

BLUE RIBBON COMMISSION ON AMERICA'S
NUCLEAR FUTURE

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REACTOR AND FUEL CYCLE
TECHNOLOGY SUBCOMMITTEE

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MEETING

+ + + + +

DAY 2

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TUESDAY,

AUGUST 31, 2010

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The Subcommittee convened at 8:00 a.m.
in Ballrooms D and E of the Washington
Marriott at 1221 22nd Street, Northwest,
Washington, DC, Pete Domenici and Per
Peterson, Co-Chairs, presiding.

MEMBERS PRESENT:

PETE V. DOMENICI, Chair
PER PETERSON, Chair

ALBERT CARNESALE
ALLISON MacFARLANE
RICHARD A. MESERVE
PHIL SHARP

ALSO PRESENT:

TIM FRAZIER, Designated Federal Official

BRIAN SHERON, US Nuclear Regulatory
Commission

MIKE MAYFIELD, US Nuclear Regulatory
Commission

MARISSA BAILEY, US Nuclear Regulatory
Commission

SEAN MCGARVEY, AFL-CIO

CAROL BERRIGAN, Nuclear Energy Institute

HENRY CIALONE, Edison Welding Institute

JOHN GUTTERIDGE, US Nuclear Regulatory
Commission

JAMES STOUCHE, Precision Custom
Components, LLC

DIANE CURRAN, Harmon, Curran Spielberg
& Eisenberg, LLP

KARA COLTON, Energy Communities Alliance

CLINTON WOLFE, Citizens for Nuclear
Technology Awareness

MARY OLSON, Nuclear Information and
Resource Service

PAUL BEMBIA, New York State Energy
Research and Development Authority

PUBLIC COMMENTERS:

KIRK SORENSEN

ROD ADAMS

LAWRENCE JACOBSON

JOHN KUTSCH

C-O-N-T-E-N-T-S

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

(8:01 a.m.)

MR. FRAZIER: Okay, we're going to go ahead and get started. Welcome to Day 2 of the Reactor and Fuel Cycle Technology Subcommittee meeting. And I will just go ahead and turn it over to Dr. Per Peterson.

CHAIR PETERSON: Good morning. Today, our first panel is entitled, "Technology-Neutral Regulatory Framework for New Reactor and Fuel Cycle Technologies." Just like yesterday's panelists, the Commission asked these panelists to consider questions ahead of time.

These are the questions that we asked them: First, what actions and resources are ongoing and needed to develop a more technology-neutral performance based regulatory framework for innovative, new nuclear technologies? And two, what role could expanded NRC anticipatory research potentially play in facilitating future NRC

1 confirmatory analysis for innovative, new
2 nuclear technologies?

3 The speakers on this panel are
4 asked to keep their presentations to 20
5 minutes or less. The remainder of the panel
6 time will be spent on questions and discussion
7 with the Subcommittee members. And moving
8 forward, we'll start with our first speaker,
9 Dr. Brian Sheron, who is Director of NRC's
10 Office of Regulatory Research.

11 Brian, I really appreciate that
12 you can be here this morning. Thank you.

13 DR. SHERON: Okay, thank you very
14 much. Can everybody hear me? I guess it's
15 on, right? Okay, yes, thank you. I'm Brian
16 Sheron. I'm the Director of the Office of
17 Nuclear Regulatory Research.

18 Just background, I've been with
19 the government for 37 years, the NRC for 34.
20 And I've worked 22 years in regulatory office
21 NRR from a staff reviewer, up through the
22 associate director of the office, and I've

1 been in the Office of Research about 12 years,
2 both as a division director, and now as the
3 office director.

4 So, I've kind of worked everywhere
5 in the agency a bit in this area. If I could,
6 the first slide? One thing I wanted to just
7 emphasize is the different roles that are
8 played by the industry, the Department of
9 Energy, and the NRC.

10 DOE and the industry really have
11 the prime responsibility to develop new
12 technologies, and to test these proposals,
13 provide the testing for them, to submit the
14 proposals with the design basis and sufficient
15 data to demonstrate safety to the NRC.

16 We don't dictate to the industry
17 what kind of reactors they should license or
18 anything. This is -- we really basically
19 react to what's presented in front of us.

20 Our job is to establish regulatory
21 requirements to ensure safety of these
22 facilities during construction operations and

1 the maintenance, to perform reviews and
2 inspections to ensure compliance with the
3 regulatory requirements, and we conduct
4 research to support all of these regulatory
5 functions, which is basically looking at what
6 areas need confirmatory analysis to confirm
7 what the licensees are telling us, and to also
8 investigate, for example, any safety issues to
9 determine if new regulatory requirements are
10 needed, and even if some can be relaxed.

11 Just quickly, we're one of six of
12 the major program offices at the NRC. We're
13 statutory in that we were mandated by Congress
14 in the Energy Reorganization Act in 1975, I
15 believe. Right now, we have about 260 staff
16 in the office. Our research budget is
17 slightly above \$68 million. That varies over
18 the course of the year, but that's a rough
19 number.

20 And we have a wide variety of
21 engineers, scientists, analysts that are
22 educated in various disciplines, and I'll get

1 into that in a little bit.

2 By the way, the -- that's just
3 contract money. That's not salaries and
4 benefits for the staff. So, if -- the \$68
5 million, if you translated that at roughly
6 \$300,000 per staff year, say at the contractor
7 or a laboratory, that may be about 250 or so
8 additional researchers that we have working
9 for us.

10 I think I was asked if we could
11 show historically what our budget has been.
12 We looked back. This is the previous
13 President's budget. This shows the budget,
14 and our FTE level. As you can see, our budget
15 has gone up slightly.

16 We really didn't have all the
17 numbers in detail back to when the office was
18 first created back in 1975. I remember I was
19 in the agency then. The budget for the
20 research office was something on the order of
21 \$200 million. But I will point out that we
22 were funding a substantial amount of very

1 high-cost research in ECCS analysis.

2 The Commission, in `73, had passed
3 the ECCS rule, and it said the staff was to go
4 off and confirm the margins in that, and that
5 involved, for example, we had the LOFT
6 Facility in Idaho, which was an actual reactor
7 that we performed loss-of-coolant tests on.
8 We had a big facility called Semiscale there,
9 which was -- LOFT was I think \$40 million a
10 year. Semiscale was around \$7 million a year.

11 The co-development for ECCS at the
12 time was -- I think it was \$15 or \$20. So,
13 there was a fair amount of money being spent
14 on the LOCA area.

15 Actually, the budget really kind
16 of dropped around the late 1980s. We had
17 finished up most of the ECCS research. LOFT
18 closed down. Semiscale closed down. We had
19 revised the ECCS rule, 10 CFR 40.56, at that
20 time. And so, basically the budget in
21 Research dropped down to I think it was around
22 \$100 million, around the late `80s, early

1 `90s.

2 Then it slowly drifted down a
3 little bit until it hit -- as you can see
4 here, it was around \$65 million in 2007. It's
5 been coming up slightly.

6 This just shows the wide variety
7 of disciplines that we're responsible for
8 conducting research in. I'm not going to read
9 all of these, but as you can see, it's a
10 fairly wide spectrum, and we have engineers
11 and scientists that are trained in all of
12 these areas.

13 How do we support license reviews?
14 Well, first we need to make sure applications
15 are complete and of high quality. I kind of
16 always joke with my staff when I said the last
17 thing I want to have happen is for a licensee
18 to come in and shake my hand, and say, "Thanks
19 for doing that research for me. I don't have
20 to do it now."

21 We believe that the industry needs
22 to really provide the technical basis for the

1 designs that they are proposing. They also
2 need to demonstrate the compliance with all
3 the regulatory requirements.

4 What we do is we support the
5 licensing reviews. We support our regulatory
6 offices. We develop analytical models,
7 computer codes, that can predict accident
8 behavior, for example. And we will run
9 independent analyses to confirm the licensee's
10 conclusions, so that their plants, for
11 example, are within regulatory limits.

12 We conduct tests as necessary to
13 independently confirm an applicant's design if
14 there's a controversial area, if we want to
15 look. We normally don't do research that just
16 repeats what the industry has done. In other
17 words, their job is to demonstrate the plant
18 is within the licensing design base.

19 A lot of times, we look to the
20 margins. Is the plant on the edge of a cliff
21 if they were to, for example somehow exceed a
22 margin if there were additional failures? So,

1 we do a lot of those type of analyses. We do
2 a lot of risk analyses.

3 We also identify gaps where
4 there's a need for new regulatory and
5 infrastructure. If a new phenomena is
6 observed somewhere -- stress- corrosion
7 cracking in an area we've never seen -- we
8 will go off and do research in that area to
9 confirm what the nature of that is, and
10 whether we need to impose any new regulatory
11 requirement, or whether the existing
12 regulations are still sufficient.

13 Technology-neutral risk-informed/
14 performance-based regulatory framework. We
15 developed this a number of years ago. I just
16 want to point out that generic regulatory
17 requirements are set forth in the Atomic
18 Energy Act and its amendment. And just so
19 we're all technology-neutral, really in our
20 mind means that its independent of the nuclear
21 technology that's being proposed, which means
22 that it's independent of the reactor design,

1 or the coolant medium.

2 But we do recognize that a
3 technology-neutral framework would require
4 design specific regulatory guidance. So, even
5 if you were to come up with a regulatory
6 structure that wasn't unique to the type of
7 coolant or the reactor, the criteria would
8 probably be such that you would have to have
9 very, very design-specific criteria in a
10 guidance document or something.

11 For example, you may want to say,
12 "I don't want the core to melt during a loss-
13 of-coolant accident." We do that in 50.46 by
14 putting limits on a peak cladding temperature,
15 on the amount of oxidation that can occur.
16 That's all predicated on having zirconium clad
17 fuel.

18 If you have a different kind of
19 fuel, like a gas-cooled reactor, those limits
20 don't mean anything. They just don't apply.
21 So, you would have to come up with new limits,
22 even if it was technology-neutral.

1 You would have to come up with
2 some equivalent, that said, "This is what it
3 takes to meet these requirements for a gas-
4 cooled or a sodium-cooled reactor."

5 The risk-informed and technology-
6 neutral document that describe the technology-
7 neutral framework was issued. It was NUREG-
8 1860, and it was issued actually December of
9 2007, although it was being worked on much,
10 much before that.

11 It does use a probabilistic risk-
12 informed approach, and identification and
13 selection of licensing basis events, and the
14 safety classification of systems structures
15 and components, and it also does provide
16 explicit consideration for defense in depth,
17 which is a term we use at the NRC to protect
18 against unforeseen events.

19 It's based on and interfaces with
20 other parts of 10 CFR. So, it utilizes the
21 existing requirements. And the regulatory
22 guidance supplements are performance based --

1 I'm sorry, regulatory guidance is needed, as
2 I said before, to supplement the performance-
3 based regulations.

4 One area we do have to look at,
5 and I'll be quite honest I don't have an
6 answer right now, and that is that I know when
7 I talk with our general counsel's office, they
8 will tell you that in order to promulgate a
9 regulation, there has to be some criteria,
10 some specificity.

11 And so, it's unclear whether you
12 can actually come up with a general set of
13 regulations that will cover everything, but
14 are specific enough that they would pass a
15 test for being promulgated as a rule.

16 But the Commission has told us
17 that we should test this framework, this
18 technology-neutral framework, when the
19 application for the NGNP reactor comes in.
20 This is the DOE gas-cooled design.

21 In summary, a technology-neutral
22 framework requires NRC to develop design

1 specific regulatory guidance for the
2 particular reactor design that is being
3 proposed. Regulatory guidance developed for
4 the most probable industry design concepts
5 that we expect to regulate domestically, which
6 is that we will -- we're not off developing
7 this technology -- or I'm sorry, the
8 regulatory guidance, okay, for every kind of
9 different reactor that people have proposed.

10 We have to look at the ones that
11 we think are most likely to be licensed, and
12 funded.

13 Industry must provide the detailed
14 technical information and data to allow us to
15 develop the regulatory infrastructure. We
16 don't want to get ahead of the industry, and
17 like I said, do all the research.

18 I did point out licensing can be
19 simplified if proposals don't push the
20 envelope. Now, what does that mean? It means
21 that if you're going to come in and you want
22 to change a lot of stuff, and you know, "I

1 don't want a containment. I want to change
2 the EPZ, emergency protection zone, and
3 stuff." That's going to require additional
4 review.

5 It doesn't mean that we're not
6 going to approve it or anything, it's just
7 it's going to take longer. It's going to be
8 more protracted. We'll probably have more
9 questions, and people -- you know, that adds
10 come uncertainty.

11 So, again, the more that the
12 designs don't raise new and challenging
13 questions for the agency, we think we can get
14 them done quicker.

15 And then in conclusion, industry
16 needs to conduct the majority of the research
17 to support the new technology. We can develop
18 regulations from industry's research. There's
19 nothing that says we have to do our own.

20 They can provide it to us, and we
21 can use it, and we do a lot of cooperative
22 research with licensees when they do come in

1 for applications, and we'll continue to
2 cooperate with industry to identify the most
3 probable future technologies develop a nuclear
4 framework.

5 We work closely with EPRI and with
6 DOE. We have very periodic meetings with them
7 to understand where they're heading in their
8 technologies.

9 And just the last slide is some
10 references. If you want to find out any
11 further information about the Office of
12 Research, NUREG- 1925 is a compendium of our
13 research programs that are ongoing. We have
14 a couple extra copies here. If you would like
15 them, can get them to you. As I said, NUREG-
16 1860 is the -- the risk informed and
17 performance based technology-neutral framework
18 licensing document. Thank you.

19 CHAIR PETERSON: Thank you, Brian.
20 Our second speaker is Mr. Mike Mayfield. He
21 is Director of the Advanced Reactor Program in
22 the Office of New Reactors. Mike?

1 MR. MAYFIELD: Good morning.

2 Thank you. Just since Brian started setting
3 the stage for how long he's been with the
4 government, I have got 30 years, give or take,
5 of government service and five years in the
6 commercial R&D sector before joining the
7 government.

8 I am the Director of the Advanced
9 Reactor Program in the Office of New Reactors.
10 Brian set the stage here for how to make this
11 thing work, and maybe I'm going to fail --
12 there we go.

13 The Office of New Reactors was
14 created in 2006 to ensure a dedicated
15 organization to consider the licensing of the
16 new reactors that were being considered at
17 that time. We focus on the safe, secure and
18 environmentally responsible use of civilian
19 nuclear power. We don't make the decisions or
20 make -- contribute to the policy
21 determinations about if a reactor should
22 built, but if one is proposed, our job is to

1 do the licensing review.

2 NRO is responsible for licensing
3 all the new reactors in the US, and at the
4 bottom of this slide, you see the workload
5 that's on the table today. It was getting to
6 be a fair bit of work, and as a lot of the new
7 technologies were being presented to the
8 staff, we concluded they were becoming a bit
9 of a distraction to the licensing activities,
10 much like the new reactors in 2006 were
11 becoming a distraction to the regulation of
12 the operating fleet.

13 So, we created the Advanced
14 Reactor Program in 2009 to focus on the
15 licensing review of the new technologies, the
16 advanced technologies.

17 What do we really mean by that?
18 We mean the high-temperature gas reactors that
19 are being proposed by Department of Energy,
20 the integral pressurized water reactors, and
21 I know you heard from two of them yesterday;
22 liquid-metal-cooled fast reactors, and there

1 are a number of these that are being proposed,
2 different technologies, and other conceptual
3 designs.

4 There was a statement made
5 yesterday, and it appears in a number of
6 places there's some 90 new designs floating
7 around the world. Pretty much any graduate
8 student that sketches something on the back of
9 an envelope and sends it in, it gets counted
10 as a design.

11 There may be a dozen or so serious
12 designs being proposed today, and you -- I
13 know the committee has heard from most of
14 them. The Advanced Reactor Program is the
15 lead licensing project management organization
16 for all of these advanced designs.

17 We do leverage activities strongly
18 from the Office of Research, just as Brian was
19 describing. We are using a matrixed
20 organization within the Office of New
21 Reactors. Rather than stand up a completely
22 separate review organization, we're building

1 on the engineering and systems talent that
2 exists in the Office of New Reactors.

3 As we need to supplement that
4 talent with specific expertise, we go out and
5 hire that expertise, work with the Office of
6 Research to make it available, or we contract
7 either with the DOE National Laboratories or
8 other commercial entities to provide the
9 expertise we need.

10 We're anticipating submittals as
11 early as 2012, and that's based on industry
12 projections for when they will submit design
13 certification applications. This slide says
14 pre-application work is starting now. In
15 fact, it started as early as 2008. Paul
16 Lorenzini mentioned that yesterday.

17 So, we've had some extensive
18 interactions with the industry on a number of
19 these designs. We are implementing a
20 structured approach consistent with Commission
21 guidance in preparing for the reviews.

22 What we mean by a structured

1 approach? Job one is to make sure we have the
2 regulatory framework and review guidance in
3 place for whatever technologies we're going to
4 take on. Second is to make sure we are ready
5 to review the next generation program once DOE
6 and whatever design is ultimately selected
7 submitted.

8 The third level of that is to make
9 sure we're prepared to review the integral
10 pressurized water reactors when they are
11 submitted. Frankly, they are probably the
12 first ones in the door for us. And then
13 maintaining awareness of other designs.

14 Again, there are so many of these.
15 You're basically talking sodium-cooled fast
16 reactors, lead-bismuth fast reactors, then
17 some of the other gas-cooled technologies.
18 You heard from General Atomics yesterday. So,
19 there are a few of these, and then the rest of
20 the 91 that you have to deal with.

21 The structured approach is
22 consistent with the schedules that the

1 Department of Energy has talked about, and the
2 layering they see in technologies being ready
3 to come in for design certification review and
4 deployment.

5 The regulations pertinent to the
6 licensing of nuclear power plants are
7 contained in Title 10 to the Code of Federal
8 Regulations parts 50 and 52. Part 50 contains
9 the technical requirements for the reactors.

10 Part 52 is the licensing approach
11 of the process, if you will, that the
12 Commission put in place in response largely to
13 some industry interests stemming from the
14 licensing experience of the existing nuclear
15 power plants.

16 There was a strong interest, and
17 we think Part 52 is providing a stable and
18 predictable licensing process. It's designed
19 to resolve safety and environmental issues
20 before authorizing construction, reduce
21 financial risks to the licensees, and to
22 encourage standardization among the nuclear

1 power plant designs.

2 Today, we have roughly 104
3 different operating nuclear power plants.
4 Brian talked about his experience in the
5 regulatory office. I've got some experience
6 there, as well as some in the research office.
7 And all 104 of them are just enough unique
8 that it makes them challenging from both a
9 regulatory standpoint, as well as plant
10 operations.

11 So, we are encouraging strongly
12 standardization through to the extent that it
13 is practical.

14 As I mentioned, Part 50 contains
15 the technical requirements for the nuclear
16 power reactors. It focuses on safety and
17 emergency preparedness. The regulations
18 addressing environmental reviews are contained
19 in Part 51, and the regulations related to
20 security are in Part 73.

21 The current regulations and
22 regulatory guidance are predicated on light

1 water reactor technology. Brian mentioned
2 zirconium-clad fuel as looking at specific
3 regulatory requirements to prevent fuel
4 damage. The light water reactor technology
5 carries through that body of regulations.

6 However, the Commission has been,
7 and probably for the last decade, has been
8 making increasing use of probabilistic risk
9 assessment, and risk informing regulations and
10 decisions on plant safety.

11 I think it's safe to say that
12 today, risk-informed decision making is a
13 routine part of the way the Commission and the
14 staff do their business. The NRC is
15 evaluating the need for changes in review
16 guidance to support review of the non-LWR
17 technologies. We're not there yet, but we're
18 getting started.

19 Now, Brian mentioned the work that
20 research has done on a technology-neutral
21 framework, and it's embodied in NUREG-1860.
22 And as soon as you start talking to anybody on

1 the reactor side of NRC, and we start talking
2 about technology-neutral framework, NUREG-1860
3 comes up almost immediately.

4 The licensing strategy for the
5 next generation nuclear plant implements a
6 deterministic but risk-informed approach. So,
7 if we didn't go down the technology-neutral
8 framework path quite deliberately, we don't
9 think it's quite ready for primetime, and the
10 Commission held that view as well, but the
11 Commission -- as Brian indicated, the
12 Commission is interested in testing the
13 technology-neutral framework.

14 So, we have an activity that will
15 launch, as we get into the review of NGNP,
16 where we will take the 1860 framework out, if
17 you will, for a test drive, and then report
18 back to the Commission on how it compares to
19 the deterministic risk-informed approach that
20 we're using.

21 The Commission has also expressed
22 interest in the possibility of making more

1 risk-informed changes to the review guidance,
2 rather than all 150 or 250 sections of the
3 Standard Review Plan, are there some of these
4 for the different technologies that don't just
5 bear the same need for review, or review in
6 the same depth.

7 So, we're looking at that. It is
8 important to keep in mind that while the
9 regulations are based on light water reactor
10 technology, historically the Commission and
11 the staff have been able to use that basic
12 regulatory structure in licensing different
13 technologies, and at the bottom of this slide
14 you see reference to Peachbottom 1, Fort St.
15 Vrain; Clinch River is a fast reactor, sodium-
16 cooled fast reactor, was under licensing
17 review, and the staff has written a
18 preliminary safety evaluation report on the GE
19 Hitachi PRISM design.

20 So, while Part 50 is largely light
21 water reactor focused, the fact is the staff
22 has figured out, and the industry has figured

1 out how to adapt that regulatory structure to
2 different technologies.

3 So, in summary, we're working to
4 develop appropriate review guidance and
5 regulatory framework to support timely and
6 thorough reviews of NGNP and the integral PWR
7 designs. We are making use of risk insights,
8 coupled with a deterministic regulatory
9 structure, and we will be using that basic
10 approach in conducting the licensing reviews.

11 Technology-neutral framework will
12 be explored. The Commission has directed
13 we're going to test the 1860 approach. It is
14 being explored, and looking at how we can move
15 that forward. However, given the technologies
16 that are being presented to the staff in the
17 near term, it simply isn't a compelling
18 interest for us to move forward.

19 In fact, there is some sentiment
20 from the industry of, "Don't fool around with
21 regulatory structure we already understand.
22 It fits us." You heard Paul Lorenzini talk

1 yesterday about all but about 15 sections of
2 the Standard Review Plan fit his design
3 exactly.

4 So, there is some sentiment on the
5 part of the industry that's been expressed to
6 us, "Don't make major changes just now, at
7 least not for the first movers in the
8 technologies that are being presented to the
9 staff."

10 So, while our regulations are not
11 optimized for non-LWR technologies, the fact
12 is if pushed, we can use the existing
13 regulatory framework to license non-LWR
14 technologies. And with that, I thank you.

15 CHAIR PETERSON: Thank you. Our
16 third speaker is Ms. Marissa Bailey. She is
17 Deputy Director of the Division of Fuel Cycle
18 Safety and Safeguards in the Office of Nuclear
19 Material Safety and Safeguards. Marissa?

20 MS. BAILEY: Thank you. Since
21 both Brian and Mike set the stage, I'd like to
22 point out that I only have 20 years of

1 government service, unlike Mike and Brian.

2 I am with NMSS, the Division of
3 Nuclear Materials Safety and Safeguards. That
4 is one of the offices that is mandated by
5 Congress, and essentially we are responsible
6 for regulating the nuclear fuel cycle.

7 That's the front end, which
8 includes conversion, enrichment and
9 fabrication of fuel -- of fuel that go into
10 power reactors, transportation, and then the
11 back end, which involved transportation,
12 interim storage, disposal and reprocessing if
13 that is where the nation decides to go.

14 In this presentation, I will be
15 talking about the regulatory framework for
16 licensing fuel facilities. I'll also be
17 discussing the ongoing efforts to develop a
18 regulatory framework for spent fuel
19 reprocessing.

20 NRC issues licenses for fuel
21 facilities under 10 CFR Part 40 and Part 70.
22 The requirements in this part are technology-

1 neutral, as licenses are issued for possession
2 and use of either source or special nuclear
3 material.

4 Under Part 40, licenses are issued
5 for possession and use of source material,
6 which includes natural uranium, and thorium.
7 Under Part 70, licenses are issued for
8 possession and use of special nuclear
9 material, which includes uranium-enriched in
10 235 or 233, plutonium or uranium 233.

11 Under these parts, applicants and
12 licenses can submit a license application to
13 the NRC for a wide variety of uses of special
14 and source material, including uses that may
15 involve new or advanced technology, as long as
16 the requirements in this Part are met.

17 To illustrate this point, I'd like
18 to note that a variety of facilities have been
19 licensed under both Part 40 and Part 70. For
20 example, under Part 70, the -- the major
21 facilities that have been licensed include
22 four low-enriched uranium fuel fabrication

1 facilities, AREVA Richland, AREVA in
2 Lynchburg, the Westinghouse facility in
3 Columbia, South Carolina, Global Nuclear Fuels
4 in Wilmington, North Carolina.

5 We've also licensed two high-
6 enriched uranium fuel fabrication facilities
7 that support the Naval Propulsion Program, and
8 that's NFS in Erwin Tennessee, and BWXT in
9 Lynchburg, Virginia. And we have licensed two
10 uranium Richmond facilities using gas
11 centrifuge technology: The URENCO facility,
12 formerly LES in Hobbes, New Mexico, and the
13 American Centrifuge Plant in Piketon, Ohio.

14 The gas distribution plants,
15 Paducah and Portsmouth, are certified under 10
16 CFR Part 76. NRC has also licensed the
17 possession and use of source material at
18 various facilities. This includes Honeywell's
19 uranium conversion facility in Metropolis,
20 Illinois, and other facilities in non-
21 agreement states, whose operations may involve
22 large quantities of natural uranium, or

1 thorium, at concentrations greater than 0.05
2 weight percent.

3 Under Part 70, we also have
4 ongoing licensing reviews for three different
5 types of facilities: The Mixed Oxide Fuel
6 Fabrication Facility in Aiken, South Carolina,
7 and I'd like to note this facility is
8 currently under construction; the AREVA Eagle
9 Rock Gas Centrifuge Enrichment Facility, which
10 is to be located in Idaho Falls, Idaho, and
11 the GE Hitachi Laser Enrichment Facility in
12 Wilmington, North Carolina.

13 And under Part 40, we are
14 currently reviewing an application from
15 International Isotopes for deconversion of --
16 for a deconversion facility that would
17 deconvert depleted uranium, hexafluoride
18 material, and extract the -- the thorium.

19 This map just shows the locations
20 of the facilities that I talked about. These
21 are facilities that are currently licensed or
22 are undergoing licensing review by the NRC.

1 The requirements in Part 70 are
2 risk-informed and performance-based. The
3 process for demonstrating compliance with the
4 requirements in this Part, and which are also
5 expected to be incorporated in Part 40, is
6 technology-neutral. For example, rather than
7 specifying design or operational requirements,
8 10 CFR Part 70 specifies performance
9 requirements.

10 In the example that I provided,
11 it's the maximum dose to workers and to the
12 public under "accident sequences." So, we
13 don't specify the design. We don't specify
14 the operation, but we do specify in these
15 regulations the performance requirements.

16 Special requirements give
17 applicants and licensees flexibility in
18 selecting the methodology to demonstrate
19 compliance.

20 In regulating fuel cycle
21 facilities, the NRC also relies on guidance
22 documents, such as regulatory guides and

1 standard review plans to guide our staff in
2 performing their functions, including
3 licensing reviews.

4 These documents may or may not be
5 technology-neutral. For example, the Standard
6 Review Plan for the MOX facility NUREG-1718
7 would be used by the NRC staff to review the
8 MOX facility. But the Standard Review Plan
9 for fuel cycle facilities, or NUREG-1520,
10 would be used to review other licensee
11 applications under Part 70.

12 The NRC responds to intent or
13 interest from industry for license
14 applications for new or advanced technology by
15 reviewing existing regulations, and looking at
16 potential regulatory gaps in the regulations
17 or in our guidance.

18 As an example of that, in 2008, we
19 received three letters of intent from various
20 industry organizations to pursue commercial
21 reprocessing of spent nuclear fuel. In
22 response, the staff is currently considering

1 revisions to our regulatory framework that
2 would be necessary to address a potential
3 licensee application for a commercial
4 reprocessing facility.

5 As part of this effort, in 2009,
6 we completed a gap analysis of our
7 regulations, and currently, we are developing
8 the regulatory basis for rule-making that
9 would address those gaps.

10 We've estimated that the resources
11 to complete a draft regulatory basis in the
12 2011 time frame would be about 12 to 13 FTE
13 and \$1.6 million.

14 Although the NRC staff understands
15 that the current commercially available
16 technology is based on aqueous separation
17 process, we do intend to the extent practical
18 to consider a risk-informed performance-based
19 and technology-neutral regulatory framework
20 for reprocessing.

21 And finally, I'd like to note that
22 the NRC staff is following the development of

1 public policy debates and decision regarding
2 the disposition of spent fuel. If the policy
3 decision is for reprocessing, it may be
4 necessary to develop insights on the types of
5 regulatory issues that might confront the NRC
6 in the area of advanced reprocessing.

7 For example, areas for future
8 research consideration could include pyro
9 reprocessing, or pyro processing, high-
10 temperature gas reactor fuel reprocessing, and
11 the implications of burner reactors. And that
12 concludes my presentation.

13 CHAIR PETERSON: Thank you. At
14 this time, we'll enter into the question part
15 of the session, and perhaps I'll go ahead and
16 start off with a couple of questions. The
17 first is for Marissa.

18 The term safeguards in the United
19 States is used more broadly perhaps than it is
20 in international context because there's both
21 the physical security of facilities and then
22 also there's the application of international

1 safeguards, which are intended to be capable
2 of detecting any attempt to divert material or
3 misuse a facility by the state that has --
4 that operates it to be potentially used for
5 nuclear weapons.

6 In the United States, the vast
7 majority of our facilities are not subject to
8 international safeguards, although we offer
9 them because United States is a weapons state.
10 But on the other hand, things that we do here
11 do influence the situation elsewhere in the
12 world.

13 And so, I -- could you tell me a
14 bit about how the NRC regulates industry
15 compliance with IAEA safeguards requirements,
16 and whether there might be some things that
17 could be done that might improve the situation
18 from the perspective of safeguards approach,
19 and seeing better practices adopted
20 internationally on safeguards?

21 That would be the international
22 component of safeguards.

1 MS. BAILEY: Yes. Safeguards is
2 really not my area of expertise, but for the
3 NRC security and safeguards are -- the
4 requirements for security and safeguards are
5 specified in Part 73 and Part 74.

6 We do interact with IAEA and the
7 international community through the Department
8 of State and other US Government agencies to
9 ensure that we are coordinated in terms of
10 international safeguards.

11 CHAIR PETERSON: Thank you. In
12 general though, we tend to treat the
13 international safeguards as something that you
14 add on at the end of the process of developing
15 and designing a facility, I think in part
16 because we don't really require that it be
17 considered earlier on. Would that be correct?

18 MS. BAILEY: I can't comment on
19 that.

20 CHAIR PETERSON: Okay, okay. Next
21 question I guess would be for all three
22 panelists. The United States currently

1 invests about \$500 million per year into DOE
2 NE research intended to develop, improve
3 reactor and fuel cycle technology.

4 And one of the questions of course
5 is how to best assure that that investment
6 will result in the actual deployment of
7 improved technology, and a piece of that
8 involves of course the need that these
9 technologies ultimately be licensed.

10 And so, one of the questions is
11 what is the optimal amount of federal funding
12 that should be invested on the DOE NE
13 promotional side, and how much might be
14 optimally invested in the NRC side to perform
15 the anticipatory work that is needed
16 ultimately to license those reactors?

17 And one of the problems that we
18 face is that the -- some of the issues that
19 one might address, and to provide a specific
20 example you could think about small modular
21 reactors that require control rooms, where you
22 would have some hope that you could have --

1 you would not need to have independent
2 staffing for each reactor module.

3 So, this is a type of question
4 actually NRC has been looking at because the
5 answer, once the first vendor gets a license,
6 will become apparent to everybody else, and
7 other people can follow right behind without
8 perhaps having to invest as much effort and
9 time. And that sort of disincentivizes the
10 first company to attempt it in the first
11 place.

12 On the other hand, NRC actually is
13 aware of these things, but the question would
14 be could one beneficially perhaps invest a bit
15 more resources to NRC so that perhaps there --
16 you'd be able to get a little bit further
17 ahead on some of these issues, which are
18 unique to advanced reactors, but also are
19 really generic issues that any single vendor
20 is not going to be able to patent the result
21 on? Maybe Mike, if you could answer?

22 MR. MAYFIELD: Let me first say, I

1 have the good sense to not comment on DOE's
2 budget. So, let's start there.

3 In terms of control room design,
4 we have engaged -- NuScale is probably the
5 leading interest in control room design, and
6 reducing staffing desires to have one operator
7 deal with multiple modules.

8 Our regulations have very explicit
9 guidance on what that means. Regulations are
10 nice. There is a process called an
11 exemptions, so we're not too worried about the
12 regulation. But we have challenged NuScale,
13 as well as the other vendors, that are seeking
14 to make changes to control room staffing.

15 It's come in and talked to us very
16 specifically about what tasks you need the
17 operators to perform, the timing in which they
18 need to perform those tasks. The vendor
19 contend that their reactors -- and I emphasize
20 this, that the vendor contention we have not
21 yet had our Office of Research do their
22 confirmatory analysis.

1 So, just to be clear, this is a
2 vendor contention. They contend their reactor
3 systems will respond so slowly that the
4 operators have relatively huge amounts of time
5 to react and perform very simple tasks. Okay,
6 that has yet to be proven. But as we get into
7 this, our Office of Research is conducting
8 research, looking at human performance, the
9 human factors aspect. We're looking at
10 control room design.

11 The I&C System, the level of
12 automation, is something that we'll have to
13 get into as the vendor begins to specify that.
14 I believe Mr. Lorenzini yesterday said that
15 they expect to have a full simulator available
16 to demonstrate the human performance of
17 control room functions as they would get into
18 licensing.

19 So, we need to look at the I&C
20 System, look at the level of automation in
21 their plant operation, look at the control
22 room and the task list.

1 I don't think any of this
2 constitutes fundamental change, fundamental
3 basic research into human performance in
4 control room staffing. Rather, this goes to
5 fairly straightforward implementation of
6 existing regulatory guidance on how you decide
7 on optimum control room staffing.

8 So, in that sense, well, Dr.
9 Sheron I'm sure can always use more money and
10 staff. The fact is this isolated area is one
11 that is pretty well in hand. We just need to
12 move forward with the vendors and actually
13 engage in their specific proposals.

14 CHAIR PETERSON: Dick?

15 MEMBER MESERVE: Good morning.
16 I'm really pleased to have an opportunity to
17 resume a former role where I had a chance to
18 question staff on various issues. You may not
19 relish it.

20 I'd actually like to follow up on
21 a few things that were touched on a little bit
22 by Per. We heard yesterday about a very major

1 effort that is underway by the American
2 Nuclear Society, where they have looked at a
3 lot of the issues arising out of the Standard
4 Review Plan for small modular reactors.

5 So, as you're very much aware,
6 over the last year or two, it has been
7 enormous enthusiasm and interest that has been
8 provoked in small modular reactors that really
9 didn't exist before the last couple of years.

10 I'm curious about whether you've
11 been involved in that effort, the extent to
12 which you're prepared to take that input and
13 engage with it, and sort of how you're -- I
14 mean it's a very major project that's been
15 underway here to try to I think frame issues
16 for you, and I'm curious about what your plans
17 are to be able to use that input.

18 MR. MAYFIELD: Why, it's -- do you
19 want me to go ahead? All right. Staff from
20 both the Office of Nuclear Regulatory Research
21 and my staff on my program have been engaged
22 with ANS, sitting on some of the specific

1 committees.

2 We are very aware of what they're
3 doing, and the timing for getting their
4 reports. We're also aware of activities that
5 the Nuclear Energy Institute has ongoing, that
6 are probably in terms of timing and content on
7 a par with those.

8 We have our own activities
9 underway. The staff prepared a paper that --
10 the infamous SECY papers that go to the
11 Commission, where we laid out some ten key,
12 what we believed, to be policy issues where
13 the Commission might need to weigh in at some
14 point.

15 The ANS and the NEI folks have
16 been working those issues at the same time.
17 We are interested in seeing the -- when the
18 ANS papers show up, when the NEI papers show
19 up, the level of content. We have had
20 historically a range of experiences from
21 papers that come in that, "Well, that's nice.
22 There was a lot of thought that went into

1 this, but it's not terribly useful," up to
2 papers where we've managed to put a cover memo
3 on them, and endorse them as staff guidance.

4 So, there's that full spectrum of
5 history that says, "We just need to wait and
6 see what they actually submit." But we are
7 aware of it. We have staff engaged with ANS
8 in particular. We meet about every six weeks
9 now with the NEI working group members, and go
10 through sort of issue by issue what they're
11 doing.

12 And so, we are very interested and
13 awaiting that input; however, if those papers
14 turn out to be in the, "That's nice. A lot of
15 good thought, but not terribly useful
16 category," we still will be able to move
17 forward.

18 So, we have our own activities
19 underway to address those key policy issues
20 that virtually all of the vendors have
21 described in various forms. You get into
22 security control room staffing and emergency

1 preparedness as the three leading contenders
2 among the vendors.

3 And so, we have activities ongoing
4 with the Office of Research, engaging some of
5 the DOE National Laboratories, to be prepared
6 to look at the input we get from ANS, from
7 NEI, from the vendors, and move forward fairly
8 smartly.

9 We don't have much choice. We've
10 talked a number of times the issues that are
11 in that SECY paper, there's nothing new.
12 Those issues are at least a decade old. And
13 what we told the Commission last April was the
14 thing that's different this time is we have no
15 choice but to bring them to resolution.

16 It's not going to be enough this
17 time to simply put forward a policy paper, and
18 the Commission say, "Well, thank you. Go
19 study some more." That's -- we've grown past
20 that. We now simply have to bring these
21 issues to a resolution, present that
22 resolution for post, resolution to the

1 Commission, and the Commission across the
2 board has said, "We're ready to act on
3 proposals from the staff."

4 So, it's kind of a long-winded
5 answer to your question. Yes, we're aware,
6 and yes, we're engaged with them, and looking
7 forward to receiving the product.

8 MEMBER MESERVE: Thank you. I
9 think it really is not often appreciated the
10 extent to which the NRC staff engages with
11 vendors and applicants more generally, long
12 before an application is submitted so that
13 there's early warning and preparation to be
14 able to deal with what's ultimately formally
15 submitted. I have a --

16 CHAIR DOMENICI: Dick, could you
17 make your last statement again? I could not
18 hear it.

19 MEMBER MESERVE: Yes. I just said
20 I don't -- I think it is often not appreciated
21 the extent to which the NRC staff engages with
22 potential applicants, long before they have

1 formally filed an application, to make sure
2 that there's common understanding about what
3 the requirements are, what the issues are, so
4 that they can be engaged in an early stage.
5 So that when an application is filed, the
6 NRC's prepared to grapple with it, and not --
7 and is not waiting to be able to deal with the
8 difficult issues.

9 We heard yesterday, from one of
10 the speakers in the afternoon, that the fee
11 system was proving to be a disincentive. I
12 think he was thinking particularly about the
13 small reactors.

14 As you're very much aware, the NRC
15 is -- operates such that 90 percent of its
16 budget is derived from fees that licensees pay
17 to the NRC to pay for its work. And we heard
18 yesterday, that those fees are sufficiently
19 large for some of the small reactors that it
20 was creating a problem in the early stages.

21 I'm curious about whether you're
22 getting that feedback from applicants. I know

1 no one is ever happy to pay for the fees, but
2 I mean --

3 MR. MAYFIELD: No one likes the
4 bill collector.

5 MEMBER MESERVE: I'm trying to get
6 a sense of how big a disincentive you're
7 seeing that being, and whether there's some
8 way to deal with these issues. And that again
9 touches onto a point that Per was raising.

10 MR. MAYFIELD: We have been
11 hearing pretty much from day one that the fees
12 were a disincentive. Chief Financial Officer
13 and his staff, in conjunction with my staff,
14 and a few others scattered around the agency
15 have been engaged in preparing a SECY paper to
16 propose what to do about fees.

17 There was a device called an
18 Advanced Notice of Proposed Rule-Making that
19 went out, I think about a year ago, maybe a
20 little longer, that sought input from
21 interested stakeholders on what to do about
22 fees. As you might imagine, the first answer

1 was quit charging them.

2 Second went to -- from the large
3 reactor guys, "Don't make a change," from the
4 small reactor guys, "Make a change." A lot of
5 specific proposals, and the staff has taken
6 those, and was drafting a proposed paper to go
7 back to the Commission. NEI and the working
8 group have also been putting together a
9 proposal on what to do about fees.

10 They expect to provide that paper
11 to us in October. So, the staff decided to
12 just hold on to our proposal, rather than give
13 something to the Commission, knowing that the
14 industry in the next couple of months was
15 going to submit something.

16 We said, "Let's just stop. Put
17 the paper on the shelf, and wait until we get
18 the NEI document, and then we will look at
19 what it says and see if it provides us
20 persuasive thought in advance of us sending
21 forward a proposal to the Commission."

22 We hope, depending on what we

1 actually get out of the NEI paper, to be able
2 to put something forward to the Commission by
3 the end of the year. This is a contentious
4 issue. It has nothing whatsoever to do with
5 safety, security, or environmentally
6 responsible use, but it is a compelling issue
7 among the industry, and it is one that the
8 staff is sensitive to.

9 In putting forward this paper, we
10 were trying to find the optimum way. I guess
11 it was sort of thing where if nobody's happy,
12 you've probably hit about the right answer.
13 So, I'm not sure that anybody would be
14 thrilled with it, but we were trying to hit an
15 appropriate balance between the large reactors
16 paying for the small guys, and the small guys
17 getting charged an unacceptable fee.

18 That's never an easy task. We're
19 very interested in input from the
20 stakeholders. The paper that would go forward
21 would simply propose something. If the
22 Commission agreed, then it would go into the

1 normal rule-making process. So, stakeholders
2 would have another opportunity to engage and
3 provide input.

4 So, this is not something that
5 would go to final rule-making, but rather
6 would go into the standard rule-making
7 process.

8 CHAIR PETERSON: Can I inject just
9 an observation and a question on this specific
10 topic? Since when you start talking about
11 fees, you're getting into the question of
12 whether or not you're incentivizing or not,
13 and the NRC cannot get into the role of --

14 MR. MAYFIELD: Exactly.

15 CHAIR PETERSON: -- promoting
16 nuclear energy, which a fee structure that
17 encouraged people to build the first small
18 unit would be one that would come down to
19 zero, pretty close, for the first one in terms
20 of making it much easier to move first. But
21 that really would be a subsidy relative to the
22 actual cost.

1 MR. MAYFIELD: And we're not --
2 and we're not headed in that direction. What
3 we're trying to do is find a balance of
4 interests recognizing that accommodating them,
5 incentivizing --

6 CHAIR PETERSON: Incentivizing.

7 MR. MAYFIELD: Yes, that's the
8 right word. That is not our role.

9 CHAIR PETERSON: You cannot do
10 that.

11 MR. MAYFIELD: That is plainly not
12 our role.

13 CHAIR PETERSON: Right.

14 MR. MAYFIELD: What we were trying
15 to is find an equitable balance among the
16 interests that were being put on the table.

17 CHAIR PETERSON: But that is
18 something that Congress or the DOE could do in
19 terms of trying to make -- come up with an
20 approach that would reduce fees, but that
21 would be an explicit subsidy to first-movers,
22 beyond what would be a reasonable fee from the

1 perspective of cost recovery.

2 MR. MAYFIELD: And is something
3 where we're not going to weigh in.

4 MEMBER MESERVE: But let me say
5 that I think there is -- there is a difficult
6 policy issue here in that the first applicant
7 is the one that bears the extraordinary costs
8 if it's paying for the NRC to resolve issues
9 that then the second applicant gets the
10 benefit of, and can free ride on the costs
11 that have been borne by the first applicant.
12 So, I mean this is a tricky issue.

13 MR. MAYFIELD: This is a tricky
14 issue, and the way we've been taking on the
15 policy issues is those are generic in nature.
16 The ten or so are generic in nature, and they
17 are not being ascribed to -- the fees
18 associated with that are not being ascribed to
19 any particular design or applicant. Rather,
20 they are coming out of the general fund.

21 MEMBER MESERVE: I have one other
22 question I'd like to direct at Ms. Bailey.

1 This is a -- there's been some press reports
2 lately about the laser enrichment technology
3 that GE Hitachi is interested in licensing,
4 and I guess as an application that is
5 something you are considering or will be
6 considering shortly. In the -- it's been
7 asserted in the press that the NRC has said
8 that it is not going to examine the
9 proliferation dimensions of that technology.

10 I would've thought that would've
11 been something that was within the common
12 defense and security obligation of the NRC to
13 evaluate. Maybe just to put safeguards
14 controls on the information, but at least
15 there's been some press report that the NRC
16 staff has said that proliferation is not an
17 issue that it will examine in the context of
18 that License Application, and I wonder if you
19 could give some guidance as to whether these
20 press stories are accurate.

21 MS. BAILEY: I'm not familiar with
22 the press reports, but I think that within the

1 context of our regulation on proliferation and
2 safeguards, it is something that we would
3 consider in our license review.

4 MEMBER CARNESALE: Thank you. I
5 have a question for Ms. Bailey to help me.
6 Looking at the last couple of slides at
7 regulatory framework for reprocessing, the
8 very last statement is, "Any research
9 initiatives and plans would be in accordance
10 with policy decisions."

11 Now, it would seem in general the
12 research would help to inform policy
13 decisions, rather than come after the policy
14 decisions have been made. So, I'm sure this
15 is carefully worded, rather than -- so, I
16 wonder if you could help me understand this a
17 little better.

18 MS. BAILEY: Yes. I think if that
19 was interpreted, that any research would come
20 after the policy decisions. I mean, that's
21 not 100 percent correct. It's probably a
22 little bit of both.

1 Right now, the -- there is -- we
2 are, or the Office of Research does have some
3 plans for long-term research for advanced
4 technology for reprocessing, but we are also
5 sitting back and looking at where the nation
6 and the industry might be headed in terms of
7 reprocessing, and what kind of technology that
8 they're looking at.

9 And so, a lot of the things that
10 we're doing is based on existing technology,
11 but we recognize that to have a flexible
12 regulatory framework, we may need to look at
13 more advanced technologies, but we're waiting
14 a little bit to see where that's going to go.
15 I hope that answers your question.

16 MEMBER CARNESALE: It does, but my
17 -- not my concern, but it would seem to me
18 that industry is unlikely to take into account
19 some of the things that might be of concern to
20 the nation.

21 Well, let's take the
22 proliferation. It's unlikely to be as

1 important to them as they would be to you when
2 it comes to licensing. And so, you would
3 think it might be helpful for you to be
4 looking ahead at the kinds of considerations
5 that you would have in licensing or
6 reprocessing for something based on advanced
7 technology that might help guide industry to
8 some extent, as one technology might be
9 preferable to another, for reasons that
10 normally would not go into their
11 considerations.

12 MS. BAILEY: I agree, and I think
13 as we develop the framework for reprocessing
14 and as we try to identify the types of
15 research that might be necessary and the types
16 of guidance that we might want to put together
17 for a reprocessing facility that that's
18 something that we would try to do to the
19 extent practical.

20 MEMBER CARNESALE: Thank you.

21 CHAIR PETERSON: Phil?

22 MEMBER SHARP: Mr. Chairman, first

1 of all, I just wanted to say a comment to the
2 many years of public service of these folks,
3 that we owe them a great debt of gratitude in
4 this country.

5 We're in another one of those
6 cyclical eras where we just simply absolutely
7 trash everybody who does anything on behalf of
8 the American public, and I think we ought to
9 step back every now and then and say part of
10 the reason we have had a good safety record in
11 the nuclear industry is precisely because of
12 the high competence and the focus on safety of
13 the people in this agency historically.

14 And certainly my interaction in
15 Congress and outside of Congress with the NRC
16 personnel has always given me a greater sense
17 of confidence in that we could count on this
18 system of regulation to help assure us that
19 industry is operating safely with safer
20 culture.

21 With that said, I want to turn to
22 that issue about the agency itself, of human

1 performance, because you already articulated
2 that one of the key concerns is human
3 performance and the management of our
4 reactors, for example, and the focus on safety
5 culture, which is what INPO does, what you do,
6 what the NRC in regulating these entities.

7 My question is since we are very
8 reliant for trust on your agency, can you give
9 us any insight into how you as an agency
10 maintain the fervor and the commitment to a
11 safety culture and a high performance, high
12 competence operation?

13 DR. SHERON: I'll take the first
14 shot, and I'll let some of the other
15 panelists, if they want to chime in on that.
16 I think we -- I think the agency itself is
17 very proud of its safety culture.

18 I think it emanates from the
19 Commission on down. I know that all of my
20 colleagues, senior managers alike, that's the
21 first and foremost thing is to make sure that
22 we have the right safety culture in the

1 agency.

2 We promote it extensively. The
3 most recent is now what we call an open,
4 collaborative work environment. We have a
5 website. We encourage our staff to come
6 forward with ideas if they have differing
7 views. All of the managers, myself included,
8 have open-door policy.

9 We try to interact with our
10 staffs. I have brown-bag lunches at least
11 once a month with my staff, just to hear
12 what's going on, what's bothering them. And
13 I always used to like the term, it's called
14 servant leadership, which is basically my job
15 is to help you do your job to my staff, okay?
16 And if you have a concern, if you have a
17 safety problem, then I've got to deal with it.
18 I've got to help you with that.

19 I think the whole agency focuses
20 on that, from our Executive Director and the
21 Commissioners right on down. We emphasize it
22 in all hands meetings. We kind of walk the

1 talk, I think. I don't know how else I can
2 really explain it, but as someone that's been
3 there that long, I just feel very comfortable
4 that staff is focused right on safety, and not
5 on anything else.

6 MEMBER SHARP: I mean, the
7 difficulty is, as you know in human
8 performance, is people get comfortable with
9 how they've been doing things, and their
10 intentions are good, but in fact they let
11 things slip. That's been a historic practice
12 in every institution I've ever been associated
13 with, including my own.

14 MR. MAYFIELD: There are -- let me
15 come back to that point. We do -- is it two
16 year cycles now? The Office of the Inspector
17 General does a safety culture survey. So
18 there's an independent body that sends a
19 survey out to the staff. We've gone from
20 moderate participation to fairly high
21 participation from the staff on this last one.

22 The results are provided from the

1 Commission on down to first level supervisors.
2 We've implemented plans on how you go about
3 improving the areas where we didn't come out
4 as well as we would've liked.

5 So there is a formal process, and
6 that trickles down to individual staff members
7 at the secretary level, and understand your
8 role in safety and security. So, it is
9 something that is very real within the
10 organization.

11 One of the -- you mentioned how do
12 you sort of stay vibrant, stay engaged? The -
13 - when we stood up the Office of New Reactors,
14 we were one secretary and nine managers. And
15 we -- in two years, we went to about 490
16 people. We brought in a lot of people from
17 the outside, and in bringing that body of
18 workforce in, we emphasized safety culture,
19 emphasized their role in the safety review,
20 and assuring safety and security,
21 environmentally responsible use of nuclear
22 power.

1 When you bring in that many new
2 people, and they weren't all right out of
3 college, these were experienced workers as
4 well as folks right out of college, we didn't
5 have any trouble instilling a safety culture
6 with them. Many of them brought it with them
7 from the nuclear industry.

8 And so, we've had no problem in
9 having folks perfectly willing to knock on the
10 door and come in and express concern about
11 various aspects of what's going on. So, it's
12 -- with that infusion of new people, it has
13 actually been fairly easy to maintain a fairly
14 engaged staff that are looking for problems.

15 MEMBER SHARP: Part of the --
16 obviously, we're not going to get into this
17 issue except for the fact that our capacity,
18 whether as a Commission, as a Congress, as a
19 public to have confidence in this whole system
20 depends on confidence, just the general trust
21 level in your agency, and that's why I just
22 wanted to reinforce that, and both applaud you

1 for it.

2 Let me just raise one issue. At
3 Davis-Besse, and again, my knowledge is
4 limited, but at Davis-Besse, it appears to be
5 that both the managers of the plant, the
6 civilian, the private sector, did not
7 anticipate the problem and were not on top of
8 it, and nor was the Resident Inspector.

9 Now, I may be in error about that,
10 but I also hope, or my impression is, the
11 agency quickly stepped in, and I don't know
12 whether your office began any special research
13 on the topic or not, the corrosion.

14 DR. SHERON: Yes, Dr. Meserve will
15 remember I was kind of heavily involved in
16 that issue. Yes, there were some mistakes
17 made by the NRC. There were some Regional
18 Inspectors that missed some signs that things
19 were not the way they were supposed to. There
20 were clogged filters in the containment.
21 There was an outage in 2000. A photograph was
22 taken which showed --

1 MEMBER SHARP: I am overstaying my
2 welcome here from my colleagues. We don't
3 need to go back over the accident.

4 DR. SHERON: No, I just want to --

5 MEMBER SHARP: Were there
6 corrective actions taken as a consequence?
7 That's what I'm trying to get at.

8 DR. SHERON: Yes, there were. But
9 I think a lot of it really focused on the fact
10 that if you remember, it ultimately came out
11 that the Department of Justice showed that
12 several individuals lied to the agency.

13 MEMBER SHARP: Right.

14 DR. SHERON: And provided us with
15 false information. We made the right decision
16 in terms of going forward with that plan,
17 okay? It was the fact that they were telling
18 us one thing, but were not -- it was not
19 truthful information. We would've made a
20 different decision.

21 So, I think that while the staff -
22 - there were some mistakes on the part of the

1 staff, there was a big safety culture problem
2 at the plant. My understanding is that has
3 been corrected.

4 MEMBER MESERVE: They were
5 prosecuted?

6 MEMBER SHARP: They were
7 prosecuted, the former chairman of the NRC.
8 If I could just make one more comment on the
9 fee situation, which is not totally unrelated
10 to this. I would just caution any desire to
11 make legislative proposals on fees. I
12 wouldn't waste my time.

13 We instituted those fees, I
14 believe in 1990, Senator, or I can't remember
15 which year it was, and under the desperate
16 effort to balance a budget that was, relative
17 to now, hardly out of balance at all. We used
18 this system to get money to operate a whole
19 series of federal agencies, and I would just
20 suggest to you it's also a guarantee that that
21 budget can be met when you are in the business
22 of whacking down everything in the government,

1 which is where we're going to be for the next
2 five years in super ways.

3 So, I wouldn't be too quick. You
4 folks have to decide how to allocate the fees,
5 but I'm not sure the industry or anybody else
6 has a big stake in trying to really transform
7 this system.

8 Maybe I'm defending old baloney.
9 So, I'll be quiet now.

10 CHAIR PETERSON: Very good.

11 Question from the Senator?

12 CHAIR DOMENICI: I asked and I
13 would like to talk to you about one question,
14 one observation with you. When Dick and I came
15 out to the -- to your beautiful offices, and
16 we visited you, and we also visited the
17 Commissioners, we were conducting a review
18 then of the NRC licensing process, just from
19 a simple proposition: was it taking too long?
20 And was that length of time it was taking, was
21 it something that we -- that you all were
22 doing, you were causing it for reasons that

1 were not necessary? And we concluded that
2 that was not the case.

3 But let me tell you when I visited
4 with you, my own reaction with most of your
5 top-notch employees in the Commission, you had
6 been then been energized by the filing of all
7 the applications for new nuclear reactors.
8 And I must say I don't know what you did when
9 we had none because you were so engrossed and
10 involved, I was proud of you.

11 I thought we really had -- were
12 paying for a group that's really going to do
13 the job of licensing and get some of these
14 applications cleared.

15 Might I ask, is the process of
16 licensing the group that came together with --
17 what was it? Sixteen or 17 with 26 different
18 reactors, are they progressing in the normal
19 and expected manner? Brian, might I ask you
20 first? Are those moving along from your
21 standpoint in an appropriate manner?

22 DR. SHERON: Well, I'm probably

1 not the right person to answer that.

2 CHAIR DOMENICI: Who knows?

3 DR. SHERON: Well, I would have to
4 talk to Mike, if he has any -- because that
5 licensing is done in his office.

6 CHAIR DOMENICI: We'll have the
7 question answered so we know. None of you
8 want to volunteer your --

9 MR. MAYFIELD: I will, since that
10 licensing is done in the Office of New
11 Reactors, I get to hear about it fairly
12 frequently. And the answer is yes. As
13 expected, given a first time through the Part
14 52 process, and for designs that have yet to
15 make it through the certification process.

16 This is moving forward, I think,
17 as well as can be reasonably expected. I
18 think that all of us, the industry as well as
19 the staff, would've liked for some things to
20 have moved forward a bit better, a little
21 faster, but the fact is given the level of
22 questioning that the applications, some of the

1 new technologies, new approaches to things
2 that are being put forward, I think they are
3 moving forward as reasonably as can be
4 expected.

5 CHAIR DOMENICI: Well, we -- our
6 information was even though we have 104
7 reactors, and it seems like we ought to be
8 experienced, it was such a long lag time. New
9 technology and everything else came into play
10 for the 30 years without a new license. This
11 was a brand new experience of significant
12 magnitude, and everybody had to put in a lot
13 of extra time on your side and on the
14 corporation side.

15 MR. MAYFIELD: Exactly.

16 CHAIR DOMENICI: But I want to ask
17 about small reactors now that are coming
18 through. Are one of you involved in what's --
19 how we're going to help --

20 MR. MAYFIELD: I am, sir.

21 CHAIR DOMENICI: You are? Is it
22 fair to say that you are being asked to answer

1 questions as to what -- what must be changed
2 to expedite licensing of small reactors? If
3 we look at what your current rules and
4 regulations are, is there some way of making
5 sure they're getting help as to what has to be
6 changed so it can be expedited?

7 MR. MAYFIELD: Yes, sir. We've
8 done a couple of things. One, we have
9 emphasized to the vendors for the small
10 reactors to pay very close attention to the
11 licensing experience from the large reactors.
12 What things have worked well? What things
13 have not worked very well for them?

14 And so, we've -- at Commission
15 meeting last April, we went through some of
16 the experiences, the lessons learned from
17 licensing the large reactors, and we
18 emphasized strongly to the vendors for the
19 small reactors to pay attention. Yes, they're
20 different technologies, but pay attention to
21 those things in the licensing process that
22 seemed to delay moving forward.

1 We have also been asked by the
2 Commission and a lot of interest from the
3 industry in looking at the regulatory
4 guidance, the regulatory framework as to what
5 needs to change and how can we expedite those
6 reviews?

7 One of the main things we have
8 emphasized to the industry, and -- well,
9 actually and we're undertaking that review and
10 making changes to that guidance. One of the
11 things we have emphasized with the vendors
12 from the very beginning is that the best way
13 to move forward the licensing process is to
14 submit a complete high-quality application to
15 limit the number of times the staff has to
16 come back and request additional information.

17 That is something that, again,
18 we've learned from the large light water
19 vendors. After a couple of rounds of requests
20 for additional information, it's time to pick
21 up the telephone and arrange a meeting and get
22 the principals in the same room at the same

1 time and talk through these.

2 That gives the public an
3 opportunity to engage, and it just cuts off
4 this endless round of communication. So,
5 there are some specific things we're doing
6 with guidance. There's some specific things
7 we're doing just with process in interacting
8 with the industry.

9 CHAIR DOMENICI: Thank you. Thank
10 you, Mr. Chairman.

11 CHAIR PETERSON: Mike, quick
12 follow on. Could you mention about the
13 composition and role of the ACRS in the
14 licensing process, since people may not be
15 aware of that?

16 MR. MAYFIELD: The Advisory
17 Committee has a very important role in what we
18 do. They review the environmental statements.
19 They review the environmental reviews. They
20 review the safety reviews.

21 They go through, and the committee
22 members spend a lot of time reading in advance

1 of the meetings, as well as spending a lot of
2 time with the staff being briefed on specifics
3 of the applications, specifics of the staff's
4 review. Hard spots in particular: areas where
5 the staff and the industry have struggled to
6 reach alignment on that. So they -- and they
7 ask hard questions. This isn't a perfunctory
8 review.

9 CHAIR PETERSON: And describe who
10 the people are on the ACRS.

11 MR. MAYFIELD: There are -- the
12 number has gone out --

13 DR. SHERON: I think there is 12
14 members right now, and they're usually
15 composed of either retired utility executives,
16 either perhaps retired or even active
17 scientists at National Laboratories,
18 university professors, both retired and
19 active.

20 CHAIR PETERSON: Very good.
21 Allison?

22 MEMBER MacFARLANE: Just a quick

1 question for Ms. Bailey, and maybe Mr.
2 Mayfield. I'm interested, when you go through
3 looking at the reprocessing technology and
4 developing a licensing framework for it, are
5 you going to be consulting with, or using
6 information that other countries have?

7 You know, Japan went through this
8 recently. They might be a resource. And also
9 with some of the new reactors.

10 MS. BAILEY: Yes. In fact, last
11 year in the December time frame, we had staff
12 visit the Japanese regulators and utilities to
13 take a look at their regulations for
14 reprocessing, and also to take a look at the
15 operations at Tokai and at Rokasho.

16 And in September, we are planning
17 a visit to France to talk to the regulators
18 there, and also to talk to the operators at La
19 Hague and MELOX. And I'm sorry; I missed the
20 second part of your question.

21 MEMBER MacFARLANE: It was about
22 new reactors. The reactors that you're in the

1 process of dealing with here have been
2 licensed and are being built elsewhere, so.

3 MR. MAYFIELD: Yes and no. In the
4 fast reactor world, yes. And let me come back
5 to the fast reactors. For the small
6 pressurized water reactors, the US is probably
7 the lead in that. The South Koreans have a
8 design similar to the small PWRs, called the
9 SMART Reactor. The Argentineans have a design
10 they are putting forward called CAREM.

11 We have been -- we have talked
12 with regulators both in Korea and Argentina.
13 I think the Koreans are perfectly content to
14 move forward with the design and ultimately
15 licensing of that design within Korea. They
16 have told us they have no interest in seeking
17 a design certification in the US.

18 The Argentineans are interested in
19 talking with us because they're still trying
20 to figure out what a prototype licensing
21 process would look like, and that is something
22 we have thought through, and it is embodied in

1 our regulations.

2 So, we're becoming -- as those
3 designs mature, we are becoming familiar with
4 them, and we are engaged with the regulators
5 on both those countries.

6 There has been a lot of interest
7 out of the IAEA, their safety standards
8 organization in the standards for small --
9 well, small modular reactors, pretty much
10 independent of technology. I had been sitting
11 on a committee called the Nuclear Safety
12 Standards Committee that promulgates the
13 standards associated with those. I remember
14 Brian's, one of his managers, now sits on that
15 committee.

16 So there has been a lot of
17 engagement in those. The fast reactors is an
18 area where we are joined with DOE principally.
19 There is a trilateral agreement with the US,
20 France and Japan, and over the last year,
21 there's been interest in having the regulators
22 from those three countries engaged more

1 directly in that trilateral discussion.

2 And so, as part of our maintaining
3 awareness, it's to maintain awareness of what
4 the regulators in the other countries are
5 doing. And so we have joined with DOE and are
6 participating in those trilateral discussions.

7 So the international engagement is
8 actually pretty extensive. The challenge is
9 to keep up with it and not let it become a
10 distraction.

11 CHAIR PETERSON: I'd like to
12 follow up from a question that Phil had asked
13 earlier related to safety culture. Just to
14 note that if you want to look for independent
15 sort of evaluations, the Union of Concerned
16 Scientists last year issued a report on
17 scientific integrity, entitled, "Freedom to
18 Speak: A Report Card on Federal Agency Media
19 Policies." And this is where the Union of
20 Concerned Scientists conducted an
21 investigation of 15 federal regulatory and
22 science agencies to assess the degree of

1 freedom with which science is communicated at
2 those federal agencies.

3 And of course, the NRC has its
4 Differing Professional Opinions Program, which
5 also exists within the nuclear industry and
6 provides a mechanism by which people can speak
7 their minds if they have differing opinions.
8 And in fact in that report, the NRC is
9 essentially ranked number 2 within all of
10 those, with the only other federal agency that
11 is ranked higher being the National Science
12 Foundation.

13 If you think about what that
14 implies, that's actually, it speaks well. But
15 that said -- and EPA. Yes, let's just say
16 that speaks well.

17 On the other hand, Ed also
18 yesterday raised a criticism which I think is
19 pretty serious. He said that the NRC does not
20 expect new reactors being licensed today to be
21 any safer than those that we built 30-40 years
22 ago.

1 And I think it's really important
2 to understand whether or not there's some
3 expectation that over time safety should
4 improve for these technologies or not.

5 MR. MAYFIELD: Unfortunately,
6 there wasn't an opportunity to comment from
7 the audience in rebuttal. The Commission
8 promulgated an Advanced Reactor Policy
9 Statement some years ago, where they plainly
10 stated -- now, they didn't embody it in
11 regulation because you don't need to, but as
12 a policy matter, there's a clear statement
13 that the Commission expects new reactors to be
14 safer than the operating fleet.

15 Okay, now you get into an
16 expectation of safer versus a change in the
17 regulations. And what we are seeing is that
18 the vendors also expect safer reactors, and
19 you can see that as you look at the
20 Probabilistic Risk Assessments that they are
21 performing and that the staff has been taking
22 a look at.

1 There is a clear reduction in the
2 calculated risk associated with the new
3 designs. I believe that the industry has
4 stepped forward and is meeting the
5 Commission's expectation for safer designs in
6 the new fleet.

7 So I disagree with Dr. Lyman's
8 contention.

9 DR. SHERON: I would just point
10 out my office conducts Probabilistic Risk
11 Assessments, and what we've been seeing, we're
12 doing right now a study called SOARCA, which
13 is the State-of-the-Art Consequence Analysis,
14 and that'll be published roughly in a little
15 less than a year.

16 Actually, I think it'll be out for
17 public comment, I think by late October -- or
18 no, in December.

19 What we're finding -- and what
20 that is is a study of, if a severe accident,
21 if a core melt accident were to occur at a
22 nuclear plant, what would the consequences be?

1 And what we're finding is that we're not
2 really hurting anybody, okay? I mean, there
3 aren't thousands of deaths or anything.

4 What we're seeing is -- and what
5 we're seeing actually as driving risk now is
6 external events, okay? Like giant earthquakes
7 and everything. And what that tells me is
8 that the industry, okay, over the years has
9 improved the designs of their plants.

10 They've made changes in their
11 plants. They've made changes in their
12 procedures that have driven the internally
13 generated risk, which is, for example, pumps
14 failing, valves failing, whatever, operators
15 making mistakes.

16 That's been driven very low so
17 that really what -- what sets the risk for a
18 nuclear plant is externally driven, okay?
19 It's the hurricanes. It's the earthquakes.

20 And so those are the things we're
21 trying to focus on now to say, "How well can
22 we calculate those risks?" But to me, that

1 tells me that the industry has been actively
2 making the plants safer. Okay? Making
3 changes to the design, adding equipment,
4 finding out where the weaknesses are and
5 fixing them.

6 CHAIR PETERSON: That makes sense,
7 and the Advanced Reactor Policy Statement I
8 think is important. If possible, could we
9 have that document transmitted to --

10 MR. MAYFIELD: We will get you the
11 copy --

12 CHAIR PETERSON: -- the Commission
13 so that we can review it, and get it into the
14 public record?

15 MR. MAYFIELD: Yes.

16 CHAIR PETERSON: One question,
17 though. With that policy that new reactor
18 designs should be safer, do we also need to
19 have an expiration date on Design
20 Certifications? In the sense that if you just
21 keep the same certified design for 15 or 30 or
22 45 or 60 years, at what point should you come

1 back and say, "Why not bring forward a new
2 design?"

3 MR. MAYFIELD: I think you will
4 find that that becomes a self-limiting problem
5 simply because the technology will move
6 forward, and there will be interest in
7 updating the certified design.

8 That said, if it's -- and this is
9 where we got when we were looking at license
10 renewal for the existing fleet: if it's safe
11 enough today, and nothing changes, why
12 wouldn't it be safe enough in 20 years?

13 So, there is a competing interest
14 between continuous improvement versus, if it's
15 safe enough today, assuming you maintain the
16 facility correctly and address aging effects,
17 why wouldn't it be as safe in 20 years?

18 So there are competing interests,
19 but I submit to you that just the simple
20 economics of, and protecting an asset on the
21 part -- a very expensive asset on the part of
22 the utilities really becomes the driving

1 consideration much more so than us changing
2 something or mandating a change in a
3 regulatory process.

4 MEMBER MacFARLANE: I just want
5 to, I think, add a clarification. One of the
6 criticisms I understood Ed Lyman to be making
7 yesterday was that given two different reactor
8 designs, and this expectation of greater
9 safety, this policy, if one is significantly
10 safer than the other, and the other meets that
11 level that you are satisfied with, there's no
12 sort of reward. There's sort of a lack of
13 incentive to become even safer, and that's the
14 complaint.

15 MR. MAYFIELD: Well, again I think
16 it -- and I understand Dr. Lyman's point. The
17 challenge to it comes -- where does the
18 incentive come to drive the calculated risk
19 for your facility down?

20 There are a number of operational
21 changes that the utilities like to make
22 because it improves cost. It reduces O&M

1 costs, generally improves operational
2 efficiency. The lower the risk, the more
3 change they get to make without increasing the
4 risk beyond an acceptable level.

5 So, there is again -- floor is the
6 wrong word -- an acceptable level of safety
7 that's set out in the regulations. And then
8 there are economic reasons, as well as just
9 good policy reasons, to go lower than that.

10 And so there is an incentive, and
11 it's frankly a cost incentive, not something
12 mandated in a regulation.

13 CHAIR PETERSON: I think that the
14 timing of the buzzer is just about perfect.
15 Do we have any additional questions from the
16 Subcommittee? In that case, I'd really
17 sincerely like to thank the three panelists
18 today for your participation and the
19 discussion that you provided.

20 The Subcommittee will be holding
21 additional meetings, and we will be digging
22 into some of the policy-related issues more

1 deeply as we go forward. This really provided
2 a good foundation to understand where things
3 stand today at the NRC. And again I, as
4 Commissioner Sharp said, commend your service
5 and work, and really appreciate the fact that
6 you were willing to come today. Thank you.

7 We will break for 15 minutes and
8 reconvene at 9:45. And if members of the
9 public are interested in speaking during the
10 public comment period, please sign up outside.
11 There's a sign-up sheet, and this is a good
12 time to get that done.

13 (Whereupon, the above-entitled
14 matter went off the record at 9:31 a.m. and
15 resumed at 9:46 a.m.)

16 MR. FRAZIER: Okay, we're going to
17 reconvene. And I'll turn it over to Senator
18 Domenici.

19 CHAIR DOMENICI: Thank you very
20 much, Mr. Frazier. Can you hear me? Thank
21 you very much. First of all, let me say to
22 the five of you in advance, we aren't sure

1 it's all going to go so great, but we thank
2 you anyway. We love you and we're glad you
3 came. Might as well tell you up front before
4 the testimony.

5 No, I'm just kidding. This is
6 such a love-in. Everything is going to be
7 great. So panel number 2. Our second panel
8 today is called "Capability Forecasting."
9 That means engineering, manufacturing and
10 construction in operations.

11 The Commission asked these
12 panelists to focus on the following four
13 questions. I'll go through them very quickly,
14 and then we'll start with you all. One: Is
15 the US prepared to maintain the existing labor
16 force if nuclear power continues to maintain
17 20 percent of the electrical generation
18 portfolio? What about for an expansion of
19 that?

20 Two: Does a lack of certain
21 manufacturing capabilities in the US affect
22 our ability to effectively meet generation

1 forecasts? Are these options for the United
2 States to regain or gain leadership in reactor
3 technology manufacturing?

4 Three: Are government actions
5 required to retool domestic manufacturing or
6 boost skilled labor capabilities to support
7 various reactor and fuel cycle technology
8 options?

9 Four: Is the pipeline for
10 engineers sufficient to maintain the nuclear
11 industry at current generation levels? And
12 what about an expansion potential?

13 Our first speaker is Sean
14 McGarvey, Secretary Treasurer for the AFL-CIO
15 Building Trades Department. Would you please
16 proceed? It's great to have you.

17 MR. MCGARVEY: Thank you.

18 CHAIR DOMENICI: You have ten
19 minutes, sir.

20 MR. MCGARVEY: Thank you. And I
21 wish to thank Mr. Domenici and Dr. Peterson
22 and the entire Blue Ribbon Commission on

1 America's Nuclear Future for extending me this
2 invitation to provide perspective of America's
3 Building Trade Unions on both the role and
4 capacities of the nation's skilled craft
5 workforce and the revitalization of America's
6 nuclear energy industry.

7 I wish to defer to my co-panelists
8 the question on governmental action needed to
9 rebuild America's domestic manufacturing
10 capacity as well as questions concerning the
11 current and future supply of engineers.

12 Although I will state for the record that
13 America's building trades unions are in strong
14 support of any and all efforts to rebuild a
15 sustainable domestic manufacturing sector that
16 will evolve into an integral source of job
17 growth for American skilled craft workers.

18 For my part, I will focus today on
19 the issues related to craft workforce
20 projections in association with the expanded
21 nuclear electrical generation portfolio.

22 First, let me state for the record

1 that American's building trades unions are
2 extremely pleased that nuclear power is once
3 again widely understood to play an essential
4 and expanded role in America's energy
5 portfolio.

6 If necessary greenhouse gas
7 reductions are to be achieved, and if we are
8 to lessen our dependence on unsustainable
9 sources of foreign-supplied energy, our unions
10 are determined to assist the industry and the
11 administration to assure that the comeback is
12 a resounding success story, not only for the
13 electrical utility industry but for the nation
14 as a whole.

15 But there are critical issues that
16 need to be resolved before any of the success
17 can be realized. It is in addressing these
18 issues that the nuclear industry will benefit
19 from having a reliable and effective partner.

20 Loan guarantees and licensing
21 issues along with the ability to provide the
22 necessary skilled labor to construct the new

1 generation of nuclear power facilities in a
2 manner that keeps costs under control are
3 challenges that can be best met through
4 government, labor and nuclear industry
5 partnership.

6 Obviously, the availability of the
7 world's safest, most highly trained and
8 productive skilled craft professional
9 workforce is a vital component of the
10 expansion of the nuclear power industry.

11 Training infrastructure is in
12 place and can be scaled upward to levels of
13 the projected demand based upon current
14 docketed License Applications. The skilled
15 craft training system that our unions operate
16 in the United States is apprenticeship-based
17 and is maintained by labor management
18 contributions.

19 Approximately \$1 billion is spent
20 each year by that system in direct training
21 expenses. When the wages paid to apprentices
22 for on-the-job training wages are included,

1 the total expense for each year is
2 approximately \$15 billion.

3 Our new nuclear power construction
4 labor agreement has a training framework that
5 is built on that apprenticeship system, and to
6 it the agreement adds important enhancements
7 necessary to achieve the level of specialized
8 training required in the exacting nuclear
9 construction industry.

10 For example, the agreement
11 includes unprecedented language that would
12 allow for labor shortages in one craft to be
13 filled with workers from another craft or from
14 any other credible source.

15 Further, the agreement contains
16 language allowing 100 percent portability for
17 outage work for the same owner in order to
18 meet short term demands such as outages. The
19 agreement additionally provides for the use of
20 apprenticeship, apprentices, and other sub-
21 journeyman classifications in order to contain
22 unit costs to encourage efficient crew

1 composition.

2 And finally, the agreement
3 establishes an extraordinary commitment to the
4 development of on-site or near-site multi-
5 craft training facilities to ensure the safe
6 supply of skilled workers to provide
7 specialized training for journeyman and/or
8 apprentices, or to be used by vendors to train
9 and certify workers on the installation of
10 specialized equipment.

11 These facilities can also be used
12 to provide career development to workers
13 recruited from the communities by the owner
14 for operations and maintenance positions
15 necessary to operate and maintain the facility
16 once -- the facility upon completion.

17 On the labor demands side,
18 according to 2009 analysis on design and
19 construction conducted by Bechtel Power
20 Corporation for Bipartisan Commission led by
21 Senator Domenici, in which the building trades
22 participated, roughly 4,000 skilled craft

1 professionals will be required at peak
2 construction for a new nuclear power plant
3 generating 1600 megawatts of electricity.

4 There are, according to the
5 Department of Energy, 17 combined operating
6 license applications embodying the
7 construction of 26 new reactor facilities that
8 will have been docketed with the Nuclear
9 Regulatory Commission. Accordingly, over
10 100,000 skilled craft professional who are
11 trained and certified for nuclear construction
12 work will be required to address the manpower
13 needs posed by these projects currently on the
14 NRC docket.

15 The report to which I refer
16 benefitted greatly from Senator Domenici's
17 personal leadership and was completed in 2009
18 by the National Commission on Energy Policies
19 Task Force on America's Future Energy Jobs, in
20 which, as I indicated, the building trades
21 participated.

22 Among the report's recommendations

1 were the following: Built upon existing
2 programs including joint labor management
3 apprenticeship programs, clarify and
4 streamline support for apprenticeships,
5 technical certifications and on-the-job
6 training for veterans by combining the
7 benefits of the post-9/11 GI Bill and the
8 Montgomery GI Bill into one program;
9 communicating that skilled trades are a vital
10 component of the American economy and should
11 be viewed as desirable options for
12 individuals seeking career training.

13 Encourage the development of
14 accredited, credential-focused programs that
15 put individuals on a long-term career track,
16 programs that should allow transferability of
17 credits throughout the industry and should
18 develop skills that translate from one program
19 to the next. Programs should issue stackable
20 credentials that allow individuals to develop
21 the building blocks of a career in the energy
22 sector.

1 Accumulating a pool of highly
2 skilled, highly valued and qualified
3 construction workers needed to build nuclear
4 units and maintain them will no doubt be a
5 challenge, especially in light of the fact
6 that qualified boilermakers, millwrights,
7 pipefitters, electricians, and ironworkers are
8 expected to be in short supply in some local
9 labor markets.

10 The use of workers from other
11 communities and states, travelers, as they're
12 known in our industry, will no doubt be an
13 important component in addressing the project
14 manpower needs for the nuclear buildout.

15 These and other factors beg the
16 question as to whether or not American's
17 building trades unions have the capacity to
18 meet this demand. And the answer is a
19 resounding yes. We do have the capacity to
20 meet this demand, and yes, as evidenced from
21 our new nuclear power construction agreement,
22 we also are looking at innovative ways to

1 supplement our current and future capacity in
2 order to address various isolated issues
3 associated with demographics and geography.

4 For example, thinking innovatively
5 and strategically about the necessary steps
6 needed to ensure the development of safe,
7 productive and qualified workforce in areas
8 that are remote and thinly populated. In
9 general, American's building trades unions, in
10 conjunction with our signatory contractors,
11 operate the largest and most effective skilled
12 craft training apparatus in the world.

13 We have well-equipped training
14 facilities in every medium to large city in
15 the country and it is important to note, in
16 these days of budgetary concerns, our training
17 infrastructure is self-supporting and self-
18 sustaining. It's not federally funded or
19 state funded.

20 Today, our training capacity is
21 significantly underutilized. That is mostly
22 the byproduct of the current economic

1 depression in the construction industry. But
2 even in tight labor markets, our training
3 capacity has been underutilized.

4 Currently, the biggest problem
5 that we face is on the demand side. The
6 current depression, and I use the term
7 depression, not recession, because when you
8 have 20 percent unemployment in the
9 construction industry today, that is a
10 depression, is putting us in danger of losing
11 many of our best and brightest to other
12 careers and industries.

13 And that encompasses not only
14 skilled construction workers but the qualified
15 instructors and trainers that train our
16 apprentices and upgrade the skills of our
17 journeyman.

18 So, the question is not whether
19 American's building trades unions have the
20 capacity to meet the needs of the burgeoning
21 nuclear industry. We do. The question is
22 whether we have the national will to take the

1 necessary steps to quickly move forward with
2 the national agenda that places a priority on
3 the revitalization of our nation's portfolio
4 of clean power generation sources, including
5 not only nuclear power but facilitating and
6 utilizing modern coal technology and renewable
7 energy sources.

8 I thank you once again for the
9 opportunity to provide this perspective.

10 Thank you.

11 CHAIR DOMENICI: Sean, thank you.
12 Thank you very much. Let me say from this
13 senator's standpoint, it's been a pleasure
14 working with all of you on the loan guarantee
15 programs and those other areas where we've
16 been trying to move the applicants and
17 licensees along.

18 In that work, we were able to see
19 how the AFL-CIO had terrific programs to train
20 the people for a new power plant. The problem
21 is we can't get the power plant started on
22 time, and we can't get enough of them going in

1 the United States because of -- for economic
2 reasons. But there's no better source of
3 training than the contracts they enter into
4 with you training the people.

5 Great jobs, high-paying, and you
6 don't worry about the fact that everybody's
7 not getting a college degree. You're saying,
8 here's \$25-\$30 an hour jobs. If we can teach
9 them and make them permanent, we're glad to be
10 part of that Middle Class America. That's
11 what you all say, and I do compliment you for
12 it. I think it's absolutely right.

13 MR. MCGARVEY: Thanks.

14 CHAIR DOMENICI: Let's move ahead.
15 Our next one is Ms. Carol Berrigan, Senior
16 Director of the Industry Infrastructure and
17 Vice President of the Center for Energy
18 Workforce Development of the Nuclear Energy
19 Institute, NEI. Carol, would you proceed?
20 Ten minutes.

21 MS. BERRIGAN: Chairmen Domenici
22 and Peterson, and distinguished members of

1 this Subcommittee, my name is Carol Berrigan,
2 and I am the Senior Director for Industry
3 Infrastructure and Supply Chain at the Nuclear
4 Energy Institute.

5 Thank you very much for this
6 invitation to speak with you today about the
7 availability of the future skilled workforce
8 and manufacturing capacity necessary to
9 support the continued operation and expansion
10 of commercial nuclear energy generation in the
11 United States.

12 The nuclear industry faces several
13 challenges in meeting its future workforce
14 demands and reinvigorating the domestic
15 nuclear manufacturing base. Chief among these
16 challenges is the lack of a durable national
17 energy policy that creates an environment in
18 which long-term investment in energy
19 infrastructure is encouraged.

20 Due to the long lead times and
21 level of investment necessary for nuclear
22 project development, adherence to a consistent

1 long-term policy is critical.

2 Despite this, the commercial
3 nuclear industry has taken aggressive action
4 to create an infrastructure through which the
5 next generation nuclear workforce will be
6 trained and has implemented a program to
7 expand the domestic manufacturing base.

8 Since the interest of this
9 Subcommittee is the forecasted availability of
10 the nation's skilled workforce and
11 manufacturing capacity, I will begin with
12 describing the size of the workforce needed to
13 support the current nuclear industry and new
14 nuclear construction.

15 Each nuclear reactor in operation
16 today directly employs 400 to 700 people. In
17 addition to direct employment, the nuclear
18 industry relies on numerous vendors and
19 specialty contractors for additional expertise
20 and services.

21 In total, NEI estimates there are
22 approximately 120,000 workers employed in all

1 sectors of the commercial nuclear industry in
2 the United States.

3 NEI's 2009 workforce survey
4 indicated that 38 percent of current nuclear
5 utility employees will be eligible to retire
6 within five years. In addition, the industry
7 continues to experience non-retirement
8 attrition, which over the same period will
9 require replacement of approximately 10
10 percent of the workforce.

11 The resurgence of nuclear energy
12 will lead to increasing demand for skilled
13 labor at all levels. According to an analysis
14 by the National Commission on Energy Policy,
15 the development of a nuclear power plant
16 project will require 14,360 man-years per
17 gigawatt installed.

18 If nuclear energy generation
19 continues to provide 20 percent of the
20 nation's electricity supply, this will require
21 construction of roughly 20 to 25 new nuclear
22 units by about 2030. If the industry were to

1 construct these units, it would require
2 between 287,000 and 360,000 man-years of
3 labor.

4 Once built, these plants would
5 require 8,000 to 17,500 permanent full-time
6 workers to operate the plants, and additional
7 supplemental labor for maintenance and
8 outages.

9 Let's see. The commercial nuclear
10 industry has undertaken a systematic program
11 to create and reinforce the infrastructure
12 needed to develop the next-generation nuclear
13 workforce. As an industry, we are hiring.
14 Over 9,600 individuals were hired into the
15 industry in 2009.

16 The infrastructure was developed
17 to meet the future staffing needs of the fleet
18 of 104 commercial nuclear reactors currently
19 in operation, but was designed to be scalable
20 so that it could be expanded to meet future
21 workforce demands of new nuclear units as they
22 are constructed.

1 In addition to ongoing support for
2 nuclear engineering, university programs and
3 their related infrastructure, the industry has
4 centered on the development of the nuclear
5 uniform curriculum program. This program is
6 a systematic approach that utilizes community
7 colleges in key locations to deploy an
8 industry-recognized standard curriculum
9 structured to meet the industry's needs for
10 new workers in key disciplines.

11 The Nuclear Uniform Curriculum
12 Program has three components: quantifying the
13 industry's needs and supply of graduates from
14 partner programs, defining the curriculum and
15 implementing the appropriate number of
16 programs on a regional basis.

17 Currently, there are 43 community
18 colleges throughout the country that are part
19 of this program. They offer courses in
20 radiation protection, operations, electrical,
21 mechanical and instrumentation control
22 maintenance and chemistry.

1 In the 30-year period since 1980,
2 the US nuclear supply chain has contracted due
3 to a lack of new nuclear plant construction in
4 the United States and abroad. Thanks to
5 nuclear energy expansion currently underway
6 and on the horizon, the United States has a
7 unique opportunity to rejuvenate the US
8 nuclear manufacturing sector through
9 investment in state-of-the-art factories and
10 facilities, and processes to supply the high-
11 precision, high-quality components demanded of
12 nuclear technologies.

13 Today, there are 60 nuclear power
14 plants under construction around the world.
15 In addition, there are 149 plants on order and
16 344 projects under consideration. This
17 represents a significant opportunity for US-
18 based suppliers and some have begun responding
19 by adding staff capacity and developing
20 additional manufacturing facilities.

21 Over the past few years, we have
22 seen a significant increase in the number of

1 domestic nuclear suppliers. ASME Section 3
2 Nuclear Certificates, commonly called N-
3 stamps, held in the United States have
4 increased 34 percent since the beginning of
5 2007.

6 Currently, 46 percent of all N-
7 stamps are held in the United States. Demand
8 for high-quality commodities, components and
9 services provides an important opportunity for
10 US manufacturers. The Nuclear Energy
11 Institute estimates that the world market
12 represents potentially orders of over \$400
13 billion in equipment and services over the
14 next 15 years.

15 As a rule of thumb, the Department
16 of Commerce's estimates indicate that for
17 every \$1 billion of exports by US companies
18 represents somewhere between 5,000 and 10,000
19 jobs domestically.

20 Due to their size and complexity,
21 nuclear plants create a broad range of
22 domestic manufacturing and export

1 opportunities. For example, depending on the
2 design, a single new nuclear plant requires
3 approximately 500 to 3,000 nuclear grade
4 valves, 125 to 250 pumps, 44 miles of piping,
5 300 miles of electrical wiring, and 90,000
6 additional electrical components.

7 NEI has gathered information from
8 companies managing three of the five lead
9 projects here domestically, and our survey
10 shows that three of the lead projects will
11 obtain between 60 and 80 percent of
12 components, commodities and services from US
13 firms.

14 Three of the five lead plants,
15 more than 2 billion of equipment and services,
16 have already been procured from US companies
17 in 17 states, and three of the five design-
18 centered project teams have set procurement
19 and labor goals of between 75 and 90 percent
20 US content and are on the way to achieving
21 these goals.

22 Beyond the development and

1 adherence to a durable long-term energy
2 policy, there are several areas where the US
3 government can assist in the expansion of the
4 workforce and reinvigoration of the supply
5 chain.

6 Robust administration support for
7 the expansion of nuclear energy domestically
8 is required, as well as a consistent policy to
9 support the export of nuclear products and
10 services. Investment and research for the
11 next generation of new technologies will
12 further open opportunities for American
13 companies to take back technological
14 leadership.

15 As with the current generation of
16 reactors, though, success will require
17 political support, consistent policy and a
18 willingness to address international barriers
19 to trade.

20 The federal government should
21 renew and expand the 48C tax credit made
22 available in the American Recovery and

1 Reinvestment Act. This credit will help US
2 industry invest in the development and upgrade
3 of nuclear manufacturing facilities.

4 Continued federal support of
5 nuclear workforce programs and tax incentives
6 for worker training are needed. The
7 integrated university program at the
8 Department of Energy and the Nuclear
9 Regulatory Commission should be continued.

10 This program is helping to effectively educate
11 technicians and professionals for careers in
12 all sectors of nuclear science and technology.

13 In addition, federal support for
14 research reactor infrastructure and the
15 Advanced Test Reactor National Scientific User
16 Facility at Idaho National Labs should be
17 continued. The federal government should
18 provide tax credits for the expenses of
19 training workers for nuclear power plants and
20 facilities producing components for fuel for
21 such plants.

22 This credit would serve to

1 accelerate hiring and allow industry to
2 utilize a broader range of workforce training
3 solutions, including apprenticeship programs,
4 community-college-based education programs and
5 specialized technical training not currently
6 available at public educational institutions.

7 In closing, the development of the
8 future nuclear workforce and reinvigoration of
9 the domestic manufacturing base have long lead
10 times and require adherence to a consistent
11 long-term policy that supports the expansion
12 of nuclear energy domestically and the export
13 of nuclear products and services.

14 Success in this area represents a
15 tremendous potential for the US nuclear
16 industry and for the American worker. I
17 appreciate this opportunity to speak with you
18 today on these important issues. I would be
19 pleased to answer any questions that you may
20 have.

21 CHAIR DOMENICI: Our next speaker
22 is Dr. Henry Cialone, President and Chief

1 Executive Officer of the Edison Welding
2 Institute.

3 DR. CIALONE: Good morning, Co-
4 Chairs Domenici and Peterson and Members of
5 the Commission. I appreciate this opportunity
6 to come talk to you.

7 EWI, located in Columbus, Ohio,
8 works with manufacturers in all sectors of
9 industry, from aerospace and automotive to
10 consumer products and shipbuilding, to help
11 them be more competitive through the use of
12 advanced manufacturing technologies.

13 So, my comments will come from the
14 perspective of technology. Two years ago, EWI
15 created the Nuclear Fabrication Consortium to
16 advance new nuclear fabrication technology
17 that helps its members to support the domestic
18 and international nuclear markets.

19 So, in response to your first
20 question about capacity, I think there are
21 three forces that act here. One is believable
22 demand. Industry can respond to a demand.

1 They need to know that it's going to be real.

2 They need to know when it's coming.

3 Many of the members of our
4 Consortium formerly were N-stamp certified.
5 They aren't today, and they're waiting on the
6 sidelines to see if this is really going to
7 happen and when. Because when you look at a
8 return on investment analysis, one of the
9 biggest factors is time. What's the delta-T
10 for when cash comes back?

11 Second is, competition from other
12 employers. What other industries are going to
13 be building things? If we look out ahead, we
14 do a lot of work with pipeline construction
15 companies. They're projecting an increase in
16 demand. They're concerned about the
17 availability of workforce in the next five
18 years or so. And so that's going to be one of
19 the factors as well.

20 Third is technology. Can you get
21 more from existing workforce through the
22 introduction of technology? And that's the

1 kind of thing that we do for a lot of our
2 customers.

3 We have worked with the US Navy on
4 what's called the ManTech Program, which
5 continuously brings forward manufacturing
6 technologies that reduce cost and increase
7 quality.

8 So, as an example, the Navy
9 Joining Center, which we operate, is currently
10 working on a project to replace conventional
11 arc welding with mechanized tandem gas metal
12 arc welding to increase productivity by 200 to
13 300 percent. That has a huge impact on the
14 number of man-hours it takes to build an
15 aircraft carrier, for example.

16 Another example involves a
17 fabrication of submarine structural
18 components. Component was fabricated ten
19 times faster by transitioning proven
20 technologies from the automotives side of the
21 house to the Navy shipyard.

22 So, I guess the short answer to

1 the question about capacity is it depends. Is
2 the demand going to be there? Is it
3 believable? Are there other industries that
4 are going to have comparable growth and demand
5 in the same time frame? And are there new
6 technologies that are going to be brought
7 forward to help to meet that demand with the
8 existing workforce?

9 Second question, capability:

10 Really all the manufacturing capabilities that
11 are needed to build a nuclear reactor exist in
12 the US today. The one that's missing is
13 ultra-heavy forgings.

14 We believe there are ways to
15 address this. One might be to modify the
16 design of next-generation reactors,
17 alternatively implementing new manufacturing
18 and welding techniques that would enable
19 fabrication instead of forging to the same
20 complex components.

21 If you could just allow six
22 additional welds in pressure vessel heads,

1 current forging capabilities in the US would
2 be adequate to meet the need. Now, the
3 challenge there is inspection.

4 Well, there are new inspection
5 technologies that have been developed over the
6 years. To name two that I think really should
7 be looked at, one is digital radiography: much
8 more accurate, much more detailed. You can
9 see and you can size defects, and the
10 challenge in inspection is not only finding a
11 defect, but knowing what size it is and where
12 it is exactly.

13 The other is matrix phased-array
14 ultrasonics. These were both developed
15 dramatically over the last decade or so in
16 other applications. They should be looked at
17 to port them over.

18 But the other is, why not build
19 the capacity in the US? We've seen rough
20 estimates to build a heavy forge, acquire the
21 special handling equipment, build the building
22 to house all this, ranging from \$200 million

1 for a retrofit to \$1 billion for a greenfield
2 site. Relative to the cost of building a
3 nuclear plant, that's not a lot of money.

4 Third question, government's role.
5 So government's role is reducing technical
6 risk and your industry deals with commercial
7 risk. And I think government can enable the
8 introduction of new technologies.

9 I mentioned the ManTech program.
10 That's something that the Navy and the Air
11 Force do. They get a lot of value out of that
12 in helping to continue to extend existing
13 platforms and to build new platforms
14 efficiently.

15 A ManTech program for reactor
16 construction would focus on high-quality,
17 high-productivity technologies. At the same
18 time, the government could engage community
19 college systems and universities to prepare
20 the workforce to implement these new
21 technologies.

22 I'm going to defer the question on

1 engineers in the pipeline. I think Carol has
2 already addressed that. But in terms of
3 wrapping up recommendations, I don't think the
4 sky is falling. I think there is an
5 opportunity here, okay?

6 We've heard from several of our
7 NFC members that while domestic manufacturing
8 capacity must be addressed, it's also vital
9 that there be a focus on transitioning these
10 technologies from the lab to US manufacturers,
11 and I think that has always been a gap in the
12 US. We create new things, and we don't think
13 about how to get it into the hands of
14 manufacturers.

15 Looking to the existing portfolio
16 of the national labs, a lot of great new
17 technologies, but nobody is thinking about how
18 do we actually build something out of this.

19 So, one thought would be, why not
20 create a lab for transitioning technology:
21 something that focuses on the manufacturing
22 challenges of taking new designs and new

1 concepts and putting them out in the field,
2 demonstrating them at scale so that people can
3 have confidence that this actually works
4 before you actually go out and build
5 something.

6 Why a lab rather than just a
7 ManTech program, which is what the Department
8 of Defense does? Well, one of the big
9 challenges in introducing new technology in
10 this space is regulatory acceptance.

11 When you've got NRC leveraging the
12 standards bodies like ASME, you need someone
13 who can engage with them, and I think a
14 laboratory could provide this function.

15 The other suggestion is
16 repurposing existing assets. We talked
17 earlier about the ultra-heavy forgings.
18 There's a lot of restructuring going on, and
19 there are a lot of assets, both human and
20 physical, that are available, or coming
21 available.

22 One example that comes to mind is

1 Northrop Grumman's Avondale facility,
2 shipbuilding facility, in New Orleans. It'll
3 be closing down in 2013. They've got 5,000
4 skilled employees there. There are metal
5 workers, welders, pipefitters, electricians,
6 a whole bunch of specialty jobs, a lot of the
7 same specialties that would be needed to build
8 nuclear components.

9 A huge site. It's on water. Easy
10 to barge product to an end customer. The
11 level of expertise is very high. There's a
12 lot of sophisticated work going on there as
13 well. I'm sure there would need to be some
14 retraining, but it wouldn't be a very long
15 putt.

16 Why not convert that to the ultra-
17 heavy forging capacity that's needed in the
18 country? And that's just one facility. There
19 are lots of others. And so I think we need to
20 take a look at it systematically and figure
21 out what are the opportunities there, and take
22 advantage of them. So that's another role

1 that government could play.

2 So, in summary, I think there
3 needs to be a plan to take advantage of the
4 opportunities. Create alignment. Connect the
5 dots. Identify and address overarching needs
6 in this reemerging industry sector. I think,
7 as I said, it's a great opportunity. Thank
8 you.

9 CHAIR DOMENICI: Thank you very
10 much, Doctor. Our next speaker is John
11 Gutteridge, Manager of Nuclear Education
12 Programs at the Nuclear Regulatory Commission.
13 Welcome.

14 MR. GUTTERIDGE: Thank you,
15 Senator Domenici, Dr. Peterson, Commissioners.
16 I spent 34 years at the Department of Energy
17 and the last three years at the NRC, about the
18 last ten years doing nuclear education.

19 As all of you know, the 1960s and
20 1980s were heyday for nuclear. We had 64
21 research reactors, over 50 nuclear engineering
22 programs, 1,800 -- more than 1,800 students,

1 and we were ordering and building nuclear
2 power plants.

3 However, things happened with the
4 accidents during the late `70s and early --
5 mid `80s. The plight of nuclear engineering
6 education was acknowledged. We have the
7 Chairman of this Nuclear Engineering and
8 Education Cause for Concerns sitting in the
9 audience, Tom Isaacs. I served on that panel
10 in Paris for the latter two years of the 20th
11 century.

12 There's a seminal document in that
13 it got the world and the US acknowledging that
14 we had a problem in nuclear engineering. And
15 after that, the DOE programs developed very
16 rapidly.

17 This is a timeline chart that
18 shows you the programs that DOE and NRC have
19 implemented over the years. Some of these
20 still exist. Some do not. I can't discuss
21 all of them here, because they're obviously
22 very numerous.

1 So what happened? In the '90s to
2 2006, the university programs at DOE grew very
3 rapidly from 3 million to 30 million. DOE
4 decided in '06-'07 to suspend the program.
5 Congress decided that the program needed to
6 continue. Actually, Senator Domenici was part
7 of that in the mid-2000s, and transferred part
8 of it to the NRC, the part that the NRC could
9 do without impacting their licensing aspects,
10 and DOE restarted their program in 2009.

11 The current NRC program is
12 authorized in the Energy Policy Act of 2005,
13 beginning in 2007 with curriculum development
14 program, \$5 million. And a year or so later
15 in 2008, Congress authorized the rest of the
16 program with \$15 million.

17 I'll tell you what's in that
18 program, but the one thing that is key is it
19 went to related trades as well, not just four-
20 year institutions. The grant specifics are
21 listed here: scholarships, fellowships,
22 curriculum development, faculty development

1 and creating community college scholarships.

2 You can see the amounts that we
3 allow, and the years that we allow them to
4 occur. And it's been a very successful
5 program so far.

6 The one thing that is unique about
7 the NRC program, versus some scholarships
8 given out by DOE and others, is we have a
9 service agreement, and this serves to focus
10 the students before they accept the
11 scholarship or fellowship to acknowledge that
12 they need to serve at least six months in the
13 nuclear industry for every year or partial
14 year of support. And failure to comply with
15 this is very costly, because they need to pay
16 back the money that NRC has forwarded to them.

17 This gives you an indication of
18 the states and the territories that have
19 received the grants. Actually, it's very
20 widespread over the years. This shows you the
21 enrollment trends, which the dark blue is
22 graduate. The light blue is undergraduate.

1 Now, if we went back before 2004,
2 back to the late '90s, you'd have about 600,
3 and now you have 4,750.

4 This is probably too small for
5 most of you to read, but it shows each school
6 that's involved, the light blue being graduate
7 students, the red being undergraduate
8 students, and the other two being people who
9 have graduated from a graduate program and
10 from an undergraduate program.

11 The top one there is always Texas
12 A&M. It'll probably always remain that way.
13 The ones below that shift from year to year.
14 But you can get the impression that there is
15 about the top ten schools that educate our
16 nuclear engineers.

17 So NRC supports over 500 students
18 annually at 108 institutions over the last
19 four years. Right now, we're emphasizing
20 trade schools, community colleges, two-year
21 programs, minority-serving institutions, and
22 health, physics and radiochemistry. The NE

1 programs seem to be doing quite well.

2 We do encourage leveraging and
3 partnering. In fact, of the \$20 million we
4 gave out last year, \$10 million of that was
5 leveraged.

6 What is working? The population
7 is growing, the student population, perhaps
8 even too fast, as I'll get to in a second.
9 New university nuclear programs are beginning
10 throughout the country. Our funds are
11 leveraged, which is nice to know.

12 Partnering is occurring not only
13 among schools, but also with utilities in
14 schools, and it has increased interest in our
15 trade schools, community colleges. The first
16 year we offered the scholarship, we had seven
17 applicants. Last year we had 19. All were
18 funded, by the way.

19 Our applications far exceed our
20 available funds. Although all the trade
21 schools are funded, only about a third of the
22 four-year institutions are funded -- of the

1 applications.

2 The greatest near-term workforce
3 needs appear to be trade and crafts. At this
4 moment, outreach to pre-college students is
5 absolutely necessary. It was a big part of
6 the DOE program. Right now, not much is being
7 done in that area, either by NRC or DOE. And
8 unfortunately or fortunately, success may
9 depend for the foreseeable future on continued
10 government support of nuclear education.

11 What hurdles do we have? We need
12 to better understand the workforce in terms of
13 personnel and the physical infrastructure
14 needs. We do not have a good handle on that.
15 That has been attempted over the past ten
16 years and we have not succeeded.

17 The NRC program has a limited
18 scope and flexibility. We are basically
19 stovepiped into the four or five disciplines
20 we've supporting. It's very difficult to
21 support things that come up that are of
22 interest to us, which we were able to do in

1 the DOE at the time.

2 There's always annual funding
3 uncertainty. The DOE program is usually
4 funded; 20 percent of the research dollars.
5 The NRC program is usually fought over among
6 the Commission, OMB and the Congress.

7 We have a lot of duplication of
8 effort going on, and we're going to try to
9 avoid that in the future, and the outreach is
10 very important. I'll give you an example of
11 outreach in this next slide.

12 While we were at DOE, we felt that
13 we needed to educate high school students
14 about nuclear engineering and energy in
15 general. We came up with The Harnessed Atom,
16 which is a high school honors edition that is
17 taught to 10th, 11th and 12th graders and gets
18 them interested, and they get to visit a
19 nearby research reactor, and it has been
20 implemented in several locations around the
21 country. Massachusetts: MIT deals with
22 Brookline. North Carolina State deals with

1 Wade County in North Carolina, and other
2 places.

3 The -- I believe the Federal
4 Nuclear Education Program appears to be
5 developing a sufficient pipeline of personnel.
6 Funding continuity does instill confidence in
7 federal commitments to nuclear education.

8 When the DOE had the hiccup in
9 '06-'07, a lot of the schools were saying, "If
10 the government is really not interested in
11 supporting education, then we need to back off
12 a little bit ourselves."

13 Absent retirements and new builds
14 though, we seem to be -- we might be incurring
15 an oversupply in some areas. Visiting various
16 schools recently, I found a lot of very high-
17 caliber students, and in some Texas schools,
18 that couldn't find employment.

19 We also had a recent call from a
20 two-year institution that said they didn't
21 need any money this year because they can't
22 place their current graduates. So that might

1 be a problem. I've never heard of that prior
2 to this year.

3 There is a supply and demand
4 survey being conducted by the DOE. It's
5 supposed to be out in October. I think it may
6 be delayed a bit, but they are going to try to
7 quantify what's needed in radiochemistry,
8 health physics and nuclear engineering, and
9 see what the supply and demand is so we don't
10 overeducate in the wrong areas. Thank you
11 very much.

12 CHAIR DOMENICI: Thank you very
13 much. Our last speaker is James Stouch, Vice
14 President of Business Development for
15 Precision Customs Components, LLC, of York,
16 Pennsylvania. I assume you're part of that
17 business, sir?

18 MR. STOUCHE: Yes. That's correct.

19 CHAIR DOMENICI: You own part of
20 it?

21 MR. STOUCHE: I own a piece of it,
22 yes.

1 CHAIR DOMENICI: Fine. We're glad
2 to have a businessman here.

3 MR. STOUCH. Very good, thank you,
4 and I enjoy the opportunity to present some
5 remarks today from the perspective of a
6 manufacturer. I appreciate your time, Senator
7 Domenici, Dr. Peterson, and the rest of the
8 Subcommittee.

9 It is the perspective of a
10 manufacturer that I bring today. We are
11 located just 80 miles north of here, and I
12 would extend an invitation to any member of
13 the Commission at any time, together or
14 separately, to visit us and see how we do
15 things.

16 We are an original Rickover-era
17 supplier, as S. Morgan Smith Company, and then
18 Allis-Chalmers nuclear, and today privately
19 held Precision Custom Components. Our history
20 is deep in both the Navy and the civilian
21 nuclear program. We manufactured the first
22 reactor vessel internals for Shippingport 1,

1 the first commercial nuclear plant in the
2 country.

3 Today, Babcock & Wilcox and our
4 company are the only remaining manufacturers
5 who have manufactured reactor pressure vessels
6 of steam generators in the United States.

7 I'm accompanied by 275 teammates
8 that include in our shop labor force the
9 International Association of Machinists and
10 Aerospace Workers, Local 1403, and fortunately
11 we have shared in the nuclear renaissance to
12 date, having won some business from both
13 Curtiss- Wright and Westinghouse, and are
14 supplying some reactor vessel internals and
15 other primary coolant pump components, and
16 other reactor-related components for the two
17 plants in China, as well as Vogtle, the two
18 units at Vogtle in Georgia, the two SCANA
19 units at V.C. Summer in South Carolina, and
20 even a couple of components for Progress
21 Energy's Levy County Plant in Florida that is
22 currently in suspension.

1 Commercial nuclear power,
2 obviously, given its ups and downs, is not our
3 only business line. We do manufacture
4 pressure vessels for other energy sectors, as
5 well as engage in the Navy nuclear program and
6 other shipbuilding programs for DOE and DOD,
7 as well as the MOX program, its dockside fuel
8 fabrication facility, and the NGNP with DOE
9 and some NASA work as well.

10 A component of our history also in
11 the energy business includes the fact that we
12 built the original hydroturbines for Hoover
13 Dam in our plant. So we've been involved a
14 long time, have maintained an N-stamp for
15 decades, and are proud of that.

16 I'm going to pass through the next
17 couple of slides in the interest of time, and
18 allow those to stand in the record, but
19 basically as we understand, even when we take
20 account of the increased demand for
21 electricity, even accounting for -- I saw a
22 number recently of a 5 percent reduction in

1 demand growth, but we account for a climate
2 change as a societal issue to increase the
3 need for base-load carbon-free generation.

4 Challenges with financing,
5 transmission grid capacity, all of that, the
6 bottom line is there will probably be a need
7 worldwide for new nuclear capacity. So the
8 balance of my remarks are getting back to the
9 agenda, first to deal with the human resource
10 component from the standpoint of labor,
11 engineering and the like.

12 First of all, I'd like to
13 calibrate this kind of discussion. The fact
14 that back in the 1950s, we didn't know how to
15 do any of this, and we figured it out:
16 developed the designs, trained the workforce,
17 adapted our manufacturing practices and
18 capabilities, and we figured it out.

19 And there were bumps along the
20 road: issues with materials and corrosion and
21 joining technologies and design and the like.
22 Today, in addition to that, we have a current

1 staff, as I mentioned, of 275. We had as many
2 as 850 employees at our site. The way we're
3 facilitized today, we could probably double
4 our current numbers.

5 So, we have the space and the
6 machine capacity to do this. We've helped
7 ourselves as well. About six years ago, we
8 reinstituted our apprenticeship program. That
9 is a four-year program to enable machinists to
10 come out of that program with a state
11 certificate as a journeyman machinist.

12 Hopefully, they will never leave
13 PCC, but nonetheless, it is transportable. In
14 addition to that, we work locally with the
15 Advanced Skill Center, which is a 501(3)(c)
16 organization, to pull pre-trained individuals
17 for our welding and fabricating capability.

18 So there are some existing
19 programs in place, and there is capacity to
20 build from there.

21 We tend to concentrate, when we
22 talk about engineering graduates, on nuclear

1 engineering an the nuclear science programs.

2 I know from our perspective, we've hired over
3 the last couple of years some very good recent
4 grads from Penn State and other quality
5 institutions in mechanical engineering,
6 manufacturing and industrial engineering.

7 There are those disciplines from
8 the manufacturing perspective that should not
9 fall off the table and be included into the
10 discussion, along with nuclear engineering and
11 nuclear sciences: metallurgists, welding
12 engineering, metallurgical engineering,
13 mechanical, industrial and manufacturing
14 engineering as well.

15 Dr. Cialone touched on this, but
16 just one caution in this: while my message is
17 one of yes, we have available capacity, I
18 believe we can -- we have the manpower and
19 training capability and capacity to take care
20 of 20 to 25 units by -- in the next 20 years
21 or so.

22 But 2007, we don't have to look

1 too far back to get to the point where a
2 number of our market segments were all on
3 overdrive. And we can argue about, was that
4 artificially supported or not? But we had
5 \$130 a barrel oil that gave other energy
6 sectors a lot of creative ideas to expand
7 plant and equipment.

8 We didn't have as much concern
9 over CO2 emissions at that time and I bet
10 every other week we received an RFP for some
11 major pressure vessel work to support coal
12 gasification plants, which does not exist
13 today in as nearly a big a way.

14 So there have been capacity
15 constraints when we overlaid strong economy
16 and strengthen all market segments. That
17 doesn't happen very often. I wish it would
18 happen more, but it doesn't, and that's the
19 only caveat I issue relative to the -- my
20 message of the fact that we have lots of
21 capacity in terms of human resources.

22 Let me address now the

1 infrastructure issue in manufacturing
2 capability and capacity. A lot of the
3 discussion in this arena typically grounds out
4 on ultra-large forgings. The ultra-heavy
5 forgings, obviously the pathway goes through
6 to Japan and France today.

7 However, we have announced ultra-
8 heavy forging facilities in Korea, China,
9 India, Russia and the UK. If they're all
10 built, there's probably, at least when you add
11 the numbers together, enough ultra-heavy
12 forging capacity in the world to move forward
13 with the plants that we perceive today.

14 Now, if we look at those
15 countries, not all of them are friendly to us.
16 The reason they're engaging in this is because
17 they have their own program. And so, would we
18 be a priority?

19 We do have a make-versus-buy-
20 question in essence ahead of us. Certainly
21 Senator Voinovich and others have been vocal
22 in terms of trying to instigate an ultra-heavy

1 forging facility here, but it's not just the
2 forge. It's the ability to melt the ingot and
3 produce the steel and the like.

4 The question at the bottom line
5 is, where is the market? And do we want to
6 make those here? The balance of the
7 components, and most of them, can be made here
8 in the United States, particular small modular
9 reactor components. They can all be
10 manufactured here. And I daresay there is
11 likely capacity or can be capacity.

12 A number of us -- you know, PCC is
13 a small business. We typically talk in terms
14 of Shaw and their modular construction
15 facility. We talk of Northrop Grumman and
16 their facility in Newport News. But the likes
17 of PCC, American Tank and Fab in Ohio, Oregon
18 Ironworks and Oregon Premier in Idaho, Rainier
19 in Massachusetts, Petersen in Utah, a number
20 around the country that are all small
21 businesses; we've got our own money at risk,
22 and most of us have stepped forward and built

1 some additional space and/or capability in
2 order to meet the nuclear renaissance, which
3 has been slower than we all expected getting
4 off the dime.

5 And so it is a small business
6 issue that provides jobs and will help sustain
7 and meet the need for the industry.

8 Lastly, the comments on government
9 actions, certainly expansion of the loan
10 guarantees: build it and they will come. We
11 have the capacity. We have the creativity.
12 We can get it done. Ultra-heavy forgings, we
13 have to figure out what we want to be there,
14 as a nation.

15 One of the things that doesn't get
16 a lot of press, but the reason why those of us
17 with N-stamps still exist and/or the
18 capability and capacity, is the fact that we
19 have adapted to other markets. Among those
20 have been the Navy Nuclear Program, the
21 shipbuilding program, the DOE programs and the
22 like.

1 It's a common supply base, the
2 common capabilities, and of course DOE, from
3 a standpoint of providing an academic base to
4 move forward. So, continued support to base-
5 load the industry and the manufacturing
6 industry.

7 If we have demand, then we need to
8 expand, certainly, and we will do what we say
9 we will do, and I believe we can do. And in
10 that case, then, certainly, investment tax
11 credit help and some training partnerships and
12 the like would facilitate that.

13 Finally, we're not afraid to
14 compete. We have exported components to
15 Japan. We are exporting through Westinghouse
16 components to China. And all we ask for is a
17 level playing field. I need a license from
18 DOE, a license from NRC, agreement at the
19 nation level through the Department of State.

20 Then I need to get a certification
21 in the country to which I'm exporting, and
22 those requirements on the other end are

1 government-generated rather than private
2 sector and market-generated. And so all we
3 ask for is a level playing field in order to
4 compete, and the imports coming the other way
5 as well.

6 I appreciate the opportunity to
7 present these remarks today and welcome
8 questions.

9 CHAIR DOMENICI: We appreciate
10 having you. Thank you very much. Thanks to
11 the entire panel. Now, I'm going to yield to
12 Per, who is going to lead off the questions.
13 Thank you again.

14 CHAIR PETERSON: If I can, I'll
15 start with questions, and then others will
16 have questions, if we could. So, the first
17 thing that I'd like to point out is that we're
18 interested, I think primarily, in trying to
19 project where nuclear power might be going in
20 the next few to several decades because that
21 is germane to the question of how we manage
22 the back end of the fuel cycle, which is the

1 Commission's charter.

2 So the issues being discussed
3 today clearly will play a substantial role in
4 what that trajectory might be, and one of the
5 major issues with workforce is associated with
6 demographics.

7 Now I think, Carol, you showed a
8 plot, which showed a bit of a skew towards
9 more gray hair, I guess. Right? So -- and
10 there are active efforts to bring new people
11 in. They tend to be young.

12 I'd be curious from each of these
13 major elements of the labor force that are
14 important: skilled trades, manufacturing. I
15 know a bit about the education part, but I'll
16 ask John to comment on that. What are the
17 implications of having essentially a gap in
18 the age range, and are there places where we
19 can fill that in?

20 In other words, are there places
21 where we can bring in talented people from
22 other backgrounds, who can fill in, for

1 example, in sort of the mid-level management
2 range or the supervisor range, or basically
3 that middle age range. I'd just like to hear
4 about what's going on in each of these major
5 labor force areas. Maybe Sean?

6 MR. MCGARVEY: On the -- on the
7 craft side, apprenticeship programs run,
8 depending on craft, three to five years. But
9 I think anybody that's in the industry will
10 say to be a real well-rounded what we call
11 mechanic, somebody that possesses the skill
12 sets to work on just about any kind of
13 application, needs -- he or she needs to be in
14 the field practicing their craft six, seven,
15 eight years until they're really a top-quality
16 mechanic, which then moves them into the
17 opportunity to be in a supervisory position,
18 whether it's foreman, general foreman,
19 superintendent.

20 So, I don't think the gap between
21 --the average age for our folks is in the
22 middle 40s, which is problematic for a whole

1 bunch of reasons, pension funding and others -
2 - doesn't lessen the skill sets that you
3 described.

4 But I think that the real problem
5 that we face and have faced: we worked for --
6 I just came back from a meeting in Panama City
7 with Southeastern Manpower Tripartite
8 Committee, where of course a lot of these
9 nuclear plants are going to be built along
10 with a lot of other heavy industrial.

11 We worked for years on putting
12 together what the problems were in the
13 industry to attract the best and the
14 brightest, and it always narrowed down to one
15 thing. It was economics.

16 If you want to attract good people
17 to an industry that's tough and for the folks
18 in the audience that don't understand the
19 unionized construction industry, we have no
20 paid holidays, no paid vacations, okay? We
21 have guaranteed two hours a day.

22 If it starts raining, and we can't

1 work, we get two hours pay. We get no more.
2 It's not like the Collective Bargaining
3 Agreement that you read about on -- in other
4 publications. We are a merit-based, market-
5 based operation in the construction industry.

6 So, in order to put up with all
7 that, and put the effort in in the heat and
8 the cold that it takes in a tough business
9 that wears your body out by the time you get
10 to your middle fifties, there has to be a
11 compensation level that makes sense for people
12 to want to go through that. And we've found
13 that the compensation level was nowhere near
14 where it needed to be, particularly in the
15 south.

16 And I want to use one example on
17 apprenticeship recruitment. I won't take a
18 lot of time. Local 134 of the IBEW electrical
19 local in Chicago, Illinois, takes in
20 approximately 500 new apprentices a year.

21 They have 7,000 applicants for 500 positions.

22 Ninety percent of the successful

1 applicants have a minimum bachelor's degree.

2 Okay, it's a \$100,000 position. 100,000.

3 Take the same IBEW local in Tampa, Florida,

4 where the economics are dramatically

5 different. They take in 100 new apprentices

6 a year. They have 150 applicants for 100

7 positions, and their academic achievement

8 nowhere comes close to what happens in

9 Chicago.

10 There's only one reason for it.

11 It's the economy of the profession down there.

12 So, we think that based on all the research we

13 did working with disparate groups, that in our

14 industry, it comes down to the economics of

15 the industry.

16 Different regions of the country

17 are going to attract the best and the

18 brightest, as opposed to other areas, which

19 are lower-wage states, right-to-work states,

20 competition, illegal immigration, other

21 factors factor into our industry, and you're

22 having it.

1 So, we could fill those gaps that
2 we have from the demographics, but it really
3 comes down to the economics.

4 CHAIR PETERSON: I think it was
5 Henry Ford that first discovered that if you
6 pay workers well, you get much better
7 production. And if you don't, you get a lot
8 of turnover, and you don't produce as well.

9 MR. MCGARVEY: And they can buy
10 your product.

11 MS. BERRIGAN: The one slide I
12 didn't put, that I actually had in the slide
13 deck that I removed was a slide showing the
14 change in that trend, short of the shifting of
15 that curve that you described.

16 What we are seeing in the utility
17 side of the industry is that we have been
18 hiring engineers. We've been hiring younger
19 people. The curve -- we're starting to see an
20 uptick from about the 28 to 32 cohort, and the
21 22 to 28 cohort in there. We're seeing
22 upticks in those areas.

1 One of the reasons that the
2 industry has invested in the Uniform
3 Curriculum Program was they did recognize the
4 need to bring people in. They recognized the
5 need to be able to train people to come to
6 work faster, and provide them with a more
7 sound academic foundation, so that they would
8 be able to move into those supervisory
9 ranks.

10 So, I think the investment that
11 we're seeing on the commercial side in
12 technicians through Uniform Curriculum,
13 through the more disciplined and systematic
14 hiring that we're seeing there is solving some
15 of the problem.

16 If you're familiar with the
17 nuclear utility industry, you know that we do
18 train a lot of folks internally. They come
19 through a training program at the plant. It's
20 a highly regimented, systematic training
21 program with a lot of licensing and regulatory
22 oversight.

1 So, I think from the utilities
2 standpoint, we're putting the things in place
3 necessary to deal with that curve that you've
4 seen. The other thing that's also a little
5 bit challenging sometimes is explaining that
6 potential retirement number.

7 The potential retirements indicate
8 people who are first eligible to retirement,
9 not necessarily who we expect to walk out the
10 door the next year. So, between the 9,600 or
11 so people we've hired in last year, we're
12 seeing that continued hiring trend. We're
13 seeing the Uniform Curriculum Program in
14 place, and we're seeing knowledge retention
15 programs and internal training programs.

16 I think we're managing that issue.
17 It's going to take sustained attention,
18 sustained investment on behalf of the
19 industry, but I think it's something that is
20 a manageable program for us going forward.

21 DR. CIALONE: Well, in the
22 technology area, I'm with Sean on a lot of the

1 comments that it's an economic question. If
2 you develop the best and brightest, have a
3 certain set of capabilities, and then you say,
4 "Well, there's an uncertain future ahead of
5 you," then they'll find a certain future, and
6 they won't go the direction that you thought
7 they would.

8 I'm happy to report from our area
9 that manufacturing is cool again. People
10 really care about it. And so, we're getting
11 a lot of bright young kids coming out of
12 college, who are looking forward to doing
13 things in manufacturing technology.

14 It still takes about five to ten
15 years before they're really -- you're able to
16 let them go without watching over their
17 shoulders, making sure that they haven't made
18 mistakes. And training is part of that, but
19 life experience is a big part of it too.

20 One of the interesting phenomena
21 we've observed is we, about five years ago,
22 started a new capability called Design

1 Controls and Automation. We never had that
2 capability in our company before.

3 So, we've got a bunch of young
4 kids running around, and they don't know what
5 doesn't work because they haven't done it
6 before. And so they're very creative and
7 they're fearless about trying new things.

8 So, yes, every now and then
9 something goes horribly, horribly wrong, but
10 that's a learning opportunity. So we've
11 recently brought in a gray-hair to make sure
12 we learn without damaging the customer's part.
13 But what you find is if there's an
14 opportunity, if there's time to learn, there's
15 time to have experiences and get good at it,
16 well, we still have a great capacity in the
17 pipeline, and we have to show them that
18 they're going somewhere.

19 MR. GUTTERIDGE: Well, NRC is very
20 fortunate to be the -- I think the only
21 federal agency that provides support for two-
22 year institutions in nuclear. And the

1 anecdotal evidence from the schools that we
2 hear is that a lot of these individuals going
3 into the welding academies, the trades, the
4 RPs, the I&Cs, the NDEs, they're much more
5 mature people than -- they're not students.
6 They're not 18-to-22-year-olds.

7 These are people in their late 20s
8 and 30s who are looking for a better job
9 opportunity, and the amazing part is that in
10 many of these schools, the people graduate
11 after two years, and they're coming out making
12 more than a four-year nuclear person would
13 make.

14 They're making \$65,000 to \$75,000,
15 and they have room for improvement as well.
16 So, that aspect is not a problem as far as the
17 distance between the folks who are retiring
18 and the people who are being hired.

19 The four-year and graduate
20 institutions, a little bit different story, I
21 suspect. But keep in mind that half of the
22 undergraduates in nuclear go on and get a

1 graduate degree, their Master's or a PhD.
2 Most of those folks are not headed to the
3 utility industry. They're headed to the
4 National Laboratories, and hopefully the
5 National Laboratories have some retention and
6 knowledge management programs in place because
7 otherwise there will be a huge gap in the
8 knowledge factor.

9 MR. STOUCH: My observations are -
10 - are basically three. One is new grads. I
11 have observed one of our customers,
12 Westinghouse, and the hiring binge that they
13 have been on over the last couple of years.
14 And gosh, I tell our guys when they're --
15 we'll go in for a kickoff meeting on a project
16 and there are three of us and 16 of them, "We
17 raise the average age of the room a couple of
18 years with just three of us," and that is
19 because they've hired an awful lot of very
20 young, smart people.

21 And because it takes five to ten
22 years for people to be kind of self-supporting

1 and functioning in the industry, people who
2 know how to build things, or we think we know
3 how to build things, sometimes provide great
4 insight back to our customer on
5 manufacturability and techniques and the like,
6 but nonetheless, there's the bottom end of the
7 pipeline being filled, the early end of the
8 pipeline being filled.

9 Another thing, anecdotally, I go
10 to conferences or I meet people and there are
11 a number of people who were in the nuclear
12 industry in the '80s, and they'd love to get
13 back into it. They've gone and they've done
14 something else, or they've been in the metals
15 industry early on. They've gone and done
16 something else, and they'd love to get back
17 into it.

18 So stealing from other industries
19 is another avenue to help that. I look at our
20 own situation, and we've got some terrific
21 resources who retired, and after about two
22 years either they've checked everything off

1 the to-do list at home, they got bored, or for
2 whatever reason, they wanted to come back.

3 We've got a number of folks: our
4 former chief engineer, I have a fellow helping
5 me who has been a program manager in our
6 organization for a long time. He was a Navy
7 nuclear officer. People who come back, maybe
8 30-32 hours a week, and provide terrific
9 resource and knowledge base.

10 And so we're stretching that
11 retirement curve, and stretching more capacity
12 out of that retirement curve. And so that
13 gives us an early, middle and kind of late
14 career resource stretch and capacity that's
15 very real by the observations I've had, even
16 though some of them are anecdotal.

17 CHAIR PETERSON: Thank you. That
18 -- it's helpful to understand what some of
19 the differences are in these areas. Second
20 question relates to domestic capacity to
21 manufacture various components.

22 I think, Jim, you noted that for

1 small modular reactors, components can be
2 fabricated here in the United States for
3 essentially all elements of that type of
4 plant. And I would expect that that's
5 probably the case also for Gen-4 technologies
6 as well, which also -- well, some of them do
7 require heavy forging. So it would be
8 dependent.

9 What I'm curious about is the
10 question of the qualification to do that.
11 That is, N-stamps and the ASME certifications
12 and other things. What the status is in that
13 area, and whether or not those are
14 capabilities that have to be added back in or
15 not?

16 Your company clearly still has its
17 N-stamp, obviously.

18 MR. STOUCH: Our observation on
19 that are -- is from a couple of angles. There
20 are a number of companies who never were
21 disconnected with the industry, who probably
22 could fill up additional capacity, and that

1 gives us one layer of capacity to utilize.

2 As Carol mentioned, there are 34
3 percent new N-stamps that have been issued
4 since 2007. So, there is some capability
5 there, albeit there were over 300 N-stamps
6 when we were doing this for real a couple of
7 decades ago.

8 The caution there is that it's a
9 culture. Nuclear quality culture takes some
10 time to practice. I daresay that you can buy
11 an N-stamp for \$50,000 or \$100,000. You put
12 together a little test piece, and as long as
13 you do that well, and you can demonstrate that
14 you have a quality manual that works to the
15 observation of the authorized inspector, you
16 can get an N-stamp.

17 In our organization, we purposely
18 do not participate in certain markets because
19 our quality culture is a bit more rigid than,
20 say, a dirt-floor fabricator elsewhere in the
21 country, and in some cases, those were hard-
22 won lessons, but nonetheless we know we don't

1 want our people to come in in the morning, and
2 ask them, "Well, dumb down on this project for
3 this customer." And then the next day come
4 in, "Well, today you're working on a nuclear
5 job, and you need to behave differently."

6 Every router, every traveler in
7 our shop, has a willful misconduct statement
8 on it that everybody reads everyday when they
9 go to perform an operation in our shop. If
10 there's a problem, we need to know about it so
11 we can deal with it. You don't sweep it under
12 the rug, and that's a cultural thing that is
13 partly learned in practice, not just trained,
14 and you wake up the next day with your N-
15 stamp, and move forward.

16 So, that's a concern, but it's a
17 process. And nonetheless, the market out
18 ahead of itself in some respects, has both
19 built capacity, as well as shown the interest
20 to increase the number of N-stamp holders, and
21 hopefully there will be enough of them in the
22 United States for us to sustain those. I

1 suspect there will be when the demand is -- is
2 certain and real.

3 CHAIR PETERSON: Allison?

4 MEMBER MacFARLANE: Just a quick
5 question for Mr. Gutteridge about your program
6 being an academic. I'm interested. Can you
7 say something about the disciplines or sub-
8 disciplines that are covered in the Curriculum
9 Development Program?

10 MR. GUTTERIDGE: Yes. The
11 Curriculum Development Program, which was the
12 first one at NRC received back in `07,
13 actually before I arrived, is much broader
14 than nuclear engineering, radiochemistry and
15 health physics.

16 It will deal with anything that is
17 nuclear related, materials, security,
18 safeguards, anything that you can tie remotely
19 to nuclear will be supported.

20 This does a couple things because
21 obviously the nuclear industry is not just
22 composed of nuclear engineers, and it also

1 opens it up a little bit to schools that don't
2 have nuclear engineering programs, which the
3 number 30 to 35, may be a little more right
4 now, it opens it up to minority institutions.

5 It opens it up to some of the
6 trade schools that I mentioned. It opens it
7 up to smaller institutions that want to start
8 a nuclear program, or have materials programs
9 right now that could go into a nuclear type of
10 material program.

11 So, it's a very broad program. I
12 didn't bring the chart that shows it, but I
13 did have one. And I'm glad to supply that if
14 you need to see all the disciplines that they
15 --

16 MEMBER MacFARLANE: I'm just
17 curious. So, can you just name a few places
18 where they're getting funding for security and
19 safeguard curriculum development?

20 MR. GUTTERIDGE: Well, probably --
21 there's not a whole lot of them actually.

22 MEMBER MacFARLANE: Right.

1 MR. GUTTERIDGE: Texas A&M might
2 be one of them. We haven't given any to the
3 Monterey School. It's a policy school. So,
4 it doesn't really qualify. Georgia Tech might
5 be another that has a minor program in that.
6 There are only three or four in the United
7 States.

8 MEMBER MacFARLANE: Yes, right.

9 MR. GUTTERIDGE: So, that's about
10 the only ones we funded.

11 MEMBER MacFARLANE: And what about
12 radiochemistry or nuclear chemistry?

13 MR. GUTTERIDGE: Yes.

14 MEMBER MacFARLANE: Would we call
15 it a lacuna?

16 MR. GUTTERIDGE: There's probably
17 five or six schools in the United States that
18 have a true radiochemistry type program. It
19 kind of gets -- nuclear chemistry kind of gets
20 lost in the shuffle with chemistry.

21 Obviously, I think the biggest and
22 perhaps the best program is Washington State,

1 Missouri, University of Missouri, Columbia.

2 There is a program at Texas A&M, Clemson. Of
3 course Florida State used to have the best
4 program. They halted theirs.

5 So, there's only about five or six
6 programs. UNLV has a program in
7 radiochemistry. So, they are few and far
8 between. When I went to a radiochemistry
9 conference recently, they re desperate for
10 graduates. They are desperate for students.

11 I think they said they graduated
12 six PhD's in `09. Six. Not many. Certainly
13 not enough to replace the ones that are
14 leaving.

15 MEMBER MacFARLANE: That's right.

16 MR. GUTTERIDGE: But Washington
17 State is doing a great job. Sue Clark is the
18 person out there that we deal with most, and
19 she has 46 students, almost all of them
20 graduate students. There's very few
21 undergraduates in radiochemistry.

22 MEMBER MacFARLANE: Thanks.

1 CHAIR PETERSON: Additional
2 questions? Okay, I think I'd like to finish
3 up with just one remaining question, which
4 relates to -- to sustaining these capabilities
5 over time. And so, Jim, you had noted that
6 there's a base of work from the Navy that has
7 done this. And John, you noted also that the
8 national labs have been a customer for nuclear
9 engineering departments over the last 20 years
10 or so.

11 Maintaining a domestic capacity to
12 manufacture and build nuclear infrastructure
13 I think has been a bit challenging. We're
14 also seeing the stability in terms of going
15 forward is making it very hard to understand
16 how to make investments in this area.

17 So, one of the things I'm curious
18 about is to what extent we can leverage other
19 areas besides the nuclear energy work to
20 sustain a more stable base? Or, is this
21 something where the fluctuations are going to
22 continue to be just a problem in terms of

1 being able to recruit and retain talented
2 people, again for each of these areas?

3 MR. MCGARVEY: For the skilled
4 crafts, I -- of course, we're desperate to get
5 this going, really get it going in a
6 meaningful way. But our biggest customer is
7 the Department of Energy. Okay, that's the
8 single biggest entity where members of
9 building trades unions work, across the
10 reservations, across the country.

11 So, the opportunity to keep them
12 certifications up, and keep those skill sets
13 up that are required to meet the DOE standards
14 at all the different facilities where we're
15 working from MOX out to Hanford is very
16 beneficial to the industry.

17 It looks like a lot of the
18 facilities that are going to be built, new
19 nuclear builds, are going to be in geographic
20 areas that are relatively close to some of
21 these DOE facilities, which is going to help
22 with the skill sets needed in the area.

1 Continuing on, we're ready to go.
2 We're ready to train. We're ready to work.
3 We have the capability, but it's not -- like
4 we were talking earlier, we don't build
5 widgets. We train skilled craft
6 professionals.

7 You don't train and put them on a
8 shelf, and when you're ready, you pull them
9 off and put them to work. It doesn't work
10 that way. It takes years to hone those
11 skills, and get the skill sets and the on-the-
12 job experience to make them that craft
13 professional that they are.

14 So, the quicker that we can get it
15 moving, the more people that we can get in the
16 pipeline, we can do that. And on top of that,
17 we -- 95 percent of all the existing nuclear
18 plants in the country, we do the maintenance
19 and refuelings on.

20 So, that again keeps up those
21 skill sets and those certifications, but
22 that's not nearly the number of people that

1 will be needed if and when, let's say when,
2 the real nuclear renaissance goes. We really
3 got to get people in the training pipeline.

4 CHAIR PETERSON: You also
5 participate then in major capital addition
6 type of activities like steam generator
7 replacements and things of that nature?

8 MR. MCGARVEY: Yes, of course. We
9 do 95 percent of all the nuclear plants in the
10 country. We do just about all that work.

11 MS. BERRIGAN: I think as we look
12 forward, the key point that I'd like for you
13 to take away around this issue is the need for
14 a durable national energy policy, and the need
15 for long-term planning.

16 The challenge that I think you
17 head each of the panelists talk about in the
18 area of workforce and manufacturing capacity
19 is the need for certainty going forward, the
20 need for a climate in which people are
21 interested in coming to work in the industry
22 because they see a future.

1 Businesses are interested in
2 investing in the industry because they can see
3 the future, and I think that's really sort of
4 the focus of where my remarks are and what I
5 hope will stick with you coming away from
6 this.

7 When we look at the nuclear
8 education and workforce challenge, we're
9 fortunate that we have 104 operating units.
10 We are developing a staff to replace retirees
11 there.

12 We developed an infrastructure
13 that's scalable, so that as new plants are
14 built, you can train people to staff those
15 plants, but you still need that long-term plan
16 in order to do it because people aren't
17 widgets. You need to invest the time and
18 effort and resources, and give them a vision
19 of the future that's attractive to them to
20 bring them into the industry.

21 On the manufacturing capacity
22 side, it's the same story. You need to have

1 a visibility into the future. You need a
2 consistent policy going forward to stimulate
3 the investment necessary in the manufacturing
4 sector.

5 One of the things that the Nuclear
6 Energy Institute has become engaged in is
7 working with the other parts of the nuclear
8 infrastructure here to talk about
9 opportunities for manufacturers and businesses
10 to support not only commercial nuclear new
11 construction, but existing plant upgrades,
12 existing plant procurement, and also the
13 Department of Energy's work in various parts
14 of the country, and have conducted eight
15 manufacturing outreach workshops to help share
16 information about this, and let folks see the
17 full range of opportunities available to them
18 in manufacturing.

19 But again, it really drives back
20 to that need for a climate that allows the
21 investment in the long-term planning so that
22 US manufacturing can respond.

1 DR. CIALONE: From the perspective
2 of manufacturing technology, there's always
3 going to be an ebb and flow among these
4 different industries. Shipbuilding is ebbing.
5 Automotive is flowing again. Mining should
6 begin to flow.

7 And so, you could imagine that
8 there will be those opportunities to steal
9 from other industries, or repatriate from
10 other industries, but at the end of the day,
11 you got to take care of yourself.

12 So, I think I'm with Carol. You
13 need to have a plan. There needs to be some
14 vision of the future that people are saying,
15 "I want to be part of that." And they will be
16 there, but if they don't see something that's
17 reliable that they can make a long-term
18 commitment to, that makes a long-term
19 commitment to them, well, good luck. You'll
20 lose people to those other industries.

21 MR. GUTTERIDGE: I guess for the
22 first time, I'm getting a little nervous about

1 telling students that this is a great thing to
2 enter right now, because we always seem to be
3 behind the curve a little bit.

4 In the early 2000s, we had a lot
5 of promise in the nuclear industry, and a lot
6 of people started entering it. We had new
7 programs opening up. We had a lot of faculty
8 hires. And now, we have a slow down, and we
9 have these very brilliant students, and they
10 are very brilliant, come in saying, "Wait a
11 second. I'm not sure that the -- no one is
12 retiring. We're not building. We're getting
13 a little discouraged."

14 You can see we have 4,700 students
15 now in the pipeline. That's frightening
16 because I'm not sure that we're going to be
17 able to employ them all, and you're going to
18 have that downturn again where we had in the
19 early '90s where they were getting educated,
20 and all of a sudden they found there was no
21 jobs.

22 So, we are really at a crossroads

1 here, and if we don't see a pick up soon in
2 retirements and in builds, and especially
3 retirements at the national laboratories and
4 the government, because they're really
5 employing the advanced degree students, we
6 might have a problem. And we might need to
7 slow down a little bit.

8 MR. STOUCH: Well, again, a point
9 I made earlier, one of the things that I think
10 kept PCC and a number of our worthy
11 competitors alive, has been the Navy
12 shipbuilding program and the Navy nuclear
13 program, DOE and the like, specifically the
14 Nimitz carrier program, and it's midlife
15 refits and refueling that are now coming due.

16 Every several years, a Nimitz-
17 class carrier is going to be coming in for
18 those major overhauls over the next several
19 decades. The Ford-class carrier program,
20 we've decided as a country, that we're going
21 to deliver those on five-year centers rather
22 than four-year centers.

1 So, that's a bit of an adjustment
2 downward in terms of the demand for the kinds
3 of long lead items that are company and others
4 like us make that we need to sustain our
5 capability. Virginia-class submarine program,
6 on the other hand, it's gone to two boat
7 deliveries a year, and that's been a positive
8 thing in that the supply chain in many cases
9 is relied upon to make up the needed capacity
10 to serve that.

11 Next will be the Ohio replacement
12 program in the early 2020s, and some of the
13 long leads and design work that's going on now
14 in order to provide this baseload that has
15 sustained us, and gotten us through the
16 valleys before.

17 I daresay that probably in the
18 mid-2000s, we probably wouldn't be around if
19 it weren't for looking at some of the long
20 lead items associated with the decommissioning
21 of the Enterprise, and some of the carrier
22 work and the submarine work that has been

1 going on.

2 DOE projects are tremendously
3 challenging and interesting. Not only the
4 nuclear reprocessing and enrichment type work,
5 but the high energy physics work. National
6 Ignition Facility, I think I had the Target
7 Chamber on one of the slides there, star
8 magnet and so forth, other very interesting
9 and challenging projects we've been associated
10 with that joining alloys that seemingly are
11 impossible to weld and join; machining very,
12 very difficult to machine materials, some of
13 which are non-weld repairable.

14 You screw something up, you now
15 have a 100-ton doorstop. So, these are the
16 kinds of things that exercise or quality
17 programs, our people, our capabilities and
18 allow us to continue to invest in replacing,
19 and/or even new machinery and equipment, and
20 it is the reason I think that for the large
21 part we still have the semblance of the
22 nuclear industry today.

1 If we'd have to rely only on
2 outage work for the existing fleet, we
3 wouldn't have nearly the capability and
4 capacity that we do today.

5 CHAIR PETERSON: Thank you. I
6 think that this provides a pretty useful
7 picture of the current situation. One final
8 question, both on manufacturing and NRC, and
9 also I think industry in general: there is
10 interest in the potential to develop new
11 reactor and fuel cycle technologies that could
12 include, for example, even reprocessing
13 facilities, things of that nature, which might
14 have significantly different technical
15 characteristics, manufacturing requirements,
16 construction methods than the current
17 infrastructure.

18 How capable is industry to respond
19 to changes in the technology? Is this
20 something that we need to be worried about?
21 Or, is it something that US industry is going
22 to be able to adapt to, and move forward

1 towards?

2 MR. STOUCH: I'd make some
3 comments. It's only money, and it's only
4 time. We have I think the creativity and the
5 capability. Where the rubber meets the road
6 in a facility like ours, laboratories such as
7 Dr. Cialone's, we can get there.

8 I know that we had a discussion
9 with Idaho Lab on NGNP. How would you build
10 a high-temperature gas-cooled reactor in
11 Idaho, given the size of some of the
12 components? It was sort of a different review
13 of a different material to build the reactor,
14 and how do you do that? How do you solution
15 and yield that? How do you quench it? All of
16 which would have to be done up there.

17 And we figured out a way to do it.
18 There is a plan that I think we can establish
19 to do this. Obviously, it takes some money
20 and some time. So, that's an important trade
21 off, and optimizing that with selection of
22 materials and size and design specifics is the

1 trick.

2 CHAIR PETERSON: Any other
3 thoughts or comments?

4 MR. MCGARVEY: I'll just say from
5 the training and craft people, this training
6 has evolved for hundreds of years, and we've
7 evolved to each new technology, and get the
8 expertise, and can produce the craft
9 professional that can install the components
10 of the new technology. So, it's not an issue
11 with us.

12 CHAIR PETERSON: That sounds good.
13 I'd like to at this point then, barring any
14 additional questions, thank all of our
15 panelists. We appreciate very much you taking
16 the time to come and visit with us today, and
17 to give us this testimony.

18 At this point, I think we can call
19 this session adjourned. We will reconvene the
20 Subcommittee at 1:00 p.m. Oh, I'm sorry,
21 1:30? All right, 1:00 p.m. by my agenda. Yes,
22 1:00 p.m., we'll reconvene, and in the

1 interim, we will take a break for lunch.

2 Thank you.

3 (Whereupon, the above-entitled
4 matter went off the record at 11:11 p.m., and
5 resumed at 1:02 p.m.)

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1 nuclear technologies?

2 The second question is with
3 respect to nuclear reactors and fuel cycle
4 facilities, what are the key safety,
5 environmental and security concerns for local
6 communities, and how should these be
7 addressed? And with that introduction, I'd
8 like to turn --

9 MEMBER SHARP: Mr. Chairman?

10 CHAIR PETERSON: Yes?

11 MEMBER SHARP: I wonder if I might

12 --

13 CHAIR PETERSON: Please go ahead.

14 MEMBER SHARP: -- make a comment?
15 Because I know it's something the chairman was
16 concerned about is one thing that I think is
17 universal on the Commission is the belief that
18 local communities are critical to whatever we
19 do here.

20 We were a little concerned that
21 several of our members have to be away, and
22 I'm going to have to step out towards the end

1 of this, that -- that we weren't going to have
2 a full battery of people to listen to your
3 testimony, and we don't want in any way for
4 anybody to assume the staff, the Co-Chairs
5 and various subcommittees are all determined
6 to make sure we are getting maximum input at
7 a recognition: we're not going anywhere on
8 these issues if we cannot meet what local
9 people are concerned about.

10 Many of you have been
11 participating in this for years. So, we
12 recognize that. But I just wanted to
13 reinforce what actually even lunch hour was
14 discussed among us this concern.

15 MS. OLSON: Can we have more than
16 ten minutes each?

17 CHAIR PETERSON: No. All right,
18 let me amplify on Phil Sharp's comment. The
19 scheduling for these meetings has been a
20 challenge for us to organize in terms of all
21 of the different participants and stuff.

22 And so, the order in which we've

1 been able to assemble the panels has been
2 driven by factors that have nothing to do with
3 topic. I can sincerely promise that.

4 The other thing is that we are
5 collecting all the information and archiving
6 it, and it will be made available of course to
7 the full Commission as well. So, with that
8 clarification, I'd like to start by
9 introducing our first panelist, Ms. Diane
10 Curran, partner at Harmon, Curran, Spielberg
11 and Eisenberg, to present. Thank you.

12 MS. CURRAN: Thank you very much.
13 Oh, that button. Thank you. I really
14 appreciate this opportunity to talk to the
15 Subcommittee.

16 I have been representing state and
17 local governments and citizen groups and
18 environment groups in nuclear licensing cases
19 for about 30 years. I must say I love my job.
20 And one of the reasons I love it is that I get
21 to work with people who are neighbors of
22 nuclear facilities, who feel a tremendous

1 sense of civic responsibility to participate
2 in the decision making process regarding the
3 safety and environmental risks of those
4 facilities.

5 There are people who, during the
6 day, might go to work as a schoolteacher, and
7 come home at night and read NRC inspection
8 reports, and write their resident inspector,
9 and call me, and say, "We need to request a
10 hearing on some problems."

11 And so, my clients take these
12 hearing rights, and rights of public
13 participation and public disclosure very
14 seriously, and so do I. So, I really
15 appreciate this opportunity to address your
16 questions.

17 The perspective that I'm going to
18 come from is the one of public participation,
19 which is really key. And my overall concern
20 today that I really want to press upon you is
21 I believe we are at a crossroads as a country
22 that although there have been -- there's been

1 this hearing right since 1954, that it has
2 eroded significantly, that it has gone -- it's
3 been very much changed since September 11th
4 for good reasons, but changed in a way that
5 now makes public participation and NRC
6 licensing decisions very difficult.

7 The question that I think really
8 needs to be addressed by this panel is this is
9 -- this technology really requires a lot of
10 government subsidies if it's going to survive.
11 And is that where you want to put your money,
12 if the people who are affected by these
13 facilities really have no real effective means
14 to participate in the decision-making process?

15 So, with that, I will go through
16 my presentation. If I could have the first
17 slide, please? Oh, do I get to -- that's what
18 this is for. Okay.

19 Okay, so, in 1954, Congress passed
20 the Atomic Energy Act. It was basically a
21 bargain that was struck. State and local
22 governments wanted the right to regulate these

1 facilities, and the federal government said,
2 "No. That's going to be done by a federal
3 agency, and in exchange state and local
4 governments will have the right to participate
5 in hearings." And at the time, those hearings
6 were assumed to be formal hearings with a
7 right of depositions, interrogatories, cross-
8 examination.

9 Over time, that hearing right has
10 eroded. There's a lot of pressure on the NRC
11 from the nuclear industry. In the late '70s,
12 the delays in licensing were linked, I think
13 unfairly, to the hearing process. I think
14 there were a lot more economic problems that
15 were really delaying the nuclear industry, but
16 as a result, the NRC has cut back on some of
17 the major hearing rights that people assume
18 they had back in 1954.

19 One is you no longer have the
20 right to cross-examine a witness. You no
21 longer have the right to depose the witness.
22 And I can tell you that a deposition is a

1 very, very important tool when you've got
2 highly technical issues.

3 If you can't sit the expert for
4 the other side down and say, "What did you
5 mean by this sentence?" Then it's very
6 difficult to make an effective case in a
7 hearing.

8 The NRC also tightened time frames
9 for hearings, set rates of standard for
10 getting more time to prepare for a hearing,
11 and it raised the standard for introducing
12 issues into a hearing, which -- which now it
13 used to be if you had a concern about a
14 nuclear facility and you understood a little
15 bit about it, you could probably get a
16 hearing.

17 Now, you pretty much need to hire
18 an expert witness, and you need to hire a
19 lawyer. Although there are many citizens who
20 do a good job, the NRC procedures are very
21 labyrinthic, I should say, and hard to
22 navigate.

1 So, the situation you have is that
2 nuclear facilities generally are not put in
3 neighborhoods where people are very wealthy.
4 They're put in neighborhoods where people have
5 less resources. And so, these people with
6 very little resources have to spend a lot of
7 money if they want to do any kind of effective
8 job in raising their concerns.

9 So, that hurdle existed as far
10 back as the `70s and `80s. But then -- oh,
11 okay, and I want to mention that the NRC also
12 has hearing procedures for new reactors, which
13 are not working well at all, in my opinion.

14 The NRC assumed that it was going
15 to have standardized reactor approvals all
16 finished in rule-makings before it got the
17 first application for an individual new
18 reactor license.

19 The process has gone backwards.
20 We're getting all these applications for new
21 individual plant licenses, when there isn't --
22 I think there might be one or two designs that

1 are -- have been actually approved, and even
2 those need to be revised.

3 So, it's kind of like if you had
4 to evaluate a dog that walked in the door tail
5 first. And you have to decide, "Okay, I've
6 only got so much money to do my analysis of
7 this dog, and I don't know how big the dog is,
8 how tall it is, how long it is, how fat it is.
9 But seeing this tail, I've got to decide what
10 to do about it."

11 It's just it doesn't make any
12 sense, but that is the process that we're
13 going through because there is this rush to
14 license new facilities. And the NRC has not
15 taken control of it in the sense of saying,
16 "Okay, we're going to stop all this until
17 we've got the standardized designs approved."

18 They're going ahead backwards.
19 So, that's one problem. But the one that I
20 really wanted to talk to you about today is
21 the -- the increased secrecy that we have had
22 to impose on information after the attacks of

1 September 11th.

2 I'm not saying that secrecy is a
3 bad thing. I'm saying that even though it may
4 be necessary to protect a lot more information
5 in order to keep people who shouldn't have it
6 from getting it, the other people who can't
7 get it are the neighbors of the facilities,
8 and that's where your dilemma is, I think.

9 If this is the way it's going to
10 be for the indefinite future; for instance, if
11 I can't get information about what are the
12 severe accident risks posed by a new nuclear
13 plant, or a fuel cycle facility, if I can't
14 get information about whether a spent fuel
15 pool that is filled with irradiated fuel poses
16 a risk of a catastrophic release of cesium
17 that could contaminate thousands of square
18 miles, is that a good thing?

19 I don't think that's a good thing.
20 And even if you can get a closed hearing, you
21 can't talk about it with anybody. You can't
22 go to your neighbors and talk about it. You

1 can't talk to the newspaper about it. You can
2 talk to the three judges on your panel, and
3 the opposing counsel, and that's it.

4 Now, most of these technical
5 issues really benefit from debate, from a lot
6 of people knowing about them, and being able
7 to talk about them. For instance, in the
8 1980s, and as far back as the '70s, the NRC
9 said, "High density pool storage of spent fuel
10 is not dangerous."

11 There were people back in the late
12 '70s saying, "That's not right." And the NRC
13 just kept saying, "No, you're wrong. We're
14 right." And then finally, I think -- well, I
15 don't know where I am, and I hate these
16 things. But I really just want to talk to
17 you.

18 Finally, okay, in the year 2000, I
19 represented a county government in a licensing
20 proceeding for spent fuel pool expansion.
21 High-density storage; the pools were packed.
22 And our expert, a PhD, said in the

1 introductory part of the hearing, "This is too
2 dangerous. Even though it's a low probability
3 accident, there's still a risk of a
4 catastrophic fire."

5 And the NRC said he didn't know
6 what he was talking about; that he really,
7 really was incompetent. And low and behold,
8 he was able to address the ACRS. The ACRS
9 raised the concern, and eventually the NRC
10 staff confirmed that Dr. Thompson was right.

11 And that led to the staff issuing
12 a technical document that changed its
13 position. That led to the National Academy of
14 Sciences study, and then after September 11th,
15 the NRC imposed a lot of security measures on
16 spent fuel pools.

17 Now, if you were reasonably
18 suspicious of whether the NRC had done a good
19 job of this, having denied that it was a
20 problem for the past 25 years, and you would
21 like to find out what exactly was done, you
22 are out of luck because that information is

1 classified. And even if you wanted to get a
2 closed hearing on that, you have to show it's
3 very high standard for a need-to-know.

4 So, I represent neighbors, for
5 instance, of the Diablo Canyon Nuclear Plant.
6 The NRC is proposing to renew that license for
7 20 years. I really don't know how or whether
8 we're going to be able to get a hearing, and
9 whether the spent fuel pool in the pools there
10 is protected.

11 So, this is just one example of
12 the kind of issues that are going to come up
13 in new facility licensing cases. All right.
14 Then there is the -- I just want to make a few
15 more points, because I realize I don't have a
16 whole lot of time.

17 The NRC has a new category of
18 information that is called SUNSI because
19 there's classified information, there's
20 safeguards information, and then there's a new
21 category for which the NRC casts a broader
22 net. That's information that could be helpful

1 to somebody who wanted to cause harm with it.

2 That includes a lot of

3 information. That includes information.

4 Supposed there's some regulatory gap that the

5 NRC hasn't recognized or filled, or they

6 recognize it and they need to do something

7 about it, but they haven't gotten around to

8 it. Well, that might be SUNSI.

9 Supposing -- for instance an

10 example of information that was hidden, was

11 the uranium spill. I don't know if you're

12 familiar with that at the NFS facility where

13 uranium was -- a puddle was leaking, and that

14 was kept secret because you wouldn't want

15 terrorists to know that at NFS they can't keep

16 control over their high-enriched uranium.

17 Well, if you were a number of the

18 public living near the NFS facility, wouldn't

19 you want to know that? Wouldn't you want to

20 know that so you could raise a concern this

21 facility needed better regulation?

22 So, I think it's an impossible

1 dilemma myself. I don't see how you can
2 resolve it because honestly, I don't want the
3 terrorists to know that either. But I also
4 think the neighbors should be aware, if that's
5 what's going on.

6 So, my final questions to the --
7 oops. My questions to this Subcommittee are
8 if we know that there are safer energy
9 alternatives available, and they need -- and
10 they need subsidies as much as the nuclear
11 industry does, is it wise for us to invest in
12 technology just to produce energy to turn on
13 the lights? Just to produce energy? There's
14 got to be a matter of government secrecy.

15 It's dangerous technology. If
16 we're going to do something dangerous,
17 shouldn't we all be able to talk about it?
18 Or, should we pick something else that's not
19 so risky?

20 I'm talking about the risk of
21 catastrophic accidents. I'm talking about
22 Chernobyl-like accidents. This is the BP you

1 can't see: catastrophic radiological accidents
2 are going to be much, much more widespread and
3 difficult to clean up than the BP oil spill.

4 The other big question is, "Okay,
5 you have a regulatory agency, and it's got two
6 sets of constituents. One set of constituents
7 is the regulated industry that has an
8 interest, which is understandable, and in
9 minimizing the cost of regulation.

10 The other side is the public,
11 which has an interest in making sure that the
12 regulations are effective, and maybe they cost
13 more money. If the only group that has the
14 information is the group that wants to
15 minimize costs, and they're the only ones that
16 can sit down with the regulators and say,
17 "Here's my concerns, and I hope you'll address
18 them," and meanwhile the public just sits on
19 the sidelines, can the regulatory agency be
20 effective anymore?

21 So, I will leave you with my
22 questions. Thank you.

1 CHAIR PETERSON: Thank you. Our
2 next panelist is Kara Coulton. She's Senior
3 Program Director for the Energy Communities
4 Alliance.

5 MS. COULTON: Thanks. You'd think
6 I would've learned. My name is Kara Coulton.
7 I'm here representing the Energy Communities
8 Alliance. We are the member organization of
9 local governments working on and impacted by
10 nuclear issues.

11 We are grateful that we can be
12 here as part of the panel, and address the
13 potential role for local governments in
14 deciding America's nuclear future. And we
15 agree with you heartily that there is a
16 critical role for local governments in this
17 discussion. They will be impacted from the
18 beginning to the end of any new nuclear
19 project. So, they really have to be involved.

20 In response to your first
21 question, what role should local governments
22 and communities play, if any, in the

1 developments and demonstration of new nuclear
2 technologies, we believe again there's a
3 critical role.

4 Local governments need to ensure
5 the environmental health and safety of their
6 communities, provide outreach and education on
7 nuclear issues impacting the community, act as
8 a liaison between the site and local
9 community, advocate for local concerns and
10 local priorities.

11 When appropriate, they can
12 advocate for the site, and the project. And
13 finally, local governments ensure economic
14 opportunities exist for the community.

15 It's the primary role of local
16 governments to protect the health, safety and
17 well being of the community. To that end, the
18 local government cares about the environmental
19 and health impacts of any new project.

20 Nuclear energy and nuclear waste
21 are issues that raise concerns for most
22 communities, and understanding the details of

1 the project, understanding both the short-term
2 and long-term impacts are absolutely critical.
3 But once known, the local government can help
4 assure that the project is safe, and then if
5 they are convinced of that, they can then be
6 supportive.

7 In its role to provide outreach
8 and education on nuclear issues impacting the
9 community, local governments usually serve as
10 the honest broker. It can be a trusted source
11 of information, providing education not only
12 to alleviate concerns, but also to outline
13 potential benefits of a proposed project.

14 Outreach and education can include
15 hosting meetings with site operators, site
16 managers for the community at large, creating
17 public information outlets, websites, and
18 releasing white papers.

19 As a liaison between the state --
20 between the site and local community, local
21 governments help to establish and maintain
22 clear lines and open lines of communication.

1 Again critical, because this ultimately builds
2 trust and accountability amongst parties,
3 which is again critical to the success of any
4 project.

5 Local governments also are able to
6 provide information back to site operators,
7 and hopefully are seen as truth brokers there
8 as well. An important area where local
9 governments can help is the perception of
10 risk.

11 In order for any nuclear project
12 or policy to be acceptable and successful, we
13 need to consider not only the technical risks,
14 but also the perception of that risk by
15 impacted parties because it's very important
16 as these are not often aligned with each
17 other.

18 In the role as advocates for local
19 concerns and priorities, local governments
20 work together with the federal government,
21 with the state, with the private companies, to
22 ensure that local values, concerns and

1 priorities are understood, and that they're
2 taken into account as the project is being
3 planned.

4 On the other side, when they could
5 be advocates as appropriate for the site and
6 the project, they can help build support and
7 make sure as well that they represent the
8 community's support to other potential
9 partners in a project.

10 Finally, local government has the
11 role in ensuring economic opportunities. A
12 community volunteering to host a nuclear
13 facility should be provided economic benefits,
14 and local governments are uniquely positioned
15 to help negotiate on behalf of the impacted
16 community.

17 These benefits may include funding
18 for oversight or training and jobs for the
19 local workforce. In fact, there already are
20 communities looking to develop workforce
21 that's got -- that have the capabilities
22 necessary to support new nuclear technologies,

1 or recycling facilities as they are being
2 discussed and possibly developed.

3 The Energy Communities Alliance
4 held a meeting in the Savannah River region to
5 talk specifically about their workforce
6 initiative this past April, and that
7 initiative engages state legislatures,
8 universities, community colleges, secondary
9 educators, community reuse organizations,
10 economic development entities, unions and
11 nuclear employers, and they're all working
12 together to look at what's going to be needed
13 down the road, and how to make sure that the
14 training and retraining programs are
15 established to meet those needs later.

16 They want to attract future new
17 development and jobs to their communities and
18 their regions.

19 In response to the second
20 question, the key safety, environment and
21 security concerns for local government related
22 to the development and demonstration of new

1 nuclear reactors and facilities, many of the
2 environmental and safety concerns that have
3 impacted communities are likely to remain the
4 same as they are now, specifically security,
5 waste-handling, transportation.

6 Fortunately, in the energy
7 communities that are adjacent to and impacted
8 by the Department of Energy, or the Nation
9 Nuclear Security Administration sites, there's
10 a greater comfort level with nuclear issues.
11 There's also a good sense of what's needed to
12 fully address these issues and concerns.

13 As I've already mentioned, and I
14 can't underscore enough: communication. There
15 also needs to be a good relationship with DOE
16 and the contractors, or it's not a federally-
17 owned site with the private sector.

18 There needs to be assured funding
19 for oversight and outreach activities,
20 including both education and training. For
21 example, in regards to security, communities
22 are going to be able to communicate with DOE.

1 We've contracted the private sector as they
2 look at security alternatives for the future.

3 Nuclear security costs are already
4 astronomical. In fact, I was talking to
5 someone yesterday at Hanford. The monitored
6 retrievable storage site, which is huge,
7 underground concrete, with a building on top
8 of it, securing that building annually is \$40
9 to \$50 million a year already.

10 Security also extends to training
11 and emergency response. Local governments and
12 communities need to partner with DOE, and or
13 the private sector, to ensure that there's
14 spending for practice drills. If and when any
15 of these new nuclear facilities are built,
16 they're likely to be cited in less densely
17 populated areas, where the resources don't
18 necessarily exist to make sure that there's
19 emergency planning and response.

20 An example in regards to
21 transportation, DOE's legally only obliged to
22 share shipping information with the state.

1 Sometimes the person in that relevant position
2 at DOE is very communicative, and there's a
3 good relationship, and that information gets
4 where it needs to get to. But that's not
5 always the case. Communication, again, is
6 key.

7 So, as a starting point, ECA
8 proposes looking at provisions in the Nuclear
9 Waste Policy Act, where funding was allocated
10 for affected units of local governments for
11 resources to provide impacted citizens the
12 means to interact with the federal government
13 and any operators, to permit the local
14 community to hire third-party scientists to
15 review data and increase public confidence in
16 the scientific integrity of a project, and to
17 demonstrate a commitment to external oversight
18 of a nuclear project.

19 Another concern for local
20 governments: As recycling facilities and new
21 technologies are being discussed, developing
22 a final waste plan needs to remain a priority.

1 We don't want new waste streams created that
2 don't have a disposition path.

3 Most ECA members support and are
4 interested in exploring hosting spent fuel
5 recycling facilities, but uncertainty
6 regarding where waste will end up directly
7 affects the health, safety and security
8 decisions in communities with sites that
9 currently produce or store waste.

10 The communities that do do not
11 want to become de facto long-term storage
12 sites. There's also a concern about the
13 environmental impacts of creating increased
14 amounts of greater-than-Class C and low-level
15 waste, neither of which have a final
16 disposition path.

17 In conclusion, 11 sites around the
18 country volunteered during DOE's now-defunct
19 GNEP program. Congress has directed the DOE
20 to go back to those communities to address
21 nuclear issues.

22 There are communities out there

1 that are interested in this, and they want the
2 jobs and the economic benefits that will come
3 with new nuclear development, and they can be
4 advocates. They can contribute to a solution
5 for nuclear waste disposition, but it's
6 absolutely imperative that they are involved
7 now, engaged from the beginning. Thank you.

8 CHAIR PETERSON: Thank you for
9 those comments and insights. Our next
10 panelist is Dr. Clinton Wolfe. He's Executive
11 Director for Citizens for Nuclear Technology
12 Awareness.

13 DR. WOLFE: Good afternoon. My
14 name is Clint Wolfe. I'm the Executive
15 Director of Citizens for Nuclear Technology
16 Awareness, or CNTA for short. In Aiken, South
17 Carolina, home to the Department of Energy's
18 Savannah River site, CNTA is a citizen-based
19 charitable corporation dedicated to educating
20 the public about all things nuclear.

21 I also serve as the Chairman of
22 the Public Policy Task Force for the

1 Carolina's Nuclear Cluster. With respect to
2 the questions that have been posed, I offer
3 the following observations based on examples
4 from our experience in the recent history of
5 Aiken and the Savannah River site.

6 Many communities are already
7 heavily invested in federal nuclear
8 initiatives, either through their historical
9 role in the weapons complex, or in the
10 handling of nuclear materials. If these
11 communities want to participate in the future,
12 they should be considered with priority
13 because they already provide the nuclear
14 industry with strong community support, and a
15 workforce familiar with nuclear processes.

16 Many of these communities have
17 already put in place infrastructure that would
18 have to be replicated at very high costs in a
19 green field setting. An educated and local
20 supported citizenry depends upon frequent and
21 effective communication and its importance
22 cannot be underestimated as misinformation is

1 often used to thwart new nuclear initiatives.

2 There are however some caveats
3 about community support in former nuclear
4 weapons related communities. We should not
5 expect new missions to be welcomed with open
6 arms if they introduce uncertainty about
7 completing the current missions.

8 Clean up of existing materials at
9 these sites should not be abandoned, postponed
10 or delayed. Also, we cannot expect these
11 experienced communities to support new
12 technology developments without commitment to
13 manage waste as they are generated.

14 SRS has a citizen's advisory
15 board, which is very effective in maintaining
16 good communication between the site and
17 potentially affected communities, and on a
18 state level, frequent presentations are made
19 to the Governor's Nuclear Advisory Council
20 about matters at SRS.

21 My organization, CNTA, often
22 provides letters to the editor and opinion

1 editorials related to matters at SRS and the
2 nuclear industry in general.

3 The degree to which local
4 communities and their governments play a role
5 in the future will depend to some extent on
6 the models used to develop new nuclear
7 technologies. For example, a pure federal
8 government program would entail a different
9 sort of participation by locals than a public,
10 private or a strictly private initiative.

11 An illustration of local
12 government participation in Aiken, South
13 Carolina is the Center for Hydrogen Research,
14 or CHR. Located in a research park developed
15 by the community to allow private companies to
16 benefit from a presence near the Savannah
17 River National Laboratory, the CHR
18 construction was financed by a bond levy by
19 Aiken County. The Department of Energy and
20 private companies can conduct research there
21 in any combination of public, private
22 arrangements.

1 The educational systems in and
2 around these communities can also be
3 significant players. Again, using Aiken as an
4 example, eight regional nuclear employers
5 participated in a workforce development study
6 financed by the Local Community Reuse
7 Organization.

8 This study pointed out the
9 impending shortfall of nuclear workers in the
10 areas as 50 percent of the workforce would be
11 retirement-eligible in the next five to ten
12 years. Aiken Technical College had already
13 initiated a radiation protection technology
14 program, and recently graduated 24 accredited
15 personnel, with another 150 in the pipeline.

16 Other nuclear training programs at
17 educational institutions on both sides of the
18 Savannah River are under development. The
19 University of South Carolina Aiken, recently
20 selected by US News as a number one regional
21 college in the south, and among the very best
22 in the country, was also a party to the

1 workforce study, and tailors its offerings
2 with the needs of a nuclear workforce in mind.

3 The University of South Carolina
4 Columbia recently initiated a new graduate
5 program in nuclear engineering. And South
6 Carolina State University, and HBCU in nearby
7 Orangeburg, has had recent graduates from its
8 new undergraduate nuclear engineer program.
9 This is the only accredited HBCU nuclear
10 engineering program in the country.

11 From the microcosm that is Aiken,
12 let me also emphasize regional commitment to
13 nuclear industries. The South Carolina
14 Department of Commerce is joining forces with
15 North Carolina to create the Carolinas Nuclear
16 Cluster. This organization is promoting
17 workforce development, small business
18 opportunities, and is supporting education
19 initiatives to provide the workforce of the
20 nuclear future.

21 An economic impact study for the
22 Carolinas was commissioned by the Cluster, and

1 performed by Clemson University, which
2 illuminated the huge economic impacts of the
3 nuclear industry on the Carolinas.

4 The Carolinas and Georgia
5 represent much of the focus of the nuclear
6 renaissance, and these three states intend to
7 pursue the development of new nuclear
8 technology. This is a natural consequence of
9 resources such as the Savannah River site, the
10 Savannah River Nation Laboratory, the
11 Institute for Nuclear Power Operation or INPO
12 in Atlanta, the Electric Power Research
13 Institute or EPRI in Charlotte, and the
14 Nuclear Fuel Division of Westinghouse Electric
15 Corporation on Columbia, South Carolina.

16 The engineering operations and
17 maintenance expertise existing at SRS in 16,
18 soon to be 20, power plants in the three
19 states is truly impressive. The
20 aforementioned educational institutions in
21 South Carolina, as well as those in North
22 Carolina and Georgia bring strong educational

1 resources to the region.

2 Now, South Carolina obtains more
3 than 50 percent of its electricity from seven
4 nuclear plants operated by SCANA, Duke and
5 Progress Energy Companies. In Georgia,
6 Southern Company is building two new units at
7 Plant Vogtle, just across the Savannah River
8 from SRS.

9 Vogtle units 1 and 2 have been
10 operating there since the 1980s. In addition,
11 Georgia has two other operating units, and
12 North Carolina has a total of five. So, at
13 the risk of tooting our own horn, I think that
14 the experience in and around Aiken and the
15 region is illustrative of how communities and
16 local governments can and should play roles in
17 the development of new nuclear technologies.

18 In particular, there is
19 considerable community interest in the
20 creation of an energy park at the Savannah
21 River site, which could be exceptionally well
22 suited to development and demonstration of new

1 reactor designs, flow sheets for recycling
2 used fuel, and fabrication of new fuel
3 systems.

4 The Mixed Oxide Fuel Fabrication
5 Facility is already under construction there.
6 The talent, the workforce, the know-how and
7 the community support are unmatched.
8 Environmental and security concerns with new
9 initiatives are going to be very similar to
10 what they have been in the past at SRS, and
11 they should be dealt with in a similar manner.

12 Safety is the hallmark of work in
13 DOE, and in particular, SRS. Our community is
14 familiar with the safety roles played by DOE,
15 NRC and INPO, and is therefore comfortable
16 living amongst so many nuclear facilities. We
17 know that working in the nuclear industry is
18 safer than working in banking, real estate, or
19 staying at home.

20 The attitude that safety is always
21 number one maintains that trust in our
22 communities. Having said that, there are no

1 apparently unique safety issues with these
2 technologies that we have not encountered
3 before. But if that view turns out to be too
4 optimistic, remember that we are never
5 satisfied that we have arrived when it comes
6 to safety.

7 We area always checking and double
8 checking when making changes that can affect
9 safety.

10 Environmentally, SRS is one of the
11 best characterized sites in the world.
12 Beginning 60 years ago, baseline environmental
13 data were obtained, and subsequently monitored
14 to fully understand the environmental impacts
15 of operations on the environment.

16 This information has been shared
17 openly with the employees, and the surrounding
18 communities, and has contributed to the
19 community's acceptance of SRS. Nuclear
20 industries and environmental protection are
21 not mutually exclusive. In fact, nuclear
22 industries which require buffer zones to meet

1 their safety and security requirements provide
2 opportunities to enhance the environment, as
3 has happened at SRS.

4 The transformation of the land
5 that was appropriated to build SRS from worn
6 out farmland back in the early 1950s, to an
7 emerald green wildlife sanctuary today is
8 truly amazing. Environmental impacts should
9 be positive ones, not negative ones.

10 Security at SRS has been
11 effective, and we wouldn't expect that to
12 change for any of these new missions. New
13 security challenges may accompany the business
14 model chosen for the work. That is public,
15 private, or some combination of the two. But
16 if handled as well as it's been done at SRS,
17 there will be no security issues that can't be
18 successfully resolved.

19 In closing, let me say that the
20 precedent that you are establishing by
21 welcoming citizens' input is greatly
22 appreciated, and it is our sincere belief the

1 illustrations of success for community
2 involvement, such as in the Carolinas and
3 Georgia, can beneficially inform your ultimate
4 recommendations.

5 Two final thoughts. First, if new
6 nuclear initiatives are cited in communities
7 that are comfortable with nuclear issues,
8 there will be many examples of beneficial
9 participation by the communities, and local
10 and regional governments.

11 Second, early, open and frequent
12 communication between the nuclear industry and
13 the host communities will ensure acceptance of
14 the industry by the community. Please accept
15 our invitation to visit Aiken and experience
16 the local community and governmental
17 involvement first hand. We are at your
18 service and thank you for the opportunity to
19 express our views.

20 CHAIR PETERSON: Perfect.

21 DR. WOLFE: Practice, practice,
22 practice.

1 CHAIR PETERSON: I think we need
2 to issue a prize. Thank you very much. Okay,
3 our next panelist is Ms. Mary Olson. She was
4 the Director of the Southeast Office of the
5 Nuclear Information Resources Service. Thank
6 you for coming, Mary.

7 MS. OLSON: Thank you for this
8 opportunity. My name is Mary Olson. I do
9 work for Nuclear Information and Resource
10 Service, often called in the world NIRS.

11 I want to personally thank the
12 three commissioners to whom I'm speaking, and
13 express the hope that some of the others might
14 watch the webcast later. I was so looking
15 forward to giving a radiation lesson to the
16 senator, and had hoped we might have a
17 conversation. So, I'll hold it for the
18 future.

19 I bring also two items I want to
20 put in the record, with the specific statement
21 on film that these are copyleft, which means
22 that if you post it on your website, there's

1 no problem. My organization was involved in
2 producing both of these. They're short; less
3 than a half hour. One, Climate of Hope, takes
4 on the whole issue of whether nuclear power is
5 in fact carbon free, and whether it can in
6 fact set enough carbon off to meaningfully
7 contribute to the climate crisis. It's not the
8 content of my comments today, but I submit it
9 to the record.

10 And Wastelands, which is an
11 incredible film produced during the life of
12 Grace Thorpe, daughter of Jim Thorpe, who,
13 along with several of us in the NGO world
14 helped turn back the targeting of Native
15 American lands for high-level nuclear waste.
16 And I sincerely hope that we will not repeat
17 that shameful piece of our history in the
18 recent past.

19 Twenty-seven tribes were
20 specifically targeted for an MRS during those
21 years, and this film documents those voices.

22 CHAIR PETERSON: We will certainly

1 get those into the public record on the
2 website. Thank you.

3 MS. OLSON: Thank you. So,
4 radiation is why I'm here today. The two
5 questions you gave us, really if it weren't
6 for ionizing radiation, we wouldn't bother.
7 I'm not saying we'd all sign up and say, "We
8 love nuclear energy," but I don't think that
9 we would have the level of concern that we
10 have.

11 I was inspired this morning to add
12 that I've been in my job for 20 years, and the
13 reason I have this job is in part because six
14 years before that, I was in a research lab
15 that had a lot more ionizing radiation than
16 most research labs have, and unfortunately, I
17 got it and took it home.

18 So, that has changed my life, and
19 I work with many people who have a similar
20 level of experience directly. So, we were
21 founded in 1978. Where am I? Okay, is that
22 how that works? Yes, okay.

1 Founded in 1978 by grassroots
2 activists in communities. Not everybody is an
3 activist, but most of us are. And they were
4 opposing the construction of new reactors at
5 that time in the 1978 in their communities.
6 Today, we have members in all 50 states, and
7 I would say that one of the failings of our
8 community is that we never trumpeted the fact
9 that we had a three-quarters victory. Over
10 400 reactors were online, under construction
11 or on order when we were founded. Only 120
12 were built, and a number have been closed by
13 the activists in communities that have shared
14 these concerns.

15 So, we have a disproportionate
16 representation in our membership of people in
17 reactor communities existing, and proposed
18 nuclear waste sites. And I'll just mention
19 that in addition to the 27 tribal sites,
20 there's a number of other high-level waste
21 sites that we've been involved in during the
22 20 years I've been on staff, and over 20 so-

1 called low-level waste targeted communities
2 have come to us during the same period.

3 So, we've been very involved with
4 all of these issues, and I hope that my
5 colleague, Diane D'Arrigo, will have the
6 chance to address some of the issues as well.
7 And I just want to mention that we did in 1998
8 petition then secretary of energy Richardson
9 to disqualify Yucca Mountain, and again, we
10 could share more about that another day.

11 But if it weren't for radiation,
12 we wouldn't be here. And so, given that fact,
13 I want to focus on it. There is no safe dose.
14 And all it takes is single cell and a single
15 radioactive emission to start a fatal cancer.

16 Obviously, it doesn't happen every
17 time, but every single event carries that
18 risk. And it's not just -- you know, a little
19 tongue in cheek here, it's not just a folk
20 song. This is enshrined in the Environment
21 Protection Agency standards. It is reflected
22 in NRC's Part 20 and ALARA.

1 The National Academy of Science's
2 series of reports, seven reports now, on the
3 biological effects of ionizing radiation have
4 upheld this view. And most important, I will
5 be sending an annotated bibliography of
6 studies with data that support this view.

7 A lot of people don't know that
8 you can actually see the damage of radiation.
9 Most of it is so small that artists have to
10 render pictures of tracks and cells, and --
11 but you can see broken chromosomes. I didn't
12 bring that picture. You can see other
13 structures damaged, cell membranes damaged.

14 This is a picture of what happens
15 to plutonium in a lung. I know none of the
16 Commissioners are trained in biology or
17 medicine, and I just want to share that I was
18 trained as a biologist, and I track radiation
19 issues very closely.

20 The Department of Energy has had a
21 low dose program that I think is well worth
22 looking at what they've been doing. And

1 basically, you have to say that it all boils
2 down to what's acceptable. What as a society
3 do we accept?

4 When I was a child, there was
5 debate about 1 in 1 million deaths coming from
6 an industrial activity. Superfund turned into
7 1 in 100,000, but then with some very
8 challenging clean ups, some of them are as
9 high as 1 in 10,000 people exposed getting
10 fatal consequences.

11 So, what do we accept from
12 recollection? And I just want to look not at
13 the radical points of view, but at the US
14 Nuclear Regulatory Commission's own dose
15 response, which was a rare moment of
16 disclosure that happened in 1990 when they
17 published the below regulatory concerns
18 statement, the other BRC.

19 Every time I hear BRC, I'm having
20 flashbacks, because this was the issue that
21 brought me into this work was the deregulation
22 of radioactive waste. In that policy

1 statement, they published their own
2 assessment. And this slide is elaborated, but
3 basically NRC said that you get 3.5 fatal
4 cancers per 1,000 exposed.

5 But the truth is that's 1,000
6 adult males exposed. What I've added on here
7 is the findings about the exposure at that
8 level to embryos, first male, and then female,
9 because we also have findings saying that
10 women are 50 percent more vulnerable to
11 ionizing radiation health effects than men.

12 Now, actually, I'm going to go
13 back for a second because I want to disclose
14 that I am including all radiation health
15 effects when I'm looking at the embryo. If we
16 only looked at cancer, which would be the more
17 fair comparison with the NRC's own 3.5 fatal
18 cancers per 1,000 people exposed, then we
19 would only see a four times increase, but it
20 is a four times increase.

21 So, forgive me. It was late
22 night. I made the wrong choice maybe, but I'm

1 disclosing that.

2 So, somewhere between four and 20
3 times more impact to the unborn child, and
4 what is this from? This is from 100 millirems
5 a year over a lifetime. So, this is perfect
6 performance. This is not an accident. This
7 is not high risk. This is we accept this at
8 this time.

9 So, again women have more
10 vulnerable tissue that accounts for why we
11 have a higher cancer rate. It's not some
12 weird gender thing. It's visible in our
13 bodies.

14 So, do the simple math. NRC
15 assumes linearity. So, if you double your
16 dose, you double your response. I just did
17 the simple division years ago, and found that
18 3.5 fatal cancers in 1,000, and I'm adding
19 men, results in 1 in 286. And I think it was
20 a bombshell. I don't think the NRC folks had
21 ever done that simple division.

22 They got kind of nervous. Then

1 you add the 1.5, and you're up to 1 in 191
2 women. Again, this is non-accident, normal
3 operations. Actually very good because the
4 licenses all allow more than 100 millirems.
5 Of course ALARA brings it down, but fuel cycle
6 facilities, they don't do so well with ALARA.
7 We don't know about waste facilities. They're
8 all leaking, we know that, at low-level sites.

9 So, you get down to the numbers
10 for impacts. Again, all types of impacts in
11 utero, and it's pretty high really. I mean
12 you get to 1 in almost 10 potential outcomes.
13 Now, again, does this happen everyday? I'm
14 not asserting that. I'm just saying this is
15 NRC's own assessment of risk of the numbers
16 that they consider allowable. I'm not
17 changing them.

18 So, when you apply it to the whole
19 US population at the rate of 1,000 here, 1,000
20 there, 1,000 all over, the numbers aren't
21 small. There's a non-fatal cancer for every
22 fatal cancer. That's well understood. And as

1 I say, we're talking about things like
2 spontaneous abortion in terms of the impacts
3 to embryos.

4 But the next slide is very
5 interesting. A lot of people in the industry
6 think that background radiation is nothing,
7 and that there's no impact on us from it, and
8 that all of this stuff about dose response is
9 like extra insurance so that if people screw
10 up, there's room to move.

11 But in fact, there's background
12 cancer from background radiation, and when I
13 started this work, 100 millirems a year was
14 touted as background radiation. I'm not going
15 to go up to 360. It looks even worse if you
16 do that.

17 So, basically, if we allow up to
18 100 millirems a year from annual operations of
19 a nuclear facility, we're doubling the dose of
20 ionizing radiation to ourselves, to our
21 public, to our family, over 100 millirem
22 background.

1 So, with a linear model, that
2 doubles the response. And I just like to
3 remind people that if you doubled all kinds of
4 parameters like carbon, or temperature, or
5 anything else, I mean as a biologist, it's no
6 surprise to me that you would see some effects
7 from this. And if you go out and talk to
8 people about cancer, we can't prove what
9 causes which cancer, but you also can't prove
10 that something didn't cause that cancer.

11 If you have somebody who loses a
12 child, you can't prove y. But you can't prove
13 it wasn't y. So, I'm going to note that I
14 have more to give in this proposal, in this
15 presentation, but I just want to share very
16 quickly the two graphs that you probably have
17 never seen in your life because dose response
18 you can understand. It's linear. You double
19 the dose. You double the effects.

20 But this is the life cycle. This
21 is what I've showed you on the bar chart.
22 This is the embryo responding, stabilizing the

1 adult, and it's Sally Stewart's work that
2 shows us that you have an uptick at the end of
3 life.

4 The healthcare debate: I'm not
5 even going to go there about care of elders.
6 But the point that I'm bringing to you from
7 the communities, as a mother, from all the
8 mothers I speak for, we cannot disregard the
9 impact to the children. Standard reference
10 men cannot reproduce by themselves. We have
11 to look at this.

12 There's the chart with the females
13 added. It doesn't go high enough actually.
14 You got to double that one-and-a-half times
15 for the girls.

16 And finally, skipping several
17 things here -- oh, I do want to say. Part of
18 why I'm here: plutonium is twice as bad a
19 uranium. What elected official should ever
20 sign off on that? I mean there's no elected
21 official alive and in office to day who is
22 responsible for the uranium fuel cycle, but to

1 sign off on a doubling of all this with
2 plutonium, which is what you get? I don't
3 think there's any elected official, if they
4 were fully disclosed, could or would do that.

5 Now, AP1000, you'll have to read
6 it later. But this is a slide I want to end
7 with, and the next one, because there's been
8 a lot of ideology expressed over the last day.
9 And I do want to come forward with the fact
10 that I really am pro-nuclear.

11 It's just I like my reactor 93,000
12 miles away. And we've heard a lot of
13 testimony about nuclear's role in the climate
14 crisis, and I ask this committee: I don't
15 think it's necessarily your job to do a full
16 NEPA analysis on the decision to spend
17 billions, possibly even into trillions of
18 dollars, on building a new build on nuclear,
19 as the -- you know, the justification for this
20 money being spent in the public sector is the
21 climate crisis.

22 I agree we must address the

1 climate crisis, but where is the NEPA analysis
2 showing that this is the cost effective way to
3 do it? And this year marks the historic
4 crossover, in which a healthy energy source --
5 but the Rolls Royce, PV, I mean retail PV. I
6 mean call the guy and have him put it on your
7 roof PV is now cheaper and going down, while
8 nuclear per unit of electricity that would be
9 generated has passed that going up.

10 So, we call it the historic
11 crossover, and on behalf of all of those
12 children who -- you know, who knows? But
13 there's future generations, and on their
14 behalf I'm here to say we have better
15 alternatives. We can do better. The
16 experiment is over. There's no reason to
17 restart it. Thank you.

18 CHAIR PETERSON: Thank you. And
19 now, our last panelist is Mr. Paul Bembia.
20 Thank you. Program Director for the West
21 Valley Site Management Program Office of the
22 New York State Energy Research and Development

1 Authority. Thank you.

2 MR. BEMBIA: Thank you, Dr.

3 Peterson. Can you hear me okay? Okay, great.

4 As you said, I'm the Director of the West
5 Valley Site Management Program for the New
6 York State Energy Research and Development
7 Authority, and also known as NYSERDA.

8 NYSERDA holds title to the Western
9 New York Nuclear Service Center, more commonly
10 known as West Valley, and it was the home of
11 the only commercial nuclear fuel reprocessing
12 facility ever to operate in the United States.

13 The events at West Valley provide
14 the basis for my comments, and the concerns of
15 the community, and the role of local
16 government, and the development of fuel cycle
17 facilities. So, I just wanted to step back a
18 little bit through some of the history.

19 In the early 1950s, the Atomic
20 Energy Commission encouraged the private
21 reprocessing of spent nuclear fuel as part of
22 the program to commercialize the fuel cycle.

1 New York State became interested in the
2 privatization program as a way to promote
3 industrial development within the state. And
4 the AEC program also created interest within
5 the business community, and the Davison
6 Chemical Company set up nuclear fuel services
7 to pursue the West Valley reprocessing
8 venture.

9 Davison Chemical would eventually
10 be purchased by WR Grace and Company.

11 Instruction on the plant began in 1963, and
12 was completed in 1966. NFS was licensed as
13 the operator, and the New York State and
14 Atomic Research and Development Authority,
15 which is a predecessor agency at my agency,
16 was licensed as the owner.

17 Construction costs were about \$33
18 million. About 640 metric tons of fuel were
19 reprocessed at West Valley between 1966 and
20 1972; 380 metric tons were from the end
21 reactor at Hanford. This was supplied by AEC
22 under a baseload contract with NFS.

1 During the time it operated, the
2 facility experienced operational difficulties,
3 higher than expected worker doses, and
4 unplanned releases of radioactive material to
5 the environment.

6 After operating for six years, NFS
7 halted the reprocessing operations in 1972 to
8 make modifications to increase capacity,
9 reduce worker doses, and reduce radioactive
10 effluents. NFS expected that those
11 modifications would cost about \$15 million.

12 During the shutdown period, there
13 were new regulatory requirements issued by the
14 Atomic Energy Commission related to waste
15 management and disposal, and earthquake and
16 tornado protection. NFS estimated that
17 meeting those new requirements could cost as
18 much as \$600 million, and they concluded that
19 it would not be economically viable to
20 continue reprocessing at West Valley.

21 NFS informed New York that it was
22 withdrawing from reprocessing, and that it

1 intended to turn the facility back over to New
2 York State. At that time, the facility
3 contained 750 spent fuel assemblies that had
4 not been reprocessed, 600,000 gallons of high-
5 level liquid waste stored in steel tanks, a
6 highly contaminated main plant process
7 building and two radioactive waste disposal
8 areas that contained almost 3 million feet of
9 radioactive waste.

10 The United States Congress held
11 hearings, directed the GAO to investigate the
12 issues, and directed DOE to study options for
13 the future of the center, and those activities
14 resulted in Congress passing the West Valley
15 Demonstration Act in 1980.

16 The Act directs DOE to solidify
17 the high-level waste, transport the solidified
18 waste to a federal repository, dispose of the
19 low-level waste, and decontaminate and
20 decommission the tanks, facilities, material
21 and hardware used in the project.

22 In 1982, DOE assumed control of

1 about 180 acres of the center, and NYSERDA
2 continues to manage the balance of the
3 property, including the commercial disposal
4 area there. As directed by the Act, the
5 federal government pays 90 percent of the
6 costs for the project, and New York State pays
7 10 percent.

8 The Demonstration Project has been
9 underway since 1982, and the liquid high-level
10 waste has now been solidified into a glass
11 waste form that is suitable for disposal in
12 the repository. And there are 275 canisters
13 of vitrified high-level waste that are stored
14 at West Valley and awaiting disposal.

15 NYSERDA and DOE are using a phased
16 approach for decommissioning there, and the
17 first phase of decommissioning will start next
18 year, and will take about ten years, and the
19 end-state for the second phase of the
20 decommissioning has not yet been decided.

21 The combined federal and state
22 expenditures for the project from 1982 to date

1 amount to approximately \$2.6 billion. The
2 phase one decommissioning work will cost
3 another billion dollars over the next ten
4 years, and the phase two decommissioning costs
5 could range from \$500 million if the
6 facilities are close in place to as much as \$8
7 billion if all the remaining wastes and
8 facilities are removed.

9 So now, I'll shift over to the
10 concerns of the local community, and they
11 really fall into three main categories:
12 environmental impacts in public safety,
13 economic impacts and long-term responsibility
14 for the facility.

15 In terms of the environmental
16 concerns in public safety, concerns there
17 developed during the six years that the
18 reprocessing facility operated. There were
19 operational difficulties that included filter
20 blowouts that released cesium 137 to offsite
21 properties.

22 There were releases of high

1 activity liquids to soil beneath the process
2 building that formed a strontium-90
3 groundwater plume, operational discharges that
4 contaminated creek sediments, disposal
5 trenches that filled with water and released
6 radioactive material to streams, and incidence
7 of worker contamination and overexposure.

8 The releases of contamination and
9 the exposure of workers: those were
10 significant concerns at the time the facility
11 operated, and these incidents undermined
12 public confidence in the safety of the
13 facility. The community safety and
14 environmental concerns also extended to the
15 present.

16 As I mentioned, the first days of
17 decommissioning, which starts next year, will
18 remove some very significant sources of
19 radioactivity, but the second phase hasn't yet
20 been decided, and facilities there that'll be
21 decided at a later date include the high-level
22 waste tanks in the disposal areas.

1 There's strong support in the
2 local community in the region for the complete
3 and immediate removal of all the remaining
4 facilities and contamination, and for
5 releasing the property from restricted use.

6 The cancellation of the Yucca
7 Mountain project has also introduced another
8 present day concern, and that's that the 275
9 canisters of high-level waste presently stored
10 at West Valley may be there for decades to
11 come. A local elected official recently told
12 me that it feels like we're starting all over
13 again.

14 Regarding economic concerns, the
15 local community leaders and residents feel
16 that they've paid a high economic price for
17 the presence of the facility there. NFS never
18 employed more than 265 full-time workers. So,
19 the economic benefits when the facility
20 operated were really minimal.

21 Residents and local officials
22 believe that property values in the immediate

1 area have been impacted due to the negative
2 perception of the presence of a failed nuclear
3 plant, and radioactive waste disposal areas in
4 their community.

5 The site also is owned by New
6 York, so the property and all of its
7 improvements are tax exempt. And according to
8 town officials, the site and its facilities
9 represent about 90 percent of the assessed
10 valuation of the property in the town.

11 We do, New York does, provide a
12 \$500,000 annual payment in lieu of taxes, and
13 that's split between the town, the county and
14 the school district. So, that does help to
15 balance the tax losses. And also on the
16 positive side, NYSERDA is presently engaged in
17 a process where we're looking to release about
18 185 acres of unimpacted property and a
19 warehouse that's no longer used.

20 We're attempting to get that
21 released from the NRC license. If we are able
22 to release it, we could then make that

1 property available for sale. And if it is
2 sold, it could be returned to the tax rolls.

3 The final concern are
4 responsibility concerns, and I think it was
5 pretty clear that when NFS announced that they
6 were leaving and turning the facility over to
7 the state, the responsibility concerns at that
8 point, it became a critical concern.

9 If there were to be a proposal to
10 establish a new facility there today, I think
11 the community and government representatives
12 at all levels would want some questions
13 answered, which would be will the facility be
14 designed, constructed and operated to allow
15 its eventual removal? Or, will it remain in
16 the community forever?

17 What provisions will be made to
18 replace tax revenue if the facility is tax
19 exempt? Who will be responsible for the
20 mitigation of any hazardous or radioactive
21 materials that are released? What happens if
22 the facility shuts down or goes bankrupt? Who

1 will fund the decommissioning, dismantlement,
2 and disposal?

3 How much money will be set aside
4 for decommissioning, and how will the funds be
5 held? If the funds are not adequate, will the
6 clean up be guaranteed by the state
7 government, federal government or both?

8 So, based on the West Valley
9 experience, I think it would be important to
10 have these types of issues clearly addressed
11 in a written agreement.

12 In regard to the role of state and
13 local government in the establishment of a new
14 facility, there would probably be a direct
15 regulatory role for the state in at least some
16 aspects of the siting, design and operation of
17 the facility, and we expect the state to
18 participate fully in that role.

19 Regardless of the specifics of
20 their direct regulatory role, there should be
21 an effort to maximize the state's involvement
22 through some kind of formal agreement in order

1 to engender the state's trust and acceptance
2 of the facility.

3 Local government is likely to have
4 some role, perhaps in citing and environmental
5 review process for a new facility. And that
6 review could include the consideration of
7 local impacts like impacts from effluence,
8 noise, traffic and land use changes.

9 Other important local
10 considerations would be the potential for
11 economic growth, jobs for local residents,
12 changes to the tax base, property values,
13 emergency planning and emergency response.

14 And I just have one more comment.
15 Because the formal role of local government
16 may be limited, mechanisms should be
17 established to allow the community and local
18 government to provide meaningful and
19 comprehensive input during all phases of the
20 project.

21 I previously suggested maximizing
22 state involvement to engender trust and

1 acceptance, and that applies to the local
2 community and local government as well. The
3 issues of importance of concern to the
4 community should be identified, discussed and
5 addressed in a formal agreement early in the
6 process. Thank you.

7 CHAIR PETERSON: Thank you.

8 That's excellent, very helpful, and
9 furthermore I appreciate also that we have the
10 written copy of this testimony. The -- you've
11 raised a whole list of --

12 MR. BEMBIA: Yes, the long
13 version.

14 CHAIR PETERSON: These are all
15 things, if one doesn't learn from experience,
16 then you have -- you have some significant
17 potential for just repeating ongoing problems.

18 MR. BEMBIA: Right.

19 CHAIR PETERSON: Definitely. At
20 this point, we'll move to the question and
21 answer session. And to mix things up a bit,
22 I won't start with questions. I'm going to

1 ask -- I have plenty of questions, I promise.

2 But I'm going to ask Phil if he'll start.

3 MEMBER SHARP: Well, first of all,
4 I just want to reiterate something I said
5 yesterday about what my belief of the charge
6 of our Commission is, and because again
7 today's panel is not yours necessarily, but
8 might suggest to the audience that we are in
9 the process of trying to judge what the
10 incentives are to be for new power plants, or
11 not be for new power plants, or which power
12 plants ought to be built.

13 Clearly, we are looking at this
14 question of whether or not the government
15 ought to be engaged in the other fuel cycles.
16 The reason for our look at that, in my view,
17 is because of the impact on waste, and while
18 all of these issues ultimately fall together,
19 our charge is to figure out what to do with
20 the waste which we've already got piling up
21 all around the country and your communities
22 obviously, kind of thing.

1 So, that's sort of my view of --
2 about new facilities is new facilities means
3 would that be an away-from-reactor storage?
4 Multiple retrieval storage, we have multiple
5 means for that thing. And the other is the
6 ultimate waste disposal site.

7 But others on the Commission may
8 have a different attitude about what our
9 charge is, and it's larger than that. But my
10 own view is it's a very difficult and serious
11 charge, but it's not quite as big as might be
12 implied.

13 One question let me ask Kara
14 Coulton. I'm trying to understand the nature
15 of your network and your organization a little
16 bit. So that if, for example, the government
17 were or were not going to pick a site, but
18 were to go into the siting business for either
19 the ultimate disposal or the other, does your
20 organization become engaged automatically
21 where there is a new site?

22 I mean do you seek out to give

1 assistance to -- because a local community,
2 it's a huge learning process I'm sure for many
3 people as to how to engage obviously. You
4 could spend a lifetime. Not a full lifetime,
5 but it may seem like it, trying to figure out
6 how to engage.

7 But I guess I'm trying to think is
8 -- I don't understand the nature of your
9 capacity and your sort of organization --

10 MS. COULTON: There's no
11 institutional framework for us to be
12 automatically engaged if a site were to be
13 suggested, but we would absolutely like to be
14 engaged if the site were to be -- were to be
15 suggested.

16 MEMBER SHARP: Because I can
17 imagine from the point of view of -- in the
18 sense -- it shouldn't just come down to
19 proponents of opponents, but there needs to be
20 an educational process as to how we can have
21 a serious conversation about the serious
22 issues, and I think it's -- organizations like

1 yours can. I noticed in your list you do.

2 I assume in some communities, they
3 tend to be more positive advocates for the
4 local facility, and others are more
5 challenging it, and even trying to maybe get
6 rid of it. And -- but the point is teaching
7 both sides or all sides how to have a serious
8 conversation. That's really tough. We even
9 have trouble in our Commission figuring out
10 how to have that conversation.

11 And so, I just think there's a
12 very useful role, which many of you have been
13 involved in on different levels on this. I
14 don't have a lot of other questions. The
15 reiteration of the West Valley experience is
16 a very important one, obviously, which again
17 tells you we're learning a lot of lessons on
18 what not to do. I'm not sure how many lessons
19 we're learning of what to do. But yes, Ms.
20 Olson?

21 MS. OLSON: I want to respond to
22 your question because we tend to be reactive

1 in so far as we're small, and yet there's not
2 a single waste proposal that hasn't ended up
3 on my desk or my colleague's desk in the last
4 20 years. And it is people who do need to
5 learn fast because things are coming at them
6 fast.

7 And I can tell you that we made a
8 commitment and are following through on it in
9 terms of this Blue Ribbon Commission to
10 facilitate awareness of your existence, to
11 facilitate awareness of your meetings, to
12 hopefully be a conduit for people to make
13 comments, whatever comment they want to make.

14 We're not passing out -- you know,
15 I can't guarantee there won't be a pre-canned
16 email. I can't guarantee that. But my
17 commitment is people's voices need to be
18 heard, whatever the voice is. And you know,
19 I think my colleagues in the southeast can
20 attest to the fact that we're there to engage
21 respectfully in processes when we show up.

22 So, I agree that the whole goal of

1 a democracy is for decisions to be as good as
2 they can be, and I think one of the things
3 that we just have to face right now is that
4 you all have the biggest hot potato in the
5 world, and I don't know how we're going to
6 come through this without it turning into an
7 us and them. I would love it for it not to do
8 that.

9 MEMBER SHARP: I don't expect it
10 not to become an us --

11 MS. OLSON: I love you for that.

12 MEMBER SHARP: But I also would
13 like to have us try to provide fora where
14 people can really seriously challenge
15 technical data as well. I mean I'm --

16 MS. OLSON: I agree with you.

17 MEMBER SHARP: Help create the
18 National Waste Technology Review Board, not --
19 I haven't really followed up on its history is
20 the thing, but the intent was to particularly
21 allow both outsiders and insiders in the
22 program to be able to raise technical issues

1 that at least could get some scientific
2 examination. Whether it's always happened
3 that way or not, I can't guarantee.

4 MS. OLSON: And I just want to add
5 one little quick additional comment, because
6 one of the shocks of my life this year was
7 going to the Nuclear Regulatory Commission
8 just in June, to actually advocate for
9 something. And one of the Commissioners said,
10 "Gee, this is the first time I've ever heard
11 you guys advocate for anything."

12 Well, it's coming from the closed
13 reactor communities, which I think has got to
14 be close to the top of your list. The call,
15 it's on your website for safeguarding the
16 waste that's there.

17 MEMBER SHARP: Right.

18 MS. OLSON: For hardening it, and
19 saying there's no intrinsic value in moving it
20 just to move it, which is basically what
21 centralized interim storage would be. I mean
22 we can't say that the sites that it's at now

1 are bad. The NRC came right when the Nuclear
2 Waste Policy Act was going to be amended in --
3 no -- yes, 1994, and said, "You can't say the
4 sites where it is now are bad." That's not
5 the basis for saying it has to move, right?

6 I mean they're licensed, right?
7 You going to go against that? I don't think
8 so. So, the issue then is how do we live
9 together with this thing we've made. And it's
10 been very impressive to me, and I hope that
11 the is Commission will hear from the people
12 who advocated for what we call HOSS, or
13 hardened on-site storage, because it's a
14 genuinely amazing stance to take that they
15 don't want to dump on someone else until there
16 is a situation that will actually improve the
17 circumstances for that material. And then the
18 transportation risks may be justified. But in
19 the interim, no.

20 And so, I think it's very, very
21 interesting what can happen in an open
22 discussion, and it took a long time for people

1 to be willing to listen to and rally around,
2 and I just want to bring to your attention
3 that there's over 200 organizations that have
4 backed that idea varying points of view on
5 energy. But in terms of waste, I just really
6 didn't have time to emphasize that. So,
7 forgive me.

8 MEMBER SHARP: No, no.

9 MS. OLSON: But that's important.

10 MEMBER SHARP: I appreciate the
11 comment, and while we're -- we cannot claim
12 it's going to guarantee everything is read, or
13 everything is perfect, this is the most
14 transparent government entity I've ever been
15 involved with so far. We're not a
16 governmental entity, but obviously we're a
17 federal advisory committee, which is the next
18 closest thing kind of thing.

19 And precisely, we get a regular
20 from the staff summary of all the comments
21 that come into the thing. And while we can
22 also peruse that all, and I can't guarantee

1 you I read each comment, but I certainly read
2 the summaries of all the comments. And so,
3 the main issues I'd be surprised of all of us
4 at least aren't aware of what people are
5 claiming. That doesn't guarantee it
6 appropriate consideration, but hopefully that
7 it will.

8 MS. COULTON: I just wanted to add
9 something in response to your question, which
10 was during G-NEP, we did as an organization
11 receive funding and support from the
12 Department of Energy to do outreach with
13 communities on issues related to recycling,
14 reprocessing and citing a facility.

15 MEMBER SHARP: One of you, maybe
16 it was you, I can't remember, in the Nuclear
17 Policy Act referred to the impacts thing,
18 which as I understand -- I don't know how well
19 that's worked because I don't know the
20 history. But in Nevada at least there was
21 funding for the --

22 MS. COULTON: Yes, the Nuclear

1 Waste Policy Act provided funding.

2 MEMBER SHARP: So that technical
3 people could not be totally at a technical
4 disadvantage as to dealing with the agency.
5 And it seems to me that ought to be a main
6 principle always of trying to make sure
7 there's a potential for technical challenge,
8 not to mention value and political challenge.
9 Thank you.

10 CHAIR PETERSON: Allison?

11 MEMBER MacFARLANE: Thank you very
12 much for your presentations. One thing that
13 I heard from a number of you was
14 communication. Actually, I think it applies
15 to all of you. And so, I would be curious to
16 know, as Phil pointed out, and I agree with
17 this characterization of our job, as we think
18 about processes for dealing with the high-
19 level nuclear waste incident, nuclear fuel,
20 and including a repository kind of situation,
21 what do you envision?

22 So, I'm asking you to go beyond

1 your remarks today, okay? And speak from the
2 expertise that you all have. But what do you
3 imagine is the best way for whatever entity it
4 is that manages this to handle the
5 communication? And what needs to be
6 communicated, and how should that be done?

7 And then B, how can we as a
8 Commission improve our communication. Just
9 start at one end, and then move to the other.
10 How about that?

11 MS. CURRAN: Well, I think
12 generally most of my work with respect to
13 waste storage, spent fuel storage, has
14 involved concerns about the risks, the safety
15 risks and environmental risks.

16 And I think there's a dilemma
17 about communication. If information is
18 sensitive security information, the only way
19 you can communicate it is in a closed setting.
20 So, then a question is is that good enough
21 where you can't really talk about something
22 publically and get input on the debate.

1 And so, I think there's basically
2 a fundamental problem there, and even if you
3 have -- even if you can get a closed hearing,
4 it's never going to be what you want when
5 something is that dangerous and that
6 complicated. You don't want to have just a
7 couple of people who are deciding the fate of
8 a huge area, and a lot of people. You want to
9 have something that you can really debate.

10 I'm not sure -- the issues about
11 say a repository, I haven't noticed that
12 there's been so much SUNSI or safeguards
13 information with that. So, that's really
14 important to look at the amount of effort that
15 went into creating a record for the Yucca
16 Mountain licensing proceeding.

17 That's really a great thing that
18 that was done, and it's great that the DOE is
19 going to preserve that information. But
20 really, when it comes to accident risks in
21 this -- in this era, in the post-9/11 era, I
22 think there's some real barriers to

1 communication. There's some real conundrums
2 that I'm not sure how we're going to solve
3 them.

4 MS. COULTON: I think there has to
5 be a true commitment to communication and not
6 just a ticking the box. I think sometimes
7 that's the problem is you put it on the list,
8 and say, "We're going to do it," but there's
9 no infrastructure for ensuring that that's
10 actually going to happen.

11 I think there needs to be a known
12 point of contact for communities; somebody
13 that is dedicated to providing outreach or
14 answering questions, and if someone with a
15 phone number that works, they answer it.

16 I mean I know it's too late to put
17 a local community on the Commission, but that
18 would've been great. And I know you all have
19 been to Hanford and to Idaho, and I think --
20 I know that the communities that have
21 facilities would love to see -- I know there
22 are limitations, but would love to see you in

1 their communities as well.

2 MEMBER MacFARLANE: Yes, okay.

3 DR. WOLFE: Yes, I guess I'll
4 approach the communication issue from maybe a
5 slightly different perspective, and that --
6 there's a good news/bad news story. Let me do
7 by example again, like I did in my
8 presentation.

9 On the good news side, I think we
10 have some examples at Savannah River that are
11 very effective. My organization, for example,
12 sponsors what we call Up & Atom Breakfasts,
13 and we have guest speakers.

14 Well, at least once a year the
15 site manager from DOE gives that talk. And
16 people can ask questions until heck freezes
17 over, and they've always been very
18 forthcoming. It's a good opportunity.

19 They also have other numerous
20 opportunities to address the public, and
21 several areas where we can -- we can --
22 several opportunities where we can talk to

1 them.

2 Now, the bad news part is the
3 community, when you develop a really good
4 relationship, feels like they're partners.
5 And they feel like you're invested in what you
6 two have decided together. And if that
7 partnership is breached, then some folks get
8 upset.

9 And frankly, that's kind of like
10 Aiken. Nobody in Aiken that I know of says,
11 "Oh my god, we never should reprocess fuel."
12 There's a lot of folks that think we really
13 ought to do that. We shouldn't put fuel in
14 Yucca Mountain, but there's also a lot of
15 folks in Aiken that are saying, "Well, we had
16 a deal, and we've got defense high-level
17 waste, and there is no alternative for that."

18 And so, there's some mad folks in
19 Aiken, okay? But in general I would describe
20 the relationship between that community and
21 the DOE and the contractors that run the site
22 and have run the site as an extremely good

1 partnership, but it gets a little fragile when
2 we feel that the deals aren't kept.

3 MS. OLSON: Wow. This is the
4 first time I think I'm going to repeat what he
5 said.

6 MEMBER MacFARLANE: I'm glad I
7 brought you together.

8 MS. OLSON: Well, we're together
9 more often than you imagine. But I hardly
10 ever come behind him and say, "Yes."

11 DR. WOLFE: Let me write this down
12 too.

13 MS. OLSON: But I'm going to use
14 the Yucca Mountain example in a different way.
15 This is a structural comment more than a
16 communication comment, but again, if what
17 you're communicating is not even mush -- I
18 mean it's completely not credible, how do you
19 get there? How you get there is because there
20 was a plan or a rule or a guideline set in
21 statute.

22 And some people said, "Hey, you're

1 not meeting your guideline." And the answer
2 comes back, "Well, you're right, but that's
3 why we have to keep studying it." And then
4 how much money is spent, and how many years go
5 by? And we're finally saying, for whatever
6 reasons, "Yes."

7 I mean I basically feel that our
8 1998 petition to disqualify Yucca Mountain is
9 finally being delivered, but the intervening
10 years was one goal post being moved after
11 another, to the point where you cannot say
12 there was a scientifically credible process in
13 the United States on high-level nuclear waste.

14 And I'll take the part of South
15 Carolina on plutonium. He didn't use this
16 example. I'm not repeating him on this. I'm
17 not putting words in his mouth. But the point
18 here is that plutonium was moved to South
19 Carolina under the auspices that it was going
20 to, "Have an exit strategy." And now, South
21 Carolina is the nation's plutonium storage
22 site.

1 I personally live on the highway
2 that would take the irradiated fuel down to an
3 energy park in South Carolina, which is why we
4 show up at the same places. And as far as I'm
5 concerned, I don't want South Carolina to be
6 the new irradiated fuel destination
7 disposition anymore than anybody in South
8 Carolina is saying they're volunteering for
9 that.

10 But when you see the goal post
11 moved, and the story change, where is the
12 credibility? How can you believe it?

13 So, I'm going to make a very quick
14 structural suggesting just because it's in my
15 craw. I think this country copied the
16 Iroquois Nation, but we left out a really
17 important piece. It was called the Council of
18 the Grandmothers. I'm not suggesting you get
19 a bunch of grandmothers, but I am suggesting
20 you get some of its size, an engineer, and
21 besides a physicist to have some oversight
22 authority on all this stuff because my

1 presentation matters. You need to get the
2 health community involved.

3 You need to get ordinary people
4 involved to have an oversight function, who
5 can say, "Wait a second. Why are you moving
6 that goalpost? Does that make sense?" And
7 have some real authority that can be turned
8 to, so that there's a restructuring and a
9 rebuilding of credibility in this picture.
10 Because right now, you know, good luck.

11 MR. BEMBIA: I've been at West
12 Valley. I started there about 20 years ago as
13 a staff geologist. And when I began there, we
14 had pretty routine one-way communication,
15 where site representatives would stand up at
16 a meeting, and there'd be PowerPoint
17 presentations, and we'd make our points, and
18 the public would make their points, and
19 everybody would go home, and nobody would
20 move.

21 And then after -- about 14 years
22 ago, after the first draft environmental

1 impact statement for decommissioning came out,
2 DOE and NYSERDA established what we call a
3 citizen task force.

4 I think we have 18 or 19 members
5 now. There are local elected officials,
6 members of the fire department, the VFW, the
7 county health department, the school board.
8 There's a local doctor, business
9 representatives, residents, some environmental
10 groups. There's a representative for the
11 League of Women Voters, a college professor.

12 That groups has been meeting
13 almost monthly for 13 years. And some members
14 have come and gone, but generally we have a
15 core of people, and folks usually stay around
16 for quite a number of years, and they become
17 very well educated on the issues.

18 And NYSERDA and DOE, the directors
19 of NYSERDA and DOE and myself and Brian Bower
20 at West Valley site, we're at the table with
21 this group when they meet. And we'll still
22 get some presentations on issues, but then we

1 really sit down and discuss them.

2 If the CTF has concerns, we really
3 try to address them, and we really try to work
4 with them to make sure we understand what the
5 concerns are, and see if there's a way that we
6 can actually address those concerns.

7 It has become pretty effective,
8 and one of the examples is I mentioned in my
9 remarks about that property release that we're
10 currently engaged in. That was a request from
11 the Citizen Task Force, and local
12 representatives. And so, we're following up,
13 and they really, even though we don't have
14 somebody waiting in the wings to redevelop
15 that property, the recommendation from that
16 group was, "Well, if some opportunity comes up
17 and it's going to take you two or three years
18 to get it off the license, we'll miss that
19 opportunity."

20 So, we are moving forward with
21 that. So, again, that group meets. We can
22 provide more information if you want to know

1 about it, but it's actually worked very well.

2 MEMBER SHARP: With the folks that
3 are representing the folks around the waste
4 disposal, the federal facilities, my
5 impression because I dealt with this for
6 years, but back when I was in the Congress
7 continually heard from the representatives
8 from those areas: Hanford and Aiken South
9 Carolina.

10 In other words, just their abysmal
11 relationship with the Department of Energy.
12 How they felt they were just continually at
13 odds with the Department folks. The thing
14 that was pleasant and surprised me at Hanford
15 was at least the testimony and the
16 conversations we had with a number of people
17 is that generally was not the case today.

18 Now, the problem was, and the one
19 that Mary Olson has raised, is I didn't
20 necessarily mean the deal is being kept, but
21 at least at the local level the management
22 teams of the Department appear to be much more

1 -- the Department seems to be much more
2 sensitive to this relationship than perhaps
3 they were in the past.

4 Perhaps they're allowed to do more
5 things. Perhaps they've just had good people.
6 I don't know. I don't know if that's an
7 accurate characterization or not. I know it
8 always will change with people and things of
9 that sort, but I don't know if you can give us
10 any insight if that comes close or not.

11 DR. WOLFE: Yes, I think it does.
12 I mean for Savannah River, even though there's
13 the disappointment I referred to earlier, I
14 would still characterize the relationships
15 between the field office of DOE and the
16 community as being very good, very
17 communicative. There's -- I mentioned the
18 Citizen's Advisory Board on the waste
19 management site.

20 MEMBER SHARP: It's just like the
21 one that you folks have at West Valley. This
22 is almost a standard way of operating today,

1 isn't it? Or not?

2 DR. WOLFE: Well, many communities
3 who have waste management, EM facilities, have
4 citizens' advisory boards, I guess. But some
5 are more active than others. Some are -- the
6 ones at Savannah River frankly are populated
7 by people who are pretty well experts in their
8 fields, and they -- they know the questions to
9 ask, and actually it's a very productive
10 exercise.

11 But I think the situation -- I
12 would characterize the relationship between
13 both field office, and frankly we -- many of
14 the community leaders make an annual trek up
15 to Washington to EM headquarters as well. So,
16 we are active. I've been there three times
17 now, I think, in my last three years of going
18 up to visit and talk about the issues that are
19 of a concern to us.

20 So, I would describe the channels
21 as being pretty open. We don't always get the
22 decisions as quickly, or the right ones, the

1 ones we'd like to see, but at least it's a
2 fairly open process that we can participate
3 in. I don't think anybody there feels like
4 we're shut out.

5 MS. COULTON: I would echo the
6 comments. I think over time, as you referred
7 to, there's been personalities that do or do
8 not click as well as maybe they should. I
9 think over time, there's been issues with what
10 you're getting from a site manager, versus
11 headquarters and whether or not there's
12 coordination between those two different
13 levels.

14 As far as ECA, and specifically EM
15 in this particular instance, we've just rated
16 them an A on their outreach activities, and
17 we've also been working with the Office of
18 Nuclear Energy lately, and people seem to be
19 feeling that the outreach efforts are there.

20 MEMBER SHARP: I don't mean to
21 imply. Let me just give my comment and have
22 you -- I didn't mean to imply things are all

1 just hunky- dory, and we -- and leave it. But
2 we may have learned something over the last
3 25 or 30 years in terms of that kind of
4 communications, but that still doesn't get us
5 to a structure that is able to make the
6 persistent decisions that are both
7 scientifically based and informed by the
8 public.

9 I don't mean to imply that the
10 public is not scientifically informed. Often
11 times the best are among the public in that
12 regard. But --

13 MS. COULTON: And just to add to
14 that, I think that assured funding, something
15 that is not based on the legislative year,
16 that really helps. I mean if you have it
17 institutionalized without swaying and
18 changing, then you don't have to worry about
19 it to the same extent that you do without
20 something in place.

21 MEMBER SHARP: I realize this
22 doesn't get at the kind of questions that you

1 were raising of how do you get some of the
2 basic information -- go ahead, yes.

3 MS. CURRAN: I would like to add a
4 but. That is in my observation of the Yucca
5 Mountain proceeding, where I represent a
6 county government that has taken a relatively
7 small role, but I watched the whole thing go
8 by, the State of Nevada put in over -- I think
9 it was something like 350 contentions,
10 challenging the technical adequacy of the
11 Yucca Mountain license application.

12 The DOE opposed every single one.
13 Every single one. There wasn't one that they
14 thought, "Well, that's worthy of a debate."
15 And to the point that one of the judges gave
16 a 20-minute speech saying, "I've never seen
17 anything like this in my life," and he called
18 the lawyers for the NRC staff the spear
19 carriers for the Department of Energy, because
20 they opposed most of them too.

21 So, there, where a party came in
22 and said, "We are challenging you on these

1 really specific things that have to do with
2 protecting public health and safety and the
3 environment," the DOE said, "We don't want to
4 play with you." So, there's an example of -

5 MEMBER SHARP: What year or years
6 was that?

7 MS. CURRAN: That was really
8 recently. That was within the last year.

9 MEMBER SHARP: Okay. Well, I do -
10 - not to defend, because there's no question
11 that there are legitimate contentions people
12 raise, at the same time, I think you can
13 imagine being on the other side of the fence
14 that the assumption is that once the state
15 has taken the political decision it has taken,
16 it is going to throw in the kitchen sink, the
17 bathroom, everything they can finally get.

18 So, I wonder if they have -- and
19 I'm not -- I don't know the facts here, but my
20 suspicion is they may not have prioritized
21 which things are really severe, and which are
22 not. But maybe I'm wrong. And I'm not

1 defending that the state is wrong, and the
2 Department was right for not contending that,
3 but one of the tragedies as we get into this
4 is both sides are so convinced, they just will
5 not open up.

6 MS. CURRAN: Yes, but I think --

7 MEMBER SHARP: They still have a
8 responsibility. They have responsibility.

9 MS. CURRAN: But you're raising I
10 think a good point. In the political process,
11 there's a lot of contention, and both sides
12 take an extreme position. You go at it.

13 MEMBER SHARP: Right, right.

14 MS. CURRAN: Supposedly the
15 hearing process is like a formal dance, right?

16 MEMBER SHARP: No, I understand.
17 I understand. Right.

18 MS. CURRAN: You can't even get a
19 hearing unless you've got something to say.
20 Unless you can describe your concern in
21 writing, have maybe an expert opinion or a
22 document to support it. So, it's not like

1 they were just throwing spaghetti at the wall.

2 MEMBER SHARP: Okay. Now, I'm --

3 MS. CURRAN: And so, the idea that
4 there wasn't one very carefully plead
5 technical issue that the DOE saw some
6 legitimacy to I think indicates that they're
7 looking at it more as a fight.

8 MEMBER SHARP: Sure.

9 MS. CURRAN: And yet, this is the
10 government which has a responsibility to deal
11 with technical challenges, right? That's one
12 forum to do it in.

13 MEMBER SHARP: I don't disagree
14 with that. I also know that all these systems
15 can be abused as well. And so, I'm willing to
16 take a hard line on the -- the reason we set
17 up the technical review board, and maybe it
18 hasn't worked well, but was to try to force
19 the Department as well as the -- that others
20 had a place on scientific technical questions.
21 I don't know about the others.

22 I can't debate this because I

1 don't know the facts at all. And you may be
2 totally right. I don't wish to debate it. I
3 don't know why I got myself down this --
4 that's not what I believe it or where I want
5 to go.

6 MEMBER MacFARLANE: I'll extract
7 you. So, I just want to go back to the
8 question of the BRC, our performance, and how
9 we can improve it or just -- I'm just looking
10 for a little feedback, sort of midstream
11 feedback. And I know a couple of you
12 mentioned something, but everybody else got
13 really into the communication question, which
14 is really, really important. But if anybody
15 else wants to add anything, I'd really
16 appreciate it.

17 MS. OLSON: I'll just add briefly
18 that I really appreciate -- maybe you all were
19 going to do it, but I know you got some
20 requests from various people. I really
21 appreciate that this is going on the web. I
22 really appreciate that there are transcripts.

1 I really appreciate that you've had a quick
2 planning process to get all these meetings to
3 happen, but that the times and dates have been
4 disclosed.

5 I feel happy that you're hearing
6 from many of my colleagues. I think as was
7 echoed a moment ago, there is still a little
8 bit of feeling -- I know personally, I was
9 surprised when I actually received the bios.
10 The degree of nuclear corporate connections,
11 I mean not just nuclear field, but people that
12 we thought were maybe kind of a little more
13 neutral in their -- I'm not speaking of
14 anybody in the room right now, but just --
15 just we're surprised the level of corporate
16 connections of the Commissioners.

17 And I'll tell you that that, in
18 terms of communicating in the broadest sense
19 of like who we are, our reason to be makes
20 sense with your title a nuclear future.
21 Certainly very, very disappointment to many,
22 many of us who -- well, I guess I'll just wrap

1 it up by saying our only explanation is it's
2 like Nixon going to China. It took a real
3 capitalist to go to red China. So, maybe
4 that's what it takes here.

5 DR. WOLFE: I guess what I would
6 like to see as a major recommendation out of
7 the Blue Ribbon Commission is simply what is
8 our energy policy? And I know that's a --

9 MEMBER MacFARLANE: That's beyond
10 our scope. I can't even -- I'm so floored by
11 that. I just --

12 DR. WOLFE: Well, then don't
13 define the energy policy, but recommend that
14 we have one. I mean I think the --

15 MEMBER MacFARLANE: People have
16 been doing that for a few years.

17 DR. WOLFE: I know, but I think
18 one of the problems we have in going forward
19 is we talked to -- you heard people the last
20 couple of days talk about uncertainty. There
21 is a lack of certainty for -- in a system that
22 we have, where we are not an integrated,

1 sovereign -- you know, we're not France,
2 Incorporated.

3 We have companies that compete
4 against France, Incorporated, and against
5 Canada and against Russia and so on. So, if
6 they are really -- if we go forward in this
7 arena, or any arena for that matter, in terms
8 of satisfying our energy requirements, and we
9 don't have the certainty that the federal
10 government will take a certain position
11 relative to initiatives to accomplish the
12 National Energy Policy, if we had one, then
13 it's going to be very difficult to risk the
14 kind of money that's involved in all these --
15 these initiatives.

16 And I realize that it's easy to
17 say. It's easy to say, "We need a National
18 Energy Policy," but I guess I'm hopeful that
19 if we don't get that kind of leadership from
20 the federal government that you may start to
21 see regional efforts that start to formulate
22 energy policy on their own.

1 That is to say that they will
2 decide what things are good for them, and then
3 pursue them.

4 MEMBER MacFARLANE: Other people -
5 -

6 MS. CURRAN: Yes.

7 MEMBER MacFARLANE: About the
8 Commission?

9 MS. COULTON: I also want to thank
10 you for inviting local governments and ECA to
11 participate. But one idea is to make sure
12 again that there's a designated individual,
13 but that you send out those designated
14 individuals to our meetings to the Energy
15 Community Alliance.

16 We have regular meetings twice a
17 year, minimum. But then we also have
18 different specific issue meetings. And if
19 those issues are issues that the Blue Ribbon
20 Commission is looking at, it would be great if
21 we invite you all; that you have the ability
22 to send, whether it's Tom or one of the

1 Commissioners, someone to come to our meeting
2 and keep you up to date as to what's going
3 on.

4 MEMBER MacFARLANE: Yes, Tim can
5 go.

6 MS. COULTON: We like Tim.

7 MR. FRAZIER: Actually, I wouldn't
8 mind going.

9 MEMBER SHARP: Tim gets a salary.
10 The rest of us don't.

11 MS. COULTON: Tim, you are
12 formally invited.

13 MS. CURRAN: I just want to make
14 one comment, and that is I was surprised when
15 I heard of the existence of this
16 Subcommittee, because I knew about the Blue
17 Ribbon Commission. And then in my mind, I
18 tried to make a connection between new nuclear
19 plants and waste, and I thought, "Well, hey,
20 that's good. They're asking this question
21 that I thought should be asked a long time
22 ago, which is why would you keep making more

1 waste if you didn't know what to do with what
2 you have already?"

3 And I think Dr. McFarlane, you
4 just said we're not involved in energy policy.
5 But I think you're kind of -- they've kind of
6 got you by the ankle a little bit, because
7 it's really --

8 MEMBER MacFARLANE: We're just not
9 developing energy policy for the entire
10 country. I mean the whole --

11 MS. CURRAN: Yes, but it begs a
12 question as to, "Well, okay, so we made a
13 mess, and we don't know how to clean it up.
14 We have all these options in front of us as to
15 how to go forward, and does it make sense to
16 keep pursuing this one? Because if we can't
17 really solve the problem, or we don't have any
18 ideas right in front of us, it might take 100
19 years or more to figure it out."

20 So, I think that's really
21 important, and I hope that this Subcommittee -
22 - I wasn't sure whether this Subcommittee

1 would be interested in the issues that I
2 wanted to talk about, but I think they're
3 relevant to what -- you know, the question of
4 whether we should have a new generation of
5 nuclear reactors is an important one in
6 relation to the waste issue, and also in
7 relation to the whole public participation
8 issue, which kind of gets brought into that
9 tangentially. That was my comment.

10 MR. BEMBIA: I would just echo
11 Kara's comment about visiting some of the
12 communities that are under consideration for
13 new facilities, or that have been impacted.
14 I think it's very important to the communities
15 to know that people are hearing them.

16 CHAIR PETERSON: Diane, I have a
17 question that goes back to what I think is a
18 really important point that you raised, which
19 is particularly post-9/11, although this has
20 always been an issue that you have this
21 conflict between security and safety, with the
22 security part requiring some elements of

1 secrecy that remove the level of transparency
2 that really would be helpful in terms of
3 allowing effective independent judgments to be
4 made about infrastructure.

5 I think this is actually more
6 pervasive across all of our infrastructure.
7 People have similar concerns about information
8 about chemical facilities and such. So,
9 there's -- I think there's two pieces to that
10 problem, and I'd like to get your reaction on
11 how we treat the two different pieces.

12 One element is the existing
13 infrastructure that we have, which is
14 literally casting concrete. For example, I
15 work in a building on the Berkeley campus, 300
16 feet from a fault that has a 50 percent
17 probability inside my career of generating a
18 magnitude 7 earthquake, and it is considered
19 to be adequate for life safety in terms of the
20 building.

21 And the State of California is
22 bankrupt. We can't -- realistically, if I

1 wanted to continue to -- but so, when we look
2 at the energy infrastructure, then we have a
3 baseload capacity system that is composed of
4 a lot of coal, and modest amount of nuclear.
5 And the policy decision you face with
6 infrastructure is how much do you invest to
7 replace the older stuff, and how rapidly? And
8 as you do that, what do you get rid of first?

9 And when it comes to the question
10 of coal versus nuclear, the existing stuff and
11 how you should prioritize, I think that that's
12 a really tough call to make. But the -- one
13 of the liabilities with the existing
14 infrastructure is the fact that from a
15 perspective of security, we face this dilemma
16 that security comes about from the combination
17 of what the -- from the perspective of a
18 terrorist deciding what to attack among all
19 the different targets, they make the decision
20 based on what they know about the facility,
21 and usually that's obvious things: gates and
22 other things.

1 And so, there's elements that are
2 obvious: what they know/they don't know, which
3 might be guard schedules or whatever. And
4 then they don't make decisions based on what
5 they don't know they don't know, but that
6 affects whether or not they will be
7 successful, right?

8 So, in general with our existing
9 nuclear plants, we're relying a lot on the,
10 "They know they don't know, and they don't
11 know they don't know," part, and not a lot on
12 the obvious things that make it difficult.
13 Because the plants were never designed with
14 these sort of security threats in mind.

15 So, you're sort of stuck with that
16 problem. I know Allison sat as a reviewer on
17 -- okay, maybe to discuss the existing ones.

18 MS. CURRAN: I don't think you
19 are, in all respects, and this is an example
20 of something that I've worked on with a couple
21 of clients.

22 Okay, we have -- at every nuclear

1 plant, there's a spent fuel pool that is
2 filled to capacity. And the way that you
3 could eliminate the need to maintain a lot of
4 secrecy about that would be to go to a
5 combination of low-density fuel storage and
6 HOSS, as Mary was talking about: harden on-
7 site storage in casks.

8 And then you could tell the world,
9 "This is what we have. You can't hurt this."
10 Or, you would have to make it a good design,
11 but you wouldn't have to have a big secret
12 about what you've done to this pool, which --
13 my first FOIA case I ever had, the judge
14 leaned over and said to the government, "It's
15 my experience that if you go down to the
16 corner bar, a lot of secrets are being
17 discussed down there that everybody thought no
18 one knew."

19 It's just hard to keep secrets,
20 but you wouldn't need to in that particular
21 case. But we haven't been able to get the
22 government to do something about that, partly

1 because they say, "Don't worry; we're talking
2 care of it." But it's a secret.

3 CHAIR PETERSON: Okay, so
4 actually, that's a very good example, and then
5 you get to the next question. Well, if the
6 government has made a decision of that sort,
7 which many people question because
8 legitimately you can; you don't have the level
9 of transparency needed. How do you affect
10 oversight to review that decision because on
11 the other hand, it might actually be a, from
12 a policy perspective, the correct one because
13 of what you don't know that is a part of the
14 protection, right?

15 MS. CURRAN: Well, that's the
16 \$64,000 question. And I think the public
17 should be able to participate in that, and in
18 the past was able to participate in that. If
19 only by -- you could go to the public document
20 room, look at the documents, evaluate them,
21 and write to the -- you know, write a petition
22 to the NRC, even if there was no licensing

1 action going on.

2 So, it really is a problem now
3 that there isn't a way to do that. And there
4 is -- there is a group that does have access
5 to the information, and that's the industry
6 that's regulated, and that would like not to
7 have to spend too much money in their view on
8 it. So, I'm not sure how you resolve it.

9 CHAIR PETERSON: So, then in 2006,
10 there was the National Academy study on spent
11 fuel. Was it -- am I getting the dates right?

12 MS. CURRAN: Yes.

13 CHAIR PETERSON: 2006, and it
14 reached a number of recommendations, which I
15 think might or might not have been implemented
16 or partially, or other things. Is it time for
17 another study, or is that -- was that
18 oversight approach of having an independent
19 review by the National Academy sufficient?

20 MS. CURRAN: Well, on a spectrum
21 of things, it's better to have some
22 independent group review it. It would be

1 preferable if neighbors of -- each facility is
2 different, and the NRC issued separate
3 security orders for every plant, and they
4 said, "Each one is going to be different
5 because of the characteristics of the plant."

6 So, what would be the best would
7 be if groups, neighbors of facilities, could
8 see the information, have the government
9 perhaps hire an expert for them because these
10 experts are expensive --

11 CHAIR PETERSON: Well, but if this
12 is -- if this is legitimately classified
13 information, could you have a member of the
14 community who is given a clearance?

15 MS. CURRAN: You have to show a
16 need-to-know, and then that's a question as to
17 whether you could get the -- whether the
18 government would approve your need-to-know.

19 CHAIR PETERSON: Okay. So, then
20 clearly this would seem to argue that if
21 you're going to build new infrastructure, it's
22 better to have it rely more extensively on

1 security features that are much more
2 transparent, where -- because the costs of
3 doing it on the new infrastructure are lower.

4 So, I'd ask in looking at, say,
5 the new reactor designs that the vendors have
6 brought forward, do they give you more comfort
7 with respect to physical security or -- or --

8 MS. CURRAN: Oh, no.

9 CHAIR PETERSON: Okay.

10 MS. CURRAN: No. For example, the
11 aircraft crash analyses that the NRC is
12 requiring for new plants, they don't have to
13 be sent to the NRC. If they're not sent to
14 the NRC, they're not subject to the Freedom of
15 Information Act. So the NRC could send an
16 inspector out to look at this stuff, at the
17 documentation, but -- and sit there, I
18 suppose, and make notes and come home with an
19 evaluation. But as long as the NRC inspector
20 doesn't bring the documents back to the
21 agency, that information doesn't have to be
22 disclosed under the Freedom of Information

1 Act, or any other law that I know of, to the
2 neighbors or the plant.

3 That's been specifically designed
4 that way so that the information can't get
5 into public hands.

6 CHAIR PETERSON: Although in
7 general for that specific type of information
8 as to the specific design features, you would
9 keep that information secure, as opposed to
10 the fact that it would be engineered for a
11 certain --

12 MS. CURRAN: Yes, but what if --

13 CHAIR PETERSON: In terms of
14 thinking of what you have to protect and not
15 in terms of --

16 MS. CURRAN: Yes, but what I'm
17 saying to you is I'm not sure even in a closed
18 hearing that the public could get it.

19 Couldn't get it under FOIA for sure, okay?
20 And a lot of information that is characterizes
21 as SUNSI, if you request it under FOIA, you
22 get it in my experience.

1 CHAIR PETERSON: Right.

2 MS. CURRAN: But, okay, supposing
3 this information isn't SUNSI. It's -- or it's
4 legitimately classified as SUNSI, the way the
5 rules are set up is that it's -- it's very
6 ambiguous as to whether the details of these
7 things are ever going to be part of the
8 licensing decision such that you could get
9 them if you were a neighbor.

10 It's been -- it's been set up to
11 kind of remove it from the public
12 participation process. And I can get you --
13 if you want me to, I'd be glad to write it up
14 and explain it to you how it works, because I
15 think it's a pretty serious issue, the
16 aircraft crash vulnerability issue.

17 CHAIR PETERSON: Understand. I
18 understand. That's very helpful. The -- let
19 me see. I have another question for Kara.
20 You mentioned as one of the things that you
21 discussed is important, local community
22 function training and emergency response. And

1 I -- if you could, just give a little --
2 amplify a bit on that particular function,
3 because clearly it's important both from how -
4 - the -- the -- what the function does, and
5 then also from how it affects local community
6 understanding of safety and risks posed by
7 having facilities nearby.

8 MS. COULTON: We were talking
9 yesterday with one of our members, and she was
10 telling us that around Richland, they only
11 have funding for one emergency response
12 planner. And I mean Hanford, you would expect
13 maybe that there would be funding for more.

14 She said that's something we
15 really have to get on top of. So, I think --
16 I think when the local communities are looking
17 at where do they need funding to be able to
18 do, what's the state's responsibility, what's
19 the local responsibilities? Can it be shared?
20 What's the relationship there? They need to
21 make sure that at the local level, the
22 emergency responders know what to expect.

1 I think she was speaking a little
2 bit about WIPP shipments, and the extent to
3 which people knew within the community,
4 emergency responders knew, when those
5 shipments were going, what were on those
6 shipments, what their shipments were.

7 And sometimes, it wasn't good to
8 know because you didn't want everybody to
9 know. I mean the same thing that you guys
10 have just been speaking about. Also, if
11 there's an accident, are those people educated
12 on what's on that shipment?

13 And so, local governments need to
14 make sure that they've got the ability and the
15 funding that they need to have everybody that
16 needs to be trained, trained, and retrained,
17 or if people are moving in and out of the
18 community, that those things happen. If waste
19 is going to stay longer, what kind of
20 retraining do we need then?

21 CHAIR PETERSON: I think that
22 that's a general observation, because

1 emergency -- the reason I cued on emergency
2 response is that actually many of the things -
3 - the elements of what you raise for safety
4 and actually some substantial parts of
5 security are good for the bottom line anyhow
6 in terms of commercial interests because they
7 increase reliability and other things.

8 Human performance measures, for
9 example, can be -- programs are good for
10 security and for safety. But there's other
11 things where there's not an alignment of
12 interests, and emergency response is one of
13 those places where it appears you have to have
14 some fairly firm commitments and oversight in
15 regulation to assure that you'd get adequate
16 capabilities in place.

17 I guess, Paul, that might be
18 something else that you could comment on, and
19 maybe others.

20 MR. BEMBIA: Yes. We do -- excuse
21 me, we do depend on the local fire department,
22 for example, to provide services for the West

1 Valley facility. They are -- they don't go
2 through formal rad training or anything like
3 that, but they do -- we bring them onsite
4 every year, and we walk through all the
5 facilities with them.

6 They are updated if there are any
7 major changes to the facilities. So, they do
8 know what to expect. We've also got our
9 onsite responders, who are in charge of the
10 emergency, and they work very closely with the
11 fire department.

12 So, during shipments and things
13 like that, there were some fuel shipments that
14 went out from West Valley once, and the spent
15 fuel was sent to Idaho, and that was very
16 closely coordinated with all the states along
17 the way. And I think DOE provided training.
18 I think there was money for that through the
19 DOE programs for emergency responders for
20 that.

21 CHAIR PETERSON: Maybe just -- I
22 have one final question that relates to sort

1 of the interactions between local communities,
2 NGOs and others, and facilities like nuclear
3 facilities where one of -- one of the sort of
4 modern inventions that has been implemented
5 fairly extensively over the last 20 years is
6 corrective action programs, which are
7 systematic programs that identify -- where you
8 encourage safety programs to identify
9 problems.

10 You incentivize workers to -- to
11 identify and report problems. You have a
12 notification system. There is a systematic
13 process that is supposed to work in order to -
14 - to correct those problems, which includes
15 things such as extent of condition to
16 determine other similar problems, actually
17 communicating information to other facilities
18 around the country and around the world that
19 might have similar issues and such, and also
20 looking at whether changes in procedure
21 training might be needed.

22 The -- the -- sort of the key

1 issue with making corrective action programs
2 work, and actually if you look at statistics
3 for -- various statistics related to nuclear
4 power plant operation, it's clear that these
5 have had a significant affect in terms of
6 reliability.

7 But it's the social contract of
8 accepting that you're constantly identifying
9 problems, and that most of those will be
10 categorized as having minor safety
11 significance if one does not sort of enter
12 into this contract as a regulator and as the
13 public to tolerate the existence of the
14 reporting of a large number of problems that
15 what ends up happening instead is use of press
16 reporting, and then worse things can happen.

17 Is there a way that we can sort of
18 encourage or facilitate the application of
19 this type of culture? Certainly, it's
20 beneficial for nuclear, but also, say,
21 medical. The medical area, for example, the
22 most likely reason that you're going to die if

1 you go into a hospital is because of a medical
2 error. That is -- you're much more likely to
3 die from a medical error than your disease.

4 So -- so -- and of course, if you
5 think about it, there's all sorts of reasons
6 why hospitals and doctors have incentives to
7 suppress the reporting of any sort of problem,
8 and therefore it's not surprising.

9 But is there something in sort of
10 the communication within a local community
11 that -- that -- or is maybe this just a matter
12 of -- of trying to build enough trust that
13 when you hear that there's problems in a
14 plant, you're willing to accept that -- that
15 if it's being well run, they're hopefully
16 minor enough that you're keeping the
17 reliability where it should be? Diane, I know
18 you've --

19 MS. CURRAN: Well, it seems --
20 that's very interesting what you're saying,
21 but I would think that an essential element of
22 a social contract like that is that the

1 playing field is even; that both sides have
2 comparable access to information, and
3 comparable resources to evaluate the
4 information.

5 Because for instance, if you're
6 the neighbor of a nuclear plant, and you get
7 on the mailing list for the inspection
8 reports, how do you evaluate those things?
9 They come in your house every night, and if
10 you don't have a degree in nuclear
11 engineering, you read them, and you think,
12 "Well, I don't know what to make of this."

13 So, you have to have somebody help
14 you evaluate their significance, but it takes
15 resources, and you have to have access to the
16 information --

17 CHAIR PETERSON: Yes.

18 MS. CURRAN: -- so that it's
19 really being reported to you, and you feel
20 confident. So, it's like a chicken-and-egg
21 situation, I guess. But then there's this
22 other piece, which is that if there's some

1 problems that you're not going to find out
2 about because they are quote- unquote
3 sensitive, then that undermines this contract.

4 CHAIR PETERSON: Yes, yes.

5 MS. CURRAN: So, I'm not really
6 quite sure how you deal with that.

7 CHAIR PETERSON: Well, then also
8 if you have any instances where you have an
9 operator of a plant that deliberately covers
10 something up, that leaves you suspicious about
11 everything. That's -- that -- of course going
12 back and reviewing everything is very
13 expensive, which I think is one of the reasons
14 why utilities are not as inclined these days
15 as, say, back at the time of Zion, to -- to
16 get into trouble that way. Because it's very
17 expensive to dig out of a hole once NRC has
18 concluded that you've been -- have not been
19 completely truthful. Mary?

20 MS. OLSON: I agree that safety
21 culture and communication go hand in hand.

22 CHAIR PETERSON: Yes.

1 MS. OLSON: And I understand what
2 you're pointing to in our society about
3 performance being the assumption that there
4 is no problem, and I think that that is
5 something that is largely gender-related to
6 some degree, and one of the things that has
7 been fascinating to me over the last 20 years
8 is seeing more and more women get involved in
9 this.

10 So, I'm hopeful that maybe some of
11 that can shift, but I think ultimately the
12 real question, and I'm going to bring this
13 back to the Commission to Allison's question,
14 if I might, is problem definition.

15 If you don't define certain things
16 as problems, then they're not going to be
17 addressed. And so, I would just like to
18 invite the Commission to understand that if
19 you don't squarely consider not making more
20 radioactive waste as an expanded capacity of
21 generation - I don't mean you're going to shut
22 them down over night - I think you're going to

1 have a little bit of a credibility issue.
2 Because if that's not even considered as an
3 option, then what was the problem you were
4 addressing?

5 CHAIR PETERSON: I thank you. I
6 take that point as, again, both to emphasize
7 our recommendations are not going to have any
8 element that recommends for or against, or for
9 -- for generation of more nuclear waste or
10 not. It will be about how to manage the --
11 the nuclear waste problem that we have, but
12 that's a separate decision.

13 MS. OLSON: May I just point out
14 that if there's any sort of sense that a whole
15 new historical period is being embraced,
16 there's no way that there wouldn't be expanded
17 generation of the waste. If you're going to
18 say that recycling is a good thing that's
19 predicated on expanded generation.

20 There's a lot of ways in which you
21 can fall in that hole. So, I'm just
22 suggesting that you might want to really look

1 at problem definition when you're talking
2 about problems.

3 CHAIR PETERSON: Right, and also
4 specific nature of recommendations that we
5 would make, and whether they would endorse or
6 not expansion or contraction of nuclear
7 energy, or things of that nature. I take your
8 point. Allison?

9 We've just run slightly over on
10 our time. I think this is the point for us
11 then to thank the panelists. I do look
12 forward, if you could, Diane, to getting some
13 additional information, and maybe the chance
14 to talk a little bit more on this topic.

15 But I'd like to thank the
16 panelists on behalf of the Commission, and
17 this does end this second meeting of the --
18 oh, this does end this third panel, which
19 leaves us with a short break, and we will be
20 reconvening for public -- I came from -- yes,
21 public comments.

22 Might I just say that first I

1 apologize, having come clearly jet-lagged
2 from California. And second thing is could we
3 have at least a five-minute break? So, we'll
4 reconvene in five minutes for public comment.
5 Thank you.

6 (Whereupon, the above-entitled
7 matter went off the record at 3:03 p.m., and
8 resumed at 3:13 p.m.)

9 MR. FRAZIER: Okay, we are in fact
10 going to begin the public statement portion of
11 the meeting. Everyone will get five minutes.
12 I'll turn it over to you, Dr. Peterson.

13 CHAIR PETERSON: Thank you, Tim.
14 I'd like to start with an apology. I
15 sometimes feel on the last day of a conference
16 on the last session, where sometimes you find
17 that people who should be around seem to have
18 departed. And so, I want to apologize
19 sincerely to the people who are joining us to
20 give public comments that -- that we only have
21 -- that we don't have the full complement of
22 Subcommittee Commissioners here.

1 We do have the staff here, and
2 since I am a professor, I promise that I am
3 assigning homework for our absent -- I don't
4 know. The best I can do is give them an F as
5 punishment. A D, okay. They can't repeat the
6 course with the D.

7 Okay, so with that said, this --
8 this is all being streamed over the internet.
9 It will become part of the transcripts, and it
10 is important input into the public record of
11 this Commission. And so, with that, I'd like
12 to welcome the people who have come to speak
13 to us from the public. The first is Kirk
14 Sorensen. So, Kirk, if you could, come up and
15 make your statement.

16 MR. SORENSEN: Thank you.
17 Commissioners, it is my pleasure to
18 participate in this meeting and address you
19 today. Yesterday, there were a number of
20 discussions on the nuclear fuel cycle. These
21 seemed to focus on whether or not fuel
22 recycles should take place, and if it does,

1 whether it should proceed in a thermal
2 spectrum reactor, like our light water
3 reactors, or if it should proceed in a fast
4 spectrum reactor, of which the most commonly
5 discussed type is based on solid fuel, cooled
6 by liquid sodium.

7 Another way to view these two
8 options is that one represents the consumption
9 of uranium-235, which is our only naturally
10 occurring fissile material, and the other
11 represents the consumption of uranium-238 and
12 its derivatives, primarily plutonium-239.

13 Due to the specific properties of
14 uranium-238 and plutonium-239, they can only
15 be consumed in a sustainable manner, in a fast
16 spectrum reactor.

17 There's another option that
18 receives relatively little attention, but has
19 compelling attributes, and that is the use of
20 natural thorium in nuclear reactors. Thorium
21 is fertile, and can be converted into a
22 fissile nuclide, uranium-233 inside a reactor

1 core.

2 Uranium-233 has the compelling
3 attribute of being able to produce enough
4 neutrons in thermal spectrum fission to
5 continue the conversion of thorium to uranium-
6 233 and then into energy.

7 Early in the nuclear age, it was
8 realized that this special property had
9 superlative value. Luminaries like Eugene
10 Wigner and Alvin Weinberg worked to develop
11 nuclear reactors based on liquid fuels.
12 Research focused on a fluoride fuel formed,
13 because it was the only appropriate liquid
14 into which thorium could be dissolved as a
15 true solution.

16 Weinberg's research and
17 development program at Oakridge in the 1960s
18 showed that it was possible to build and
19 safely operate liquid fluoride thorium
20 reactors. The fluoride fuel form is
21 particularly compelling, since it represents
22 the most chemically stable form of nuclear

1 fuel.

2 In fact, all of our nuclear fuel
3 goes through a fluoride form in today's
4 nuclear fuel cycle, preparatory to enrichment.
5 We know how to turn uranium oxide into uranium
6 fluoride, and we do it everyday at conversion
7 plants. Then we successfully use uranium
8 fluoride in enrichment plants.

9 Many of these technological
10 accomplishments are directly applicable to the
11 use of uranium and thorium fluorides and fluid
12 fueled reactors. Thorium's performance means
13 that it's possible to build a reactor that
14 once started on fissile material, requires no
15 additional fissile input, and runs only on
16 thorium.

17 This has profound consequences for
18 energy future. For instance, if this small
19 steel sphere represented metallic thorium,
20 this would represent the volume of thorium
21 that it would take to provide all the energy
22 you would need in a normal lifetime in a

1 liquid fluoride thorium reactor.

2 Fluoride reactor technologies can
3 also be used to help solve our current
4 nuclear waste concerns. Our spent uranium
5 oxide could be fluorinated into a fluoride
6 fuel form. Once converted, it is straight
7 forward to move the uranium that comprises
8 roughly 95 percent of spent nuclear fuel into
9 uranium hexafluoride gas that could be removed
10 and potentially recycled.

11 The same nuclear technology that
12 allows us to use thorium could also be used to
13 destroy plutonium while extracting electrical
14 energy. Fluoride fuels would not require the
15 long and lengthy fuel qualification program
16 that solid fuels require. Fluoride fuels are
17 impervious to radiation damage due to their
18 ionic chemical bonds.

19 They do not swell, crack or
20 undergo bold property changes, even under
21 stronger radiation. The base fluoride can be
22 used and reused essentially forever, by adding

1 fuel and removing fission products
2 periodically.

3 I encourage the Commission to
4 strongly consider the potential benefits of
5 using fluid-fueled reactor technology to solve
6 our current nuclear waste concerns, as well as
7 to open a bright, new energy future based on
8 the effective use of natural thorium. Thank
9 you.

10 CHAIR PETERSON: Thank you. Our
11 next speaker is Rod Adams. His affiliation is
12 with Atomic Insights. It's a well-known blog,
13 and extensively read. So, Rod, thank you.

14 MR. ADAMS: Thank you for the
15 opportunity to speak today. I publish the
16 Atomic Insights Blog. I've been doing Atomic
17 Insights in various forms since 1995. Today,
18 I am on my last day as a US Naval Officer.
19 Official retirement date is tomorrow.
20 Submarine trained nuclear officer, served as
21 a chief engineer on a submarine.

22 I'd like to take this opportunity

1 to remind you that nuclear energy competes
2 against other energy sources, some of which
3 are supplied by the world's largest, most
4 powerful and richest companies. They have an
5 economic interest in hampering and soiling the
6 growth of nuclear energy.

7 None of the competitive energy
8 resources are without risk. The overall
9 supply of energy versus the overall demand for
10 energy is what determines the price of energy.
11 So, any new supply, say from an expanded
12 nuclear power business here in the US, would
13 drive down the price of energy, and reduce the
14 profits for those large and powerful
15 companies.

16 Some of the activists who have
17 campaigned against nuclear have done so
18 professionally for many decades. Economic
19 competitiveness was discussed in one of the
20 sessions earlier, and it's not just a matter
21 of cost per kilowatt hour. In the energy
22 business, there are other products and

1 services that get sold.

2 For example, in a reliable, stable
3 grid, the grid operator will pay an operator
4 for what's known as reliable capacity. When
5 the operator bids in for reliable capacity, if
6 the grid operator needs them, they're there to
7 provide it. If the reliable operator cannot
8 provide, they get charged a penalty.

9 In the ERCOT, which is Texas grid,
10 wind operators have been assessed that the
11 maximum amount of capacity can bid in for this
12 capacity payment is 8.7 percent of their
13 nameplate capacity. Wind operators would love
14 to be able to bid in and get capacity
15 payments, but they also do not want to get
16 charged a penalty when they fail to deliver
17 because the wind stops blowing.

18 In some areas, wind developers --
19 I'm sorry. One man's cost is another man's
20 revenue. When it comes to whether or not
21 nuclear is an economic value and interest, the
22 investors recognize that high wages and long-

1 term assets that require continual maintenance
2 are a cost to them.

3 Those investors love investing in
4 600 megawatt wind farms with a guaranteed rate
5 of return of 113 -- I'm sorry, a guaranteed
6 power purchase agreement of \$113 a megawatt
7 hour for 25 years, especially when under
8 current tax law, the equity investors get
9 returned their equity investment six to nine
10 months after they make it in the form of an
11 investment tax credit that gives them 30
12 percent of the wind farm development.

13 Predicting the economic value of
14 an asset that's going to take six to ten years
15 to put into service, and then run for 60 years
16 is a dark art. Anybody who can say that they
17 know that a nuclear power plant can't be
18 competitive today has got a much better
19 crystal ball than I have, and a much better
20 crystal ball than all of the financial
21 analysts who have recommended to utilities
22 around the world that nuclear is a worthwhile

1 investment as part of their balanced energy
2 portfolios.

3 One of the issues that would --
4 the Blue Ribbon Commission needs to try to do
5 is establish a predictable regime to allow
6 people to make long-term investments.

7 Somebody mentioned today that
8 secrecy causes problems from the opposition
9 point of view. Well, from the point of view
10 of somebody who supports nuclear, it causes
11 secrecy for us -- secrecy causes a problem for
12 us as well because the opposition can make up
13 any story they want, and there's no way for us
14 to counter if with good information.

15 One of the invited witnesses today
16 talked about the acceptable rates of impacts,
17 injuries, deaths from energy sources, and
18 basically it seemed to us the acceptable rate
19 for nuclear is zero. The competition has a
20 different acceptance rate. The 50 percent of
21 the US electricity supplied by coal is
22 estimated to kill about 25,000 people a year

1 early due to the effects of the emissions.

2 This year, in the first half of
3 2010, in the eastern part of the United
4 States, so a very limited geographic area,
5 three accidents caused the deaths of 46 people
6 due to clean natural gas explosions. And I
7 think my time is up. Thank you.

8 CHAIR PETERSON: Thank you for
9 that statement. Our next speaker, a member of
10 the public, is Lawrence Jacobson. He
11 represents the National Society of
12 Professional Engineers, or he's affiliated
13 with the National Society.

14 MR. JACOBSON: I am affiliated
15 with and employed by.

16 CHAIR PETERSON: Excellent. Thank
17 you.

18 MR. JACOBSON: In this country,
19 there's 4 million engineers. One-tenth of
20 them, one in ten, is licensed. That's an
21 important number. The National Society of
22 Professional Engineers is grateful for the

1 opportunity to comment before the Blue Ribbon
2 Commission's Reactor and Fuel Cycle Technology
3 Subcommittee.

4 NSPE supports investment in
5 nuclear energy technology, green and
6 renewable. Nuclear power will be an essential
7 component of our energy future. The nuclear
8 energy industry has an excellent safety
9 record, thank in part to strict regulation,
10 comprehensive safety planning and rigorous
11 training and qualification standards for
12 employees.

13 Nuclear power's great potential,
14 however, is accompanied by the risk of
15 disaster. Though unlikely, an accident at a
16 nuclear facility could cause serious harm to
17 people, their livelihoods and the environment.
18 NSPE believes that any industry that deals
19 with such great risk should require
20 engineering plans to be signed and sealed by
21 a licensed professional engineer.

22 Licensure serves to maintain and

1 acceptable standard of competence for the
2 protection of the public's health and safety.
3 When professional engineers seal plans, they
4 are taking full responsibility for those
5 plans. That's individual responsibility.

6 NSPE recommends that professional
7 engineering services be used to help maintain
8 the nuclear energy industry's strong safety
9 record and minimize the potential for
10 disaster. Thank you very much.

11 CHAIR PETERSON: Thank you for
12 those comments, and I'm -- as a registered
13 professional engineer, I appreciate very much
14 your comments on the importance of
15 registration. I think that every engineer
16 should become registered.

17 MR. JACOBSON: The important thing
18 is that the professional engineer reports to
19 a higher power. All employees are responsible
20 for their employer. They all have a duty of
21 responsibility to their employer. But to also
22 have a duty to the state, to the government to

1 protect the public is a safeguard that is
2 inexpensive, is prudent.

3 Why wouldn't we do that? Because
4 if a professional engineer signs and seals
5 documents at critical places along the way, we
6 have a trail going backwards to find out what
7 happened along the way from somebody whose
8 responsibility is higher than their
9 employment. We think that's the key piece.

10 CHAIR PETERSON: Thank you. Our
11 final member of the public who will be
12 speaking is John Kutsch. He represents the
13 Thorium Energy Alliance. John?

14 MR. KUTSCH: Hi there. Thank you
15 Blue Ribbon Commission. Thank you very much
16 for having an open meeting. I know you didn't
17 have to. So, it means a great deal to us that
18 you're allowing us to come here.

19 As Per said, I'm John Kutsch. I'm
20 the Executive Director for the Thorium Energy
21 Alliance. Thorium Energy Alliance advocates
22 for all uses of thorium. No one particular

1 use is advocated, but we do have a preference,
2 and we do favor the development of an MSR, or
3 a liquid thorium reactor in particular.

4 The LFTR, or MSR, is a proven
5 design. Several units were built and operated
6 for thousands of hours in the '60s. This is
7 not a paper reactor. This is a real design
8 that operated for a long time.

9 LFTR has among its attributes, and
10 it is for all intents and purposes a non-
11 proliferating system, it can consume waste,
12 so-called waste, runs at ambient pressure so
13 it won't blow up. Little or no water is used
14 in its cooling. So, it can be located just
15 about anywhere.

16 Development of an -- development
17 of an MSR or a LFTR could be justified, just
18 in the fact that it can consume and degrade
19 actinides. That alone is a reason to develop
20 this technology. But this paradigm is
21 shifting, and the technology is shifting, and
22 we will not be creating this technology if we

1 don't understand that there is an existential
2 problem at hand.

3 We need to fund R&D in this area.
4 There are three steps the BRC could take today
5 or through their recommendation. I would ask
6 the BRC to support the proposed legislation by
7 Kit Bond to create a new domestic ability to
8 refine rare earths and thorium.

9 When you mine rare earths, you
10 also get thorium. So, when you get the
11 materials you need to building electric motors
12 and high energy circuits, you also get the
13 fuel that will run them.

14 Step 2: Save the uranium-233. It
15 is in a precarious position. It is set to be
16 destroyed, and it is too precious to let that
17 happen, and the BRC could have influence in
18 this area if they recommended preserving it,
19 instead of destroying such a valuable
20 commodity.

21 Step 3: We must realize that time
22 is of the essence. We do not have ten or 20

1 years to bring small reactors online and
2 approve new fuel cycles. China will not be
3 having a Blue Ribbon Commission of their own.
4 Believe me. They will choose to pursue MSRs,
5 LFTRs, small modular reactors as a business
6 proposition, and once again, they will be
7 shutting the USA out of an existing and
8 emerging technology.

9 The United States of America
10 created the technology and they will be
11 selling it back to us, which is a crime. This
12 is what has happened to, for instance, rare
13 earths. China controls 99 plus percent of the
14 rare earth production in the world.

15 Why is that important? Because
16 when you make the rare earths, you get to
17 decide who makes the magnets, who makes high
18 energy circuits, who makes new integrated
19 circuits. You get to control all the
20 technologies that are built on that
21 foundation.

22 So, we cannot let China or Japan

1 or South Korea or India, Norway, France,
2 Brazil, South Africa, Canada, we cannot let
3 these other countries be first movers in MSR,
4 not again. This has happened before with
5 photovoltaics, with windmills, with batteries.

6 These are all technologies we
7 thought we'd build here, right? And now, who
8 is building them? Other countries are
9 building them in a much more efficient manner
10 than us. And so, the BRC must get the leaders
11 of the United States of America and its
12 regulators to understand the existential
13 nature of nuclear power issues.

14 United States' ability to compete
15 in the world will suffer another major setback
16 if we stick with business as usual, and I
17 believe in your ability to make great good
18 change happen. Thank you for letting me tell
19 you a little bit about the opportunity that is
20 thorium energy, and molten salt reactors,
21 liquid fluoride thorium reactors.

22 And you can contact us any time at

1 ThoriumEnergyAlliance.com. Thank you so much
2 for your time and all your hard work. If you
3 care to, Dr. Hargraves, who spoke yesterday,
4 wrote a fabulous set of articles with Ralph
5 Moore.

6 CHAIR PETERSON: I think we may
7 have copies, but if you can leave them with
8 us, we'll make sure that we get those into the
9 record as well.

10 MR. KUTSCH: Very well. Thank you
11 very much for your time.

12 CHAIR PETERSON: Excellent. Thank
13 you, John. Very good. At this point, I will
14 call closed this second meeting of the Reactor
15 and Fuel Cycle Technology Subcommittee. Thank
16 you, everyone.

17 (Whereupon, the above-entitled
18 matter went off the record at 3:33 p.m.)
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21
22

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