called Part 7X that NEI developed. Well, in there
13 they have what they call a safety envelope. So we're
14 going to start with that threshold question of safety
15 goal, and I don't want it to derail the rest of the
16 discussion unless it's really relevant to that. And
17 then we're going to go into the integrated safety
18 assessment issues, probabilistic risk assessment. And
19 then we're going to move to opportunities for
20 questions from the public.

21 And then we're going to go to design and
22 operational requirements for reprocessing and those
23 are laid out in a couple of different categories for
24 you. The first two dashes talk about general design
25 criteria. You might hear people around the table

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1 talking about basic design criteria. Correct, Robert?

2 Or BDC. And one of the things that we need to get
3 straight right off the bat is that are these the same
4 things just under two different names, or is there
5 some fundamental conceptual difference between GDC and
6 BDC, because I think that can be confusing.

7 Then there's the whole issue of tech
8 specs, operator licensing requirements, emergency
9 planning cyber security, but I think the main focus of
10 our discussion there is going to be on the general or
11 basic design criteria and the tech specs. And that's
12 where you really need to start thinking about what the
13 relationship is between design criteria, what comes
14 out of the integrated safety assessment and/or the
15 probabilistic risk assessment, how these items relied
16 on for safety, IROFS, are generated out of an
17 integrated safety assessment process, and then where
18 do the tech specs come into play.

19 So one of the things that we have to make sure that we
20 understand is how all of those relate to one another.

21 And then we go to the public again.

22 And we do have a break this afternoon and
23 we don't have one built in this morning, but when we
24 get to 10:30 or so, we might want to just take a
25 break. There's a coffee shop right out here where you

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1 can get some coffee because I think we have enough
2 time in two days to take a break this morning, to
3 allow ourselves a break.

4 And then tomorrow, and I'll go over
5 tomorrow's topics at the beginning of the day
6 tomorrow, but we have security and safeguards issues
7 and there are proliferation issues there, and there's
8 also issues around material MC&A, material control and
9 accounting. So we just want to make sure that we keep
10 those straight. Waste has been mentioned a couple of
11 times, Anne and Beatrice, important issues. Jim
12 talked about his experience with that. So we'll go
13 into all of those issues.

14 And then we're going to close up with
15 environmental issues, and I just would say that
16 environmental issues are not going to be directly
17 covered by this particular NRC rulemaking, as I
18 understand. Is that correct, Tom?

19 MR. HILTZ: That is essentially correct.
20 There are certain environmental emission regulations
21 that we'll look at, but a separate effort which will
22 be a companion effort if we move on to rulemaking,
23 will be to develop an environmental impact statement,
24 and although that's not the topic of this workshop, if
25 we have an opportunity to gain any insights on that,

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1 we do have some folks in the room that would probably
2 appreciate that.

3 MR. CAMERON: And that's an important
4 aspect of this. As many of you know, the
5 environmental review requirements of the National
6 Environmental Policy Act, either an environmental
7 assessment or an environmental impact statement, also
8 apply to rulemaking if it would be considered a major
9 federal action significantly affecting the human
10 environment. There's a whole set of environmental
11 issues, not just effluent emissions, and that's very
12 relevant to this rulemaking.

13 The two related efforts, the NRC is
14 starting to develop potential revisions to its
15 radiation protection requirements in 10 CFR Part 20.
16 That's on a separate track, but whatever comes out of
17 there, just like existing Part 20, is going to apply
18 to these facilities. If there's no change, the
19 revisions to Part 20 would also apply. So that's one
20 thing to keep in mind.

21 And then importantly enough, there's the
22 EPA regulations on radiation in the environment in 40
23 Code of Federal Regulations Part 190. They are also
24 contemplating a rulemaking at some point. They're not
25 with us at the table today, although we would have

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1 liked them to be here, but we understand that they're
2 very early in their process and there's not much they
3 can say about this upcoming rulemaking, and it's very
4 relevant to reprocessing. And we might want to talk
5 about how those issues might affect reprocessing
6 facilities for the edification of EPA and the NRC Part
7 20 staff.

8 But I just wanted to emphasize that those
9 are important rulemakings, they're related
10 rulemakings, but they're off the table at this point.

11 I mean, we can discuss them but they're not going to
12 be addressed in this rulemaking.

13 So that's a long-winded overview of the
14 agenda. Are there any questions about the agenda at
15 this point?

16 (No response.)

17 MR. CAMERON: Okay. Well, Marissa, are
18 you ready to talk with us? Okay. Marissa Bailey is
19 going to give you a context on this rulemaking.

20 MS. BAILEY: Normally I'd like to stay
21 seated down also because I'm short also, but I
22 couldn't push the button the entire time.

23 First of all, I'd like to welcome you to
24 our workshop on reprocessing, and it's been mentioned
25 a couple of times already, but this is the second

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1 workshop that we are having on this issue, the first
2 one being in Rockville.

3 And it's been mentioned a couple of times
4 already that the NRC is in the process of establishing
5 a regulatory framework for reprocessing, and where we
6 are in that process is that we are developing a
7 regulatory basis for rulemaking. The purpose of this
8 workshop is to get stakeholder input on the gaps that
9 we've identified and how we should be addressing those
10 gaps in our regulatory basis document.

11 This is an important part, this workshop
12 and the public process is an important part of the
13 regulatory framework development of the rulemaking
14 process, so I'm looking forward to a good discussion
15 on the issues that we're bringing up today. I would
16 like to encourage robust discussion among all the
17 participants, and like Tom, I'd like to encourage the
18 staff to be open in sharing their thinking so that we
19 can fuel the discussion.

20 What I'll be doing basically is giving a
21 fairly quick overview on the effort of developing a
22 regulatory framework for reprocessing. I'd like to
23 talk about basically where this effort lies in the NRC
24 organization, talk about where the regulatory
25 framework is now for reprocessing and the public

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1 process, and also talk about the schedule for this
2 whole effort.

3 So first let me talk about where this
4 effort belongs organizationally, and this is an
5 abbreviated org chart of the NRC, as you can see, it
6 doesn't really have all of the offices in the NRC but
7 it does identify some of the major offices that are
8 involved in reprocessing. And NMSS has the lead for
9 developing the regulatory framework for reprocessing,
10 but I'd like to point out that this is a multi-
11 organizational effort, as you can see by the staff
12 that's sitting at the table and will be sitting at the
13 table in the next couple of days.

14 The Office of Federal and State Materials
15 and Environmental programs, or FSME -- and from now on
16 I'm going to use that acronym even though we're trying
17 to avoid acronyms -- is a key player to this effort.
18 They are responsible for the environmental piece, the
19 environmental impact statement. They also are playing
20 a key role in helping us to address the waste gaps.

21 The Office of Research is also a key
22 contributor to the tech basis document and they are
23 helping us to address some of the issues related to
24 risk and also to the structure of the regulatory
25 framework.

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1 NSIR is also a key player and they're
2 helping us to address some of the security and
3 safeguards issues.

4 And within NMSS the lead division for this
5 effort has been in the Fuel Cycle Safety and
6 Safeguards Division, but over the next few weeks we do
7 plan on transitioning the management responsibility
8 for that effort to the Division of High Level Waste
9 Repository Safety.

10 And I'd just like to take a couple of
11 minutes to give you the reasoning for why we are going
12 to be transitioning the management of this effort to
13 the Division of High Level Waste Repository Safety,
14 and it really has a lot to do with an integrated
15 approach to spent fuel management.

16 Reprocessing is going to be or could be a
17 very important component in the national strategy for
18 managing spent fuel, and we recognized that when we
19 developed the integrated spent fuel management
20 strategies, and in the Integrated Spent Fuel
21 Management Program, reprocessing is a key component
22 along with disposal of high level waste and extended
23 storage and transportation. And if you review the
24 regulatory gaps for reprocessing, you can see that
25 it's got kind of tentacles those two issues, to those

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1 components, and it's also got tentacles to low level
2 waste management and security.

3 So the object of the Integrated Spent Fuel
4 Management Program is basically to enhance the
5 effectiveness and efficiency of regulating the back
6 end of the fuel cycle, and we want to make sure that
7 as we move forward in addressing reprocessing and
8 addressing ultimate disposal and in addressing
9 extended storage and transportation that we're working
10 closely in addressing those three components that
11 we're integrating and that we're not promulgating
12 rules and policy and guidance that could have an
13 adverse impact on one of the three components, so we
14 want to make sure what we are truly integrating.

15 And it's in the spirit of integration and
16 in facilitating that integration that we are putting
17 the responsibility for reprocessing under the one
18 management umbrella and that's going to be Division of
19 High Level Waste Repository Safety which is why you
20 see today Lawrence Kokajko here and Jack Davis and
21 Jack Guttman. I think most of you know Lawrence is
22 the director for the Division of High Level Waste
23 Repository Safety, Jack Davis is the deputy director
24 there, and Jack Guttman is one of branch chiefs. So
25 that's why you see some Yucca Mountain refugees, as

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1 Chip put it here, in this meeting, because we are
2 preparing for this transition.

3 Let me just talk about reprocessing
4 specifically now. There is actually an existing
5 framework for regulating reprocessing or for licensing
6 reprocessing facilities, and that currently exists in
7 10 CFR Part 50. In fact, in the 1960s and 1970s, we
8 did license a reprocessing facility and we did issue a
9 couple of construction authorizations for reprocessing
10 facilities.

11 But over the years, Part 50 has evolved
12 and it's evolved to have a greater focus on power
13 reactors and has really left reprocessing or
14 production facilities behind, and that is why we have
15 initiated the effort, first of all, to do the gap
16 analysis, and then to start developing the regulatory
17 basis for reprocessing.

18 The process for developing the regulatory
19 framework will involve the gap analysis which we
20 completed a couple of weeks ago, the development of
21 the regulatory framework which we're in the process of
22 doing now, drafting the rule, and conducting the
23 environmental impact statement. This is a process
24 where public involvement is very important. We do
25 want to and we need to make sure we consider and

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1 factor in the input of stakeholders because the issues
2 are broad, and technically and policy-wise they're
3 very complex.

4 The rulemaking we envision is going to be
5 a considerable effort that's going to affect many
6 parts of the NRC regulations, and so the input from
7 our stakeholders we believe is very important. And as
8 we continue to move forward in developing this
9 framework for reprocessing, we are going to continue
10 to reach out to our stakeholders to get your input.

11 And I think Chip already talked about the
12 approach for the workshop and so I won't spend any
13 time on that.

14 And I'd just like to talk about the
15 schedule. Right now we are writing the regulatory
16 basis for rulemaking. We expect to complete the draft
17 regulatory basis in September 2011, and then somewhere
18 in the 2012 time frame complete the final regulatory
19 basis, and if approved, initiate rulemaking. At that
20 time we would also initiate the initial environmental
21 responsibilities. Our goal is to have a draft rule
22 published in the 2013-2014 time frame and the final
23 rule in the 2015 time frame. Of course, the schedule
24 depends on resources and in 2011 I think we're fairly
25 well resourced to at least complete the draft

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1 technical basis in September.

2 And these are just a list of websites
3 where information on reprocessing and on this effort
4 is available, so it's there for your convenience.

5 And that concludes the overview that I
6 wanted to provide.

7 MR. CAMERON: Okay. We're going to go
8 around the table, and we'll start with Don. I just
9 wanted to ask you to emphasize one thing that you
10 already had up on the slide is that after you complete
11 this stage of the process in September 2011, then it
12 has to go to the commission for the commission to
13 approve proceeding further.

14 MS. BAILEY: Right. The commission has to
15 approve proceeding with rulemaking.

16 MR. CAMERON: Okay. And Marissa, do you
17 want to relax and sit, and we'll go to questions.
18 Don.

19 MR. HANCOCK: Thank you. I had a couple
20 of questions that I wanted to get some clarification
21 on and also relating to part of this comes from the
22 SECY 09-0082 document. Can you be a little bit
23 clearer with me about what the resources are that the
24 NRC is putting into it? And I guess it may be more of
25 a question for some of the industry folks around the

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1 table than for you, but there's been reference to
2 industry saying they want to come, having said they
3 were going to come in with a license application in
4 2012, and so I'm trying to get some understanding from
5 the industry folks about what their schedules for
6 licensing applications might be.

7 MS. BAILEY: Yes. The resources that
8 we've estimated, at least for 2011 to develop the
9 regulatory basis, is about 12 FTE and about \$1.5-1.6
10 million. And I'll let the industry answer the
11 question about their plans for submitting an
12 application.

13 MR. CAMERON: Rod McCullum.

14 MR. McCULLUM: I think the simple answer
15 to industry's plans is we're still developing our
16 plans. You know, you have a lot in play right now.
17 You have a Blue Ribbon Commission out there that is
18 visiting the whole fuel cycle question. After the
19 Blue Ribbon Commission makes its recommendations, I
20 think we should see some draft recommendations from
21 them early next year. There will have to be some sort
22 of a legislative initiative in Congress. There will
23 be a different Congress coming up next, maybe the same
24 administration, maybe a different administration.

25 As I think you've already heard from Dan

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1 here, and as you see the representatives of the
2 companies out there, there's a lot of interest in
3 doing this but there really isn't a specific schedule.

4 And I think one of the most important points that I
5 can make here on behalf of industry here is the time
6 in which a group of companies and industry have
7 decided okay, we're going to build a facility and
8 we're going to submit an application on date X, that
9 is not the time to start developing the regulatory
10 framework. If you wait until that time, it's too
11 late.

12 Rulemaking is a very deliberative process,
13 it should be a very deliberative process. NRC has
14 laid out a schedule and most of industry appreciates
15 the schedule leading up to a rule in 2015, some would
16 like it to go faster. But we hope NRC will go through
17 that deliberative process, develop a robust, a strong,
18 a defensible rule -- that's very important to us that
19 we have a defensible regulatory framework -- and then
20 seeing that framework in place.

21 You know, I talk about the Blue Ribbon
22 Commission, the politics, the economics, what's going
23 to happen to the price of gas and all that sort of
24 stuff, what's going to happen to the price of uranium,
25 looking at what long-term projections are out there,

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1 but having the regulatory framework in place is a key
2 decision-making input.

3 So where there may be interest in industry
4 in submitting an application in 2012, 2013, whatever
5 the date might be, the more we know about what the
6 regulations are going to be, that drives our decision-
7 making. You can't make sound business decisions
8 without knowing what the impact of the regulations are
9 going to be. So this is an input for us.

10 MR. CAMERON: Okay, Don.

11 MR. HANCOCK: Can I just do a follow-up?
12 And this is back to Marissa or whoever else from the
13 NRC can answer it. What I just heard Rod say is very
14 similar to what I hear other parts of the nuclear
15 industry say. One of the parts of the nuclear
16 industry that is, in fact, active, is working in New
17 Mexico and other parts of the nation is the uranium
18 development industry, and particularly with what they
19 like to call the new in situ leach technology. There
20 is no in situ leach regulation that the NRC has,
21 rather they're bootstrapping the old regulation for,
22 quote, old uranium mining.

23 And so I guess my question is how was the
24 decision made to prioritize the reprocessing part of
25 the nuclear industry over a rulemaking on in situ

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1 leach which if we were doing such a rulemaking
2 roundtable in New Mexico, we would have lots of people
3 in the audience for that rulemaking as opposed to the
4 reprocessing rulemaking which seems, frankly, less
5 relevant to a lot of us in New Mexico.

6 MR. CAMERON: Marissa.

7 MS. BAILEY: I really can't speak to the
8 part of the in situ leach and what the decision for
9 that is, but for developing the framework for
10 reprocessing, I guess I'd have to go back about three
11 years or so with the Global Nuclear Energy
12 Partnership, and at that time the commission had
13 instructed the staff to look at the regulatory gaps
14 for reprocessing with GNEP in mind.

15 Ultimately, GNEP sort of got dropped, the
16 administration lost interest in that, but around the
17 same time frame we received two letters of interest
18 from the nuclear industry for at least their interest
19 in pursuing licensing of a reprocessing facility. And
20 so it was with that in mind that the commission
21 directed the staff to continue with conducting the gap
22 analysis and completing the gap analysis and
23 initiating the development of a technical basis for
24 reprocessing.

25 That's the direction that we are working

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1 with, and until the commission directs us otherwise --
2 well, that's the direction we're working with, that's
3 how we've been resourced, and I guess until the
4 commission directs otherwise, that's kind of where
5 we're moving forward.

6 MR. CAMERON: Go ahead, Don.

7 MR. HANCOCK: To maybe not belabor the
8 point, but to make the point clear, in New Mexico a
9 major issue has been, is and will continue to be the
10 uranium part of the nuclear industry, and some of the
11 companies here at the table are also involved in that.

12 But from an NRC standpoint, it's frankly
13 disappointing for people in New Mexico to have a
14 meeting like this -- which we're not opposed to having
15 a meeting like this, we certainly support a roundtable
16 kind of discussion and the people in the room who've
17 have dealt with know on the stakeholder side we've put
18 in a lot of time and energy into having EPA and DOE
19 and the state do roundtable kinds of things, so I want
20 to be clear what I'm going to say is not
21 misunderstood -- but the NRC has a lot of role in New
22 Mexico now in terms of cleanup of licensed facilities
23 that are affecting people's health today.

24 The NRC isn't putting enough resources
25 into the Homestake Superfund tailings cleanup in New

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1 Mexico, isn't putting the resources needed into the
2 cleanup of the Northeast Church Rock Mine -- and I'll
3 be interested in talking to the GE people about that
4 as well -- so when it comes to resources, we have a
5 really strong interest in how NRC uses its resources,
6 and frankly, the reprocessing rule doesn't look to me
7 and to other people in New Mexico as the right place
8 for the NRC to be putting because there are other
9 things -- and I've already mentioned two: one,
10 another rulemaking, and another, actually on-the-
11 ground work that needs to be done now to protect
12 people's health.

13 Just to make the point clear, one of the
14 staff people from my organization has been relocated
15 twice in the last three years from his home by the
16 Northeast Church Rock Mine because it's too dangerous
17 for he and his family and other people to live there
18 because it hasn't been adequately cleaned up, and the
19 NRC has part of the responsibility for that, as well
20 as EPA and other groups.

21 So it's a direct health and safety issue to people in
22 this state. The NRC has responsibilities that they're
23 not fulfilling.

24 And so I want to make it clear I'm clearly
25 willing to talk about the reprocessing rule but the

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1 record needs to be clear, and frankly, the NRC people
2 in this room need to go back to Rockville and to make
3 sure that all of the various agencies, and frankly,
4 the commissioners, because you don't come out and have
5 these kinds of meetings on the kind of cleanup that
6 we're talking about in this state.

7 So from a New Mexico standpoint, we want
8 to make it clear that we'll talk about reprocessing
9 but we fully expect to have the NRC, and frankly,
10 industry people, be a lot more responsive on the
11 problems we're facing today, the industry proposals
12 that we're facing today and tomorrow and next year and
13 not just the industry desires to have a reprocessing
14 rule in 2012 or 2015 or whenever. That's not the only
15 issue.

16 And frankly, in terms of health and safety
17 and livelihood of people in this state and some other
18 states that are affected by uranium development, this
19 one is not the top priority. NRC needs to hear that,
20 that needs to go back and there needs to be some clear
21 rethinking about it. And if I'm wrong and other
22 people in New Mexico are wrong, there needs to be a
23 more formal discussion with the industry and with the
24 NRC people about this resource question, and it needs
25 to happen soon because this is going to keep coming.

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1 MR. CAMERON: And I think that New Mexico
2 is our host for this meeting and at this beginning
3 stage of this workshop it's appropriate for that issue
4 to be brought up. And for Marissa is it going to be
5 will we be able to, will we take a message back to the
6 executive director of operations and the commission on
7 the concerns expressed by Don and sort of an
8 intriguing idea also to do public meeting, public
9 outreach not just on a particular facility or issue
10 but on a group of issues that are facing a particular
11 state, like New Mexico. Marissa.

12 MS. BAILEY: Yes. I appreciate that
13 feedback. Actually in the meetings that we've had on
14 reprocessing, this is the first time that that issue
15 has been raised, and really the overall issue of
16 resources and where does reprocessing fit in terms of
17 resourcing and prioritizing when you consider all of
18 the other things that the NRC is responsible for. So
19 yes, we'll take that back.

20 MR. CAMERON: Okay, thank you.

21 And before we go to Rod, let's hear from
22 Beatrice. There may be some issues for Rod to respond
23 to, too. Beatrice.

24 MS. BRAILSFORD: I actually had a specific
25 question for Rod. But I did want to, not just from a

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1 New Mexico perspective though, obviously, I have
2 wondered why we're meeting in New Mexico rather than
3 Washington state or Idaho which are the two western
4 states that actually have experience with
5 reprocessing. And I, too, from a broader perspective
6 am puzzled by how exactly this rulemaking is
7 occurring, who is initiating it.

8 I think, Marissa, you were in a meeting
9 with me when I asked what specific corporations were
10 interested in pursuing reprocessing, and the answer at
11 that point was that that information was proprietary
12 but that I could probably guess. Well, you know, now
13 I look around the room and I have a better guess than
14 I did before.

15 It does seem to me that there is a
16 possibility that the industry's interest in
17 reprocessing is somewhat speculative which is fine
18 from a business perspective, but from an expenditure
19 of public funds, that does raise some questions. You
20 know, I think GNEP was an entirely speculative thing.

21 So I would just flag that.

22 And then, Rod, my question was in the sort
23 of list of outcomes from the BRC you had a sentence in
24 there that it might lead to legislative action, and if
25 you could be specific about what legislative action

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1 you, if not anticipate, at least contemplate coming
2 out of the Blue Ribbon Commission that would have
3 anything to do with reprocessing.

4 MR. CAMERON: And can I just clarify one
5 thing for the record before you go? Beatrice's
6 reference to BRC is to the Blue Ribbon Commission. I
7 wasn't talking about the acronym, I just wanted to be
8 sure that everybody knows we're talking about the Blue
9 Ribbon Commission rather than the four-letter three-
10 letter acronym that we had some exposure to back in
11 the '90s, Below Regulatory Concern. Rod.

12 MR. McCULLUM: Yes. I want to first start
13 out by responding to Don and I want to be very simple
14 there. My area here is reprocessing and I'm not well
15 versed on the topics with uranium mining, however, I
16 know the folks in industry who are, and I received
17 your message and I will take your message back.

18 The second thing for Beatrice, I really
19 wish I could answer that question: What will the
20 legislative proposal look like? In order to answer
21 that question, I have to be able to predict the
22 outcome of several Senate races, House races,
23 leadership in Congress, and a lot of things. I simply
24 am not that smart, I wish I was, but I'm not.

25 However, I do know the Blue Ribbon

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1 Commission is going to tender recommendations early
2 next year. I do know there is an expectation that
3 those recommendations will take the form of
4 legislation. I know that that will kick off a debate.

5 There are a lot of perspectives as to how you get
6 from those recommendations to a piece of legislation.

7 And you raise a very good point, Beatrice,
8 about the use of public funds here for speculative
9 interests, and I would certainly say that I think on
10 industry's behalf it's far more than speculative. And
11 you had GNEP which was a very aggressive program for
12 reprocessing, then you had an election and now you
13 have a different strategy, and then you'll have
14 another election.

15 And one of the things we like about our
16 regulator in the industry is they're not a political
17 agency. NRC can't change its policies; it can't
18 rewrite its rules every time there's an election. And
19 one of the things we hope we'll get out of the Blue
20 Ribbon Commission, by the way, is a recommendation for
21 a durable policy on waste that doesn't change with
22 every election and some way to implement that.

23 But for NRC's part, and this is why I
24 think the public funds are appropriate here -- not
25 that they should be distracted from other priorities

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1 NRC has -- but the public funds are important here
2 because NRC needs to be able to inform that policy
3 debate that we all know is coming, and if we know what
4 the regulatory framework is, the chance that we'll get
5 a reasonable conclusion to that policy debate is far
6 better. And I think from the interest in industry and
7 I think from a lot of others out there that would like
8 to see the best possible energy portfolio deployed in
9 this country, that's important.

10 MR. CAMERON: Marissa.

11 MS. BAILEY: I guess I'd just like to
12 repeat that I really do appreciate you folks bringing
13 up the issue of resources and whether we're committing
14 our resources to the right things, and that's
15 something that we will look at.

16 But I also want to make sure that everyone
17 here understands that when it comes to the NRC
18 committing our resources that what's most important to
19 us is ensuring the safety and security of operating
20 facilities, fuel cycle facilities and reactor
21 facilities and so on. So I just want to make sure
22 that everyone understands that, that when we are
23 committing our resources, that is our primary focus,
24 that's our foremost priority.

25 With respect to your comment about the

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1 companies that have expressed interest in reprocessing
2 and whether those are proprietary, I don't think they
3 are but I would have to turn to Tom to kind of refresh
4 my memory as far as who those companies are.

5 MR. CAMERON: And maybe after we hear from
6 Tom, if Sven or Dan or Jim, anybody wants to say
7 anything about that, we'll be glad to hear it. Tom.

8 MR. HILTZ: We actually received, in about
9 2008, two letters of intent/interest in submitting for
10 a commercial application and one letter in support of
11 revising the framework. AREVA has indicated its
12 interest publicly. The other organization submitted
13 its letter to us under a proprietary considered
14 business and commercial proprietary, and while my
15 understanding is that they didn't have any concerns
16 with releasing their name, they never actually
17 followed up with us with a letter which told us that
18 that information was no longer considered business
19 proprietary.

20 MR. CAMERON: Okay. Anybody from around
21 the table want to add anything more on this? Sven.

22 MR. BADER: I'll just give you the AREVA
23 perspective. AREVA did, during the GNEP studies, come
24 up with a time line, and unfortunately the NRC time
25 line doesn't adhere to our time line. And we'd like

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1 to think we're part of the public too, so from a
2 business interest, yes, we're definitely looking for
3 some regulatory guidance to make a business argument
4 on why reprocessing is feasible in the United States.

5 Right now it's very difficult to do. As Marissa
6 pointed out, it's in Part 50 which is not cohesive, I
7 guess, it's kind of split up a little bit, and so
8 we're looking for some clear guidance on how to design
9 our facility to meet the regulatory limits in the
10 United States, whatever they might be.

11 MR. CAMERON: Okay. Thank you, Sven, and
12 thank you, Dan, Beatrice, Marissa, Rod.

13 I think we're ready to move to the first
14 discussion item. I guess we already had the first
15 discussion item but we're ready to move to the first
16 agenda discussion item, and Jose Cuadrado is going to
17 tee that up for us, and this is what type of
18 regulatory framework should there be, should the NRC
19 establish for licensing and regulating reprocessing
20 facilities.

21 MR. CUADRADO: Thank you very much for
22 teeing up my introduction. My name is Jose Cuadrado.

23 Alex Murray, unfortunately, could not join us -- so
24 I'm pinch hitting for him -- due to medical reasons,
25 so we wish Alex a speedy recovery.

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1 Let's go to the first slide. Essentially
2 what we're trying to do with this first presentation
3 is to try to provide some context and some explanation
4 of some of the terms and issues and gaps that NRC will
5 be taking public input on as part of this ongoing
6 effort to revise the regulatory framework for
7 reprocessing facilities. This first slide provides
8 sort of the context for which we'll be referring to
9 some of the terms.

10 As you can see here, we're going to talk
11 extensively about reprocessing and recycling. The
12 context in which we're going to talk about this is the
13 one that's provided by NUREG-1909. NUREG-1909 is a
14 white paper that the Advisory Committee for Reactor
15 Safeguards prepared, and essentially in this white
16 paper they express their views concerning establishing
17 such a regulatory framework.

18 In this paper the ACRS and the NRC refers
19 to reprocessing as the first part of the separation
20 processes that are going to happen in separating spent
21 nuclear fuel from its useful constituents and
22 separating the waste streams and conditioning all
23 these wastes and removing all the high level
24 radioactive materials. And for the purposes of
25 recycling, the reference refers to the subsequent

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1 stages which may include some additional treatment or
2 additional conditioning of these materials, it may
3 also include the conversion of some of these materials
4 to MOX fuel assemblies and other types of waste
5 treatments.

6 This slide is important because the Atomic
7 Energy Act which is the legislation that essentially
8 lays out a lot of the requirements for the
9 establishment of NRC and for NRC regulations. It
10 provides definitions for production facilities and
11 reprocessing facilities would be classified as
12 production facilities. And it is important because it
13 is a law passed by Congress and goes above any
14 regulation, and NRC codifies a lot of these
15 requirements from law in NRC regulations.

16 Right now the NRC regulations in 10 CFR
17 Part 50 which are applicable to production and
18 utilization facilities, production facilities would be
19 classified as reprocessing facilities and utilization
20 facilities would be essentially nuclear power reactor
21 facilities. These regulations identify essentially
22 the minimum requirements for the safe operation of
23 these types of facilities.

24 Also a bullet that we have in there is
25 special nuclear material is regulated under a separate

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1 provision which is 10 CFR Part 70.

2 This slide we have sort of two columns
3 that lays out sort of the main differences between 10
4 CFR Part 50 and 10 CFR Part 70. This is important
5 because as part of our deliberations we're determining
6 what kind of regulatory framework are we going to lay
7 out, is it going to be a Part 50 revision or a Part 70
8 revision or a new part that's going to incorporate
9 aspects of both. That's some of the issues that NRC
10 is considering.

11 In the left column we have Part 50 which
12 applies to, like I said, reprocessing facilities.
13 Part 50 has a regulatory philosophy that's based on
14 very specific prescriptive requirements, very
15 deterministic. It establishes a set of design basis
16 accidents that the facilities that are licensed under
17 this regulation must meet, and it also lays out a set
18 of general design criteria, technical specifications,
19 particular source terms, quality assurance
20 requirements and requirements to maintain those as low
21 as reasonably achievable.

22 And as we have already spoken here, one of
23 the issues that we have right now is that the focus of
24 this regulation over the years and over its revisions
25 has solely focused on power reactors and these

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1 revisions have not been applicable to production
2 facilities or reprocessing facilities.

3 On the right side we have a column talking
4 about special nuclear material licensing which is 10
5 CFR Part 70. This is a regulation that applies to
6 domestic licensing of special nuclear materials which
7 includes facilities that for the most part deal with
8 uranium processing, enriched uranium processing. This
9 essentially includes uranium enrichment facilities,
10 fuel fabrication facilities, and the MOX facilities.

11 The requirements of this regulation are
12 slightly different because it does include a risk-
13 informed requirement which essentially the regulation
14 states that licensees perform an integrated safety
15 assessment. ISA is essentially like a risk-informed
16 requirement which licensees evaluate the operations of
17 the plant to determine the probabilities and the
18 consequence of possible accidents, and based on those
19 results, they determine what are the appropriate
20 design aspects that need to be implemented to protect
21 public health and safety.

22 This slide is very interesting because we
23 also included it in the last reprocessing workshop and
24 it created quite a bit of discussion. This table over
25 here lists some of the -- let me just rephrase it this

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1 way, I think our intent with the table is to sort of
2 provide a context of the relative hazards that we're
3 dealing with the facilities that are licensed under
4 the separate parts. If you go towards the top, low
5 enriched uranium, uranium 235, these are facilities
6 and the hazards that these facilities provide are
7 regulated for the most part under 10 CFR Part 70.
8 These are relatively lower risk.

9 And as you go down on the table, you start getting
10 into the types of facilities that are regulated under
11 10 CFR Part 50 which you could say are relative higher
12 hazard and higher consequence facilities.

13 Another one of the issues at NRC is also
14 debating as part of this reprocessing regulatory
15 framework development is what kind of licensing
16 process are we going to implement, is it going to be a
17 one-step or a two-step licensing. As many of you are
18 aware, all the current operating fleet of reactors are
19 licensed under 10 CFR Part 70 and they follow a two-
20 step licensing process under which we first issue the
21 construction permit and then follow by an operating
22 license.

23 Current revised regulations for reactors
24 now contain a requirement that allows one-step
25 licensing during which the NRC can issue a combined

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1 construction and operating license. In addition to
2 these requirements, there's also requirements for
3 early site permits or separate design certifications,
4 and many other licensing requirements to verify
5 compliance with the licensing basis of the plants.

6 10 CFR Part 70 also allows for a one- or a
7 two-step licensing process. Essentially most of the
8 facilities that we have operating, fuel fabrication
9 facilities and fuel enrichment facilities, are
10 following the one-step licensing process that is
11 ongoing. However, the MOX fuel fabrication facility
12 is following a two-step process under which we first
13 issued a construction permit and they have essentially
14 requested a position and use license which the NRC is
15 currently considering.

16 The next slide provides a bit of context
17 concerning this issue regarding technology-neutral
18 regulations and I think we're going to talk at length
19 about this, and I just wanted to briefly talk about
20 what this is all about.

21 Right now existing commercial reprocessing
22 facilities, most of them which operate -- actually all
23 of them operate overseas -- use a separation process
24 called aqueous separation process. This process is
25 commonly known as PUREX, which is an acronym that

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1 stands for plutonium and uranium extractions.
2 Essentially this process is a solvent extraction
3 process under which you dissolve the spent fuel and
4 separate its components and waste.

5 However, there are actually other types of
6 technologies, non-aqueous, which are under different
7 bearing levels of lab or pilot scale research which
8 also include pyrochemical or also called
9 electrorefining processes.

10 So as part of the ongoing deliberation,
11 we're debating what kind of separate requirements or
12 what kind of consistent requirements could we
13 implement so that we don't necessarily discriminate
14 against one technology or the other. As the NRC is
15 aware up to these days, we believe that any potential
16 domestic commercial reprocessing facilities are going
17 to be using some type of aqueous process, maybe PUREX
18 or some other variation of that; however, there's also
19 discussions from members of the nuclear industry to
20 consider other separation techniques such as
21 pyroprocessing.

22 And I think that pretty much summarizes
23 all the issues that I wanted to talk about. In this
24 slide we have a whole bunch of questions that,
25 although they may or may not align identically with

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1 the ones that you have in your agenda, we just
2 included them to promote discussion, and if you see
3 something out there that piques your interest and you
4 want to talk about it, you're more than welcome to do
5 so.

6 So Chip, I'm done.

7 MR. CAMERON: Okay. Thanks a lot, Jose.
8 And I'm going to find out if there's any questions for
9 Jose before we begin the discussion, but I think it
10 might be useful to start with the question, re-framing
11 it to see if we can see if there's any consensus here
12 as to are there any advantages to the NRC using a Part
13 50 approach or a Part 70 approach as opposed to
14 writing a new regulation. So that's where I'd like to
15 start with this, but let's see if there's some
16 questions first. Don.

17 MR. HANCOCK: I'm not going to do what you
18 just said because you earlier had said are there
19 questions for Jose.

20 MR. CAMERON: That's what I meant,
21 questions for Jose.

22 MR. HANCOCK: Well, it's for Jose but I'd
23 also like to hear from industry folks. I guess I was
24 struck by the comment that you made toward the end
25 about you want the rule to not discriminate among

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1 technologies, and I guess I want to understand that a
2 little bit more.

3 From my standpoint, the PUREX reprocessing
4 technologies that we've used in the United States have
5 had pretty disastrous results and I would argue we
6 want to discriminate against that technology
7 continuing to be used with the kind of disastrous
8 economic environmental health results at the DOE
9 reprocessing sites and at West Valley in New York. So
10 I guess I need to understand better why you don't want
11 to discriminate against failed facilities.

12 MR. CAMERON: And Jose, just a couple
13 other things on that. Besides answering Don's
14 question about what you meant about not
15 discriminating, do you also mean that this is the
16 technology, what industry refers to or people refer to
17 as technology-neutral.

18 MR. CUADRADO: Yes. I guess the concept
19 of discrimination can be sort of misunderstood.
20 Ultimately it is NRC's goal that regardless of the
21 technology that we propose requirements for, that
22 those requirements are consistent with the resident
23 hazards and that we lay out requirements that indeed
24 will ensure that the public and the environment will
25 be protected.

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1 This will likely mean that we're going to
2 have to understand a lot more about one technology
3 over the other. I think for the PUREX and aqueous
4 process, there is experience out there for which we
5 can draw on to understand what has worked, what has
6 not worked, what are the things that we need to ensure
7 that we do it correctly if we decide to do it. And
8 for the other technologies such as pyroprocessing and
9 others, we need to ensure that we also understand a
10 lot more about the nature of the processes that these
11 are, so that we can lay out requirements.

12 But what we want to make sure is that the
13 NRC doesn't want to make judgments as to what is the
14 most adequate and what is less adequate. We need to
15 make sure that regardless of the technology that is
16 used that we have the proper requirements consistent
17 with that technology so that it can be safely used
18 without drawing any preference to each one of these.

19 MR. CAMERON: Thank you, Jose.

20 Rod, could you also, in addition to
21 whatever you're going to say, how do you address
22 concerns such as Don expressed with one particular
23 technology, or other people might have concerns with
24 other technologies. How can that be handled in the
25 regulatory process, the fact that one might have more

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1 deleterious consequences, perhaps, than another.

2 MR. McCULLUM: Well, I'll try to tie
3 everything together here, and if I don't, maybe that
4 means it's time for a break. But I did have a
5 question. I'll start with a question for Jose that I
6 think will get into this, and Jose, if you could,
7 could you go back to the slide that had the chart of
8 the different hazards, that slide right there.

9 I think this gets into the essence of --
10 it gets a little bit of technology-neutrality but it
11 gets into the essence of why we in industry feel a new
12 regulation is needed. You've got the things that are
13 deemed to be lower hazard up there, and you say more
14 like Part 70 and the things at the bottom and you say
15 more like Part 50. We looked at this question in
16 developing Part 7X, it's just not that simple because
17 it's not a question of what is the inhalation of a
18 given population of radioactive materials, it's what
19 energy sources exist that could potentially release
20 those materials, how complex are the systems that must
21 interact to potentially mitigate that release which is
22 why you can't go up the arrow and you can't go down
23 the arrow, strictly speaking. You need a new
24 regulatory approach.

25 Now, to tie that back to technology-

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1 neutrality which is our big principle here in
2 industry, and the first way you do that is, of
3 course -- and Chip got tired of me saying this at the
4 last workshop but I'm going to start it again --
5 you've got to be risk-informed, you've got to be
6 performance-based to be technology-neutral. And in
7 saying that, we need a regulation that will assure
8 that the right mitigative features are put in between
9 the hazards and the things that can release the
10 hazards and the people. And if you look at the
11 nuclear industry's record, we've gotten very good at
12 doing that.

13 So you need a regulation that won't
14 prescribe analytical tools and methodologies -- and
15 I'll talk about this a little bit more with integrated
16 safety analysis -- that will assure that you have
17 appropriate barriers between those radioisotopes and
18 people, both the workers and the public.

19 So when I say risk-informed, performance-
20 based, I mean not specifying you have to have the
21 following seven items that you rely on for safety
22 because in order to say that you'd have to know
23 whether you're an aqueous or pyroprocessing facility,
24 but here I show you determine what are your items
25 relied on for safety. And that really is the essence

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1 of what we're doing here in nuclear safety. Is you've
2 got to put the right barriers in between those hazards
3 and the people.

4 I'll just say a little bit about the
5 different technologies, and I would agree we don't
6 want NRC to produce a regulation that would simply
7 lead us to where we are at West Valley, but I'll also
8 say that that was a long, long time ago. We have a
9 great base of experience. You look over in France --
10 and Sven can chip in here if he wants -- but one of
11 the most powerful things I'm struck with whenever I
12 hear the French present on their technology how even
13 today it's evolving as they've processed thousands of
14 metric tons of spent nuclear fuel.

15 There's been a lot of evolution in how you
16 ensure safety since West Valley, and the
17 representative from GE will be here later today, I
18 understand, but he's in the pyroprocessing side, so on
19 his behalf, a lot of experience with pyroprocessing
20 technologies out at Idaho National Laboratory, EBR-2
21 and some of the other facilities that have operated
22 out there.

23 So I think you need to capture the base of
24 experience. And my finger is wearing out anyway. But
25 where you can't be completely risk informed,

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1 performance-based, you can provide what we like to
2 call off-ramps or reserved sections where you can put
3 in the regulation okay, here's how you go about
4 determining the right items relied on for safety, but
5 there's a specific 7X.YZ that would recognize some
6 unique concerns to pyroprocessing, a specific 7X.QW
7 that would recognize some specific concerns relative
8 to aqueous, and you can develop those at different
9 times as the knowledge becomes available.

10 MR. CAMERON: And we'll go to Robert, and
11 then to Dan and we'll check back in with Don, but in
12 terms of concerns about particular technologies, the
13 process that the industry would envision putting into
14 place, and maybe it's more appropriate to talk about a
15 particular proposed facility rather than process, but
16 if that facility or process couldn't make it through
17 the process, then that's how those facilities or
18 processes would fall by the wayside.

19 MR. McCULLUM: Correct. We'd expect NRC
20 to lay out a very rigorous path for this risk-
21 informed, performance-based demonstration of safety,
22 and if a facility couldn't get to the end of that
23 path, they wouldn't get licensed.

24 MR. CAMERON: Okay. Let's go to Robert,
25 and then we'll go to Dan and Beatrice. Robert.

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1 MR. HOGG: I just want to tie what Rod
2 said back to the regulatory framework and how we
3 considered many of these things when we were first
4 developing Part 7X and thinking about what the
5 structure was, and Part 50, it was pretty clear that
6 there was an intent at one time to put reprocessing in
7 that regulation. And after the last workshop, Alex
8 provided us the appendices that would have applied to
9 those regulations, and they're great ideas and great
10 bases, but put in a prescriptive regulation like Part
11 50, that's what would be there.

12 And knowing what we know today, those were
13 written in 1974 and they're great things and we do a
14 lot of those things at a lot of facilities, but we do
15 more today too, and we wouldn't have to if that was
16 the regulation because that's the prescriptive nature
17 of Part 50.

18 A part that is driven by performance and
19 that has a performance basis would demand that the
20 licensee continually think about how one meets those
21 performance requirements and would continue to update
22 and develop the bases and the considerations for the
23 facility, and that was why industry was leaned towards
24 a performance-based approach.

25 MR. CAMERON: Okay. Thanks, Robert. And

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1 Dan, and then we'll go to Beatrice and Jose.

2 MR. STOUT: I just have one small point.
3 As industry we have boiling water reactors and
4 pressurized water reactors, both licensed under Part
5 50 or new facilities under Part 52. The experience
6 has experienced or the industry has experienced that
7 there's no reason why a similar model wouldn't apply
8 to recycling technology where you would have one rule
9 and then different technologies would require
10 different designs to meet those requirements.

11 MR. CAMERON: Okay. Beatrice.

12 MS. BRAILSFORD: Well, I guess I was going
13 to ask if I could have a real brief statement from
14 both industry and the regulators what they saw as the
15 advantages and disadvantages of technology-neutral,
16 but I think we're going to spend a lot of time hearing
17 about the industry's perspective in the next two days,
18 and that does seem odd to me. I do know that industry
19 is a stakeholder in this process, but it does seem to
20 me that this particular discussion is driven to a
21 notable extent by industry's desires.

22 So I do, at some point in the next two
23 days, want to know what's in it for you, the
24 technology-neutral versus not, but in the meantime, I
25 would like to hear from the Nuclear Regulatory

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1 Commission what are some of the advantages and
2 disadvantages from a regulatory perspective in
3 technology-neutral versus not.

4 MR. CAMERON: Okay. Thanks, Beatrice. I
5 think technology-neutral is a major issue that fits
6 within this particular agenda item, and we need to get
7 to it sooner or later. We still have the Part 50,
8 Part 70, new regulation, and I would imagine that if
9 we wanted something to be technology-neutral, you
10 could fold that into whatever one of those approaches.

11 I'm not sure if you could or not. We still need to
12 get to that, are there any advantages of using
13 existing Part 50, 70.

14 But we had a couple of cards up, Jose and
15 Phil, and I just want to make sure we get those out
16 before we start to answer Beatrice's question about
17 technology-neutral. And someone needs to define that
18 for us, and we also want to hear from Rod and his
19 colleagues about what are the advantages, and from the
20 NRC what are the advantages of doing technology-
21 neutral.

22 But perhaps another question is what are
23 the disadvantages of doing it. In other words,
24 Beatrice, I get from the implication of your question
25 is that you don't think that technology-neutral may

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1 necessarily be a good idea from a public health and
2 safety standpoint, so we'd like to explore that a
3 little bit. But let me hear, Jose, what did you want
4 to say, and Phil, what did you want to say?

5 MR. CUADRADO: I guess the first thing I
6 wanted to say is a brief clarification on the slide.
7 The fact that the arrows point towards Part 50 and
8 Part 70, that must not be misunderstood as an
9 indication that the staff is leaning towards a certain
10 way. I mean, we clearly have commission policy
11 towards making regulations more risk-informed and
12 performance-based, and that's definitely a part of the
13 considerations as we go forward.

14 So I just wanted to clarify the fact that
15 these arrows are out there, that doesn't necessarily
16 mean that this is the only piece of information that
17 the staff is using for developing its regulatory
18 framework.

19 MR. CAMERON: And Phil.

20 MR. REED: Well, with regard to this
21 slide, it's only related to inhalation does and mostly
22 to workers.

23 The comment I was going to make was the
24 broad comment about technical neutrality and also with
25 the various separation processes. First of all, we

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1 don't expect to a PUREX type reprocessing type of
2 separation. I think what we're looking at mostly now
3 is either the COEX extraction or the NEWEX extraction
4 and also the pyrochemical.

5 In the commission paper that we wrote, I
6 think it was either the first commission paper or the
7 second commission paper, we identified the strategies
8 for the particular separations and we identified a
9 very simple extraction process where we would extract
10 the plutonium and neptunium and make mixed oxide fuel.

11 But we also identified the complete separation
12 process, separating all the fission products the TRUs
13 and all the other materials. And in a technical-
14 neutrality type regulation, what we would like to aim
15 at is simplicity for the aqueous separations.

16 At this point it doesn't appear as if
17 there's going to be a broad differences, and we hope
18 that's not the case, we hope that we don't have the
19 complexities that we can handle the aqueous
20 separation. The problem has come in with the
21 pyrochemical, of course, and the pyrochemical is a
22 molten chloride solution process, there's nothing
23 aqueous about it. And that's, I think what the staff
24 is struggling with now, to try to come up with some
25 kind of regulations that would apply to all three of

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1 these kinds, recognizing that we do.

2 The other thing that the staff is sort of
3 struggling with is a lot of these separation processes
4 work fine in a laboratory on a tabletop, we're not
5 sure whether they actually work on an engineering
6 scale or a full scale yet. Now, the PUREX process, of
7 course, has worked in France and also Russia and also,
8 I think, Japan, and they have tons of experience on
9 that, but the experience that we have here is very
10 limited on some of these scaling processes.

11 MR. CAMERON: Okay. Thanks, Phil. And
12 let's put that on ice for a little bit and really try
13 to dive into the technology-neutral issue because it
14 comes up as a big issue and let's have a discussion as
15 to what are the alternatives to the technology-neutral
16 approach.

17 And Beatrice, at some point we want to ask
18 you what your problems are, if you have problems -- I
19 don't know if you do -- with the technology-neutral
20 approach.

21 And Rod, were you going to start the
22 topic?

23 MR. McCULLUM: Yes. I was going to speak
24 about technology-neutral

25 MR. CAMERON: Can you give us a context on

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1 that, and then we'll go to Robert, and then Tom and
2 continue with the discussion.

3 MR. McCULLUM: Obviously, from where I
4 sit, technology-neutral is the only way to go, so it's
5 not surprising I'm going to see more advantages in
6 technology neutrality than disadvantages. I will
7 highlight what I think are each.

8 And I'm coming at this from a perspective
9 of a representative of a trade association that
10 represents a very diverse industry. Dan has already
11 mentioned we have BWRs and PWRs out there. We have
12 companies that sell boiling water reactors and we have
13 companies that sell pressurized water reactors.

14 We also have in the dry cask storage, to
15 get a little bit closer. This is when the reactor
16 pools are filled up and we have to come up with an
17 alternate storage means for the spent fuel. We have
18 three major vendors in the United States that split
19 the market, I don't know what the percentages are, and
20 some of them have technologies of vertical casks, some
21 of them have horizontal casks, they're different.

22 I guess I can sum all the advantages up of
23 technology neutrality in that competition is good.
24 And we have out there, and you saw it in the GNEP
25 expression of interest, we have a competition, we have

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1 multiple purveyors of multiple technologies seeking to
2 bring reprocessing to the United States. You're going
3 to get to a better answer if you have competition as
4 you go down that process. So being technology-neutral
5 allows all of those purveyors to play into the
6 national debate without having NRC -- which is not a
7 political agency, which does itself have to be
8 neutral -- influencing that decision one way or the
9 other.

10 If you look, again, in dry casks, we've
11 loaded 2,000 of these things safely. There's a
12 confidence and the commission recently expressed its
13 confidence in that technology. It works, in part,
14 because of the competition that exists between the
15 vendors. So allowing the national debate on
16 reprocessing to progress to get us to the best
17 possible technology means not killing the competition
18 at the very initial stage, which you would do if you
19 tried to prescribe a regulation that was not
20 technology-neutral.

21 As far as the disadvantage, and I'll say
22 this to the folks at NRC, it does make the challenge
23 of writing the regulation a little bit harder. An
24 easy regulation is when you know exactly what the
25 widget is going to look like, and so NRC has to

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1 stretch its thought processes a little bit further to
2 do this. We think they can do it and we think in the
3 end the risk-informed, performance-based regulation
4 will be a better regulation.

5 Sometimes an easy regulation isn't
6 necessarily the best regulation. I won't name any
7 other industries out there that don't have the safety
8 record of nuclear, but those regulators probably
9 should have stretched their minds a little bit more in
10 the past too. So basically the advantage is
11 competition, the disadvantage is it's a more
12 challenging thought experiment for NRC.

13 MR. CAMERON: And let me just clarify or
14 just ask you to affirm a clarification on what you
15 just said that may be instructive for people, and it's
16 a point that Robert brought up earlier, is that you
17 mentioned risk-informed, performance-based. In other
18 words, a technology-neutral regulation would need to
19 be risk-informed, performance-based, as opposed to
20 prescriptive regulations that were tied to a
21 particular technology?

22 MR. McCULLUM: Yes, I see those two
23 concepts as going hand in hand. Risk-informed,
24 performance-based is what you are trying to accomplish
25 without specifically prescribing how that gets

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1 accomplished in a given facility. And in the end it's
2 a better regulation. It's a challenging regulation to
3 write.

4 MR. CAMERON: Okay. Let's go to Robert
5 and Tom Hiltz, Jim Lieberman, and then jump back over
6 to Jim Bresee, and then hear from our colleague from
7 the UK, Rex.

8 MR. HOGG: So I really empathize with the
9 discussion because when we were considering the
10 framework as we wrote it, there are some things that
11 are not -- what's the word that I'm looking for --
12 that are not dependent on the technology. The
13 performance of the facility is going to be set at an
14 expectation level, the ability to be non-proliferant
15 is going to be set at an expectation level, there are
16 certain things that are going to be dictated.

17 But we don't know what the design today
18 is, and so the thing that we shouldn't dictate is what
19 the design is. There are good designs and there are
20 bad designs, and we don't want to fall into the trap
21 of directing the design effort down a bad path, we
22 want to go in the direction of directing the
23 performance effort down a good path, and that's where
24 we can be prescriptive in performance goals, or as
25 what we ended up with in the white paper that NEI

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1 wrote was more of a set of performance goals.

2 We saw a slide that was directed at dose
3 consequence to the worker, and that's one goal, and
4 then there's other goals, there's boundary goals,
5 there's projected goals for local populations. Those
6 things are the right things to think about and to
7 prescribe, but not how to get there. And that's one
8 of the things that I think Bob Pierson says it best,
9 when the general design criteria were established, it
10 was an expectation of how to design things.

11 The baseline design criteria, as we've
12 proposed in our regulations, are the right things to
13 consider, and the baseline design criteria in Part 70
14 are the right things to consider for a facility that
15 could be designed to do a plethora of things, not
16 necessarily one specific task every day every step of
17 the way.

18 So that was the conceptual paradigm that
19 we built that piece of the proposal under, and so it
20 really is focused on the performance requirements and
21 that's the first thing that we establish. And then
22 from that, knowing all the good things that we've
23 learned as engineers over the years, and we've learned
24 them the hard way, put those things into the
25 considerations of the design criteria.

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1 MR. CAMERON: Thank you, Robert. Tom, and
2 then we'll go to Jim.

3 MR. HILTZ: Thank you, Chip.

4 In partial response to Beatrice's
5 question, I'd like to provide a little bit of context.

6 In SECY 09-0082 which was our last commission paper
7 that we wrote regarding reprocessing, and I think we
8 also said it in a subsequent follow-up memorandum
9 earlier this year, we intend to make, to the extent
10 practical, any new rule in reprocessing risk-informed,
11 performance-based, and to the extent practical,
12 technology-neutral.

13 There, I think, is continuing discussion
14 around the NRC about what technology-neutral means and
15 how it is implemented, and I think it will be
16 challenging to develop a technology-neutral rule.
17 Rulemaking in itself is a very deliberative,
18 thoughtful process that we enter that also has to
19 abide by certain rules and a certain framework. So
20 it's impractical and not reasonable for us to develop
21 a regulation, a one-liner that says any reprocessing
22 facility shall ensure the public health and safety is
23 protected. We have to go to a sufficient level of
24 detail in our rulemaking to provide that regulatory
25 framework, and that stability, that efficiency and

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1 that effectiveness.

2 We made a presentation to the Blue Ribbon
3 Commission, I think it was in September or August, and
4 one of the topics that we talked about was technology-
5 neutral, and those slides are available publicly if
6 you are so inclined to go look at those.

7 I think from an agency perspective, there
8 is a tradeoff in technology-neutral, and a tradeoff in
9 regulatory stability and effectiveness and efficiency.

10 A technology-neutral framework that has high level
11 performance requirements will likely require more
12 detailed regulatory guidance in order to implement.
13 You get to the same point, I think, whether you strive
14 for a technology-neutral or for a more prescriptive
15 regulation, because in the end, ultimately to provide
16 that regulatory stability, you need sufficient
17 guidance that a potential applicant or a licensee can
18 use, and that the NRC staff can use in reviewing an
19 application or a submittal.

20 So I think it's a challenge for us, I
21 think it is a goal to the extent that we can to make
22 our reprocessing regulation technology-neutral, but to
23 the extent that we're able to make it technology-
24 neutral, I think that the downside -- not the
25 downside, but the other side is that we will have to

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1 develop more detailed regulatory guidance in order to
2 make sure that that framework is stable and
3 predictable.

4 MR. CAMERON: And just let me clarify one
5 other thing with you, Tom, and it seemed like this is
6 what Rod was saying, is that are you equating
7 technology-neutral with performance-based? And I'm
8 just asking that from a point of understanding because
9 that will make it easier to understand.

10 MR. HILTZ: And I'll offer my opinion. I
11 think to the extent that there are performance
12 requirements that are applicable to an array of
13 technology, then you have developed a technology-
14 neutral framework. The challenge is can you get
15 performance requirements that cover the whole span of
16 potential technologies that may be submitted, and I
17 think that's a daunting and very challenging and maybe
18 not a reasonable task.

19 MR. CAMERON: And you established one end
20 of the spectrum for us on performance-based which
21 would be any reprocessing facility must protect the
22 public health and safety, one-line rule. That's the
23 end of the spectrum and I'm not sure what the other
24 end is.

25 Beatrice, can you hold for a minute? I

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1 want to come back to you, ultimately, after this
2 discussion to see what your take is on all this.
3 Let's go to Jim Lieberman, and then Jim Bresee, and
4 then let's go to Rex Strong, and then Marissa.

5 MR. LIEBERMAN: I was going to basically
6 make the point that Tom said, in response to your
7 question, Chip, that to some degree technology-neutral
8 is almost a red herring. If you have a risk-informed,
9 performance-based approach meaning you focus on what
10 the outcome is, you want to meet a certain standard,
11 you want to keep the risk to a certain level, you want
12 the doses kept to a certain level, you want the
13 releases kept to a certain level, you want the
14 chemical impact kept to a certain rule, and then the
15 rule focuses on the practices and methodologies, what
16 issues do you consider, how do you consider them.

17 And it really goes to the Part 50/Part 70
18 question. Part 70 is a regulation that addresses a
19 whole variety of regulatory activities. It doesn't
20 prescribe in general the specific items each facility
21 has to have. Compare that with Part 50, Part 50 is
22 very prescriptive as to what each facility generally
23 has to have.

24 In developing the NEI white paper on
25 Proposed 7X, we looked at Part 70 and we said that

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1 concept was good, the performance requirements were
2 good, but the detail on methodology and the processes
3 needed supplementation, and we took some things from
4 Part 50, we took some things from Part 70 too, various
5 parts of the regulations, to build so that when the
6 particular design comes in, whatever that design might
7 be, the applicant will be able to demonstrate the
8 safety objectives and performance requirements to be
9 met, and that way it will be technology-neutral.

10 MR. CAMERON: Thank you, Jim. I think
11 that was helpful.

12 And Beatrice, we're going to end up back
13 with you to give us your opinion on everything that
14 you heard here.

15 MS. BRAILSFORD: I'd like to ask the
16 regulators some follow-up questions.

17 MR. CAMERON: Do you want to do that now?

18 MS. BRAILSFORD: Yes, please.

19 MR. CAMERON: Okay. Then we'll go to Jim
20 Bresee.

21 MS. BRAILSFORD: So Tom, could you
22 delineate some of the challenges that you see with
23 this technology-neutral approach, and as important,
24 tell me what you think you get out of it.

25 MR. CAMERON: And Beatrice, we're going to

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1 let that sit there and simmer and let Tom and the
2 other regulators think about that, as well as all of
3 the rest of you. But let's go to Jim Bresee, and then
4 we'll go to Rex. Jim.

5 MR. BRESEE: Let me just make a few
6 background comments on separations technology or
7 reprocessing, or whatever term you want to use.
8 Incidentally, the favorite term among my colleagues in
9 Europe is partitioning. To people involved in that
10 same technology in Europe, that seems to be a less
11 threatening term than separations or recycling or
12 reprocessing.

13 The whole purpose of
14 recycling/reprocessing is going to be driven in the
15 future in the U.S. by the products, and these
16 requirements for the products can be reached by a lot
17 of different pathways which is why it may turn out to
18 be technologically useful to try to stay as much as
19 possible in a technology-neutral regulatory framework.

20 I don't believe any serious thought is
21 going into a separations process purely for the
22 purpose of producing materials which will then be
23 thrown away or disposed of through some type of
24 combination of storage and disposal. In other words,
25 the separations process will only take place if there

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1 is a particular product in mind that has value
2 sufficient to support the decision to do that
3 separation.

4 That product most often will be fuel. It
5 will be fuel for a variety of reasons, producing
6 energy, transmuting materials which are hazardous,
7 whatever. It will be a fuel issue that we will need
8 to address in the development of the separations
9 process. That is why within our current Advanced Fuel
10 Cycle Program at the Department of Energy, the
11 separations and fuels technologists work side by side.

12 We have an understanding that depending
13 upon the specifics for a fuel design, there will be
14 specifics ultimately dictated on the separations
15 process. You can get to almost any fuel design by a
16 variety of processes and these processes, each one of
17 them has its own technical economic challenges, but
18 they are not ruled out per se simply because of the
19 product requirements.

20 So to the extent that our discussions
21 today and tomorrow reflect the fact that separations
22 are simply pathways to a product and that the
23 specifications of the product itself determines the
24 kind of separations that will be required, that may
25 help in our discussions then of the regulations that

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1 will be associated with those processes.

2 MR. CAMERON: Okay. Thanks, Jim. And
3 keep the eye on the products and there may be several
4 types of designs or processes that can get you to the
5 product and each of those designs and/or processes
6 will have their own technical economic challenges.
7 All right. Rex.

8 MR. STRONG: Thank you. A few comments.
9 I'm not sure whether you'll necessarily find these
10 helpful, but you can judge that for yourselves really.

11 My experience is in the UK regulatory
12 framework which is actually quite different from
13 yours, and I just wanted to point out some of what I
14 think are differences because that might help inform
15 your future discussion.

16 Our regulations around nuclear safety are
17 goal-based regulations, not target-based, and the
18 goal, the fundamental goal is around reducing risks to
19 a level as low as reasonable practicable. Now, as low
20 as reasonable practicable ultimately is a judgment,
21 it's a matter of opinion. Of course it takes into
22 account the state of technology at the time the
23 decisions are made, but it's not absolute. So a
24 decision this year may well be different from one in
25 ten years time or twenty years time.

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1 And from an operator's point of view, the search for
2 improved performance does not stop so there's no such
3 thing as met the target, on to the next issue.

4 Now, specifically in terms of nuclear
5 plant or new nuclear developments, there's a
6 fundamental requirement that they shall be justified
7 which means, very simply, that the societal benefits
8 of the facility shall quite clearly outweigh the
9 society dis-benefits. Now, all sorts of things, of
10 course, can be taken into account in benefits and dis-
11 benefits, but fundamentally there has to be
12 justification.

13 In the UK the issue around whether UK has
14 a nuclear power plant, for example, or whether the UK
15 reprocesses spent nuclear fuel, for example, those are
16 fundamentally political decisions made by our
17 parliament, of course, taking into account
18 stakeholders' views through various sorts of
19 consultation processes, but they're fundamentally
20 political decisions. They're not fundamentally
21 decisions for a regulator.

22 The regulator has a role in respect of
23 deciding whether a specific proposal should or should
24 not be licensed, and when a developer wants to, say,
25 build a new nuclear plant or an operator wants to do

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1 that, the safety case for that facility has to be made
2 by the operator. It's not made by the regulator, it's
3 judged by the regulator, but the safety case is owned
4 by the operator. So the accountability in our regime
5 at all times, under the law, rests with the operator
6 because it's the operator's case.

7 Now, if I just loop that back to a
8 discussion about technology-neutral, what I've just
9 said is independent of particular choices of
10 technology. The operator has to make the case. If
11 these are really, really big decisions, like whether
12 we want a new nuclear power plant in the UK -- which,
13 incidentally, we do -- that's a political decision.
14 Choices of reactors and licensing of reactors comes
15 along, as it were, separately, and similarly with
16 reprocessing technologies.

17 I hope those comments maybe help.

18 MR. CAMERON: Thank you, Rex. That's
19 instructive. I think that what you said about the
20 policy choices made by the party is similar to what
21 happens here, and also what you said about the
22 applicant's responsibility and the regulators. So
23 thank you for that comparison, and at some point, if
24 you want to comment specifically on what types of
25 regulations you have in place, that would be very

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1 helpful to hear too.

2 Marissa you had your tent up and you were
3 going to say something. If you want to begin to take
4 a crack at Beatrice's question about what the
5 challenges are of trying to establish a performance-
6 based.

7 MS. BRAILSFORD: But I also need to know
8 what the benefits are.

9 MR. CAMERON: Yes, the challenges and the
10 benefits of performance-based, in parens, I guess, and
11 technology-neutral, in parens. And then we'll go to
12 Tom with that. And then after that, Beatrice, I would
13 like to ask you if you have reached a conclusion, or
14 not a conclusion, but what are your concerns with a
15 performance-based, technology-neutral approach so that
16 we can see if there's some way to talk about those
17 concerns. Marissa.

18 MS. BAILEY: I guess I'll try to answer
19 that question by maybe giving a practical example. If
20 you want to take a look at a regulation that comes
21 close to being technology-neutral or is technology-
22 neutral, you can take a look at 10 CFR Part 70 which
23 is a risk-informed, performance-based regulation. And
24 what it does is it gives performance requirements such
25 as the dose to the worker and to the public,

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1 prevention of criticality. So it gives the
2 performance requirements but it doesn't dictate the
3 how to meet those performance requirements, it doesn't
4 give design criteria, it doesn't give design
5 specifications.

6 So under Part 70 we've been able to
7 regulate a variety of fuel cycle facilities, all the
8 way from a fuel fabrication facility to an enrichment
9 facility and now the MOX fuel fabrication facility,
10 and also facilities that are for special nuclear
11 material licensees. So that is an example of a
12 technology-neutral regulation.

13 The advantage to that, of course, is that
14 we are able to regulate a variety of facilities and
15 ensure that they are safely operating without having
16 to go to rulemaking each time something new comes
17 along. The disadvantage, I guess, is that there is a
18 level of uncertainty in the licensing process because
19 it is looking at a variety of different facilities,
20 different processes.

21 And so we've had to deal with those
22 uncertainties in some cases by developing guidance.
23 For example, most fuel facilities are reviewed under
24 the standard review plan for fuel cycle facilities
25 that's in 1520, whereas, for the MOX facility we had

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1 to develop a new standard review plan for that. So
2 that's one of the disadvantages, I think, maybe the
3 uncertainty that you end up with in the licensing
4 process.

5 I guess another disadvantage is when you
6 are establishing performance requirements, as Tom
7 said, you have to establish the performance
8 requirements that's applicable to the range of
9 facilities that you're anticipating, and so when that
10 fuel cycle facility is a reprocessing facility, that's
11 when you see Part 70 falling short because it doesn't
12 begin to address the risks that are associated with a
13 reprocessing facility that is dealing with spent fuel
14 and highly radioactive material.

15 So the challenge then for establishing, to
16 me, a technology-neutral set of regulations for
17 reprocessing is figuring out what those performance
18 standards are that can capture the range of technology
19 that you're anticipating with reprocessing.

20 MR. CAMERON: Okay. Thanks, Marissa. And
21 I'm surprised that it's quarter after 11:00 already.
22 I guess that there's the old saying about when you're
23 having fun like this, the time passes fast. But I
24 think this really gets to the crux of the issue on
25 this first agenda item, and so we should continue this

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1 discussion, but it's not just a discussion for the
2 regulators, it's a discussion for all of you about
3 what are the benefits of performance-based,
4 technology-neutral, what are the challenges.

5 But also, don't you need to also look at
6 what are the challenges of whatever that alternative
7 is, the prescriptive, I guess, alternative, what are
8 the benefits of that, what are the challenges of that
9 because you need to figure out what's the best thing
10 to do here.

11 So with that in mind, let's go to Tom, and
12 then let's hear from Beatrice and anybody else on what
13 their concerns are with this performance-based
14 approach and let's talk about maybe some of the ways
15 that those concerns can be addressed. Tom.

16 MR. HILTZ: Thanks, Chip.

17 I was essentially going to say, although
18 probably not as eloquently as Marissa did, the
19 benefits and challenges of technology-neutral. So if
20 Beatrice can provide some context.

21 MS. BRAILSFORD: If you could be clearer.

22 MR. HILTZ: I think the benefits are that
23 you develop one regulatory framework that's applicable
24 to multiple processes or facilities, and it provides
25 some efficiency and effectiveness, at least in one

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1 part of the regulatory process, that you don't have to
2 engage in rulemaking every time a new process or a new
3 facility is proposed.

4 MR. CAMERON: And let me open it up just
5 very quickly on benefits, benefits that people see
6 from using the performance-based approach. You heard
7 Marissa, you heard Tom, efficiency, effectiveness.
8 Anybody else want to chime in on benefits of the
9 performance-based, which I'm making the equivalent of
10 technology-neutral. Dan.

11 MR. STOUT: I think one additional benefit
12 is it encourages innovation and competition. You have
13 a broader framework within which you can develop
14 technologies, design facilities, build them and
15 deliver products to market that have value. If the
16 regulations were too prescriptive, it stifles that
17 innovation and creativity because facilities have to
18 be designed very narrowly.

19 MR. CAMERON: Okay. That's good. And I'm
20 not forgetting what Rod said originally about
21 everybody can play -- I think is the way you put it.
22 And while we're talking about all this, we might want
23 to think are there benefits in terms of protecting
24 health and safety from such an approach too.

25 Robert.

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1 MR. HOGG: I would imagine that some of
2 the benefits are reaped in what doesn't happen too.
3 We don't end up in a situation where things are lost
4 over time, such as Appendix B, Appendix Q, which
5 fortunately weren't lost. We reap the benefits of
6 being able to develop new smart technologies, small
7 modular reactors, develop all kinds of potential
8 advances in a technology that is really born to be
9 advanced and to use the intuitive and technological
10 capability of the country to move things in a
11 direction where people do things more smartly
12 engineering-wise and more smartly safety-wise.

13 We have developed over time a much more
14 well-defined understanding of dose to the body and our
15 regulations have not really followed the direction of
16 the knowledge there. They're very prescriptive in how
17 they were developed and so we really need to think
18 about how we say things in our regulations such that
19 we don't close things out in the future. So it's not
20 just the question of what things do happen, it's what
21 we avoid as well.

22 MR. CAMERON: So you would have the
23 ability to take into account advances in technology
24 and you wouldn't have to scrap your whole regulatory
25 framework or develop a whole new regulatory framework

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1 if a new technology came along.

2 MR. HOGG: Right. Rex was indicating that
3 there's a societal benefit expectation. Societal
4 benefit could be ICRP-3, ICRP-30.

5 MR. CAMERON: You're just doing that to
6 provoke Beatrice.

7 (General laughter.)

8 MR. HOGG: I'm sorry. The answer, though,
9 isn't in stating what we're limited by, we should
10 state what we expect and what we want.

11 MR. CAMERON: And Beatrice, I think you've
12 heard some benefits, you've heard some challenges.
13 What are your concerns, or what are anybody's concerns
14 about using a performance-based approach and what
15 would make you, perhaps, more comfortable?

16 MS. BRAILSFORD: And I will say that some
17 of it is just that I'm an old battleaxe, so sometimes
18 when I ask a question, I actually just want to hear
19 the answer, it's not a throwing down of the gauntlet.

20 But I guess I am still -- and I understand
21 what Marissa and Tom said about, you know, it makes it
22 a little easier, though you go back and you have to
23 write special guidance for something that even though
24 it's technology-neutral, it still falls outside of it,
25 and that perhaps that guidance process is not as

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1 rigorous and as to the point accessible to the public
2 as the more cumbersome rulemaking process.

3 I think competition is a very fine thing
4 but I don't see in the coming decades a wildly
5 competitive reprocessing market, and that's partly
6 because in the preceding decades that's not what we've
7 seen. We've seen reprocessing done by the governments
8 of countries. So you know, encouraging innovation I
9 think is, by and large, a good thing, but I don't know
10 that that's a goal that is particularly important in a
11 regulatory framework.

12 And particularly, Tom, if the United
13 States builds a single reprocessor in the next quarter
14 century -- right -- and I know that DOE is looking at
15 a range of reprocessing technologies, but the range is
16 not all the way from a dry cask to a PUREX plant, so I
17 think that it's an odd goal to set up, particularly in
18 the reprocessing arena. I mean, I can see some
19 competition, very valuable and very doable in dry cask
20 innovation, but I don't see however many billions of
21 dollars it's going to take to build one of these, I
22 don't see that easing or streamlining the regulatory
23 process is going to mean that three of them are built
24 versus one.

25 And I would just like to note that Chip

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1 highlighted, kind of going back to NRC's mission, Chip
2 gave you folks to say and what are the health and
3 safety benefits, and nobody said anything about it.

4 MR. CAMERON: And two comments on that,
5 just from the facilitator's perspective, is that I
6 don't think we really gave people a chance yet to
7 really address the public health and safety issue.
8 And also, you responded to one of the benefits that
9 was proposed in terms of competition, but some of the
10 benefits, I would take it from this approach, could
11 apply even if there was no competition.

12 But Beatrice, I really thank you for
13 putting this out on the table because I think this is
14 really the meat of this agenda item. Let's go to that
15 public health and safety issue specifically and let's
16 go to Jim, and then let's go to Anne, for whatever,
17 Anne, you want to say, even if it doesn't fall in
18 that. Jim.

19 MR. LIEBERMAN: Well, that's good team
20 because that's was just what I was going to address.

21 I think my point on benefit is what Rex
22 said. Safety is what it's all about, and the Part 70
23 type approach puts the burden on the applicant to
24 demonstrate to NRC's satisfaction, and if there's a
25 hearing, to the judge's satisfaction, that why the

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1 particular facility meets the safety standards. And
2 whether it's one facility or multiple facilities,
3 whatever that facility is, the design has to be
4 demonstrated why it works to achieve the safety
5 standards.

6 I have 30 years at NRC and a lot of my
7 time was in enforcement, and I'm familiar with lots of
8 requirements in the reactor area which had a very good
9 purpose at a particular time when the requirement was
10 adopted, but over time things changed, technology
11 changed, and their value and importance changed over
12 time too.

13 And NRC is a very smart agency, they have
14 very good people, but there's no way they ever have
15 the degree of expertise -- I don't want to say never,
16 but it's rare that they have the degree of expertise
17 that the industry might have, given the hundreds, the
18 multiplier number of employees the industry has in a
19 given field. And to put the burden on NRC and to make
20 sure they have the right prescriptive requirements up
21 front, I think, does a disservice to the protection of
22 the public. Putting the burden on the applicant and
23 NRC being the judge and the questioner results in a
24 better safety outcome, in my view.

25 MR. CAMERON: And are you also saying that

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1 a prescriptive regulation could put the NRC in a box,
2 so to speak, so that they might want to do something
3 different that would protect public health and safety
4 but they're sort of stuck with whatever the
5 prescriptive regulations?

6 MR. LIEBERMAN: Well, that's a possibility
7 if NRC prescribes that a given system is two widgets
8 or three widgets and it turns out that like four or
9 five widgets is a better way to go in a particular
10 situation.

11 MR. CAMERON: Okay. Thanks.

12 Let's go to Anne, and then we'll come back
13 to Tom, and then go over to Rod.

14 MS. CLARK: It appears to me -- and I
15 believe that I may represent closest to the lay
16 perspective here because I'm probably the least
17 technically adept person at the table -- is that from
18 an outsider, a regular everyday person's point of view
19 that I think the balance between the details that have
20 to be provided in a regulation that is specific to
21 certain technologies versus the broader direction that
22 you provide in a technology-neutral regulation, is
23 what's at hand right here. And if you have the risk,
24 in my perspective, of having a regulation that is
25 technology-neutral is that we cannot anticipate every

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1 issue that's going to come up.

2 Now, so what I'm saying is that even
3 though the benefits are stating that we won't have to
4 do new rulemaking every time a new technology comes on
5 to the stage, in order to protect health and safety,
6 we are likely to have to do new rulemaking every time
7 a new technology comes on the stage because there will
8 be new issues that come up that nobody guessed at.

9 And just to use an example from my own
10 area of expertise in transportation safety, there was
11 the Type B container, double containment issue that
12 came up a few years back that the NRC reversed its
13 rule on that. It used to require double containment
14 for all Type B containers and it was transporting
15 plutonium and plutonium dotter products type of waste.

16 Now they said they don't need that double
17 containment. What changed in the interim? Well, it
18 was changing of technology, changing of understanding
19 of the materials that are being evolved.

20 The same kind of thing is going to change,
21 and so regardless of whether it means loosening
22 certain regulations or adding more regulations, it is
23 sort of a red herring to say that we can do
24 technology-neutral regulation.

25 MR. CAMERON: Okay. Thank you for that

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1 perspective. And again, I think you need to look at
2 what happens under an alternative regime, too, in
3 cases like the NRC example.

4 But I think it might be -- and I know I'm
5 cutting into your lunchtime and we have Tom and Rod,
6 but if anybody wants to comment on what Anne's very
7 common sense looking at this from a person who is not
8 involved in this particular technology but knows
9 process, if anybody wants to respond to that, let's do
10 that now, and then I have just one question for all of
11 you to maybe close.

12 So let's go to Tom, and then Rod, and
13 anybody else who wants to respond to what Anne just
14 said.

15 MR. HILTZ: I wanted to actually go back
16 to Beatrice's comments and just provide some context
17 or some comments.

18 First, I think in listening to her
19 comments, I may be inclined to think about technology-
20 neutral in a different way, and Anne's comments also.

21 When Beatrice asked the question is there any public
22 health and safety benefit from doing technology-
23 neutral, what the difference is, I haven't, quite
24 honestly, thought about it in that context because my
25 context is whatever regulation we publish, whether

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1 it's technology-neutral, deterministic, risk-informed,
2 performance-based, an underlying assumption of every
3 regulation is that it will adequately protect the
4 public health and safety.

5 So listening to your comments, and Jim's
6 and others about maybe there is a followed discussion
7 that we need to have about is there an approach that
8 better protects public health and safety. But I did
9 want to emphasize that any regulation that we publish
10 as its core has it will adequately protect public
11 health and safety and the environment and the common
12 defense.

13 I think you've also captured, and I
14 mentioned in my first comment and I want to
15 reemphasize, that while there is certainly some
16 perceived benefits to doing technology-neutral, there
17 are also some perceive deterrents or detractors from
18 technology-neutral. It's not all roses. If it were
19 easy, I think every regulation we would do would be
20 technology-neutral.

21 The tradeoff is while there may be less
22 effort -- I'm sorry -- not less effort, but you do one
23 rulemaking and it encompasses a broad range of
24 processes or facilities, I think you articulated it
25 and I think you captured it, there's going to be a

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1 tradeoff, because depending on the level of
2 specificity in that regulation, in order to provide
3 stability further down the road, you're going to have
4 to develop detailed guidance.

5 I think one of the reasons why the
6 industry doesn't want to proceed with licensing a
7 reprocessing facility under Part 50 is because we
8 don't know what the rules are. The staff doesn't know
9 how to review a reprocessing facility under Part 50.
10 So there is benefit to having a look at the framework
11 and guidance and the balance between regulation and
12 guidance.

13 And the third point I wanted to mention is
14 that you mentioned -- and I'm not sure how much of a
15 concern it is to you about the public process for
16 rulemaking about regulatory guidance -- but we have
17 made efforts at the agency to engage extensively in
18 involving stakeholders in the development of
19 regulatory guidance, having workshops, public
20 meetings. It's a goal that when we publish a proposed
21 rule that the available guidance that would implement
22 that rule was also made available at the same time.

23 MR. CAMERON: Okay. That last point was
24 something that Marissa had mentioned, and I think it's
25 relevant to Anne's concerns and Beatrice's concerns is

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1 that when you have a performance-based, technology-
2 neutral rule -- I don't know if always is the right
3 term -- but often there's going to be a need to
4 develop regulatory guidance to fill in the spaces,
5 perhaps.

6 Let's hear from Rod and Jose, and go back
7 to Anne.

8 MR. McCULLUM: I want to address, both
9 Beatrice and Anne raised some very excellent points,
10 I'm going to try to address both of those in the
11 context of why I believe that technology neutrality
12 benefits public health and safety. And if I can't do
13 that, it's because you didn't give us a break and it's
14 lunchtime.

15 MR. CAMERON: I was having too much fun
16 and I missed it.

17 (General laughter.)

18 MR. McCULLUM: I will agree with Beatrice
19 that it is unlikely we're going to be developing a
20 whole lot of reprocessing facilities here in the
21 country. If we did have three or four of these things
22 and they become competitors, I think my member
23 companies would all be very happy, but that's not
24 where we start.

25 What we're really talking about in terms

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1 of competition here is competition to bring
2 technologies to market, and if the government
3 prescribes the technology, either advertently through
4 GNEP making a choice, or inadvertently through NRC
5 putting out a technology-specific regulation, the
6 government will get what the government asks for,
7 won't necessarily be the most innovative, the best or
8 safest technology. Indeed, having a competition to
9 bring technologies to market inspires the safest
10 technology to win, and if they all have the same bar
11 they have to meet in terms of the regulation, that
12 goes.

13 Now, Anne raised a very similar point
14 along the same lines is that the technology will
15 always be changing. To me, that again is another
16 reason to be technology-neutral, risk-informed,
17 performance-based because you do not want the
18 regulation to discourage the innovation of technology.

19 I drove an AMC Pacer in the '70s; it wasn't as safe
20 as the car I drive today. So if you have a very
21 technology-specific regulation, you have to update it
22 every time there's a change in technology, or
23 alternately, you just don't update the technology
24 because it's too much trouble to change the
25 regulation.

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1 We call that in the industry regulatory
2 stability. Regulatory stability benefits the industry
3 because we know what our regulation is. It benefits
4 the public because you know the bar for safety isn't
5 moving. If I'm going to bring on a new technology,
6 I'm going to have to use the same rigor and the
7 performance-based tools to demonstrate the safety of
8 that technology. You don't have to wait for a new
9 rulemaking to do it.

10 MR. CAMERON: Thank you, Rod. Jose, and
11 then we'll go to Anne.

12 MR. CUADRADO: I just wanted to make a
13 quick comment based on what Beatrice said, and partly
14 on what Tom said. A lot of the role of the regulator
15 is to promote regulations that protect public health
16 and safety, however, I see that what you're trying to
17 communicate is that in order for us to accomplish that
18 better there has to be trust in the regulator, there
19 has to be confidence or sort of like an operating
20 experience, if you could think about it, in that we've
21 done that role in the past appropriately and that we
22 will continue to do it.

23 One of the things you were bringing up is
24 as we develop a technology-neutral or a performance-
25 based regulation, we're going to rely a lot more on

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1 issue below the rulemaking part, issues like
2 developing regulation and all those issues. So my
3 question to you would be what things do you feel would
4 do a better job on enhancing confidence, because
5 ultimately, enhancing public health and safety is
6 going to rely a lot more on the public having the
7 confidence that we can do that job better.

8 So if you can throw some ideas out there,
9 and maybe now is not the right time, maybe we can do
10 it later, that could be a great help.

11 MR. CAMERON: That probably wasn't the
12 right time.

13 (General laughter.)

14 MR. CAMERON: Let's go to Anne and then
15 we'll go to Don.

16 MS. CLARK: That is opening a big door.

17 I just wanted to clarify or just rearrange
18 a little bit what I stated before is that I think one
19 of the things that we make the assumption, and all of
20 us -- and I'm a government employee as well, so I
21 understand the perspective of government agencies --
22 is that we assume that regulations are purely
23 procedural or process-oriented as opposed to being
24 policy-oriented. And what I'm hearing from Rod,
25 actually, most recently -- and I'm sure everybody said

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1 it at some point or another -- is that really
2 regulations do create policy. And that is my more
3 closer area of expertise and I completely agree that
4 regulations do create policy.

5 And so here is what I was really saying is
6 how do we find that balance of creating enough
7 specificity so that people are confident in the health
8 and safety issues and still have a policy that allows
9 diversity and broad competition, as you said, and a
10 broader offering of technology.

11 And we are not the ones that are going to
12 end up making that decision in the end, really. It
13 will be determined at an administrative level and we
14 will really end up having to carry out whatever our
15 state representatives push, our Congress people push
16 within the Congress and whatever our president
17 supports from the executive side, unfortunately.

18 MR. CAMERON: Thank you, Anne.

19 MR. McCULLUM: Chip, can I make a motion
20 that no matter what Don says, it will be the last
21 thing that gets said before lunch?

22 (General laughter.)

23 MR. CAMERON: Go ahead, Don.

24 MR. HANCOCK: Were you going to have a
25 public comment period, as is in the agenda?

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1 MR. CAMERON: Yes.

2 MR. HANCOCK: Well, let me be real quick
3 because I tried to make the point early but maybe I
4 didn't make the point, so let me try again.

5 In New Mexico what would give the public
6 more confidence in the regulator was for it to be a
7 regulator. NRC regulation of nuclear facilities in
8 New Mexico equals Superfund sites that years after
9 they've closed we still haven't cleaned up and are
10 still endangering public health, safety, water supply,
11 et cetera. So NRC has got to do a better job,
12 frankly.

13 For the industry, what would give the
14 public more confidence in reprocessing is if the
15 existing reprocessing messes in the United States were
16 cleaned up which they're not, and not just the
17 government ones, the DOE facilities, like in
18 Beatrice's backyard and in Savannah River and Hanford,
19 but West Valley isn't cleaned up yet either. So it
20 would really be helpful if we saw a demonstration of
21 health and safety as opposed to discussion about
22 health and safety when it comes to reprocessing.

23 MR. CAMERON: Okay. Thank you, Don.

24 We're going to go see if there are any
25 comments out there in the public. I think this was a

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1 very good discussion, an informative discussion for
2 the NRC. I guess the issue about 50, 70 or a new
3 approach, this issue is going to have to be addressed,
4 and I'm not sure that that issue is a real big issue.

5 But Anne's point about balance and all
6 these things we're talking about, I think that when we
7 get to our next session when we actually look at what
8 the building blocks possibly are of a performance-
9 based approach, I think we're going to be able to make
10 judgments about whether there's a balance there or
11 not. So I think that's going to be instructive for
12 us.

13 I know it's often when we hear the
14 industry put forward a particular proposal, or even
15 the NRC, and maybe picking up some on Don's point, is
16 that it might be met with suspicion, perhaps, or
17 skepticism about motivation, et cetera, et cetera.
18 And that's why I think this discussion has been a good
19 discussion because I think it gets us away from any of
20 that. So that was good.

21 Public? I'm not going to task Miriam with
22 this which she has done, because she's ailing a little
23 bit, but any public comments, questions at all from
24 what you heard?

25 (No response.)

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1 MR. CAMERON: Well, we're going to give an
2 hour and a half for lunch, and I think we do have
3 time, not that we want to waste time, Dan, but why
4 don't we come back at quarter after 1:00 and we'll
5 start with the next topic.

6 (Whereupon, at 11:50 a.m., the workshop
7 was recessed, to reconvene this same day, Tuesday,
8 October 19, 2010, at 1:15 p.m.)
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A F T E R N O O N S E S S I O N

1
2 MR. CAMERON: Welcome back, everybody, and
3 good afternoon. And we're going to go to the second
4 agenda item which is safety and risk information.
5 Correct, Jose? Since I seem to have lost my agenda --
6 oh, I just found it. Not a good sign for the
7 facilitator to lose the agenda.

8 But we're going to talk about a number of
9 issues here connected with safety and risk, and one of
10 the most important issues that the NRC is dealing with
11 is what methodology, so to speak, what process to use
12 to determine safety measures, and that's usually
13 framed in the context of something called an
14 integrated safety assessment. The competing
15 methodology -- and competing may be the wrong word --
16 is probabilistic risk assessment.

17 Who is going to tee this one up, Jose?
18 Are you going to do it? Okay, Phil is going to tee
19 this one up for us, and then after Phil is done, I'm
20 going to ask Rod McCullum to just talk about some of
21 the information that's in a recent paper that the
22 nuclear energy industry, and as part of that, I want
23 them to also give us a context of where this ISA or
24 PRA fits into this total safety framework. And I
25 think that will help us for this discussion but also

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1 for the last discussion on design information, and
2 it's going to tie us back in on a real level to some
3 of the concerns that we talked about this morning in
4 terms of performance-based.

5 And Phil, with that, can you just tee it
6 up for us and then we'll go for discussion.

7 MR. REED: The first slide talks about two
8 main aspects of the risk assessment. The first is the
9 total safety and risk, and this is a summation of all
10 the impacts from all credible accidents, a safety and
11 risk goal. We also added ALARA here, and ALARA is not
12 really normally considered for accidents but it is a
13 method by which you can control the exposure to
14 workers through effluent limitations and other things
15 like that.

16 The other issue is the safety and risk
17 assessment approach, which approach should we use and
18 what should the methodology be. And finally in the
19 last bullet there is a website that you can find a lot
20 of information with regards to risk PRA approaches,
21 and before I turn the slide, if you want to copy it
22 down, feel free to do so.

23 The NRC approach to risk is basically
24 through five fundamental documents. The first
25 document is the Policy Statement on Safety Goals that

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1 was published in 1986. The second is the Policy
2 Statement on the use of Probabilistic Risk Assessment,
3 PRA; this was published in 1995, 14 years ago. The
4 third is a white paper on Risk-Informed and
5 Performance-Based regulation that was published in
6 1998. Finally, in 2000 we published the revised Part
7 40, Domestic Licensing of Special Nuclear Material.
8 And finally, the last bullet is our latest document
9 and that's the Risk-Informed Decision-Making for
10 Nuclear Material and Waste Applications; this was
11 published in 2008.

12 In the next couple of slides we'll go into
13 these approaches and provide a little bit more detail.

14 The first is a safety goal that was published in
15 1986. This was a qualitative approach. This was an
16 approach designed to find risk to the public, to the
17 individuals with no significant additional risk to
18 life and health. There was also a society risk
19 involved from nuclear power plant risk compatible or
20 less than other viable electrical generation risk.
21 The third was quantitative, this was quantitative to
22 an individual. And finally in the last bullet, on the
23 average, all three of these generally translate to a
24 risk of less than one to ten to minus six, and this is
25 cancer fatalities that we're talking about.

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1 The commission PRA statement came out in
2 1995 and this sort of dramatically changed the way we
3 looked at things. This was designed to be used in all
4 policy matters to the extent practical, and that
5 includes reprocessing facilities. The idea here was
6 to reduce unnecessary conservatism and support
7 proposals for additional regulatory requirements. In
8 other words, you had to be as realistic as possible.
9 The PRA evaluations would be as realistic as practical
10 and then the safety goals and subsidiary objectives to
11 be used with appropriate consideration with
12 uncertainties. Before, when we did any type of
13 assessment, uncertainties was not a major
14 consideration. This policy statement provided us with
15 that opportunity to deal with this.

16 The PRA usage. The current PRA standards
17 and guidance are developed principally for operating
18 white water cooled reactors. There are different
19 amounts of detail, there are different intended
20 results, probabilistic failures, types and quantities
21 of releases, and consequences. The current PRA
22 standards do not fully address all facility aspects.
23 For example, within the scopes there are some plant
24 design considerations, particularly with construction.
25 There are also some passive systems that are being

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1 built into the new advanced reactor systems which
2 raise some questions about the applicability of the
3 PRA.

4 Some additional standards will be needed
5 to support new designs and fully risk-informed
6 regulatory structures. And finally, PRA is
7 significantly more quantitative than the ISA approach.

8 The ISA is the acronym for Integrated Safety
9 Analysis. This is the type of approach you'll see
10 with a Part 70 approach.

11 The next item is the 1998 document and
12 this is the risk-informed, performance-based approach.

13 This approach uses risk insights, engineering
14 analysis and judgments in performance history for five
15 different reasons: to focus attention on the
16 important activities, to establish objective criteria
17 based upon risk insights, to develop measurable or
18 calculated parameters for monitoring performance, and
19 finally, we want to focus on the results as the
20 primary basis for regulation.

21 We talked a little bit about this this
22 morning. Now finally we're going to go to Part 70.
23 What I talked to you about previously has been mainly
24 implemented through Part 50. Now I'm going to go to
25 Part 70, and Part 70 is the fuel cycle regulation

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1 which was published in 2000. This includes a subpart
2 which was added for SNM, special nuclear material
3 processing facilities. It incorporates risk via
4 binding process similar to chemical approaches.

5 There are three consequence levels, high,
6 medium and low; three likelihood levels, high
7 unlikely, unlikely and not unlikely; there's a
8 qualitative semi-quantitative methodology; and it also
9 includes the chemical risk and baseline design
10 criteria. I have a slide in the background that shows
11 you exactly how this fits together and what the dose
12 limits are for each one.

13 This requires the ISA and safety controls,
14 IROFS, items relied on for safety analysis. This is
15 in the regulation, this is in Part 70. Finally, we
16 have a sequence, these are not aggregated risks,
17 generally corresponds to facility risk less than one
18 in a million.

19 Now, before we were talking principally
20 about Part 50. Now, Part 50 is fine when you have
21 fission products, when you have transuranics, when you
22 have activated metals, and particularly when they're
23 separated, when they're in solutions, when they're in
24 aqueous solutions, or when they're in organic
25 solutions. What Part 70 brings to the game is the

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1 intent to look at chemical risk, and you will notice
2 that in Part 70 there's specific requirements for
3 chemical hazards. This is specified in the
4 regulation, and this will help in reprocessing
5 because, like I said, we have a lot of solutions,
6 chemical solutions where we need to quantify risk in a
7 manner in which we have not done previously.

8 The risk-informed decision-making is
9 mentioned in 2008 and I also put the atoms number up
10 there. This describes general concepts of risk and
11 total quantitative health guidance, it provides three
12 levels of regions of risk, unacceptable, tolerable,
13 and negligible, and it suggests some other QHGs.
14 These are total risk values summed up over all
15 scenarios, and generally for the U.S. worker fatality
16 risk is generally around 3.9 times ten to minus five.
17 Again, this is cancer risk.

18 The next slide discusses a little bit
19 about the points of discussion we'd like to talk
20 about:

21 Should NRC have a safety risk goal for
22 reprocessing?

23 What type of safety analysis assessment
24 methodology should NRC processes require?

25 What type of methodologies, PRA, ISA,

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1 LOPA? LOPA is an acronym for layers of protection
2 analysis. This is a system that's used in the
3 chemical industry.

4 Can semi-quantitative or qualitative risk
5 assessment methodologies, such as those that we use
6 for Part 7, be used?

7 How can NRC apply a PRA policy statement
8 to reprocessing facilities?

9 Based on current practice with PRA, are
10 there limits or obstacles on using the PRA approach
11 for evaluating reprocessing facility risk?

12 What should be the balance between risk-
13 informed and performance-based requirements such as
14 ISA and PRA?

15 And finally, are there any specific
16 hazards and accident categories that should be
17 quantitatively assessed in reprocessing facility
18 safety analysis? This latter means are there data
19 available out there now that we can use, or is it such
20 a system that we have to develop a lot of data on
21 exactly what can we use from existing facilities both
22 here and also international facilities.

23 I wanted to show that backup slide. This
24 is the backup slide for Part 70 that shows you the
25 high consequences, intermediate and low receptors.

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1 And for the workers, I know you can't see it but there
2 are dose limits associated with this. And you will
3 notice in the second one I think there's also chemical
4 hazards associated with this. And finally, for the
5 individual outside the control area there's also dose
6 requirements.

7 And that completes my presentation. I'll
8 go back to the questions that we would like the
9 audience to address.

10 MR. CAMERON: Okay. Thank you, Phil. And
11 I just want to point out about the questions, there
12 really is four questions because I think a lot of them
13 really relate to the methodology that's this overall
14 goal, then there's the methodology which is integrated
15 safety assessment, probabilistic risk assessment, and
16 then there was a question on there that we talked
17 about this morning about the balance between
18 performance-based and prescriptive. I think that's
19 always going to be sort of the question that's going
20 to hang in the background that we're going to be
21 talking about in more specific terms. And then
22 there's the question about specific hazards.

23 One of the major questions is the whole
24 idea of the methodology integrated safety assessment,
25 or PRA. Rod McCullum is going to do a presentation on

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1 that for us, and I'm going to ask Robert Hogg to just
2 put some context for us there. But I want to make
3 sure, are there any questions? I don't want to go
4 down the discussion trail yet, but are there any
5 questions raised by Phil's presentation that we should
6 answer before we go to Rod? And obviously we'll have
7 plenty of time for questions. I just wanted to make
8 sure that we were clear there.

9 And Rod, are you ready?

10 MR. McCULLUM: Perfect timing, just coming
11 up there.

12 MR. CAMERON: Hold on one second, Rod.

13 MS. BAILEY: I think I just wanted to add
14 another point of reference. Phil had a slide about
15 the different documents that are out there that
16 articulated NRC's position in terms of risk assessment
17 and PRAs and ISAs. I do want to point out that we
18 recently issued a draft ISA/PRA comparison, I think it
19 was issued last week, and this is a paper that the
20 commission has directed the staff to write and it
21 compares the use of ISAs versus the use of PRAs for
22 the purpose of the fuel cycle oversight process. I
23 think that might also shed some light.

24 MR. CAMERON: Okay. And do you think that
25 we might be able to put that paper up on the

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1 reprocessing rulemaking website?

2 MS. BAILEY: Yes, we should be able to do
3 that. And we are having a public meeting on that
4 paper on November 5.

5 MR. CAMERON: So the paper was done for
6 another purpose but it is also relevant.

7 MS. BAILEY: It was written for another
8 purpose, but I think it might be relevant to this
9 discussion.

10 MR. CAMERON: Okay. Thanks, Marissa.

11 Now we're going to hear from Rod on this,
12 and then finally, I'd like Robert to try to set a
13 context for us, so this will be more understandable.
14 So what Rod is going to address is the second category
15 of questions up there which basically is methodology.
16 Go ahead, Rod.

17 MR. McCULLUM: And I think the paper -- I
18 was reading it in the airport when I was changing
19 planes on the way out here -- it is relevant, and
20 indeed you'll see here one of the examples we want to
21 cite is the experience that has been had. When
22 Marissa says fuel cycle facilities, she's talking
23 about the front-end type of facilities, I would call
24 them, now we're talking about a back-end type of fuel
25 facility here, with some added hazards that I think

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1 you saw earlier.

2 But anyway, I am going to follow Phil's
3 example, I'm going to sit here and hold the button
4 down as opposed to go up to the podium, not because
5 I'm short but because that will keep me briefer, I
6 think. I have to quit before my finger goes numb
7 here.

8 And I am also sensitive to the concern
9 that Beatrice expressed earlier about industry driving
10 this, and I think that we don't want it to be that
11 way. I think it is a very important principle of
12 effective regulation that the folks doing the
13 regulating reach an understanding of that thing that
14 they are regulating to the maximum extent possible.
15 Of course, the best way to do that is to interface
16 with the folks that are the experts at designing and
17 building and operating that thing, and of course, when
18 we do that we need to do that in public, as we did in
19 the last workshop and as we are doing here, and it is
20 good that we are bringing in others as well.

21 To facilitate that, industry formed a
22 Recycling Task Force back in 2006. Felix Kellar was
23 the leader of it, he's retired from NEI since, and due
24 to the Yucca situation, I just happened to be
25 available around the time that he retired. A lot of

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1 work -- and you see many of the experts, particularly
2 Jim and Robert sitting here -- went into developing.
3 Okay, if industry was going to write a regulation,
4 what would it look like, and we went through the whole
5 dichotomy of should we just do Part 50, should we do
6 Part 70, do we need something else. For reasons that
7 have already been discussed earlier, we concluded we
8 would need something else. We called this Part 7X and
9 we came up with a white paper describing a proposed
10 Part 7X that we submitted to NRC.

11 We think NRC has done the right thing as
12 opposed to starting from this input, they've started
13 down the approach that would be expected for any new
14 regulation, okay, what are the gaps, what are the
15 needs. And we think as they go through this, an
16 interesting basis for comparison can be Part 7X, and
17 we look to continuing to compare back and forth. And
18 as Chip mentioned, I'm going to go through this
19 quickly, then I'll ask Robert to give some additional
20 context.

21 Gap 5 on risk analysis is one of the
22 things that we in industry consider to be high
23 priority. A lot of talk about risk-informed,
24 performance-based, technology-neutral, and when you
25 say those things and you want to give them meaning and

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1 make then doable in a way that ensures public health
2 and safety, it is the tool, the analytical tool that
3 really is where the rubber meets the road. You're not
4 going to describe the shape and size of tanks, their
5 vessel thickness, the number of valves you have to
6 have on the outlet piping in regulation, but you do
7 need to prescribe a tool that can provide an assurance
8 of safety.

9 And in support of that, building on what
10 we had done in Part 7X, we went a step further
11 submitting this just recently. We alluded to it at
12 the last workshop in Washington, and actually we were
13 informed by the dialogue that happened at the workshop
14 in Washington -- we thank you for that -- and that
15 gave us the impetus to finish up the paper, we sent it
16 to NRC, and we're looking forward to continuing
17 dialogue on that which I'll briefly highlight here.

18 In that paper we compared integrated
19 safety analysis to probabilistic risk analysis, as did
20 the recently issued NRC paper that I was reading on
21 the airplane. And from my airplane scan, airport
22 scan, there's a lot of consistency between the two
23 papers. I think there's a strong recognition of what
24 has been accomplished through integrated safety
25 analysis in the NRC paper. There is discussion about

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1 the potential role of PRA, and I'll get into that in
2 our perspectives in a little bit. I wouldn't say it's
3 inconsistent at this point.

4 We've talked about something called the
5 safety envelope and when you look at the bullets under
6 systematic analysis here, it's really all about
7 putting the right barriers, measures, things -- we
8 call them IROFS, items relied on for safety -- in
9 between the hazards and the people and the
10 environment.

11 I like the term semi-quantitative I saw in
12 Phil's slide. I think that's what you get with an
13 ISA. You don't have a PRA that describes the detailed
14 probabilities, but you don't get a sense of
15 likelihood, and you want to drive that to the point
16 where you can get an assurance that the likelihood is
17 small enough and the consequences are small and/or
18 mitigated enough that you have assured safety and that
19 you have all these things in place and you've defined
20 a safety envelope.

21 It is an outstanding tool for risk-
22 informed, performance-based, technology-neutral as it
23 is deployed in the fuel cycle facilities. I think
24 chemical hazards were also mentioned earlier, and it
25 was discussed earlier here that we need to be worried

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1 about chemical hazards as well as radiological hazards
2 at these type of facilities, and this is another
3 area -- and again, I think Robert is going to
4 elaborate in a minute -- where integrated safety
5 analysis is a proven tool. We think that with the
6 types of facilities you have that this can be
7 effective in assuring safety.

8 Probabilistic risk assessment is a
9 quantitative tool and I think the second bullet is
10 probably the most important distinction, and I'm still
11 thinking about the NRC paper from the context of how
12 much both sides may need to explore this more. And I
13 think the term was used in Phil's presentation: PRAs
14 can be as realistic as practicable. And I think where
15 as practicable comes into play is in the extent to
16 which you have data to construct a PRA.

17 At a commercial nuclear power plant you've
18 got 104 of these things that have operated for 20, 30,
19 40 years and they all have similar systems, and they
20 fall into two major categories, PWR and BWR, you have
21 an incredible database, so you've got good data on the
22 probabilities of human failures operating certain
23 systems and the probabilities of different kind of
24 valves not functioning.

25 When you have unique facilities, as you do

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1 on the front-end of the fuel cycle and as you would in
2 the case of a reprocessing facility, you need to make
3 sure that you have enough data to make the PRA
4 realistic. Otherwise, it's garbage in, garbage out if
5 you really don't have the data.

6 Another thing that happens at a reactor,
7 and this we pointed out earlier this morning, it's not
8 just the hazard in terms of what is the material, what
9 is its radio toxicity, its inhalation hazard, what is
10 the source of energy that could potential drive the
11 hazard to affect people. If you have a reactor and
12 you have the temperatures and the pressures and the
13 nuclear chain reaction going on, you have a lot of
14 safety systems that have to interact with each other
15 and they have to function, they have to failsafe, they
16 have to come on within seconds, valves have to close
17 within fractions of seconds. You can see where a tool
18 like a PRA in this instance is important in that it
19 allows you to quantitatively look at how those
20 interactions perform to meet your safety goal, as
21 opposed to where in ISA space we're talking about a
22 semi-quantitative definition of a safety envelope.

23 So certainly before applying a PRA to a
24 reprocessing facility, we need to look at on the third
25 bullet what is really the need here in terms of the

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1 interdependencies and the complexities and the energy
2 sources and what data are available. But as you can
3 see in the fourth bullet, we recognize that there are
4 instances where if you have enough information you can
5 use the PRA to give quantitative insights.

6 It can help you demonstrate where you have
7 margin of safety. It can be another confirmatory
8 check on you've got the right items that you're
9 relying on for safety and all of the right items
10 you're relying on for safety and help figure out
11 within those items where to focus your resources,
12 perhaps. So there may be within an ISA framework a
13 role for a PRA and we would certainly welcome
14 exploring that.

15 So our recommendation is that ISA is the
16 most appropriate tool, it's a proven tool. I think at
17 this point I'll ask Robert to say a few words on the
18 idea of context of how we view our experience with
19 ISA.

20 MR. HOGG: Thanks, Rod.

21 I guess what we did back a couple of years
22 ago was take a lot of the experience that we had at
23 our different fuel cycle and related facilities and
24 evaluate both the iterative design process, design
25 analysis feedback, design analysis feedback process,

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1 and see where that touched the existing regulations,
2 and then evaluate whether those were the right pieces
3 to incorporate within the regulatory framework that we
4 were trying to identify.

5 So if I was to describe that iterative
6 process in a little more detail, we identified the
7 performance requirements, we didn't reinvent the
8 entire box. We certainly understand the regulatory
9 environment that we exist in, including both Part 50
10 and Part 70, so we didn't throw that out and maybe try
11 and establish an entirely new paradigm of regulatory
12 expectations. We identified performance requirements
13 that we knew were tried and true by the NRC and by the
14 industry and used those and used as many of those as
15 we could possibly find within the relevant
16 regulations.

17 We identified design criteria. An
18 interesting piece that the existing facilities can
19 bring to the table is that we understand that just
20 simply writing that the facilities will protect the
21 health and safety of the public is of limited value,
22 it's a real need but as one moves to implementation,
23 one wants to know what the specific things are that
24 one has to do to create that protective feature of the
25 facility.

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1 So we looked for the design criteria and
2 the framework that the design criteria would most
3 effectively establish, along with the performance
4 requirements, the appropriate envelope for the safety
5 of such a facility. And so we described what we
6 believed was a safety envelope in that proposal that
7 covers both workers, the public, criticality, release
8 of chemicals, environmental controls, so it was broad
9 in its scope.

10 We understood that the expectation of the
11 agency and the expectation of anybody investigating
12 facilities would be to understand the design of the
13 facility in order to demonstrate compliance with those
14 criteria, and so we wrote in, as is fairly
15 traditional, an expected design report or safety
16 report that included the documentation of the relevant
17 design details that would be applicable to the
18 structures and components of the facility.

19 Equally consistent with previous
20 experiences, then the content of the analysis that
21 would go into evaluating whether that design met those
22 performance criteria. And we listed all of those
23 things that are there: criticality, safety analysis,
24 seismic analysis, integrated safety analysis, chemical
25 safety analysis. And I'm talking a little bit about

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1 what all the next layer of those safety analyses are
2 because no one of those is a unique analysis to
3 itself, more they're a system of analyses that one
4 will then use to evaluate where systems interact,
5 systems are well described and not well described,
6 systems are well designed and not well designed and
7 need refinement, and those analyses are used to then
8 progress that set of design statements that will then
9 later be used as the basis of safety of the facility.

10 So we established the safety report that
11 included these design statements and analysis results,
12 included metrics and an evaluation of adequacy, some
13 measure of adequacy, and then feedback into the design
14 process, and then repeat. And so you would then take
15 that back to your performance requirements and
16 evaluate whether those are still valid performance
17 requirements, are we barking up the right tree, the
18 baseline design criteria, have we established the
19 right approach to controlling some particular aspect
20 of the facility, and then redefining and reclarifying
21 what the safety envelope is for the facility.

22 So we talk a little bit about analyses and
23 some of the analysis techniques and we really dove
24 pretty deeply in some of the industry reports that
25 we've written over the course of the last two years

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1 into what the difference and values and shortcomings
2 of some of the different analytical of some of the
3 different analytical techniques are.

4 We pulled from the chemical industry where
5 HAZ OPS is used, identified some of the more robust
6 failure modes analysis type valuation techniques,
7 looked at the scope of PRAs as they're done today,
8 both at nuclear power plants, at existing reprocessing
9 plants around the world, and as we envisioned doing
10 analyses in support of the safety basis of this type
11 of facility.

12 And then, of course, we looked at our ISA
13 techniques which we're very familiar with as far as
14 how they could be used, how they could be used to
15 risk-inform decisions and to relate the relative risks
16 of different accident sequences, and rolled all those
17 together and tried to establish a framework within
18 which one could use any of those tools in the
19 appropriate fashion and within the appropriate bounds.

20 And any analysis technique is going to identify your
21 boundary conditions and identify where you have valid
22 data and where you don't have valid data. And so we
23 tried to establish, based on our experience, exactly
24 which of those tools would be most appropriate to use
25 and when.

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1 MR. CAMERON: Okay. Thank you, Robert.
2 That's very detailed on the approach, and this is
3 prologue for our next agenda item as well as this one.

4 I just wanted to make sure that these basic building
5 blocks, at least as I understand them, that everybody
6 would know where this ISA question is. And the way I
7 looked at it was you talked about the baseline design
8 criteria, you also mentioned performance requirements.

9 This was your safety envelope. The ISA would then be
10 performed to identify certain accident possibilities,
11 things like that, and also identify these IROFS, and
12 for certain types of IROFS, high consequence events,
13 then it would be tech specs. Okay?

14 But the question now before us is, is the
15 integrated safety assessment the best way to do the
16 safety analysis for one of these facilities, and
17 that's the big question facing the NRC. Before we go
18 to that -- and I don't know how much controversy there
19 is based on what Rod put out in terms of should be
20 doing an ISA, should we be forced to do a PRA -- I
21 want to ask you what's the controversy on that.

22 But the first question on the sheet is
23 what role the existing safety goal plays. Maybe we
24 should have some discussion of that. And I'm just
25 wondering does everybody understand what that question

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1 is? I'm asking that because I probably don't
2 understand it. James.

3 MR. ROSS: I was going to ask are we
4 talking about ALARA type requirements here?

5 MR. CAMERON: I don't think so. I think
6 we're talking about the commission's safety goal which
7 is ten to the minus whatever. The question is framed
8 as do we need to use a specific safety risk goal for
9 reprocessing or is the current approach sufficient.
10 Now, there are some things that are in there that
11 might need to be explained. When we talk about safety
12 risk goal, are we talking about probabilities? And
13 when you talk about the current approach, is the
14 current approach sufficient? Well, what is the
15 current approach?

16 And maybe someone from the NRC could just
17 explain what that means, safety risk goal. In other
18 words, how would that safety risk goal be expressed,
19 and what is the current approach for a fuel cycle
20 facility? And then perhaps people might have opinions
21 on those two questions.

22 Phil, how about the first one?

23 MR. REED: Well, the first one, the safety
24 goals is what came out in 1986, and basically it was
25 just a goal, it was a statement that we should do

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1 this, do that, it was not quantitative, it was not
2 qualitative in a sense, it just said that you should
3 keep your releases as low as practical, you should
4 make sure that the person outside the fence should not
5 get an exposure of such and such. It was basically a
6 goal, it was very qualitative.

7 MR. CAMERON: So there was a ten to the
8 minus six.

9 MR. REED: There was. But over the years,
10 people wanted something more, better. It was a very
11 general approach because it did not include almost the
12 design, it did not include realism, it was just a
13 fundamental belief that we ought to do something and
14 we ought to do it, it didn't say how we'd go about
15 doing it.

16 With regard to the fuel cycle approach,
17 the item in the fuel cycle facilities there is the
18 current 10 CFR Part 70. That's basically Appendix H,
19 I think, of Part 70 and that talks about the ISA part.

20 MR. CAMERON: Okay. So that second part
21 of that current approach basically is using the ISA,
22 integrated safety assessment methodology.

23 Marissa, and then we'll go to Robert.
24 Marissa.

25 MS. BAILEY: Yes. I guess this is

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1 probably one area in the work that we're doing where
2 there's a diversity of view among the staff as far as
3 what is the right risk method for assessing
4 reprocessing facilities. And I'm not a risk person so
5 I don't really know a lot about risk and risk
6 assessment methods.

7 But to me, the basic question for
8 reprocessing -- and I don't have an answer and so I'm
9 trying to get input from all stakeholders here -- the
10 basic question is, is an ISA sufficient for a
11 reprocessing facility, for licensing a reprocessing
12 facility, understanding that an ISA is qualitative but
13 it can be quantitative to the level that you need it
14 to be quantitative or for certain aspects.

15 Also understanding that an ISA doesn't
16 really give you the full picture of what the risk is
17 for a facility. The purpose of an ISA is to identify
18 the items relied on for safety. The purpose of an ISA
19 is to do a systematic assessment of the hazards in
20 your facilities, and what's the probability or
21 likelihood of those hazards and then identify items
22 relied on for safety to either prevent or mitigate
23 those hazards.

24 And I guess the question is, is that good
25 enough for every processing facility, or do you need

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1 something more that gives you a better understanding
2 of the total risk that's associated with that
3 facility.

4 MR. CAMERON: Okay. So that really this
5 first bullet there is basically the ISA versus or in
6 addition to some quantitative analysis question.

7 And let's go to Robert and then to Tom,
8 and then let's explore this ISA issue. Robert.

9 MR. HOGG: I guess I see it slightly
10 differently if I read the first bullet. The first
11 bullet is a question of a safety risk or goal, and
12 that's the envelope, that's the question of whether
13 the criteria are singular or multiple or worded in a
14 very clear and distinct fashion or worded in a
15 somewhat higher level not specific type of
16 description. So the safety goal that Phil described
17 relative to the policy statement is a kind of a high
18 level overarching statement versus the safety goals
19 and criteria of Part 70 are specific dose criteria
20 that are identified to specific individuals with
21 detail that can be measured pretty deeply.

22 The second question is what type of safety
23 risk or assessment methodology should be required, and
24 that's where I think we're going to get into the
25 discussion of ISA versus PRA or combinations or some

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1 of this and some of that, whatever.

2 MR. WILEY: Okay. I just want to make
3 sure that people understand what the hierarchy is
4 here, and is the answer to should NRC have a safety
5 risk goal, for you is that what your baseline design
6 criteria establish, or is there something outside of
7 that?

8 MR. REED: No. That's the performance
9 requirements.

10 MR. CAMERON: So that safety risk goal,
11 those are what you call performance requirements.

12 MR. REED: That's correct.

13 MR. CAMERON: And can you give us an
14 example of performance requirements?

15 MR. REED: So the examples that we wrote
16 for a dose to the key worker of one CVRT or 100 REM or
17 greater, acute does of .25 CVRTs or 25 REM, intake of
18 soluble uranium of 30 milligrams or more. So those
19 are the kinds, versus ten to the minus six, or as well
20 as ten to the minus six, those are the questions that
21 I think are involved in that first question of safety
22 goal.

23 MR. CAMERON: Okay. Why don't we just do
24 you Marissa, and let's go to Rex then.

25 MS. BAILEY: I guess just a clarifying

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1 question, and I think I'm going to show my ignorance
2 here when it comes to risk assessment, but if I were
3 to draw an analogy with reactors, there are safety
4 goals for reactors and then there's the surrogate for
5 those safety goals which are incorporated into
6 regulations and that's the CDF core, damage frequency
7 and LERF, large early relief something. But I guess
8 what I see here is that what you're suggesting is that
9 there would be safety goals and then this would be the
10 surrogate to those safety goals. That's what would be
11 incorporated in the regulation.

12 MR. CAMERON: And I think this is an
13 important discussion because where we really get off
14 track in these discussions is that we really don't
15 have a good idea of what the entire context is here.

16 MR. HOGG: And I think maybe we're saying
17 the same thing only with slightly different words.
18 These goals or surrogates are ones that are used in
19 the analysis to determine whether the design is
20 adequate or not, and be it the early release fraction
21 or the other surrogates that are not described in dose
22 terms, what we ended up using was dose terms because
23 they were consistent with the performance of the
24 facility relative to its impact to individuals, and
25 that's essentially how we decided whether to use that

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1 or a ten to the minus six for the effectiveness of the
2 confinement or some criteria like that.

3 MR. CAMERON: Okay. I think maybe we're
4 getting some focus here.

5 Rex, from your experience, what do you
6 have to tell us on this, and then we'll go over to
7 Tom.

8 MR. STRONG: A few comments. In the UK
9 we, in effect, do have a risk goal, risk to the
10 members of the public arising from accidents, and that
11 was work done actually by the Royal Society in the
12 late '80s, early '90s to try and answer the question
13 or illuminate the answer to the question: What risks
14 are acceptable and what are unacceptable to members of
15 the public going about their normal lives? So woven
16 into the way we do stuff are numbers like the ten to
17 the minus six which has been appearing here.

18 Just as a matter of fact, we have carried
19 out PRA on nuclear chemical plants since the 1980s.
20 As a technique it has its limitations. One of them is
21 to do with the basic data about reliability and human
22 performance reliability which are built into the
23 answers. It has other limitations in that it is
24 possible for analysts to deceive themselves into
25 believing that the methodology is giving answers

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1 which, in some sense, are absolutely correct. As a
2 way of illuminating risks that might arise from
3 different parts of the process, it nevertheless is a
4 useful tool because it can illuminate those
5 differences.

6 And back to my earlier comment about
7 reducing risks to a level as low as relatively
8 practicable, knowing when these risks arise and in
9 roughly order of magnitude is quite useful, but it
10 certainly isn't adequate to create safety system in
11 our situation. This is like back to basics, a design
12 of a nuclear plant must be well founded which means,
13 in our terms, it has to take into account national and
14 international design codes, appropriate design codes,
15 and then once designed, there has to be some
16 independent means of verifying that the design of,
17 let's say safety equipment system, is actually capable
18 of delivering the duty expected of it.

19 Because we're a nuclear chemical plant, we
20 have used techniques like HAZOPS borrowed from the
21 chemical industry, again for the 30 years, another set
22 of useful techniques for illuminating the kind of
23 things which can go wrong. So there are then choices
24 to be made about design if that reasonably
25 practicable, or if not that, working out how to

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1 mitigate the consequences.

2 So for me, it isn't a simple straight
3 golden bullet that answers this question that you're
4 posing to yourselves. There are parts of the answer.

5 For us, a risk goal is part of the answer; for us,
6 making use of techniques such as PRA is part of the
7 answer, but has to be set against making use of good
8 engineering practice with substantiation that systems
9 as designed are capable of delivering the duty
10 expected of them. But PRA has its limitations, not
11 the least of which [inaudible].

12 MR. CAMERON: Is your microphone still on?

13 MR. STRONG: Sorry. PRA is extremely
14 expensive and is not without its shortcomings.

15 MR. CAMERON: Thank you, Rex, for that
16 description of how you do it over there, and it sounds
17 possibly similar to what Rod was talking about also.

18 And we're going to go to Tom. And I'm
19 just wondering what's the controversy here, what are
20 the worries, what are the concerns about doing this?
21 Is it how you piece it together or what? Tom.

22 MR. HILTZ: Thanks, Chip.

23 I'd might further contribute to some of
24 the confusion.

25 MR. CAMERON: That's great, just what we

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1 need.

2 (General laughter.)

3 MR. HILTZ: I understand this issue to be
4 a bit different than what folks have articulated, and
5 I actually break it down more like Robert did. I
6 think there are two issues that we're faced with.
7 Number one is do we want to have a policy, an
8 overarching policy or goal related to safety or risk
9 associated with the reprocessing facilities, recycling
10 facilities. And then the second issue which is them
11 more technical issue, I think, is what's the
12 methodology by which we want to assess risk and make
13 risk safety decisions.

14 The 1986 commission policy statement, as I
15 understand it, was meant to be applied to classes of
16 facilities, not to individual facilities. There were
17 qualitative health goals and then the surrogate
18 quantitative objectives, but they were never meant to
19 be applied to a single facility, in my understanding,
20 they were meant to be applied to classes of
21 facilities.

22 And I heard some folks say that one times
23 ten to the minus 6 are incorporated in regulation, and
24 I'm hard pressed to recall where we've actually
25 incorporated those numbers into regulation. We may

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1 have with the new Part 52, there may be some things in
2 citing that that we've updated. But in general, those
3 numbers are used for regulatory decision-making in our
4 guidance document about how we assess amendments to
5 operating reactor facilities. It's not meant to be
6 regulating by the numbers.

7 Now let me jump back to the first one.
8 The first one, if we establish a safety goal or a
9 safety policy, that is actually a policy decision
10 which will likely go up to the commission, so I don't
11 think, at least when I think of safety goals, that
12 we're talking about performance criteria because
13 performance criteria, I think, will ultimately be
14 incorporated into the regulation.

15 So for me, there are two important
16 questions. Do we need an overarching safety goal that
17 is more or less a policy issue that will be resolved
18 at levels above the staff, potentially, or don't we?
19 And I think the other issue is then what is the right
20 methodology that we need in order to reach a risk-
21 informed safety decision regarding the facilities.

22 MR. CAMERON: So just to make it clear,
23 before we go to Sven, your overarching goal is you're
24 disagreeing -- and I'm putting a light tone on that
25 disagreeing -- is that Robert and Marissa, at least

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1 Robert was saying that these type of performance
2 requirements are a surrogate safety goal. Okay? And
3 what you're saying is that should there be an
4 overarching safety goal, there would also be
5 performance requirements -- you called them criteria
6 but they'd be performance requirements, but the safety
7 goal would be something in and of itself, a high
8 level.

9 And I guess the question there is has a
10 similar overarching safety goal been established for
11 other categories of facilities and do you need that
12 type of goal.

13 Let's go to Sven.

14 MR. BADER: I'm actually a little
15 perplexed. An overall safety goal is sort of like a
16 core damage frequency? Is that what you were
17 suggesting?

18 MR. HILTZ: I'm suggesting that if you go
19 back and you look at the commission PRA policy
20 statement -- I'm sorry, not the PRA but the
21 qualitative and quantitative health objectives, they
22 were designed for a class of reactor, either a PWR or
23 a BWR, they were never meant, it was my understanding,
24 to be applied as this is the magic number that every
25 facility needs to meet, and that the surrogate about

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1 how you would meet those qualitative health objectives
2 of the quantitative goals of one times ten to the
3 minus six -- and I'm not even whether if one times ten
4 to the minus seven as a large early release was ever
5 in that, I'm not sure, and again, it's my
6 understanding that somebody here who is smarter than
7 me might be able to provide an example -- that we
8 resisted incorporating those into regulation, that
9 they were set as policy goals and objectives which, in
10 turn, I think rolled down into some of our guidelines
11 for how we make decisions but didn't carry the sort of
12 regulatory footprint of incorporated into regulation.

13 MR. CAMERON: And Sven, why don't you keep
14 going.

15 MR. BADER: I'm going to keep going. The
16 ten to the minus six, as I understand it and the way
17 applied it for the M-Triple-F -- we didn't use ten to
18 the minus six -- but up here we have highly unlikely
19 for events that have high consequences, we had to
20 demonstrate those events where highly unlikely, and
21 that would be considered ten to the minus six in some
22 cases, depending on the guidance documents you look
23 at.

24 So when we say performance criteria, I
25 believe it's all actually wrapped up in this table up

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1 here, actually, where you have your dose criteria,
2 your chemical limits, your environmental limits,
3 solubility limits, and so forth. And then you have
4 the probability which the highly unlikely, the
5 demonstration you have to make which would be ten
6 minus six some could say, the intermediate which has
7 to be demonstrated to be unlikely which I guess you
8 can say ten to the minus third to ten to the minus six
9 and so forth. So I think the performance criteria up
10 here kind of incorporate those criteria.

11 What I'm worried about is that there's
12 some add up all the events in your facility and come
13 up with one criteria, one number, identify all these
14 different consequences, look at the probability of
15 each of those consequences and sum them all up and
16 come up with one frequency for the whole facility. Is
17 that what we're talking about?

18 MR. HILTZ: I'm not talking about that.
19 I'm just trying to provide you the background and why
20 there's so much confusion about this issue about how
21 we proceed forward to resolve whether there should be
22 an overarching safety goal for a reprocessing
23 facility.

24 MR. CAMERON: I think from what Sven is
25 saying, then we're going to go to Marissa and Don, is

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1 that that overarching goal that's already there is
2 already being considered in these performance
3 requirements, and so that you don't need to try to
4 grapple with the issue of should there some new
5 overarching goal in terms of this rulemaking.

6 MR. BADER: And that's what I'm
7 suggesting. And I guess the question Marissa posed is
8 ISA a good process, and I would actually pose the
9 opposite, is PRA a good process. I mean, Davis-Besse
10 happened. I don't think there's any PRA that would
11 identify the chemical degradation or rusting of a
12 containment facility and its analysis. And we have
13 lots of the chemicals in the process so there's lots
14 of chemical reactions going on that I'm not sure are
15 very quantifiable with a PRA.

16 MR. CAMERON: Can you hold that because I
17 think that's where we need to get to, and that's a
18 good example and perhaps would an ISA have revealed
19 that. That's what we really need to get to discussing
20 this ISA/PRA issue. I'm just always thrown by this
21 safety goal issue that we started off the questions
22 with, and I'm trying to see if there is some unanimity
23 of opinion here that you rulemakers for reprocessing
24 that you don't have to reinvent the wheel in terms of
25 this overarching goal.

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1 MR. HILTZ: Chip, if I can ask a question
2 for the panel. Is there an impression that there
3 already is a safety goal for reprocessing facilities?

4 MR. CAMERON: Or not specifically for
5 reprocessing facilities but one that the commission
6 set generally for all types of facilities that are
7 applying that, and I thought that Sven was sort of
8 referring to that when he was talking about the ten to
9 the minus six. Go ahead.

10 MR. BADER: Since you asked the panel,
11 I'll consider myself part of the panel. I think up
12 here is what I think is the safety goals and the
13 performance criteria, that you have to demonstrate
14 highly unlikely events, high consequence events or
15 highly unlikely, intermediate consequence or unlikely,
16 that's part of the safety assessment.

17 MR. CAMERON: Okay. We need to get you
18 all on the microphones. And let me go to Marissa and
19 then to Don, and then we'll see if we can see what
20 Beatrice's question is, and then Jim, I just want to
21 get this cleared up about do you need to do this in
22 your rulemaking. Marissa.

23 MS. BAILEY: I guess I just want to put on
24 the record that I don't disagree with Tom. Tom just
25 articulated my thinking and my questions a little bit

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1 better than I did which is really do we need a policy
2 statement on safety goals, and to me, actually the
3 more important question is what is the right
4 methodology for assessing the risk at reprocessing
5 facilities. That's really what I would like to get to
6 is what's the right methodology, what are the
7 advantages and disadvantages of ISAs versus PRAs for a
8 reprocessing facility.

9 And I guess if you want to pursue the
10 question of safety goals a little bit more, I'm not
11 the right person to talk about it but there might be a
12 couple of people in the audience that could answer the
13 safety goal question.

14 MR. CAMERON: But I guess that's the
15 question: Do you need to include some sort of a
16 safety goal policy in this rulemaking? That's the
17 question.

18 And Don, let me go to Jim first and then
19 come back to you. Jim.

20 MR. LIEBERMAN: Well, frankly, I'm getting
21 a little confused too on this safety goal. I think a
22 safety goal in the Part 50 sense, core damage
23 frequency, I think the real issue the ISA or the PRA
24 is the methodology to show that something has been
25 met, and the question is what's that something.

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1 What's on the slide here is the performance
2 requirements that used in the fuel cycle industry by
3 NRC and you can say we need to decide whether we use
4 PRA or ISA to decide whether high consequence events
5 are prevented such that they're highly unlikely or
6 not.

7 If these are not the right standards for
8 reprocessing, then the question is, are these the
9 right standards for the rest of the fuel cycle
10 industry. The goal wasn't to reinvent the standard
11 but basically use the standard NRC has found
12 acceptable in the fuel cycle industry, and then how do
13 you design or demonstrate a recycling facility has met
14 these standards. And I think that's what the issue
15 is.

16 MR. CAMERON: Oh, okay. And I don't want
17 to belabor this point about this overarching safety
18 goal because it may exist, it may be a red herring,
19 it's something that staff needs to be able to say we
20 don't need to address that here.

21 Don, you've listened to the conversation
22 and I hope all the individual pieces might still be at
23 least not completely fuzzy at this point, but what do
24 you think on this?

25 MR. HANCOCK: Well, I actually had some

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1 questions. And one of the things that's always
2 bothered me, and the slide is a good illustration of
3 it, and I guess I want to specifically ask the
4 industry folks at the table, and I'm not sure exactly
5 how's the right way to phrase it is so that it gets
6 the question engaged. I've always been disturbed by
7 the, in my view, significantly differing standards for
8 workers and the public, and I'd like to have a quick
9 understanding. And obviously we're not litigating
10 here and that's not what I'm asking.

11 When I'm in discussions with other folks
12 in the public about this, the frequent question that
13 comes is why are workers expendable -- is the word
14 that sometimes is used -- why have such a different
15 standard for workers and the public. So I guess maybe
16 that relates to the whole safety goal envelope
17 question, maybe it doesn't, but I guess I'm interested
18 in an industry perspective on that, and then I may
19 have a follow-up and then I have a different question
20 in a different area.

21 MR. CAMERON: Okay. That may relate to
22 this all. And that's an important question. You're
23 asking it of the industry.

24 MR. McCULLUM: And if NRC prefers to
25 respond, I'll put my card down.

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1 MR. CAMERON: The NRC, the agency sets
2 those limits based on international practice and other
3 things, but can we give Don a quick answer about why
4 doses for workers are different from doses to the
5 public

6 MR. McCULLUM: I'll take a crack at it and
7 at least inspire the regulator to tell me if I'm wrong
8 here. But I think, first of all, I take exception,
9 having been a worker at a nuclear power plant, to the
10 notion that workers are expendable. I took my own
11 personal protection very seriously, as everyone who
12 works at a nuclear plant does, and you wouldn't be
13 working at them if you didn't otherwise.

14 I think the difference is twofold. One,
15 it comes into the notion of voluntary versus
16 involuntary risk, and the second comes into the notion
17 of training which is certainly one of the things that
18 when I was taking my own personal risk seriously at a
19 nuclear facility came into play. I had to be trained
20 on all the radiation protection procedures and how to
21 respond to things and what to do in different areas,
22 and I accepted the risk, given that knowledge, to go
23 into those areas.

24 Now, it doesn't mean I wasn't protected,
25 and I think if you look at any health studies of

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1 workers at commercial nuclear power plants, I know
2 when I worked for a utility that had coal plants and
3 nuclear plants, the union workers would take loss in
4 seniority and cut in pay to go from the coal plants to
5 the nuclear plants because having been educated on the
6 risks of both, they considered the nuclear plants to
7 be much safer.

8 So we do protect our workers, but again,
9 you do have to say something about the level of
10 understanding of the risk that comes with being a
11 nuclear worker and the required training that makes
12 sure they do understand the risks they're taking on,
13 and second, the notion of voluntary versus
14 involuntary. If you're living in a community near a
15 nuclear plant, your perception of risk might be
16 different than someone who chooses to work in it, and
17 I think we recognize that. We're protecting the
18 workers, I guess, and we're protecting the public even
19 more.

20 MR. CAMERON: Okay. Thank you. And as
21 important as that question is, I don't want to get us
22 off this track that is already winding. So Don, can
23 you take us back there?

24 MR. HANCOCK: Maybe not because I had
25 another question and it came up in Robert's

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1 discussion, if you can help me, it's at least part of
2 the rest.

3 So when you talk about safety envelope,
4 what's the time period that you're talking about
5 safety envelope for?

6 MR. HOGG: Well, what we did was establish
7 safety envelopes in the similar vein to the way,
8 again, Part 70 essentially established such envelope.

9 As you have already identified and we discussed,
10 identified the envelope as it applies to individuals
11 outside of the facility, the members of the public,
12 the workers, we established for normal operations and
13 accident conditions much as they're currently
14 established for existing facilities.

15 From an environmental standpoint we
16 established them for the time period of operation of
17 the facility and during decommissioning after the
18 facility is removed. So we tried to be comprehensive
19 in doing it, not to say that we've captured all of it,
20 but that would be the intent would be comprehensive
21 and capture both all potential receptors in groups and
22 all time periods.

23 MR. HANCOCK: So then a question for Sven.
24 He appropriately, and I appreciate it, used the PRA
25 example of Davis-Besse -- I'm skeptical about PRAs for

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1 other reasons from my experience -- but I guess I
2 didn't understand, and so my question is how would an
3 ISA in that situation have captured chemical problem
4 at Davis-Besse?

5 MR. CAMERON: Okay. And that's great
6 because that takes us right to the heart of the
7 question: ISA and PRA, and let's discuss that. And
8 it's great that you gave us that example, and let's
9 hear from Don and Beatrice and perhaps Anne and others
10 on this issue. This safety goal question, I think
11 seems surrounded by it may be questionable whether
12 that has to be part of your rulemaking, but I think
13 we're going to leave that there and let's spend the
14 rest of our time talking ISA/PRA. And SVEN.

15 MR. BADER: The ISA process would go
16 through and identify -- we call them IROFS from Part
17 70 but I think it's important to safety in Part 50 --
18 and then once you've done that, you have to
19 demonstrate highly unlikely the ten to the minus six,
20 or whatever number you want to assign that. And so
21 the primary confinement would have been identified as
22 an IROFS and the next step is to look at the different
23 failure modes of that IROFS, and corrosion is clearly
24 one of those issues in the chemical industry that you
25 have to worry about so that would be something that

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1 you would look at.

2 Specific to Davis-Besse, I don't know the
3 details of what caused the corrosion, I believe it --
4 I'm not even sure, I can't tell you -- I know they had
5 collected a lot of material in the filters and it
6 should have been obvious that there was a corrosion
7 issue going on.

8 An ISA process and you identify your
9 safety features and then from there you have to
10 identify why those safety features make an event
11 highly unlikely and it's able to sustain through all
12 the conditions all the environmental qualifications
13 that are necessary to demonstrate the safety
14 throughout the operating history.

15 MR. CAMERON: And Don, do you want to tell
16 us about what some of your misgivings are about the
17 use of PRAs.

18 MR. HANCOCK: Well, the specific example
19 that I am most familiar with and have been most
20 involved with is the PRA for WIPP, and part of the
21 reason I asked the time period, you know, the WIPP
22 time period is 10,000 years which is way short of the
23 risk period, so that's a problem. Probabilities, I
24 mean, we don't -- and again, I would argue in the
25 Yucca Mountain case which I know less about and the

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1 WIPP case which I know a lot more about, probabilities
2 are basically hand weighed.

3 From my standpoint, we don't have good
4 bases in history, in engineering and any other way,
5 from my standpoint, to really assign the
6 probabilities, but yet they were assigned and
7 decisions were made that I think on the basis of both
8 good science and just practical experience were
9 clearly wrong. Well, when will we know? Well, we'll
10 know in a few hundred years down the line and that
11 could be a little late, or longer than that down the
12 line. So those are fundamental problems.

13 And people have talked about limitations,
14 et cetera. That's a severe limitation, in my
15 standpoint, and again, I understand there may be
16 differing time periods we're talking about with
17 different kinds of facilities, but a reprocessing
18 facility, from my standpoint, based on at least my
19 understanding of the history of reprocessing
20 facilities in the United States, is a very long time
21 frame and it's a lot longer than the operational
22 lifetime.

23 And I don't know and I'm interested in
24 people talking about how the ISA addresses those kinds
25 of issues as well because, from my standpoint, the

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1 issues relate to risk and consequence and public
2 health and some ways that I'm, frankly, skeptical that
3 either PRA or ISA does what I think needs to be done.

4 That's why I'm glad to hear more reasons why
5 limitations and strengths from people's perspectives,
6 industry and regulators' perspectives for either one.

7 MR. CAMERON: And I think that the
8 industry might say that it's not just the ISA in and
9 of itself that gives you that confidence, it's the
10 performance requirements, the baseline design
11 criteria, and then you have the ISA and IROFS. But
12 the implication, perhaps, of what you're saying that
13 I'm picking up is that if you rely too much on a PRA,
14 it can give you false confidence, perhaps.

15 So let's go to Rod and then Phil.

16 MR. McCULLUM: And the word false
17 confidence was exactly the word that I was sitting
18 here with my card up wanting to bring up. And I think
19 Sven hit it just right when he talked about if you had
20 an ISA for Davis-Besse, the safety basis for Davis-
21 Besse was established by deterministic means, and
22 then, of course, you have PRAs within that
23 deterministic framework.

24 Let's say it was integrated safety
25 analysis, you have a situation there where it's items

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1 relied on for safety, not just components, not just
2 the vessel material itself, items or procedures and
3 administrative controls. And you had a case there
4 where all of those things were in place, the human
5 beings simply didn't deploy them appropriately, the
6 human beings simply kept cleaning corrosion out of the
7 strainer and didn't ask the question where it was
8 coming from.

9 Knowing the probability with some
10 precision of that hole being punched in the vessel by
11 that corrosion mechanism would have probably only
12 given you a false sense of confidence. And with an
13 ISA or with the deterministic approach they did have
14 in place, you had all the right IROFS there already.
15 So relying on an exclusively probabilistic where it
16 becomes too much about the number and does lead you to
17 a false sense of confidence.

18 And what I did want to do, Chip, since we
19 have reached the point, on at least my watch, where we
20 are owed another break, is I want to try to summarize
21 and answer your question.

22 MR. CAMERON: We started late.

23 MR. McCULLUM: That's true. Well, then I
24 have plenty of time to summarize.

25 You asked the question where's the

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1 controversy here, and from my e-mail that came in when
2 I was changing planes yesterday and I tried to read as
3 much of that as I could, and from what I heard today,
4 I'm not sure there is a controversy. I think
5 everybody around here agrees that there is a safety
6 goal, it's a question of how we articulate that safety
7 goal and more importantly, how we assure that that
8 safety goal is met in requirements.

9 And you see a framework up there. Within
10 that framework, and that is a pretty good framework
11 and it's worked, and I think the paper that NRC
12 released yesterday recognizes that that framework has
13 worked, you have an established tool of integrated
14 safety analysis that can give you a very high level of
15 confidence.

16 You have another tool called probabilistic
17 risk assessment, and that tool, I think, again NRC's
18 paper and industry's paper have recognized that there
19 are limitations to PRA, however, it's all about
20 defense in depth sometimes and we recognize that if
21 you define your compliance with integrated safety
22 analysis within that framework, there are instances
23 where you do have enough data. Maybe you do have a
24 complexity of interactions where a limited scope PRA
25 can give you an additional layer of confidence where

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1 you can say I've defined this event highly unlikely
2 and I've put all these IROFS in place and I've put all
3 these procedures to make sure people check those
4 filters and ask the question where the corrosion is
5 coming. But I also want to do a PRA because there are
6 a set of equipment in here that I do have some data on
7 and that might also support additional confidence in
8 that safety basis.

9 So looking at what NRC has put on the
10 table and looking at what we've put on the table and
11 looking at the discussion here, I'm not sure that this
12 is that controversial. NRC still has a big task in
13 front of them to make it all work, but I think there's
14 a basis to go forward here.

15 MR. CAMERON: Okay. Thank you very much.

16 Let's to go Phil, and then we'll go to
17 Sven. And I don't know, Don, if you have your card up
18 from before, or you have it up now. Okay. Let's go
19 to Phil and then Sven and then Don.

20 MR. REED: I want to point out a comment
21 that Bob made which is extremely important, and that
22 is design, When we do PRAs for reactors, we have the
23 complete design, not only do we have a design, we have
24 an operating system. We know where every nut and bolt
25 is, we know where every pump and valve filter is.

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1 When we do a reprocessing facility, we're lucky if we
2 get a circle in the ground or a square. We just don't
3 have the detailed design right now of what we're
4 working which you really need to do a PRA because if
5 you do a good PRA, a PRA will eliminate a lot of the
6 things that you really don't need so you can
7 concentrate your resources on something more
8 important. So I think that's an extremely important
9 point to consider.

10 The second thing is with regards to Part
11 70 versus Part 50 PRA. In a part 70 analysis, you
12 only have to worry about maybe three isotopes, three
13 isotopes of uranium, maybe if you do a plutonium
14 facility, there's a couple more isotopes, but when you
15 deal with spent fuel of 60,000 megawatt days for
16 metric tons, you have hundreds and hundreds and
17 hundreds of isotopes, fission products, transuranics
18 and activated metals, and they're not just sitting
19 there, they're moving around, they're going from one
20 aqueous phase maybe to a non-aqueous phase, they're
21 going to an evaporator, they're going here, they're
22 going there.

23 So as a result, it's pretty difficult
24 sometimes to get an estimate of risk to the public and
25 to the individual, so you need something, I think,

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1 much more important than just a little qualitative
2 survey like Part 70. On the other hand, Part 70, like
3 I said before, does recognize the chemical exposures.

4 That's something that we've wrestled with in our
5 working group. So there are some good points and bad
6 points about the Part 50 and the Part 70.

7 MR. CAMERON: Thanks, Phil. Sven.

8 MR. BADER: In my haste to answer Don's
9 question about Davis-Besse, I gave that answer that he
10 didn't appear to be too pleased with, so let me try to
11 improve on that a little bit better.

12 From an ISA process, we probably would
13 have performed the HAZOP on the activities that were
14 going on in the reactor. You would have seen the
15 deviation of the chemicals that they use in the
16 reactor, and then you would have to establish what
17 consequences would have come from that. Clearly
18 whatever happened, I'm not sure, increased the
19 corrosion, so you would have experts in the room that
20 would be able to tell you, Yes, if I change this
21 chemical content in the process, I could potentially
22 increase the corrosion in the process. If it were an
23 ISA process, you would evaluate the changes to the
24 process, the deviations to the normal reactor
25 operations and identify potential consequences.

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1 With respect to Phil's point there on the
2 fission products, those are going to put you way up
3 high from a consequence standpoint, so I'm not sure we
4 really have to distinguish events with fission
5 products that might be in the intermediate consequence
6 category. I mean, you have to demonstrate any event
7 with these fission products is going to have to be
8 highly unlikely because the consequences from those
9 events are going to be high, I don't know how high but
10 clearly to the point that you don't want to have any
11 of those events, you're going to have to demonstrate
12 that they're going to be highly unlikely.

13 MR. CAMERON: But you're taking that into
14 account when you do your performance requirement.

15 MR. BADER: I can tell you for the M-
16 Triple-F, working with plutonium, plutonium puts you
17 really quickly up into these high consequence events
18 as well, especially for facility workers. You end up
19 having quite a few safety systems identified for any
20 little bit of ventilation plutonium.

21 MR. CAMERON: And the safety systems are
22 the IROFS?

23 MR. BADER: The IROFS, correct.

24 MR. CAMERON: Okay. Good. That puts it
25 in context. Don.

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1 MR. HANCOCK: Thank you for the further
2 clarification. I guess the sort of obvious mindless
3 question that I have on the one hand is I fully agree
4 with the idea of whatever we want to call it, a false
5 sense of confidence that can come out of PRAs. I
6 guess the obvious question is why can that not happen
7 with the ISAs, number one.

8 And number two, I guess I need some
9 clarification from Rod in terms of your conclusion
10 that there is no controversy because I guess I
11 understood clearly your presentation as being an ISA,
12 the industry recommendation is ISA, and while I'm not
13 a fan of PRAs, quite the opposite, I guess I was sort
14 of presuming something along more the lines that Phil
15 was talking about that you're going to do both, going
16 to be required to do both, and is that what you were
17 saying or not?

18 MR. McCULLUM: The answer is yes. I mean,
19 we recognize in our paper that there is a role for PRA
20 as a complement to ISA. And I think in terms of false
21 sense of confidence, I mean, again it comes down to
22 the human beings involved in the system and how
23 diligent a job they do and the requirements need to
24 make sure they do as diligent a job as possible.
25 Complacency is the enemy we fight every day in our

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1 industry, and we work very hard to make sure we don't
2 become complacent and don't get a false sense of
3 confidence.

4 If you do a good enough ISA so that you're
5 identifying all the things out there, meaning you're
6 consulting all the right experts, and then you do a
7 PRA here and there to check your confidence where you
8 have the ability to do that, not just relying on the
9 PRA to spit out a number where you may not have enough
10 data.

11 MR. CAMERON: When you have the data.

12 MR. McCULLUM: Right. I think that's what
13 I'm saying and I saw some of that in NRC's paper that
14 there might not be a controversy, that we've got a
15 tool here that works in ISA and we've got an
16 opportunity which, given the high hazard of some of
17 these things -- and I think Phil recognized that --
18 maybe we want that in a few areas, that additional
19 measure of confidence.

20 So this is doable, and again, that's the
21 heavy lifting our friends at the NRC have to do, but
22 we look forward to additional discussions as you do
23 that.

24 MR. CAMERON: Okay. Thank you. Jim.

25 MR. LIEBERMAN: Well, I was just going to

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1 say what Rod said, that in the NIE 7X we specifically
2 provide for supplementing the ISA with quantitative
3 assessment when there's an accident with the potential
4 for a high consequence event involving fission
5 product. So for that type of situation, we would do
6 more than just the ISA.

7 MR. CAMERON: And I think this illustrates
8 for the people who are going to have to do the
9 rulemaking, I think Don's question about what does the
10 ISA do for you, statement of consideration,
11 supplementary information on the use of an ISA is
12 going to have to try to answer some of those
13 questions, I think.

14 We're going to continue down this path in
15 the next agenda item when we're talking about design,
16 and baseline design criteria, IROFS, tech specs to get
17 a complete picture of how all this fits together and
18 how some of this flows from the ISA. I want to make
19 sure we go out to the public, but we have time for
20 Robert and Marissa. Robert, go ahead.

21 MR. HOGG: I was just going to add that,
22 you know, what I think we've done is come somewhat
23 full circle around to the description of the process.

24 And back to what Rex said at the very beginning, it's
25 very important not to rely on any parts of this

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1 system, and the system includes all these components,
2 and if we anticipate that any one of these is a silver
3 bullet, that's where the complacency has stepped in
4 and we've really made a fundamental mistake.

5 What we should do is we should maintain
6 flexibility in the approach such that we can use these
7 tools to their best advantage, and we've got
8 experience doing that, so we should be able to do that
9 smartly and not fall into those traps that Rex
10 mentioned.

11 MR. CAMERON: Okay. Thanks, Robert. And
12 in England they use a gold bullet, we're going to try
13 to settle for silver bullet. Marissa.

14 MS. BAILEY: And I guess my question sort
15 of follows the comment that Robert just made, and I
16 think I heard this comment at the workshop in
17 Rockville, so I'll ask everyone here as far as what
18 the thinking is. In this debate between ISA versus
19 PRA, are we just getting caught up in semantics here?
20 Isn't an ISA and a PRA really just a spectrum of how
21 you do the risk analysis where a PRA is quantitative
22 and then as you go towards more qualitative, you're
23 going towards an ISA type approach?

24 And so I guess that's the question, is
25 this semantics? And whatever risk assessment

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1 methodology we ultimately decide is the right one for
2 reprocessing, really the question is what's the level
3 of detail that we are looking for in terms of whether
4 it's quantitative or qualitative.

5 MR. McCULLUM: I agree. I know I didn't
6 put my card up. I do agree with that, and that's why
7 I like the term semi-quantitative because there are
8 degrees of quantitative analysis you can apply in an
9 ISA, and you hit it right on the head, level of
10 detail, and that has to be proportionate to the risk.

11 MR. CAMERON: And there may be a better
12 way to express it than semi-quantitative, but a
13 combination of both. Right?

14 MR. McCULLUM: Yes.

15 MR. CAMERON: So it may be that going back
16 to the no controversy, it may be that there's no
17 controversy.

18 MS. BAILEY: Well, there is a controversy
19 as far as what is it that we need to know to be able
20 to assess the risk with a reprocessing facility and
21 ultimately come to a decision that this is acceptable,
22 that it is an acceptable design, that it is acceptable
23 to operate.

24 MR. CAMERON: And that takes into account
25 more than just the ISA, I guess.

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1 Robert, and then let's go and see if
2 anybody in the audience has a comment on all of this.

3 MR. HOGG: I guess that last line of
4 thinking does bring us right back to the goal because
5 if we state the goal in terms that only PRA can
6 measure, then we're going to box ourselves in with
7 respect to what tools we use. So I'm not against
8 having qualitative goals that are risk measures that
9 are measured by the accumulation of events and the
10 math involved in the PRA process, but we should also
11 have the goals that we can evaluate as we do under our
12 Part 70 approach.

13 MR. CAMERON: Thank you, Robert. Thank
14 you all.

15 Janice, anything? And please introduce
16 yourself to us.

17 MS. ARNOLD-JONES: Janice Arnold-Jones. I
18 represent House District 24, and I guess I'm
19 struggling since I sit through a lot of legislative
20 committees. So I'm unclear as to why we're struggling
21 between the ISA and the PRA when we clearly need the
22 best parts of both, and so I'm not quite sure why the
23 struggle.

24 MR. CAMERON: Well, I think that the
25 conclusion reached here after this discussion is that

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1 we don't need to be struggling with an either/or
2 approach.

3 Is that correct, Marissa and Rod?

4 MS. BAILEY: It's a thought.

5 MR. McCULLUM: For the record, it's a
6 thought that industry agrees with.

7 MR. CAMERON: Do you want to say some more
8 on this? I think that the struggle may be over going
9 into another arena perhaps. Anything else you'd like
10 to say? And that's House District in New Mexico?

11 MS. ARNOLD-JONES: I'm sorry. Sure, it's
12 House District 24 in New Mexico which is like right
13 over there.

14 And so as we go forward, my purpose for
15 being here is I am certainly interested in the
16 recycling of fuel and I see that as the ultimate
17 expression of technology as well as use of good
18 resources, so the safety statement certainly needs to
19 be there, but I feel like you're getting kind of
20 bogged down in the minutiae when, in fact, there is a
21 clear target here. And I'm not quite sure how to help
22 you get there, but I know that we need to move
23 expeditiously but safety has to be the primary
24 concern, and so I'm trying to figure out why we're not
25 moving forward. I guess that would be my last

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1 question.

2 MR. CAMERON: Okay. Why we're not moving
3 forward with efforts to have reprocessing facilities
4 or have the rulemaking? I think probably all the
5 industry people would say that's a good question, and
6 the NRC would say well, we need to make sure that we
7 have an effective regulatory framework for licensing
8 and regulating these facilities, and that might take
9 some time. And of course, the NRC is not promotional
10 about this, you know, all of that sort of thing. But
11 at any rate, I think you helped to at least confirm
12 the fact that we may not need to struggle with this
13 particular issue.

14 Rod, go ahead.

15 MR. McCULLUM: I just wanted to respond to
16 that and echo something that Anne said earlier about
17 the relationship between policy and regulation. As
18 far as why we're not going forward, there are a lot of
19 things policy-wise on the table there and economic-
20 wise about reprocessing. However, one thing that the
21 people in this room can do something about is the
22 regulatory piece which needs to at least inform
23 policymaking in as neutral a way as possible.

24 MR. CAMERON: And I think Rod pointed out
25 earlier that one of the policy issues that's

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1 developing is to see what comes out of the Blue Ribbon
2 Commission also.

3 And Marissa.

4 MS. BAILEY: I guess I'd like to sort of
5 answer that a little bit. When it comes to
6 reprocessing, the NRC is agnostic. We don't take a
7 position for or against reprocessing, that's not our
8 role. We recognize that reprocessing can be an
9 important component in the national strategy, but
10 that's not our decision, that's a decision that's
11 happening above us, beginning with the Blue Ribbon
12 Commission.

13 Our role is to make sure that if we do
14 receive an application for a reprocessing facility
15 that we have a predictable and stable regulatory
16 framework that can address the safety issues and the
17 security issues and so that we can do our job and
18 carry out our mission of protecting public health and
19 safety and security, so that's our role.

20 And in anticipation of what might happen,
21 what the nation might ultimately decide, we are moving
22 forward at least with the process of developing the
23 technical basis for rulemaking for reprocessing. And
24 that's what this workshop is all about, it's to be
25 able to get input from a variety of stakeholders on

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1 what they think is important for that regulatory
2 framework.

3 MR. CAMERON: Thank you, Marissa. Well
4 said.

5 And let's go to Mike. Can you introduce
6 yourself to us, and then we'll go back to Janice.

7 MR. EHINGER: Mike Ehinger from Oak Ridge.

8 Let me first say that it's very difficult
9 to sit in the audience and come up with a question at
10 the end that reflects the thoughts that you've had all
11 through the discussions, but if I can try to do that.

12 Early on it was mentioned probability risk
13 assessment is something that is well developed and
14 well defined and has been applied for a long time in
15 the reactor evaluation, something where you know the
16 components, and I think it was said early on that
17 there's history on performance of components.
18 Reprocessing is different.

19 The other thing I'd like to say is
20 reprocessing is very much different than a lot of
21 these things because all of the processes take place
22 within very, very heavy structures and most of the
23 consequences, first of all, there's a limited amount
24 of material in any one location, and generally it's in
25 a well defined piece of equipment in one way or

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1 another that considers criticality and a number of
2 other reasons.

3 And all of that stuff takes place in a
4 very, very heavy, massive structure and the
5 consequences of most of the events that you might see
6 that you could be concerned about are really contained
7 within this structure, and there's very few things
8 that can possibly mitigate to an outside major release
9 kind of thing. So in that sense, in my opinion, it
10 seems that you lean toward the ISA approach because
11 you can define just a few things that can breach
12 this -- I hate to use the word containment, but the
13 structure. So it's very different.

14 The other part of it was brought up, the
15 length of time, and it's not like Yucca Mountain where
16 it's a million years or 100,000 years or anything,
17 because there's a usable amount of lifetime of the
18 facility and after that the materials are gone, and
19 it's not the same kind of thing. You're shaking your
20 head, the materials are gone, there's some legacies
21 left over, but the consequences, the explosions, the
22 things that you consider in the context of operating
23 facilities are no longer there. It's a risk of a
24 garbage pile or something else, it's the hazards that
25 are in the garbage pile.

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1 But like I say, it's very difficult to
2 construct a question that transcends the entire
3 discussion.

4 MR. CAMERON: You don't need to do that
5 either. It's just good to hear your comments on this
6 from your experience from Oak Ridge. And Janice.

7 MS. ARNOLD-JONES: If I might, and I
8 appreciate your patience, but let me just take this
9 down to Joe Q. Public. You know, we're in an election
10 right now and here are the questions that I am being
11 asked. So you promised to take waste and deal with
12 it, and we have not. Most people understand that
13 reprocessing is probably the ultimate in terms of
14 recycling and we're not doing it. And so with all due
15 respect, Marissa, we cannot allow regulation to move
16 so slowly that we don't have answers, and it is the
17 chicken and the egg, but there's a come point at which
18 we have to get off the dime and move forward, and
19 that's kind of where we are.

20 And so I guess I would ask you when do we
21 intend to deal with the waste that is merely stored
22 when we clearly have proven technologies to move it
23 forward. It seems to me you've got processes in
24 place, and if I'm asking the wrong questions, I simply
25 am telling you what people are asking me.

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1 MR. CAMERON: And it's good that you're
2 adding that voice to the conversation and I think that
3 it's not a rhetorical question, obviously, but it's a
4 question that is good for everybody up here to hear
5 but I don't think we're going to be able to answer it
6 right now. But let's go to Beatrice and then Anne,
7 and then we'll go for a break.

8 MS. BRAILSFORD: Promises, promises.
9 Should a reprocessor be built in the United States of
10 America, it will be built by a private corporation, so
11 when you look at a government official and say why
12 aren't we moving forward, you are asking the wrong
13 person.

14 MR. CAMERON: Anne.

15 MS. CLARK: From a policy perspective,
16 governments involved need to not just look at the fact
17 that this is going to change the amount of high level
18 waste that's out there, but it is also going to create
19 a whole other stream of waste that has to be dealt
20 with an entirely different way, and here are many
21 people who believe that that's a much more noxious
22 stream of waste than the original high level waste
23 that it would be used to reprocess.

24 MR. CAMERON: Okay. And I think this is
25 the type of conversation that will probably continue

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1 offline at this point. Let's take a break and come
2 back right around 3:30, maybe a little bit after, and
3 we're going to continue to go down the road.

4 (Whereupon, a brief recess was taken.)

5 MR. CAMERON: Okay. We're going to get
6 started and we will finish by the appointed time with
7 this one. This I on the design requirements, and
8 we've already started to go at least down the path of
9 some of the major issues.

10 Jose, who is teeing up design? Phil, I'll
11 just let you have at it and we'll get to discussion.

12 MS. BAILEY: I'm substituting again for
13 Alex who was normally going to give the presentation
14 but because, as you've heard, for his medical
15 condition he will not be here.

16 We've already talked about the first
17 bullet, we've talked about the first two items. The
18 third item is the issue we're going to be discussing
19 right now, that is the minimum requirement or areas
20 for review. Now, the minimum requirement includes,
21 among other things, design base criteria, and of
22 course, I've listed acronyms. GDC is the general
23 design criteria, this is a Part 50 requirement. And
24 right beside that you see the BDC, that's the baseline
25 design requirement and that comes from Part 70. But

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1 for all practical purposes for our discussion this
2 afternoon, we're going to assume that those are
3 essentially the same.

4 We're also going to be talking about
5 technical specifications which are part of the minimum
6 criteria, and in addition to that, we also have
7 training and qualifications of personnel. All of
8 these together support redundancy, diversity, defense
9 in depth and all the safety functions that we believe
10 are needed for reprocessing facilities.

11 What are GDCs and BDCs? Well, the NRC has
12 established minimum requirements for proposed
13 facilities or applications of licensed radioactive
14 materials that provide assurance that important
15 structures, systems and components will have the
16 ability and reliability to perform their intended
17 safety functions, also assurances that there are
18 uncertainties and that there are errors from designs,
19 analysis and unknowns are adequately addressed, that
20 we have adequate defense in depth, redundancy and
21 diversity must be present, and we have assurance that
22 the balance of plant and unanalyzed situations do not
23 impact the safety. NRC's regulations frequently
24 identify these minimum requirements by terminology.
25 I've already mentioned GDCs and the BDCs as coming

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1 from two separate parts of the regulations.

2 Currently reprocessing and recycling
3 facilities are production facilities. As we've
4 learned, they're licensed under 10 CFR Part 50,
5 production facilities are authorized under the Atomic
6 Energy Act. And GDCs are in 50.34 and Appendix A.
7 The other sections of Part 50 imply additional GDCs,
8 i.e., Appendix F. Now, Appendix F is the regulation
9 for reprocessing, Appendix I is the regulation for
10 ALARA, as low as reasonably achievable to meet design
11 objectives. And Appendix S is the earthquake
12 regulation, the engineering criteria for nuclear power
13 plants.

14 The GDCs specific to recycling and
15 reprocessing facilities are needed to address the
16 large quantities and types of radionuclides in these
17 facilities, and that includes fission products,
18 transuranics and also activated metals. There is also
19 an item in Part B of Part 50 which relates to quality
20 assurance, and it turns out that the quality assurance
21 is actually entitled Quality Assurance Criteria for
22 Nuclear Power Plants and Reprocessing Facilities.

23 Part 50, as mentioned previously by
24 Marissa, there was a previous regulation that
25 addressed GDCs. This regulation was a regulation that

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1 was published in 1974, it was Appendix P, it was
2 essentially deferred when we had to essentially get
3 out of the reprocessing business. It was deferred in
4 1984 and I think the actual Federal Register noted it
5 was deferred until NRC's regulations were actually
6 needed again.

7 We've identified in this analysis 27 GDCs
8 in seven different categories. These are in the
9 actual extra slides that have been added to the
10 presentation. 50.34, we should note Section (a)(3)(I)
11 has a footnote that the GDCs for chemical processing
12 facilities were being developed. I think this has
13 been in the regulation for at least 15 years, if not
14 more. But as you see, the reason, like we commented
15 earlier, that Part 50 cannot address the chemical
16 impacts but Part 70 can.

17 The next slide is also a previously
18 proposed regulation that deals with reprocessing
19 issues but no longer exists. This is a design
20 criteria for the protection of fuel reprocessing
21 plants and licensed material. It was published in the
22 Federal Register in 1974 and it was withdrawn in 1974
23 until needed by NRC.

24 The current NRC status on the review of
25 the GDC is that we were reviewing the existing GDCs

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1 and BDCs and relevant documents. The regulations have
2 no thresholds for applying existing GDCs and BDCs at
3 this point. We've identified ten potential categories
4 of the general design criteria, and within these
5 categories there are 77 potential areas within these
6 ten categories. Many of these have found significant
7 fraction of areas could become our draft GDCs.

8 The ten potential draft GDCs are listed on
9 the slide. They are the overall and general
10 categories, multiple confinement and containment
11 barriers, process safety features, nuclear
12 criticality, radiological protection, physical
13 security, materials control and accountability,
14 another acronym, fuel and radioactive waste sighting
15 and decommissioning. And in the backup slides we've
16 listed all of these categories, these general
17 headings, and within these general headings we have
18 actually the GDCs and BDCs for these particular ones.

19 I don't know whether we're going to show all the
20 slides but they are certainly in the backup.

21 These are some examples of some of the
22 GDCs and BDCs: quality standards record, minimizing
23 risk from R&R, firing protection, negative pressure
24 differentials, flammable gas, monitoring habitability,
25 seismic protection, emergency processes, control

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1 rooms, criticality, ALARA, shielding, waste
2 management, aircraft impact, and design for eventual
3 decommissioning.

4 We also have identified technical
5 specifications as a baseline design. Technical
6 specifications are actually required for reprocessing
7 facilities, they are required by law under the Atomic
8 Energy Act, they are described in Part 50.36 of our
9 regulations, and it turns out that 50.36 actually
10 references the word reprocessing, it uses reprocessing
11 plants.

12 There is an extensive documentation on
13 tech specs, Part 50, for reactors. In the Federal
14 Register notice there was a technical specification
15 published in 1973 specifically for reprocessing
16 plants. That regulation also has been rescinded.

17 There are no technical specifications as
18 part of Part 70. Part 70 uses integrated safety
19 analysis and the items relied on for safety. The GDP,
20 the Part 76 does have a technical safety requirement
21 which is similar to technical specifications, and Part
22 76 is a regulation for the gaseous diffusion plant.

23 Technical specifications are derived from
24 safety analysis to protect people from uncontrolled
25 releases. 50.36 to 50.36(a) for effluents. There are

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1 five categories within these areas: there's safety
2 limits, these are events, uncertainties, etcetera;
3 there's limiting conditions of operations, minimal
4 equipment; there's surveillance identified
5 requirements; there are design features that we look
6 at; and then there are alternative controls such as
7 minimal staffing and calibration.

8 There is another area that's recently been
9 added to the regulation, and this is operating
10 training. The Atomic Energy Act requires NRC to
11 establish minimum criteria for operators of production
12 and utilization facilities. This is now codified in
13 10 CFR Part 55, and as with Part 50, the regulations
14 and associated guidance now focuses more on power
15 reactors than it does for reprocessing facilities, and
16 there appears to be an appropriate level for R&R
17 facilities, needs to be determined, and that's
18 included in Part 55 revisions or either a new R&R
19 regulation.

20 These are the potential questions that we
21 hope to discuss this afternoon. I'm going to run by
22 and run it into a background. These are the relevant
23 sources that we've considered for the GDCs. We've
24 considered Part 20, 50, 52, Part 70, 72, and also the
25 regulations that have been rescinded, Appendix P and

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1 Q. We also looked at the NEI white paper. This is
2 the NEI white paper that was submitted to us back in
3 2008. NUREG 1909 is a publication of our Advisory
4 Committee on Nuclear Waste and is the background
5 studies that they did for reprocessing.

6 The next slides relate to the categories
7 and also the potential areas within these categories.

8 I'm not going to discuss it and I can go through and
9 show you that we have them. This will be published on
10 our website, but each one of these categories that we
11 do discuss has individual criteria.

12 I'm going to go back now to the questions
13 and then I'll turn the presentation over to Chip.

14 MR. CAMERON: Okay. Thanks a lot, Phil,
15 very comprehensive.

16 You'll notice that these questions, the
17 first two are on general design, the first three,
18 general design criteria. Then I guess that maybe the
19 agenda has different potential questions. Is that
20 true?

21 MR. REED: It should be the same.

22 MR. CAMERON: So I'm working from the
23 agenda, and the first two dashes on the agenda talk
24 about GDC, then the next two talk about tech specs,
25 and then we go into some specific areas, operator

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1 licensing, emergency planning, and cyber security, and
2 I want to use the cyber security example to kick off
3 the discussion about what should be in the general
4 design criteria.

5 And I guess I'm always flummoxed about
6 whether we should use GDC or BDC here, baseline design
7 criteria. And I guess this since this is more of a
8 Part 70 and it may be a hybrid new regulation, you're
9 probably going to be using baseline design criteria, I
10 don't know. But is it okay if we use baseline design
11 criteria for this discussion? I mean, is there a
12 substantive difference? Okay. We'll use baseline
13 design criteria.

14 And Phil, could you put slide 9 up again.

15 This is the slide, I think that tells you what the
16 NRC thinking is on potential areas for BDCs, and Phil
17 showed you within each BDC what areas would be
18 considered, and that may be too daunting a task to get
19 down into that level of detail, but maybe the
20 discussion we should have now is are there areas that
21 you see that aren't covered there that should be in
22 there. And that last dash on the agenda, the cyber
23 security, that might be an example of something that
24 you would want in there.

25 And I guess that I if I remember

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1 correctly, the industry 7X had 28 -- weren't there 28
2 design criteria there? Could someone tell us?
3 Robert, or could someone tell us what's in the
4 industry design criteria, and this is not an example
5 of how the NRC might do it, but to give people an idea
6 of how a design criteria is stated. Can you not only
7 tell us what you might have thought of in here but
8 just tell us how that -- read one of them to us so
9 people get an idea of how a design criteria is stated,
10 and then let's have a discussion, more of a discussion
11 on what other design criteria there should be.

12 MR. HANCOCK: So from the way that we
13 developed the industry white paper, we really focused
14 on the words around GDC and BDC, as opposed to whether
15 you call them a general or baseline criteria, it's
16 what's the expectation of how one uses that criteria
17 and is it a priori expectation or is it to be
18 considered. The baseline design criteria in Part 70,
19 the words around it are considering the design, the
20 following criteria, the general design criteria or the
21 design criteria that are to be incorporated in the
22 design, and any time you don't incorporate such
23 criteria, you will use as much an engineering effort
24 to demonstrate why that's not necessary.

25 MR. CAMERON: So there is an important

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1 difference, I guess.

2 MR. HOGG: GDC and BDC, the word general
3 versus baseline isn't the issue, it's what's the words
4 around the design criteria.

5 MR. CAMERON: Okay.

6 MR. HOGG: And we went through a very
7 similar process that Phil described with respect to
8 how we identified. We didn't group them into areas
9 any differently than the way the Part 50 criteria are
10 currently grouped, so some of the areas that are from
11 Appendix P and Appendix Q, I think, are really very
12 relevant and we would endorse considering those types
13 of criteria too.

14 And the way that we wrote the criteria
15 were relatively consistent with the BDC from Part 70
16 also, that they introduced the concepts and they left
17 them open with respect to how one would consider the
18 design as opposed to being prescriptive in their
19 nature.

20 MR. CAMERON: And can you talk a little
21 bit about that because people might assume that it
22 would be better for safety and design if they were
23 more prescriptive which might not be a correct
24 assumption. So can you tell us why you took the more
25 BDC-like approach in terms of consider, this, that, et

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1 cetera, et cetera?

2 MR. HOGG: I can give you my opinion and
3 perspectives because we didn't know. Probably it
4 would be helpful to a designer to be prescriptive
5 because it leaves that that much further ahead. But a
6 lot of the things, containment versus confinement, we
7 didn't really know what the answer was to be
8 prescriptive in stating the criteria.

9 MR. CAMERON: So in other words, there's a
10 lot of areas here where you might not have enough
11 information to tell an applicant here's what you have
12 to do.

13 MR. HOGG: Some of them we could pull that
14 from existing criteria, so some of the potentially
15 would be more prescriptive. But the ones that were
16 somewhat unique in their nature, we understood the
17 need for gas management and explosion control that is
18 descriptive in Part 50 elsewhere than in the general
19 design criteria, but we incorporated that as a concept
20 without being prescriptive about how one would go
21 about it.

22 MR. CAMERON: Okay. And Jim, do you want
23 to put a finer point on that?

24 MR. LIEBERMAN: Right. The way the draft
25 is worded is: Each applicant shall address the

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1 following baseline design criteria in the design of
2 new facilities. The application of these criteria
3 shall be maintained unless the ISA demonstrates that a
4 given item is not relied on for safety but does not
5 require adherence to the specified criteria.

6 So they are kind of prescriptive but it
7 really turns on the ISA and the basic analysis whether
8 in a given case there's a basis you can demonstrate to
9 NRC's satisfaction that you don't need it because of
10 your particular design. The wording of each
11 individual criterion, the design must provide for
12 adequate protection against natural phenomena, but a
13 site's characteristics must comply with the provisions
14 of whatever.

15 So they are specific but you have the
16 escape if you can demonstrate for your particular
17 design there's a basis that you don't need it in order
18 to meet the performance requirements.

19 MR. CAMERON: And we're going to go to
20 Beatrice in a second, but are there some obvious
21 things that you have in the design criteria that may
22 not be on this particular list because this particular
23 list, I guess, Phil, has been drawn from a lot of
24 things that were done in the past. In other words, I
25 use this word loosely, but how modern is in terms of

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1 that.

2 MR. REED: Many of these were taken from
3 the current regulations of Part 50, Appendix P, Part
4 70, I think there are a couple of them up there --
5 well, even the aircraft impact is now codified. All
6 of these we do have references back to a regulation or
7 I believe an industry document, like the NEI report,
8 that has been mentioned as being a part of the overall
9 design basic criteria.

10 MR. CAMERON: Okay. Beatrice, do you have
11 a question or a comment on this?

12 MS. BRAILSFORD: Well, I wanted to help us
13 not talk about the first question for the entire hour
14 or whatever, because I do think in the lat discussion
15 there were some other questions that might have been
16 more fruitfully discussed.

17 If somebody could just explain to me what
18 habitability means. And you may have started to do
19 this, Jim, should NRC consider different GDCs for the
20 different types of separation technology used -- that
21 goes back to the technology-neutral question. And
22 then I guess I was seeing a couple of some of the, you
23 know, an earthquake or a fire are sort of natural
24 phenomena, and then you called out cyber security and
25 aircraft impact which are a different kind of peril

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1 thank acts of God, but I don't know that there's
2 anyplace to go with that.

3 MR. CAMERON: Habitability.

4 MS. BRAILSFORD: Yes, so habitability and
5 then I think we keep going back and forth between
6 facilities that massive liquid waste streams and
7 facilities that don't.

8 MR. CAMERON: Phil.

9 MR. REED: Habitability and control are
10 related. The habitability is the design areas around
11 the control room material, things like that. Human
12 factors might be another way of saying that.

13 What was your other question?

14 MR. CAMERON: I think the other one was
15 technology-neutral. In other words, should you have
16 different GDCs for different types of separation
17 technology, and Beatrice realized that Jim's
18 explanation of the fact that if you a designer or
19 applicant could show that a particular design
20 criterion did not apply to that facility, then they
21 didn't have to address it and it might not apply
22 because of the specific reprocessing technology.

23 MS. BRAILSFORD: But I guess I thought
24 that it was different. In our discussion this
25 morning, it was almost as if this morning we were

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1 almost proving a negative, and now you're saying if I
2 can demonstrate that I don't have to do this because
3 it's not in my technology, but you've written rules
4 that capture all the technologies, which is different
5 than technology-neutral, frankly.

6 Now, remember, I'd just as soon the NRC
7 participate in this discussion as well.

8 MR. LIEBERMAN: Well, what we did we took
9 from existing baseline material design criteria in
10 Part 70 which, in theory, covered all the fuel cycle
11 facilities. We looked at Part 50 to see where there
12 GDCs that weren't covered in Part 70 that we thought
13 were relevant to cover the universe. Then we went to
14 part 72, and Part 72 is the regulation of storage of
15 spent fuel and they also have baseline design
16 criteria. We looked there to see if there was
17 anything there that might be relevant because you're
18 going to be storing spent fuel at a reprocessing
19 facility.

20 And we tried to be comprehensive. And
21 obviously we're interested to hear NRC's views and
22 there may be different perspectives, but the goal is
23 to be as comprehensive as we can to cover the areas
24 where a person developing a design for a reprocessing
25 facility will make sure they cover those points. If

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1 your for some reason your design doesn't need it, then
2 you have some flexibility, but the burden is on you to
3 demonstrate to NRC that you don't need it.

4 MR. CAMERON: And Rod.

5 MR. McCULLUM: I was going to say along
6 the lines of Jim, and I think we tried to 7X -- and
7 you can correct me if I'm wrong -- we want to be as
8 all-encompassing with these as possible, recognizing
9 that any given applicant has the burden to show if my
10 design is unique and this doesn't apply here, they can
11 demonstrate that.

12 Now, that being said, we had some
13 discussion of this in trying to prepare for this
14 meeting, and really when you look at what industry has
15 recommended, Appendix P, Appendix Q, Part 70, Part 50,
16 the best way to address this -- and this is really not
17 the right forum here -- is to just have detailed
18 meetings on each of these things. I mean, on the
19 surface, most of those looked pretty technology-
20 neutral up there. I mean, an earthquake is going to
21 affect any kind of facility, they all have control
22 rooms, they could all have aircraft impact.

23 But I think really a set of detail and
24 public interactions between NRC and other stakeholders
25 on each of these -- maybe you don't want to have 28

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1 meetings but you have one meeting where you have an
2 agenda or have specific expertise brought to bear
3 here, and at the end of that series of meetings we ask
4 ourselves: Okay, did we get them all? And maybe
5 there needs to be a provision in the process for an
6 emergent GDC, who raises that, how does it get raised,
7 how does it get dispositioned if we do learn
8 something. Because technology does evolve, we're not
9 going to be regulating the AMC Pacer in the future
10 here.

11 And anyway, I think that's kind of why
12 you're hearing what you're hearing here, or not
13 hearing, is that I think this is a subject we really
14 need to go criteria by criteria and get the experts
15 and talk about the details a little bit here.

16 MR. CAMERON: And there is only one, cyber
17 security was mentioned somewhere on the agenda. Let
18 me ask about that, is cyber security something that
19 should be on as a general or a baseline design? Is
20 there anything else that seems obviously missing here?

21 MR. McCULLUM: I think, Chip, cyber
22 certainly is something to be discussed, but again, I
23 wouldn't want to have that discussion and I'm not sure
24 NRC would want to have that discussion without our
25 respective cyber security experts here.

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1 MR. CAMERON: All right. Just looking for
2 suggestions. Anything on baseline design criteria or
3 general design criteria? Is there something that the
4 rulemaking staff would like to specifically ask the
5 people around the table, while we have them here,
6 about this before we got to tech specs? Phil,
7 anything, or Marissa or Tom, Jose, Wendy?

8 MR. REED: I think the question that was
9 posed was whether or not some of the other
10 reprocessing techniques may have specific GDCs, and
11 the only thing I can think of is that I think GE's
12 facilities, the pyrochemical may have some that are
13 different. Now, we have not looked at that in detail,
14 we've only been concentrating on the aqueous
15 reprocessing. Maybe somebody else can address that.

16 And I think the only new one we've added
17 since the last one has been cyber security. Again,
18 we're looking for information on that. Whatever any
19 individual wants to comment, we'd certainly be
20 interested in what they have to say.

21 MR. CAMERON: Okay. And can we make sure
22 that if you do have these meetings on the GDC that we
23 may have to provide phone links for people to join us
24 from Pocatello?

25 Anybody have anything on this at this

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1 point? Jim, yes, I wanted to ask. Go ahead.

2 MR. BRESEE: I'd just make one
3 introductory comment on electrochemical processing
4 that should be followed up just exactly like Rod
5 mentioned. It needs detailed discussion, there are
6 experts available, we certainly would be quite happy
7 to join some discussion.

8 But one of the most interesting
9 differences at present between electrochemical
10 processing and the more conventional processes
11 involving solvent extraction is that it is a batch
12 process, and as a batch process, it introduces a lot
13 of additional issues, technical issues that need to be
14 carefully considered. The concentration of all
15 materials in all of the batches changes with time
16 throughout the process, so the monitoring and all the
17 other things that have to do with controllability are
18 more difficult.

19 This trades off against other differences
20 which may be on the plus side, but from the standpoint
21 of regulatory design, that is a significant,
22 fundamental difference between electrochem and what
23 might be called conventional technology.

24 MR. CAMERON: So there might be, based on
25 that difference, there might be a GDC that could be

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1 fashioned for that particular technology. Okay.

2 MR. McCULLUM: Right, and Chip, an aqueous
3 applicant would then just say that's not applicable to
4 them.

5 MR. CAMERON: Okay. So that would be in
6 the pantheon and then aqueous could come in and say
7 that's not applicable to us.

8 MR. McCULLUM: Right.

9 MR. CAMERON: Marissa, do you don't want
10 to say something?

11 MS. BAILEY: No, I don't.

12 MR. CAMERON: You don't want to say
13 anything. Okay. Tom wants to say something. No.
14 Okay.

15 So Beatrice, that goes to your point about
16 there may be something in there that may be specific
17 to a particular technology.

18 Marissa, you still want to say something.
19 Go ahead.

20 MS. BAILEY: I guess when you are trying
21 to write a regulation, you don't want to put yourself
22 in a position where you would end up regulating by
23 exception, and so one of the things that I would be
24 concerned about when you do something like specifying
25 general design criteria but then it may not be

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1 applicable to something else, is that you get yourself
2 into that realm of regulating by exemption.

3 MR. LIEBERMAN: So you'd feel sort of
4 uncomfortable with perhaps the approach where someone
5 could come in and say that doesn't apply to us. And
6 would that mean then that you would have to pretty
7 thoughtful about how all of these things apply to
8 every type of technology. Maybe you'd have separate
9 GDC for the batch processing?

10 MS. BAILEY: And this is just me, I have
11 not discussed this with my staff so they can disagree
12 with me, but I guess I would see general design
13 criteria, that we would want to identify the minimum
14 set of general design criteria that we think are
15 really important, especially if you're looking at a
16 technology-neutral regulation that would be applicable
17 to the spectrum of technology that you might be
18 seeing.

19 And I recognize that that could be a
20 challenge, and so the challenge really is what's
21 identifying the minimum set of general design
22 criteria. I guess an example would be something
23 that's based on standard practice. For example, for
24 criticality the double contingency principle, that
25 that might be something that we would want as part of

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1 the design, regardless of what the technology is, that
2 there's double contingency for criticality safety.

3 MR. CAMERON: So you might have design
4 criteria that you know are going to apply to whatever
5 technology, and then you might have for batch
6 technologies -- and I'm bungling that all up -- but
7 for this particular type of technology, in addition to
8 the general, so they'd be like specific design
9 criteria rather than general.

10 Let's hear from James and then Jim and
11 think about this idea.

12 MR. ROSS: I guess my one comment would be
13 that we would want a general BDC for everybody
14 consistent with Part 50, and when I kind of look at
15 this issue, I kind of think about some of the other
16 areas like the fuel cycle area or the enrichment area,
17 and even though there are different technologies out
18 there that the GDCs are still -- we've been able to
19 make them consistent for everybody. So I don't know
20 why we would want to change that in this process. I
21 mean, what would make us make that decision to change
22 it here?

23 MR. CAMERON: Okay. Rather than following
24 sort of the standard.

25 MR. ROSS: It should stay consistent.

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1 MR. CAMERON: And Jim, what do you think
2 about this?

3 MR. LIEBERMAN: I think this is the
4 challenge of marrying a performance-based, risk-
5 informed system which is based more on Part 70 with
6 adding the prescription of having more baseline design
7 criteria from Part 50. So I think that's why you need
8 the escape valve for the particular case. You may
9 never use this escape valve, but if you do need it,
10 it's built into the process.

11 MR. CAMERON: And is there an existing
12 analogy in an NRC regulatory program that takes the
13 approach that you described to us?

14 MR. LIEBERMAN: Well, there is a change
15 process. 50.59, for example, in Part 50, and Part 70
16 I think is 70.62, but I may be wrong. But there are
17 change processes allowed in the regulations with fixed
18 standards of what you have to meet if you want to make
19 a change. And so that's basically what we did here,
20 we had the built-in standards up front of what you
21 would do to make a change.

22 MR. CAMERON: So you took that change
23 process and you incorporated it into that. Okay.

24 Jim, do you have anything for us? Okay.
25 Don't worry. Rod.

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1 MR. McCULLUM: I just wanted to agree with
2 Marissa that we don't like regulating by exemption
3 either and that's not what I was proposing. I was
4 proposing a regulation that's constructed such that
5 you can demonstrate compliance when you apply for your
6 license by demonstrating that certain parts are not
7 applicable, and that's in your license to begin with.

8 Now, that's a matter of construction and
9 that's certainly a challenge, but I think preserving
10 the risk-informed, technology-neutral, performance-
11 based approach is worth taking on that challenge. But
12 I did not mean to imply at all that we would say
13 regulate by exemption because that's not a good way to
14 start a new regulation.

15 MR. CAMERON: Okay. Well, let's move on
16 to tech specs because I know Beatrice is going to hold
17 me to addressing every topic. Right, yes, exactly, by
18 5:00.

19 Tech specs, what issues or considerations
20 should NRC evaluate for establishing tech specs and
21 should there be thresholds for tech specs? Now, I
22 hate to keep going back to this 7X but it's useful to
23 use for an example of an approach, and the 7X approach
24 to tech specs does have a threshold. Is that correct?
25 I don't know who wants to address that, but can you

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1 tell us how that works, Jim?

2 MR. LIEBERMAN: When we looked at tech
3 specs, we looked at 50.36 in Part 50 but Part 50
4 doesn't have IROFS. In this approach we're using
5 IROFS, the items relied on for safety, so we said the
6 tech specs should be the more significant IROFS, and
7 the standard that we propose is tech specs addressing
8 IROFS to prevent or mitigate identified accident
9 scenarios that could result in high consequence events
10 involving fission product releases to an individual
11 outside of the control area.

12 So the concept is the fission product
13 releases, the high consequence events, those are the
14 most significant problems at a reprocessing facility,
15 those should be tech specs. IROFS are capable of
16 preventing the others, IROFS are still requirements so
17 you still have to meet these, but we put the label of
18 tech specs on the higher ones.

19 MR. CAMERON: So just to go back to this
20 taxonomy, so to speak, there's the basic design
21 criteria, there's the performance requirements that
22 were up on that chart, then an ISA is done in concert
23 with any PRA where there's significant, there's data
24 available to make meaningful conclusions. That ISA
25 tells you what items relied on -- is it relied or

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1 required? That ISA tells you these items relied on
2 for safety. Certain of those items relied on for
3 safety are going to result -- could result in high
4 consequence events, and for those events you would
5 have tech specs.

6 And can you give us an example of how a
7 tech spec would address one of those high consequence
8 issues? Because I just want to make sure that people
9 understand how the tech specs are going to be used.
10 Why do you need a tech spec for those? Robert.

11 MR. HOGG: So an example might be if we
12 have a minimum or a maximum ventilation flow rate in a
13 certain part of a facility that if exceeded may cause
14 offsite consequences because of the transfer of
15 contaminants from that part of the facility through
16 the stack. We would establish IROFS under the ISA
17 process that would identify those components,
18 preferably engineer features, potentially management
19 measures that would involve both human activities and
20 equipment, and we would establish limiting conditions
21 of operation for those IROFS that if they do, when
22 they fail, cause an offsite consequence.

23 So the type Jim mentioned, we would
24 establish in the license technical specifications to
25 ensure that those limiting conditions of operations

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1 are met.

2 MR. CAMERON: Okay. And I think that's
3 maybe helpful for people to understand what does the
4 tech spec get you, what is required by the tech spec
5 that the IROFS doesn't get you, doesn't include it in
6 the IROFS.

7 MR. HOGG: The tech spec could get you a
8 set of conditions under which you could operate
9 temporarily as you regained control of that particular
10 limit or piece of equipment.

11 MR. CAMERON: So the tech specs are
12 basically stated in limiting conditions of operation?

13 MR. HOGG: And typically have the
14 potential for some limited operation for some period
15 of performance while the equipment is recovered and
16 reestablished. Whereas, IROFS -- and this, again, is
17 kind of a construct of the fuel fabrication
18 facilities -- IROFS are somewhat on off switches. If
19 the IROFS fail, the system is down. Whereas, a
20 technical specification will give you a limiting
21 condition of operation during the period while the
22 equipment is regained.

23 MR. CAMERON: Well, does the tech spec
24 then really give you additional protection, or does it
25 just allow the operator to operate for a while?

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1 MR. HOGG: That would depend on how it was
2 constructed. Typically, it's constructed much more
3 conservatively to allow that continued operation.

4 MR. CAMERON: Okay. Because I think
5 people might think, well, if the tech spec is an add-
6 on that it's always going to be a more conservative
7 type of situation. Tom.

8 MR. HILTZ: Thanks, Chip.

9 I think the concept of tech specs and
10 mixing tech specs with IROFS is going to be a pretty
11 interesting challenge for the NRC. And I think what
12 Robert has tried to articulate is sort of some of the
13 areas where he's trying to marry tech specs and IROFS
14 where they really have two different purposes. And I
15 would be interested in sort of broader discussion on
16 how we might establish safety limits that are
17 typically required for tech specs, limiting conditions
18 for operation, and then actually the limiting -- not
19 the LCOs but the safety limits, LCOs, and I'm missing
20 another concept in tech specs which alludes me.

21 But at any rate, the LCOs, at least in
22 50.36, are meant to establish the minimum requirements
23 for equipment operability, and they establish that
24 time that equipment can be out of service where you
25 don't have to take a particular action. And I think

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1 that risk has been used to inform technical
2 specifications to determine how long that time should
3 be or even if there are systems that are determined to
4 be non safety-significant, even to remove systems from
5 tech specs.

6 But I'm interested in understanding a
7 little bit more about the marrying of 50.36 and IROFS
8 because it's not clear to me how that's going to
9 happen.

10 MR. CAMERON: Any clarity we can provide
11 on this for the rulemakers?

12 MR. McCULLUM: I do want to provide some
13 clarity because I think there's a notion about tech
14 specs getting lost here, and I agree with Tom 100
15 percent here, and I think that's why there needs to be
16 more discussion. Tech specs do give you an additional
17 layer of protection. When you put a system in the
18 tech specs and you put surveillance requirements on
19 there, we haven't discussed that that's how you're
20 going to assure it's operable, you put limiting
21 conditions of operation on it where these are things
22 you're going to do if operability is questioned, and
23 up to shutting down your plant if you can't
24 demonstrate something is operable.

25 These things represent an agreement

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1 between the licensee and the regulator on how they
2 will operate the plant on those things that are most
3 important to safety. And so if the IROFS describe
4 those things that are most important to safety, those
5 are the things that go in the tech specs.

6 You have things that aren't in the tech
7 specs, the licensee has certain levels of control and
8 the licensee will still want to do certain things and
9 will describe certain programs in their safety
10 analysis. But to be perfectly clear here, the tech
11 specs are the most important to safety things, and the
12 ISA tool, if we use that to define what those things
13 are -- and I think we can -- that's an area where we
14 need to be very clear as to how that applies.

15 MR. CAMERON: So does every IROFS need to
16 have a tech spec?

17 MR. McCULLUM: I'm not prepared to answer
18 that right now. I think that gets into how we
19 prioritize the IROFS and I think that's why there's
20 more discussion needed.

21 MR. CAMERON: And let's go back to Tom.

22 MR. HILTZ: I would actually be surprised
23 if there was a conclusion that every IROFS required a
24 tech spec because I think for the M-Triple-F facility,
25 we heard that there are what, 10,000 to 15,000 IROFS.

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1 So I suspect that we'll want to consider a more
2 manageable set of technical specifications.

3 MR. CAMERON: Let's go to Sven. He's had
4 experience with the 15,000 IROFS.

5 MR. BADER: The 15,000 IROFS are a bit of
6 a misnomer. IROFS, the way we counted them, included
7 passive equipment, included the building, things that
8 we considered items relied on for safety, a difference
9 between other Part 70 facilities. I think we were
10 very conservative in our approach, plus that 15,000
11 includes every component of a train. I believe some
12 of the other Part 70 facilities consider one train an
13 IROFS, not every component of that train is a separate
14 IROFS.

15 But to get back to the technical
16 specifications, in Part 70 we have management
17 measures, we don't have technical specifications, and
18 that might be a little bit of the confusion here.
19 They're similar in nature, there are, I believe, 15
20 management measures that are specified -- I can't even
21 remember where it's coming from but I want to say it's
22 from Appendix B, actually, of Part 50 -- so there
23 might be some relationship there with tech
24 specifications. But measurement measures were
25 included in surveillance and the limiting conditions

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1 of operation.

2 So we might be getting a little wrapped
3 around the axle, but I think applying those to every
4 single IROFS, we did not do that for the M-Triple-F.
5 There is some grading that we did, facility worker
6 grading because a lot of the IROFS were specified for
7 protecting the worker.

8 I'll give you an example. Delta Ps and
9 glove boxes, Ron mentioned ventilation flow rates,
10 making sure you have differential pressure so that the
11 flow is into the glove box because if it's out of the
12 glove box, it's very important for facility worker
13 protection. Then each one of these glove boxes has
14 redundant pressure measurements.

15 I'm not going to say that we did a
16 technical specification for each individual pressure
17 measurement, we did one more globally for all those,
18 but again, they're not as restrictive of those that
19 were protecting the public. Those examples are ones
20 preventing red oil explosion hazards or hydrogen
21 nitrate explosion hazards. Those beget very tight
22 surveillance requirements as part of the measures. So
23 we kind of graded them depending on who the recipient
24 was.

25 MR. CAMERON: But you called them

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1 management measures rather than technical
2 specifications?

3 MR. BADER: Part 70 says management
4 measures.

5 MR. CAMERON: But management measures,
6 like technical specifications are designed to provide
7 additional protection, or maybe not in all cases.

8 MR. BADER: Well, their intent is to make
9 sure your IROFS are available and reliable. So that
10 your safety systems are available and reliable, you
11 implement all those management measures.

12 MR. CAMERON: Okay. Available and
13 reliable.

14 And Tom said it was going to be -- you
15 used the word interesting -- to try to marry up IROFS
16 with tech specs, and I guess maybe it would be
17 interesting for people to know what your anxiety is
18 about that because that might reveal what needs to be
19 done in the rulemaking process. Marissa, do you have
20 the same type of anxiety?

21 MS. BAILEY: Yes. I think I would have to
22 agree that it's going to be interesting to marry up
23 the concept of IROFS with technical specifications.
24 And Sven is right that management measures could be
25 surrogate for tech specs, but management measures are

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1 there to ensure the availability and reliability of
2 IROFS. And like IROFS, they can be changed through
3 the 70.72 process, so they are subject to the 70.72
4 process, whereas, technical specifications cannot be
5 changed by the licensee, they would require prior
6 approval from the NRC.

7 IROFS, as long as they're not sole IROFS,
8 licensees can make changes to them if they follow the
9 criteria in 70.72.

10 MR. CAMERON: So is there anything that
11 anybody around the table can help you with in terms of
12 that anxiety, that interest, at this point in time,
13 given this process as opposed to perhaps some more
14 detailed discussions?

15 MS. BAILEY: Well, I mean, I guess it's
16 trying to identify what are the minimum set of
17 technical specifications that we would really need for
18 a reprocessing facility. Because it is sort of
19 interesting that you've got the IROFS and the IROFS
20 are those items relied on for safety, and so there's a
21 certain set of controls that a regulator would want
22 imposed on those, hence, the management measures, and
23 hence, it's got to go through the 70.72 process, and
24 hence, sole IROFS have to have prior approval before
25 you make any changes to them.

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1 And then even more -- maybe important is
2 not the right word but I'll use that -- maybe even
3 more important than that then are the technical
4 specifications where you want regulatory control over
5 that, so what are those sets of technical
6 specifications.

7 MR. CAMERON: So I think you've revealed
8 something that's important about what you call these
9 which is the level of NRC approval that's required to
10 change these things. Jim.

11 MR. LIEBERMAN: I'm concerned if NRC is
12 concerned with the relationship with tech specs and
13 IROFS because the IROFS are the result of the safety
14 analysis to make sure that the facility meets the
15 performance requirements. So the IROFS, the items
16 relied on for safety, that's important, so which ones
17 of those IROFS are the ones that NRC wants to make
18 sure you have in tech specs. So I can't imagine
19 anything in a tech spec that isn't in an IROFS;
20 otherwise, you have calculate your IROFS properly.

21 So the issue is which IROFS, and I would
22 think it would be those IROFS which are associated
23 with the potential events of higher consequence. So I
24 think all those things have to be tied together when
25 you develop your set of tech specs, and then of those,

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1 when you lose enough IROFS that you lose a safety
2 function, that's when NRC is going to want to be
3 notified, and that kind of sets the limiting
4 conditions for operations. So I think they have to be
5 all tied together.

6 MR. CAMERON: Okay. Thank you, Jim. Rod,
7 do you have something else?

8 MR. McCULLUM: Yes. I agree with what Jim
9 said. I mean, it's a question of which IROFS are tech
10 specs, and I think in a risk-informed, performance-
11 based, technology-neutral manner, I don't think we
12 would look for a regulation to prescribe the following
13 IROFS should have tech specs and the following IROFS
14 should not. Rather, we should expect that the
15 regulation would describe how a licensee goes about
16 determining whether or not an IROFS requires a tech
17 spec, what level of protection, what significance of
18 hazard or energy.

19 And that's one where I think some more
20 detailed dialogue among the experts is probably
21 appropriate because I think tech specs are an
22 important aspect of this, whether they're called
23 management controls, and I think making sure that we
24 preserve a level playing field for all technologies,
25 we need the regulations to be clear on how do you

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1 determine whether or not an IROFS needs to be
2 supported by tech specs meaning these are things
3 you're going to make an agreement with your regulator
4 that you will not change without their approval.

5 MR. CAMERON: Okay. And you have a
6 criterion on doing that.

7 All right. How about operator
8 qualifications and licensing, anything additional
9 that's needed here? And I guess I would ask
10 additional to what. Anything more than what's
11 required now for reprocessing operators? Tom.

12 MR. HILTZ: I think there has to be
13 something more because I think that some sub group of
14 operators for a reprocessing facility need to be
15 licensed by the NRC which is different from other fuel
16 cycle facilities, and this is a requirement that's
17 carried over from Part 50 for a production facility.
18 So the NRC will need to license some operators for a
19 reprocessing facility

20 So I think the discussion is what should
21 those operators be, what role will industry play in
22 doing the qualification, would they follow a similar
23 role as reactor operators, and that would help define
24 NRC's role in actually issuing a license certificate
25 to the operators.

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1 MR. CAMERON: And Jim, did you want to
2 talk about perhaps one answer to Tom's question about
3 which of those operators should be licensed?

4 MR. LIEBERMAN: The current regulatory
5 framework, Part 55, only applies to reactors so that
6 there is no existing process. Recognizing there's
7 lots of individuals in a chemical facility that will
8 operate a facility, and recognizing in the general
9 fuel cycle facilities, enrichment, fuel fabrication,
10 whatever, they don't have licensed operators, the
11 question was which of the operators should be
12 licensed.

13 And we tied it back again to the ISA in
14 the analysis and those operators who could have the
15 potential to create high consequence events with
16 fission product releases to the outside, that was a
17 standard that we use for tech specs, we use that
18 standard for when you have the PRA quantitative
19 analysis, the ISA, and that's a standard we use to
20 decide which individuals should be licensed by NRC.

21 MR. CAMERON: Okay. Does anybody see any
22 problem with that logic? Is there anything important
23 that's left out by using that as a criterion for which
24 operators need to be licensed?

25 (No response.)

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1 MR. CAMERON: Okay. Emergency planning.
2 There's two questions here. Go ahead, Tom.

3 MR. HILTZ: I'm sorry. Before you go on,
4 is there any insight into the process for operator
5 qualification? Part 50 has a model where the industry
6 has a substantial role in the qualification process,
7 and NRC -- well, they have NPO who goes and looks at
8 their qualifications and we take some credit for their
9 process. Is there any thought about how a
10 qualification process might work for a reprocessing
11 operator?

12 MR. CAMERON: Jim.

13 MR. LIEBERMAN: This is an area where
14 clearly we're going to need a lot of a dialogue
15 between the industry and the NRC. But what's proposed
16 here is a certification process where the applicant
17 developed the qualification standards for the
18 operators as part of the application, NRC has to
19 approve that qualification process, and the applicant
20 develops a certification process how the applicant
21 would certify that these individuals have been
22 properly qualified, trained and tested, NRC has to
23 approve the certification process. And then NRC would
24 monitor the applicant's training, testing and
25 certification process to be satisfied that the

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1 individuals have properly gone through the training,
2 been properly tested and certified.

3 So it's a little different from the
4 existing Part 55 reactor operating license program,
5 but because there's only going to be so few of these
6 facilities, we thought this type process would make
7 more sense to make sure the operators were properly
8 certified and licensed.

9 MR. CAMERON: Okay. Mike.

10 MR. EHINGER: Just to add some historical
11 perspective to this, there really was a licensing
12 process in place for both West Valley and Barnwell.
13 There were C, B and A operators and senior operator
14 licenses. I happen to know of only two senior
15 operators that are still in existence, and I'm not one
16 of them, but there was a process.

17 And the C operator was just a guy that
18 turned valves or went and did samples or something
19 like that. Going up to the senior operator who was a
20 control room operator and in charge essentially of a
21 shift, and he had the responsibilities that you're
22 talking about. As I recall, the qualification exams
23 for C, B and A operators were pretty much developed
24 and administered at the site. At the time, the only
25 ones that really did have the actual issued senior

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1 licenses was West Valley, and that test was
2 administered by the AEC at the time.

3 I don't know how you're ever going to get
4 away from the idea that the requirements and the
5 training and everything else is the responsibility of
6 the operator. That can't be the responsibility of the
7 NRC, it has to be the responsibility of the operator.

8 And I come back to a lot of the things
9 that I hear along here, the NRC really is an audit
10 group that is there to be sure that everything is done
11 as specified and defined and agreed upon. I don't
12 know how much the NRC really gets involved in actually
13 doing it as much as being the one that assures that
14 it's done properly and in the proper sequence.

15 But there is a history -- and I don't know
16 where the exams are or anything else -- but there is a
17 history for physically qualifying operators in
18 reprocessing plants.

19 MR. CAMERON: Thank you, Mike. That's
20 very useful.

21 And Tom, can I move to emergency planning?
22 Okay. A couple of issues on emergency planning.
23 What emergency plan requirements should NRC establish
24 for reprocessing facilities? And should a regulation
25 be more like Part 50, Appendix E requiring licensees

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1 to determine an emergency planning zone, or Part 70?
2 And perhaps someone could tell us how does Part 70
3 address emergency planning. If you're juxtaposing do
4 we need a Part 50 arrangement or a Part 70, what's the
5 difference between those two? Does someone from the
6 NRC want to talk to that particular issue?

7 MS. BAILEY: I don't know that I can speak
8 to it specifically, but I can characterize the
9 difference between an event in a reactor facility
10 versus in a fuel cycle facility. A fuel cycle
11 facility which is essentially a chemical facility, the
12 event happens quickly, a chemical explosion, then it's
13 over. Whereas, with a reactor facility it's an event
14 that's slowly developing. So I think given that
15 difference, that's maybe something that we would want
16 to consider with regards to emergency planning.

17 MR. CAMERON: Thank you for that
18 characterization of the difference. What would that
19 say about what types of emergency plan you should
20 have? What would that say about that?

21 MS. BAILEY: Well, I mean, I think -- and
22 there may be other thoughts here -- that with a fuel
23 cycle facility you're recovering and you're preventing
24 any more exposures, I guess is the thing that you're
25 looking at. I guess the other thing that I would

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1 point out is that with fuel cycle facilities, the
2 events impact workers more than it does the public --
3 at least that's my understanding. It's more of a
4 threat to your workers versus a threat to the public.

5 MR. CAMERON: So there's not really all of
6 these considerations of evacuating people, it's more
7 trying to help people.

8 MS. BAILEY: Maybe more hunker down versus
9 trying to help people.

10 MR. CAMERON: Any comments from anybody on
11 emergency planning issues? Jim.

12 MR. LIEBERMAN: Well, we had a lot of
13 debate whether we should take the Part 50 approach or
14 Part 70 approach, and as Marissa said, we focus on
15 what's the likelihood of having an offsite situation.

16 So we concluded that you use the Part 70 approach
17 unless there's the potential for what we call a
18 general emergency classification type event which is
19 defined as an offsite release that could be expected
20 to exceed EPA's protection action guidelines for more
21 than the immediate site area.

22 So if you design a facility that there's a
23 likelihood that you could have an event that could
24 have substantial offsite consequences, then you should
25 have a more formal emergency plan being in Part 50;

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1 otherwise, you can use the Part 70 approach.

2 MR. CAMERON: And can you just tell us
3 what that Part 70 approach is?

4 MR. LIEBERMAN: I knew you'd ask but I
5 just don't recall off the top of my head.

6 MR. CAMERON: What is the Part 70, do we
7 know what the Part 70 emergency planning approach is?
8 Marissa talked a little bit about the differences in
9 the facilities, but is Part 70 that basically there's
10 no emergency planning?

11 MS. BAILEY: Hopefully Robert can speak to
12 this, but my understanding is that it depends on the
13 licensee and they are required to develop their
14 emergency plans.

15 MR. CAMERON: Okay. Robert.

16 MR. HOGG: So the approach, and I'm not
17 sure how we wrote it up exactly in the proposal but it
18 was pretty consistent with the approach that we used
19 at our Part 70 facility, and the approach is graded
20 and so I think the different Part 70 facilities with
21 different potential events could say different things
22 in their plans. But generally, they required to
23 classify events, identify actions, notify the
24 appropriate agencies and local resources. So there
25 are no different activities, they're just a different

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1 level of formality with respect to how one describes
2 it.

3 MR. CAMERON: So that's the key
4 difference, the level of formality required.

5 MR. HOGG: Again, as opposed to a
6 relatively prescriptive description in Appendix E of
7 Part 50.

8 MR. CAMERON: Okay. Let's go to Tom, and
9 then let's go to Rex.

10 MR. HILTZ: I guess I was just going to
11 echo my perhaps uninformed understanding of Part 70
12 and Part 50 because I'm not an expert. But Part 70
13 has certain requirements that if you determine that
14 you're going to exceed these thresholds, you're
15 required to have an emergency plan. That emergency
16 plan has to deal with the hazards that you determine,
17 prior require coordination, require notification,
18 periodic testing.

19 Part 50 in Appendix E requires, I think
20 regardless, requires establishment of an emergency
21 planning zone certain distances out, requires much
22 more extensive coordination, I think more frequent
23 formal exercising of the emergency plan. And I think
24 from my perspective, a reprocessing facility, I think
25 we all recognize, is not going to be like any current

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1 fuel fabrication facility or fuel cycle facility.

2 And I think that not only is there going
3 to be a technical element associated with what the
4 requirements are for an emergency plan, but there also
5 may be a policy element of what's required for an
6 emergency plan which I don't know that we can debate
7 here. But I think there's a public confidence issue
8 that is real and that's going to have to be addressed
9 surrounding any potential licensing of a commercial
10 reprocessing facility.

11 MR. CAMERON: And that's, I think, the
12 second time we've heard the term public confidence is
13 that requirements being put into place because that's
14 going to give the public a lot more reassurance about
15 the facility. Rex.

16 MR. STRONG: Emergency plans. In my world
17 emergency plans are one of the very things which our
18 nuclear safety regulator actually approves for every
19 nuclear installation. Now, those plans can be
20 different from one installation to another because the
21 plan reflects what's come out of the safety analysis,
22 particularly around the design basis for said
23 emergency plan.

24 The requirement is that that plan is
25 detailed but is capable of being extended, by which I

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1 mean that irrespective of the design base of the plan,
2 if something else happens which is out with the
3 planning base, then the operator and the local
4 agencies must be capable of adapting their plans to
5 cope. And I just make that point because our plan
6 doesn't stand in isolation, it has to be integrated
7 with those of the local authorities and the national
8 agencies. And in our case, those plans are
9 demonstrated twice a year with a national emergency
10 plan once every three years.

11 MR. CAMERON: And is there any distinction
12 for the different type of facility? In other words,
13 we're talking here should there be a plan for a
14 program process for a Part 50 versus a Part 70. Do
15 you make any distinctions like that?

16 MR. STRONG: The distinctions that we make
17 have to do with the potential nature of the event on
18 the site and the potential offsite impact. And then
19 from there the plan is developed, I have to say, in
20 consultation with those who may be affected by it.

21 MR. CAMERON: Okay. Thank you, Rex. Rod.

22 MR. McCULLUM: Yes. I think this is
23 another example of something we hit on this morning
24 where you had that chart that Jose put up, lists of
25 hazards, and he was indicating in the figure that you

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1 go up to Part 50, you go down. It's not that simple.

2 And again, this is why I think the approach that Jim
3 outlined, it really is triggered do you trigger
4 protective action guidelines for action offsite.

5 Now the Part 50 approach is what it is
6 because in Part 50 every reactor is required to
7 analyze certain severe accidents deterministically,
8 and those do, by nature, trigger offsite response. So
9 to automatically say we're going to go to a Part 50
10 approach, that wouldn't be appropriate because you
11 don't have those accident scenarios, you don't have a
12 design basis loss of coolant with a reactor involved
13 at these facilities.

14 But then by the same token, to say that
15 they can be treated the same as Part 70 facilities
16 when they have a fission product inventory, a lot more
17 isotopes, that also is not appropriate. So you really
18 have to start to look through your safety analysis and
19 do you have potential accident scenarios that could
20 trigger protective action guidelines where you would
21 need to involve offsite responders and start to
22 shelter or evacuate people.

23 And I think the British approach where you
24 always want to go one level up and maybe be able to
25 extend it in case something you didn't anticipate

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1 happens, that might also be prudent. But this is why
2 we always have to keep focused on not is it Part 70,
3 is it Part 50, but why do we have an emergency plan,
4 and I think if we keep focused on that question as we
5 develop the regulation, we'll get to a sensible
6 answer.

7 MR. CAMERON: And that goes across every
8 issue that we've been talking about too.

9 MR. McCULLUM: Yes.

10 MR. CAMERON: So good point to close on
11 before we go to the public. Anybody out here? We
12 heard from the experience, Mike told us about that.
13 Anybody have anything else to say about this general
14 area of design and operational?

15 MR. EHINGER: I guess my first question
16 involves the idea of technology-neutral regulations,
17 and as I'm sitting here listening to discussion, does
18 the NRC not have some experience in that area in the
19 enrichment plant licensing? You've got a couple of
20 plants that are completely different in technologies.
21 Does that have any impact? I don't know if that's an
22 appropriate question or not, but it's one thing that
23 had dawned on me listening to the discussion.

24 MR. CAMERON: Do you have another one?

25 MR. EHINGER: Well, the other question

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1 that I had was again a reaction that I hinted to with
2 a lot of the discussion that I've heard: What is the
3 real role of the NRC? A lot of times you get the
4 impression that they are writing tech specs, for
5 instance, but I'm not sure that's really the case.
6 Reactors are a different thing than other facilities
7 and it's the operator who really knows the facility,
8 and I don't think you can expect the NRC to have the
9 same level of expertise for the facility that they
10 could be writing tech specs and writing certain
11 things.

12 So it comes back to defining the role of
13 the NRC as auditing that it's done and approving, as
14 opposed to doing a lot of the stuff. And I'm taken by
15 the commentary and the implications of some of the
16 things that are said. And I don't know if anybody
17 else feels strongly in that area or not, but that was
18 a reaction from sitting out on this side listening to
19 the discussion.

20 MR. CAMERON: Okay. Thank you for that
21 reaction. I don't know if we'll have anything -- oh,
22 we do.

23 MR. HILTZ: Yes. I just feel compelled to
24 respond a little bit.

25 I think we talked about the technology-

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1 neutral framework that's already embodied in Part 70
2 this morning, I think Marissa mentioned that, and we
3 do recognize that we have some experience in licensing
4 different processes, different facilities under a
5 single regulation, so we're not blind to that as we
6 move forward with what we're trying to do with
7 reprocessing.

8 With regard to your discussion about the
9 role of the NRC, I certainly have a fundamentally
10 different view of what the regulator's process should
11 be, and I think it goes back to a fundamental concept
12 that a strong and independent regulator is ultimately
13 going to mean that nuclear materials will be used
14 safely. If you don't have a strong and independent
15 regulator, you lose public confidence and I think you
16 lose the focus on safety.

17 There's nothing here, I hope, that's been
18 said that detracts from the operator's responsibility
19 ultimately to maintain and operate that plant safely.

20 They are principally responsible for doing that. But
21 our role is not just an audit role, our role is to
22 provide oversight, and in this case with regard to
23 reprocessing, our role is to provide the regulatory
24 framework by which we will license which means we will
25 make a decision that that facility is safe to operate

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1 and will operate and protect public health and safety.

2 So while no one on the NRC staff will be
3 an expert in reprocessing, I suspect that we won't
4 have a lot of experience on the NRC staff, it's
5 important for us to be able to understand the
6 processes and understand what the right requirements
7 would be so that if those requirements are met, we
8 feel confident that the facility will operate.

9 And I don't think anyone here was
10 suggesting -- at least in my discussion in wasn't
11 suggesting that the NRC be the one who writes the tech
12 spec or that the NRC be the one who does the
13 integrated safety analysis. I think we have an
14 obligation to establish those requirements under
15 which, those criteria under which tech specs will be
16 established so that when a licensee comes in or an
17 applicant comes in, they have confidence and stability
18 that they know they understand what the regulatory
19 requirements are and we have confidence that if they
20 comply with those, it will operate safely.

21 Sorry for the long answer.

22 MR. CAMERON: I'll tell you what, we're
23 going to close with Tom's statement. It was a good
24 statement, a good ode to regulation which we needed
25 and perhaps we did misunderstand a little bit what

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1 Mike said, but I think that was a good close for the
2 day. It's a little bit after 5:00.

3 And we're going to start at nine o'clock
4 tomorrow with safety and safeguards, and we'll have a
5 tee up by some staff from a mysterious organization at
6 the NRC. And then we'll talk about waste and then
7 finish up with environmental.

8 So thank you all. I thought it was a good
9 day, good work. Thank you.

10 (Whereupon, at 5:05 p.m., the workshop
11 session was concluded, to resume at 9:00 a.m.,
12 Wednesday, October 20, 2010.)
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