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UNITED STATES NUCLEAR REGULATORY COMMISSION'S

ADVISORY COMMITTEE ON NUCLEAR WASTE & MATERIALS

December 18, 2007

The contents of this transcript of the proceeding of the United States Nuclear Regulatory Commission Advisory Committee on Nuclear Waste & Materials, taken on December 18, 2007, as reported herein, is a record of the discussions recorded at the meeting held on the above date.

This transcript has not been reviewed, corrected and edited and it may contain inaccuracies.

1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON NUCLEAR WASTE AND MATERIALS

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6 185TH MEETING

7 + + + + +

8 VOLUME II

9 + + + + +

10 TUESDAY,

11 DECEMBER 18, 2007

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13

14 The Advisory Committee met at the Nuclear

15 Regulatory Commission, Two White Flint North, Room

16 T2B3, 11545 Rockville Pike, Rockville, Maryland, at

17 8:30 a.m., Dr. Michael T. Ryan, Chairman, presiding.

18

19

20 MEMBERS PRESENT:

21 MICHAEL T. RYAN, Chair

22 ALLEN G. CROFF, Vice Chair

23 JAMES H. CLARKE, Member

24 WILLIAM J. HINZE, Member

25 RUTH F. WEINER, Member

1 NRC STAFF PRESENT:

2 ANTONIO DIAS

3 LATIF HAMDAN

4 SCOTT FLANDERS

5 JIM KENNEDY

6 DEREK WIDMAYER

7 MICHAEL LEE

8 LARRY KAMPER

9 DAVID TIKTINSKY

10 KELLI MARKHAM

11 MICHAEL MURANO

12 ELAINE KEEGAN

13 JOHN THOMPSON

14 STUART RICHARDS

15 ROGER PEDERSEN

16 STEVE GARRY

17 JIM SHEPHERD

18 FRANK GILLESPIE

19

20 ALSO PRESENT:

21 BILL HOUSE

22 KATHY MARTIN

23 DEALIS GWYN

24 GARRETT SMITH

25 RALPH ANDERSEN

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


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

2 (8:32 a.m.)

3 CHAIR RYAN: Okay, the meeting will come to

4 order.

5 This is the second day of the 185th

6 meeting of the Advisory Committee on Nuclear Waste and

7 Materials.

8 During today's meeting the committee will

9 consider the following: the status of operations at

10 the Barnwell Low-Level Radioactive Waste Disposal

11 Facility; the NRC 2006 commercial low level strategic

12 planning initiative; review of planned waste

13 management activities at the U.S. Department of Energy

14 Mixed-Oxide Fuel Fabrication Facility; a briefing on

15 tritium task force actions to revise the significance

16 determination process to address spills and leaks; and

17 discussion ACNW letter reports.

18 This meeting is being conducted in

19 accordance with the provisions of the Federal Advisory

20 Committee Act. Mike Lee is the designated federal

21 official for today's session.

22 MR. DIAS: He just went to get the name

23 tags. There he is.

24 CHAIR RYAN: We have received no written

25 comments or requests for time to make oral statements

1 from member's of the public regarding today's session.
2 Should anyone wish to address the committee, please
3 make your wishes known to one of the committee staff.
4 It is requested that speakers use one of
5 the microphones, identify themselves, and speak with
6 sufficient clarity and volume so they can be readily
7 heard.
8 It's also requested that if you have cell
9 phones or pagers you kindly turn them off or place
10 them on mute. Thank you very much.
11 Feedback forms are available at the back
12 of the room for anybody who would like to provide us
13 with his or her comments about the meeting.
14 It's with a note of sadness that we will
15 have to report that this will be the last ACNW&M
16 meeting for Professor William Hinze. He has announced
17 his intention to retire at the end of the year for the
18 second time.
19 We are happy to report though that he has
20 agreed to remain on as a consultant to the committee
21 for the next several months while we seek a
22 replacement.
23 For those of you who may not know, Dr.
24 Hinze was a charter member of the original advisory
25 committee on nuclear waste. At that time he first

1 joined the committee in 1989, Dr. Hinze was a
2 professor of solid earth geophysics at Purdue
3 University.
4 His first term on the committee ended in
5 1998. In 2004 as professor emeritus, Dr. Hinze agreed
6 to rejoin the advisory committee for a second time.
7 We sincerely thank Professor Hinze for his
8 great and numerous contributions to the committee for
9 these so many years. We know Bill has a number of
10 academic projects related to books and other academic
11 interests that he would like to complete, as well as
12 spending more time with his family and friends.
13 Bill, we wish you and your wife Marilyn
14 and your entire family all the luck and good things
15 that the future may hold for you and continued
16 success.
17 MEMBER HINZE: Very kind. Thank you very
18 much.
19 CHAIR RYAN: Thank you very much.
20 (Applause)
21 CHAIR RYAN: But before you leave --
22 MEMBER HINZE: I'm saving my questions.
23 (Laughter)
24 CHAIR RYAN: All right, with that we'll
25 take up our first session this morning, which is a

1 presentation by Mr. Bill House with Energy Solutions
2 who will give us a status on operations at Barnwell
3 Low-Level Radioactive Waste Disposal Facility.
4 Bill, thank you for coming. What I wanted
5 to accomplish by today's briefing is, we've heard a
6 lot about Barnwell from many different sources, some
7 of it I'm sure accurate, some of it I'm sure not
8 accurate.
9 So I thought we'd have Bill come up and
10 give us the status of the facility; the status of
11 their licensing with the state; and the plans forward
12 so we can have a straight from the horse's mouth view
13 of what the facts and figures are for Barnwell and the
14 outlook for the future.
15 So again, thanks for being with us. We
16 appreciate your time.
17 MR. HOUSE: Okay, I appreciate the
18 opportunity to update the committee and tell you what
19 has happened for a little while, and our plans for the
20 next two to three years as to transition into in-
21 region operations.
22 So in summary, I'll talk a little bit
23 about the site status, what things we're doing for
24 planning, for in-region operations, and Phase I
25 closure, as we call it, and the cost of doing the

1 operations as well as the closure activities. In 1971
2 the important note here is that not only was the
3 license for disposal issued, but the Fund for
4 Institutional Control was also established at the very
5 beginning.
6 The site evolved to be in its current
7 configuration 235 acres in 1976. A decommissioning
8 trust fund was started in '81, so it's continued to
9 grow and remain sufficient to do those activities.
10 And we've gone through the political
11 things that have happened in the '80s and '90s, and
12 now in 2000 we joined the -- South Carolina joined the
13 Atlantic Compact with Connecticut and New Jersey, and
14 we've moved forward in in-region operations.
15 We have actually been in timely renewal
16 status since the middle of year 2000. In '04 the
17 license was appealed by Sierra Club, and the basis for
18 the appeal was the tritium migration and also storm
19 water management on the site.
20 In 36 years of uninterrupted operations
21 we've disposed of 28 million cubic feet. The
22 remaining inventory is about 3 million cubic feet, and
23 that's remained constant over the last few years, even
24 though the as-buried curies are above 12 million.
25 A hundred and nineteen acres of trenches,

1 and about 80 percent of those have already been capped
2 to put in their final closure configuration.
3 The remaining capacity of the site is
4 about 1.2 million cubic feet.
5 What have we done --
6 CHAIR RYAN: I was just going to say, at
7 the current rate of receipt and volume, how many years
8 that would last?
9 MR. HOUSE: If you tell me how much the
10 current rate of receipt will be in region I'll be glad
11 to do that math. But that's one of the issues we're
12 working with the utilities on is trying to determine
13 the annual receipt rate.
14 The capacity remaining is more than
15 sufficient to accommodate the in-region waste
16 including decommissioning waste for the current fleet
17 of reactors in those three states. There are 13
18 operating reactors, and we'll go into that a little
19 bit later; sufficient capacity to deal with that.
20 And I'll be glad to take comments or
21 questions as we go along, and certainly at the end.
22 Under the Atlantic Compact Act, the
23 volumes were restricted in reduced fashion, and this
24 is our last year of full access to the country, and we
25 expect to get the 35,000 cubic feet by June 30th of

1 2008.

2 These are class B/C volumes for the entire
3 country that is shipped to Barnwell. And non -- you
4 average those out, the total B/C volume is about
5 20,000 - 21,000 cubic feet. That's the total
6 commercial Class B and C waste volumes for the country
7 if you will, except for the northwestern states.

8 Currently we have three trench designs
9 that we use at the site, a large, what started to be
10 a Class A waste trench, and as we evolved into it, the
11 agency, DHAC, allowed us to place any class of waste
12 in any trench if you will provided it's segregated by
13 concrete vaults now versus segregated by a trench as
14 the original requirement in Part 61 was laid out.

15 The B/C trench, you'll see a photograph of
16 that a little later, and the slit trench we call it is
17 for the irradiated hardware shipments.

18 All waste forms are placed in concrete
19 vaults, and the traditional packages go in one of the
20 standard vaults, either cylindrical for liners,
21 rectangular for boxes and drums, or a coffin style
22 vault I call it for the long slender irradiated
23 hardware liners.

24 We have two types of large components if
25 you will, the medium-sized components such as certain

1 pumps, control rod drives won't always fit in one of
2 the standard sized vaults, so we design and construct
3 a specially designed vault based on a particular piece
4 of equipment that is coming for disposal.
5 And then those components are placed in
6 the vault, and encapsulated with cement.
7 The true large components, steam
8 generators, reactor pressure vessels, they are
9 assessed for structural stability, and meet the
10 requirements for disposal as a vault themselves.
11 We're starting into our transition to in
12 region, and we will continue to work with all the key
13 parties, trying to project the volumes of waste
14 expected, deciding how we plan to operate, what
15 trenches we plan to use. And of course one big factor
16 for the customers is, what is it going to cost us.
17 So on the volume project aspects, this is
18 the historical volumes received from the Atlantic
19 Compact generators. And the average -- if you average
20 these out, it's about 10 - 11,000 cubic feet of all
21 waste classes that have been disposed at the site.
22 And Class B and C waste averages about
23 4,000 cubic feet on an annual basis.
24 Compact generators consist primarily of
25 the utilities. There are 13 reactors operating, four

1 in New Jersey, seven in South Carolina, and one in
2 Connecticut. And we do have two Navy facilities in
3 the Compact region.
4 The remaining generators are -- contribute
5 very small volumes of waste, a few hundred cubic feet
6 maybe.
7 One of our first projections, normal
8 projections if you will, in the middle of '07, was
9 based on those historical numbers that we have seen
10 coming to the site, and it lays at with a high end of
11 about 11,000 cubic feet.
12 The held waste it's called was a waste
13 stream at any generator in the Compact that would hold
14 their waste and allow non-Compact generators to ship.
15 And they got a price reduction for doing that, or they
16 will get a price reduction when they send that for
17 disposal.
18 And we did project some large components,
19 and obviously a little bit of irradiated hardware
20 continuing to come in.
21 The low end would be on the Class B/C
22 waste at about 4,000 cubic feet. So it's a pretty
23 wide range there, and we're getting done to some very
24 low volumes.
25 But we decided to build a scenario on

1 4,000 cubic feet if we were at that level, or 11,000
2 cubic feet, but only operate two or three months out
3 of the year for the 4,000 cubic foot scenario, and
4 have one trench design.
5 If we were to get commitments for the
6 11,000 we'd try to accept waste throughout the year as
7 we do now; that'd be a convenience to the customers,
8 but still only use one trench design.
9 We did not include any large components or
10 irradiated hardware in these operational or cost
11 scenarios. That's not to say that we wouldn't be able
12 to take it, or wouldn't take it; we're just down to
13 the base case scenarios.
14 How would we operate? We evaluated three
15 different trench designs: the single layer vault; the
16 progressive trench; and the existing B/C trench.
17 And this pre-stage vault array was
18 developed by the budget and control board and their
19 contractor in an effort to purchase vaults, put them
20 in place, and do that while there was sufficient funds
21 coming in from this year's waste streams, and this
22 year's volumes.
23 Part of the issue with that is the fact
24 that we are still in timely renewal; we're still under
25 an appeal by the Sierra Club; we are waiting on a date

1 now to go to Court of Appeals to continue that appeal
2 process. And we're not able to get the license
3 renewed with no changes. So this would be a
4 significant change in how we construct and operate.
5 So a minimal chance of having that done in less than
6 a year.
7 We propose this progressive trench design
8 as a response to the license appeal and the decision
9 of the administrative law judge in 2005. The issue
10 was the management of storm water in the open trench.
11 So rather than have large areas of open trench, we
12 would excavate as we needed the space and backfill on
13 the left side as we put in the vaults and filled them
14 and disposed of the waste.
15 This was also a design that would
16 accommodate small, small volumes of waste during the
17 in-region period.
18 Now we still have the tried and trued
19 Class B/C waste trench. As you can see it's three
20 vaults, three vaults wide, two high, typically. And
21 the top width is about 50 feet; bottom width is about
22 25. But this would certainly provide the ability to
23 receive all the waste that we have projected in our
24 scenarios.
25 We did a comparison here, and all this is

1 related to cost, and related to our ability to
2 continue operating the site. And these factors on the
3 left were considered, and it really gets back down to
4 what will we be able to get approval for in a
5 timeframe that we will need this trench or this
6 design.
7 And the only confidence we have is, the
8 existing trench, we continue to use it, the Class B/C
9 trench.
10 We had to estimate the costs. The
11 customers want to know how much it's going to cost
12 them. We're going through kind of a chicken-and-egg
13 scenario now. We ask how much waste they are going to
14 send, and they ask h ow much it's going to cost. So
15 we're trying to work all that out.
16 We assume the existing regulatory and
17 license requirements. For the most part we are using
18 the same cost structure as we do for the Public
19 Service Commission applications. We have to apply
20 annually to get the Commission to approve our
21 allowable cost for our using the site.
22 We use the latest labor and materials cost
23 rates. And we did include all the costs of operating
24 the site, including the trench construction disposal
25 vaults, et cetera.

1 These are four scenarios that we developed
2 cost estimations on. We've been operating for 36
3 years. We've got most of the site already completed.
4 A lot of that is already capped in the final
5 configuration. And that's the significant ongoing
6 cost, a significant component of the ongoing cost, of
7 operating the site.
8 However, with low volumes, that's also a
9 significant contribution to the cost of those few
10 generators that we have. So we evaluated what it
11 would take just to maintain and monitor the completed
12 portions of the site. And that's what the scenario
13 would be, after full closure, and in a storage-only
14 mode if you will for the license itself.
15 The next level up would be the operating
16 cost with now waste acceptance. I call it the engine
17 idling scenario. In addition to the maintenance and
18 monitoring, you need more equipment. You need some
19 more personnel on hand. You need to make sure your
20 procedures are maintained and in place for operations.
21 And you have the ability to receive waste shipments.
22 Then the -- you add on above that the
23 variable costs if you will, more equipment to operate
24 for disposal and backfilling and more personnel for
25 the different levels of volume that you're expecting.

1 Let's see how these build up.
2 Institutional cost, and we did some ratioing based on
3 times of operation versus non-operational periods for
4 waste disposal, and took away if you will some of the
5 closed site costs or institutional costs.
6 About 600,000, environmental monitoring.
7 Site security we still assumed 24/7 guard at the
8 facility. Site maintenance, all those things
9 continue.
10 We have worked out with the Budget and
11 Control Board for closure activities a margin of 14
12 percent, versus the allowable cost margins of 29
13 percent under the operating scenarios.
14 So all those costs continue, and that
15 would be about 2.6 million.
16 No waste scenario: we go into the approach
17 that we've developed with the Public Service
18 Commission. Fixed costs are those that are in
19 categories that continue on a regular basis and change
20 very little over time. Variable costs are those that
21 are associated primarily with the waste receipts, the
22 labor, the vaults, the equipment, for actual disposal
23 of waste.
24 Irregular costs are for items such as well
25 abandonment, or trench construction; updates of

1 drawings; things that occur irregularly in time, and
2 they are hard to predict on an annual basis of what
3 actual costs may be in those categories.
4 The reimbursable costs are the license
5 fees, the taxes for real estate, et cetera. There is
6 no margin gained from that; they are straight pass-
7 throughs.
8 So just to keep the engine idling at the
9 site, this includes all the institutional costs that
10 were in the previous slide. So we are talking 3.7
11 just to keep the motor running so to speak, being able
12 to receive a waste shipment and dispose of it.
13 So you add in some additional costs,
14 particularly variable costs for 4,000 cubic feet. The
15 largest component there of costs in variable is the
16 vaults, disposable vaults themselves.
17 Irradiated costs went up slightly for
18 trench construction, and fixed costs with additional
19 equipment and so forth continues to go up for the
20 waste operating scenarios.
21 The 4,000 cubic feet, all these are
22 cumulative, and include all the previous costs that
23 I've discussed. Talking $6 million for 4,000 cubic
24 feet.
25 Eleven thousand, another increase, $7.6

1 million. The fixed costs and irregulars go up
2 slightly; the variable cost is the key component.
3 That increases.
4 Also the reimbursable cost continue to
5 rise because the Budget and Control Board and the
6 Atlantic Compact Commission are financed based on a
7 rate per cubic foot of waste disposed. So those
8 things continue to go up as well as local taxes in
9 Farmore County.
10 So it's 7.6 million for 11,000 cubic feet.
11 These number were prepared and presented to the
12 Atlantic Compact Commission back in October.
13 Obviously generators were there, and
14 utilities were present. So this putting it all on one
15 page. The institutional cost we are approaching the
16 Budget Control Board to have those costs paid from the
17 long-term care fund. And they are taking a look at
18 the balance in that fund, and what the cost for other
19 activities will be.
20 Now this has got to be estimated out to
21 140, nearly 150 years.
22 So if you do take this 2.6 away from costs
23 to be paid by the waste generators shipping waste, you
24 are talking less than 4 million for the 4,000 cubic
25 foot scenario, and about 5 million for the 11,000

1 cubic feet.

2 Now these costs at that disposal rate on

3 the average would be about what non-Compact generators

4 are paying, but significantly more than what the in-

5 Compact generators are currently paying.

6 Same values. Right now we have about 54 -

7 55 people at the Bonneville site, and these are full-

8 time equivalent values, not necessarily staffing. We

9 have other activities at Barnwell complex that we

10 share personnel with, and this is about the full-time

11 equivalent values that we see would be needed for the

12 four different scenarios. So we are moving along with

13 the transition and the planning. We have met with the

14 Atlantic Compact Commission. Budget Control Board was

15 there. Compact generators were there as well as DHAC.

16 So everyone is aware of the estimated cost.

17 And we will continue to work towards a

18 viable scenario for in-region operations at the site.

19 We need to get some volume commitments, and then we

20 can finalize the disposal rates in conjunction with

21 Budget and Control Board, because they actually set

22 disposal rates for the site.

23 Once we do that, we can work with the

24 other groups to stabilize the costs that are beyond

25 our control. For example, DHAC has a proposed change

1 to their fee structure to double our license fees;
2 it's $285,000 now and they want to raise it to about
3 $600,000. That hasn't passed through the legislator
4 yet.
5 But other organizations continue to
6 operate off of funds coming in from the site, Budget
7 Control Board and the Compact Commission.
8 We need to finalize this mechanism to be
9 reimbursed for the institutional costs we call them
10 from the closure fund and the long-term care fund.
11 We're also moving into closure. WE call
12 it Phase I closure. And this will be to get as much
13 closure activities completed as possible before we go
14 into the in-region period and minimize those future
15 costs for site closure.
16 We've updated the actual cost estimates.
17 We're working with Budget Control Board. They control
18 the funds in both the decommissioning trust fund and
19 the extended care and maintenance fund. So we go to
20 them for financial authorization, and obviously for
21 technical approval we go to DHAC for that.
22 We're preparing what we're calling
23 performance objectives verification plan. It will
24 have the technical aspects of meeting each performance
25 objective. For example one is the service at the site

1 will have direct radiation levels that are essentially
2 background for the region. So we're working out what
3 is background and how we measure it on the trenches,
4 and when is it acceptable.
5 Phase I closure is about a 15-month
6 period, and we are going to start that as soon as in-
7 region operations start. That helps us keep the
8 current crew that we have, and get the job done with
9 experienced folks.
10 This is the current site configuration,
11 and the color-coded trenches and sections of the site
12 are already capped.
13 We are nearing completion of this filling
14 trench 86, the large trench here, and we also have
15 another operating trench in this area.
16 So you can see we are getting there. The
17 largest stormwater management pond is already
18 constructed. We will have to construct another one in
19 this area, since about a third of the site drains in
20 that direction.
21 So a number of things have already been
22 done over the years. We actually started capping back
23 in the early '90s.
24 The cap itself is contains a 60 mill HDPE
25 liner, and a bentonite clay layer immediately below

1 that.

2 We recompact the existing clay and work up

3 from there to install this gap.

4 What'S that going to cost us? Cost

5 estimates for the Phase I closure we call it is about

6 $18 million. We'll take down four buildings, and that

7 we won't need anymore, and we need those out of the

8 way to do the final site grading. We will cap all

9 completed trenches; continue to do site maintenance

10 and monitoring.

11 We had to estimate this cost of closure on

12 a conservative fashion as if an outside contractor

13 were coming in to do this work. And it includes the

14 same items of cost that we're also calling

15 institutional costs in the current cost estimation

16 scenarios.

17 So we will continue to do those

18 activities, pay it from the closure fund until that

19 fund is eliminated.

20 MEMBER CLARKE: Bill, before you leave that

21 slide, you've got $7 million for the enhanced cap,

22 which actually has three barriers in it instead of the

23 normal two.

24 How many acres would that --

25 MR. HOUSE: It's about 25 acres. And the

1 cost of capping has increased probably overall about
2 40 percent in the last couple of years, and one of the
3 biggest cost components of that is the HDPE liner
4 itself, with the cost of oil going up.
5 MEMBER CLARKE: You have an HDPE and a
6 geosynthetic liner, and then clay below that, which is
7 I guess why you are calling it enhanced. MR. HOUSE:
8 Yes, it's an enhanced cap. This is the geosynthetic
9 clay liner is a very thin Clamax layer that is
10 immediately below the HDPE, and if there were to be a
11 failure in the HDPE, then any moisture getting into
12 that clay swells and closes them.
13 MEMBER CLARKE: Then you've got compacted
14 clay below that as well.
15 MR. HOUSE: That's correct. That's
16 correct.
17 Closure fund has about $21 million in it
18 now, so certainly sufficient do this work, and also to
19 set aside some money for the final closure at the end
20 of in-region operations, which right now we are
21 estimating to be about 30 years of in-region ops.
22 CHAIR RYAN: Bill, how is the long-term
23 care fund doing? Is state paying back what they took
24 out of it?
25 MR. HOUSE: They have paid that back. It

1 is at $119 million now.

2 CHAIR RYAN: They paid back everything, or

3 just partial?

4 MR. HOUSE: No, that's a full payment.

5 There won't be anymore funds coming from -- other than

6 contributions for the waste that go in, and that's

7 very few dollars. You know, these days we're below

8 volumes.

9 Budget and Control Board has a contractor

10 that's looking at the viability of that fund over the

11 long haul.

12 I presented this slide and some others

13 back in May of '06 at the workshop, and essentially

14 the groundwater performance projections remain the

15 same. The compliance point tritium concentration

16 level at about 20 percent of the compliance limit has

17 been in that state for seven years now. So that is

18 hovering around 100,000 picocuries per liter of

19 tritium.

20 And the stream that it's in flows to

21 Savannah River site property, and eventually to

22 Savannah River. And essentially this is a

23 hypothetical dose and not a real dose.

24 I took this photo to show you that the

25 plume is about 1,000 feet wide up at the -- just down-

1 gradient from the trenches themselves. It travels
2 underground about 3,000 feet down to the spring where
3 it comes out, and then it's part of the surface water
4 system going off the site property, owned by Energy
5 Solutions.
6 But the concentrations of tritium various,
7 you can't tell from this; this map was made for DHAC.
8 It's about 10^7th tritium here, picocuries per liter,
9 and it gets down to right above the spring about
10 10^6th in the spring and on down to the compliance
11 point, 10^5th.
12 So very short duration plume. We have
13 confirmed that it does not go past the stream. It all
14 comes up into the stream itself and flows off.
15 This past fall we had a lot of attention
16 from the local newspapers in South Carolina about the
17 tritium plume, and the fact that we had kept
18 information, we being Chem-Nuclear and DHAC had kept
19 information from the public.
20 Well, the facts are that we have provided
21 the environmental monitoring data since Day One to the
22 state, every calendar quarter. And the fact that they
23 were able to eventually get hold of a map similar to
24 this is what started the controversy.
25 Chem-Nuclear and DHAC ended up sampling

1 and analyzing about 80 private water wells around the
2 site and determined that most of them were non-
3 detectible for tritium based on the count times and so
4 forth that we were using.
5 We considered the background levels of
6 tritium in the Barnwell area about 800 to 1,000
7 picocuries per liter.
8 So this confirmed that no residents were
9 impacted from the site, and the plume is essentially
10 what we have said all along. And we will probably add
11 eight to 10 residential wells to our routine sampling
12 program as a result of that.
13 CHAIR RYAN: Bill, while you are on that
14 slide, could you talk a little bit about your capping
15 program and its impact on the plume over time?
16 MR. HOUSE: Sure. You recall the previous
17 slide. This was the first capping area. It's the
18 oldest set of trenches that were used in the '70s.
19 That's where we first saw tritium migration out of the
20 trenches themselves and into groundwater. And
21 essentially the concentrations of tritium immediately
22 down gradient of that cap have started to decrease, so
23 they are almost an order of magnitude lower than they
24 originally were, and what we have determined through
25 25 years of monitoring data is that it takes about 10

1 year travel time vertically for the groundwater to
2 move from the bottom of the trenches to the horizontal
3 aquifer of water, and then about another 10 years to
4 get from these most southern trenches to the spring
5 itself.
6 So a total of about a 20-year travel time
7 at the most southern part.
8 So we are seeing some reductions in
9 tritium concentrations based on the caps.
10 On the in-region operations, the Budget
11 and Control Board is amenable to a break-even scenario
12 where we only derive enough revenue to cover direct
13 operations at the site. There is a portion of the
14 Atlantic Compact Act that discusses suspended
15 operations, and that scenario is that if monies
16 derived from disposal of waste fall behind expenses,
17 the -- it's called suspended operations, and the waste
18 is to be stored at the Compact generator locations
19 until sufficient volume accumulates to restart
20 operations.
21 Now it's kind of a false scenario there.
22 We have recently interpreted that to mean the cash
23 flow goes negative, they are going to ring the bell.
24 So that means no more waste coming to the site for
25 awhile. In my opinion it means the closure of the

1 site.

2 So the board is amenable to having no

3 money come to the state coffers from operations of the

4 site, and they will monitor this condition of cash

5 flow.

6 MR. HAMDAN: Excuse me, but can't you

7 increase the cost to make up for cash flow?

8 MR. HOUSE: Sure.

9 MR. HAMDAN: Why don't you?

10 MR. HOUSE: The Budget and Control Board

11 sets the disposal rates. And if you will remember

12 back in that slide that I showed year 2000 all the way

13 to the present, we were restricted in the volume,

14 total volume of waste that we could receive. And it

15 continued to go down, the allowed waste that we could

16 get.

17 But we did not get the limit. We did not

18 reach that limit. And that was because of the pricing

19 scenarios at that particular time. It took two or

20 three years up front for the Budget Control Board to

21 get the pricing structure right, so that we were able

22 to get the maximum amount of waste.

23 They were, the generators were either not

24 shipping at all and storing, and they could store

25 certain volumes of waste without a problem and then

1 ask for a special rate.

2 So they were holding back. More and more

3 Class A waste continues to go to the Clive, Utah site.

4

5 So those are two types of competition that

6 we had over these last few years for receipt of waste

7 coming to Barnwell.

8 Now we've got a captured audience come

9 July 1, '08. But those same potentials for

10 competition exist.

11 CHAIR RYAN: Bill, after the July 1 date

12 can in-Compact generators ship to any other site?

13 MR. HOUSE: Yes.

14 CHAIR RYAN: They are not restricted to use

15 Barnwell?

16 MR. HOUSE: That's correct.

17 CHAIR RYAN: So that's the point you are

18 looking for I think, Latif, is, if they are not

19 required to use it, so the pricing has to make sense

20 from a financial standpoint to the generator.

21 MR. HOUSE: We are working with the Compact

22 generators to try to get to the right volumes that

23 they plan to ship, and the Budget Control Board did

24 send a letter out recently asking for their

25 commitments to support the site, and also went on to

1 say if you don't support the site it won't be there,
2 because if there is no money being generated, we go
3 back to rule number one, ring the bell for suspended
4 operations.
5 CHAIR RYAN: Bill, the commission in our
6 last briefing expressed some interest in this
7 changeover and what's happening, the waste folks have
8 an inventory now. Can you talk about what generators
9 might be doing in anticipation of the change in July?
10 MR. HOUSE: Sure. Over the last year or
11 so, the number of irradiated hardware shipments
12 continues to rise. And in fact, in the last six
13 months, from July until today, we received 40
14 irradiated hardware shipments, and were able to get
15 them from anywhere in the country.
16 There is 50 hardware shipments scheduled
17 January through June of 2008.
18 CHAIR RYAN: What would be a normal number
19 of shipments in a 12-month period?
20 MR. HOUSE: Probably 25.
21 CHAIR RYAN: So you're looking at a
22 fourfold increase in Class C shipments?
23 MR. HOUSE: Right. So reactors and
24 utilities are cleaning out their pools with irradiated
25 hardware. That's probably the biggest level of

1 planning that they are doing, is to get those pools
2 cleaned out.
3 There's a few generators that have some
4 resin stored, and they were awaiting, if you will, to
5 get a better deal. So they are cleaning out their
6 storage areas to eliminate all those wastes that they
7 possibly can.
8 And that's good for this year for the
9 state and for the company, but it'll all end June
10 30th, '08.
11 Anticipation in the in-region period is
12 maybe one hardware shipment every other year. Now
13 that may not be but every three or four years, and
14 they wait until a campaign, like they do now, and do
15 enough hardware processing for two or three loads.
16 So that's why we didn't build that into
17 our scenarios.
18 Budget Control Board is also amenable to
19 funding some of the closed site maintenance and
20 monitoring costs out of the long-term care fund, and
21 they have hired URS to do a financial assessment of
22 the adequacy of that fund.
23 And as I said, it's got to be there for
24 about 140-150 years, based on the minimum 100-year
25 institutional control period in the regulations.

1 But we are going to be in a transition
2 state for two or three years. We'll get a lot of
3 hardware shipments first half of the year. We will
4 get the 35,000 cubic feet by June if not before. When
5 we reach that limit we are finished; can't receive
6 anymore in the fiscal year.
7 So we are encouraging everyone to get what
8 volume allocation they can. It's pretty much all
9 locked up now. There are a few hundred cubic feet
10 left for sealed sources, for the non-utility folks to
11 be able to ship some of their sources. But
12 essentially it's all spoken for.
13 We've got a lot of work to do with DHAC
14 and Budget Control Board to get ready for closure
15 activities. DHAC approves each cap project, and we
16 have estimated three different capping phases over the
17 course of that two-year period starting in January of
18 this coming year.
19 We hope to get the held waste the first
20 year or so from the in-region generators, and we will
21 continue operating as the in-region site.
22 We will use existing open trenches, but
23 also use existing trench designs as we move forward.
24 And hopefully within this two-year period we can get
25 some baseline on what the in-region volumes are going

1 to be at some reasonable constant level, and figure
2 out the mechanisms for us to get paid out of the long-
3 term care fund for some of the closure and maintenance
4 activities; and essentially our staff near the end of
5 this transition will be about half of what we have
6 today.
7 Moving through the changes. Be glad to
8 take any more questions.
9 CHAIR RYAN: Okay, Jim?
10 MEMBER CLARKE: Thanks, Bill, that was very
11 informative.
12 Just a couple of questions. You went in
13 for a license renewal, and that's being appealed. If
14 the license is granted what will the period be?
15 MR. HOUSE: It'll be a five-year period
16 from the date of issuance.
17 MEMBER CLARKE: Thinking down the road to
18 decommissioning and site closure, will the site be
19 under the ownership of the state at that time?
20 MR. HOUSE: The property is already owned
21 by the state, and we have used some company property
22 for some of the stormwater management features, and
23 drainage systems, and that land will have to be
24 transferred as well.
25 MEMBER CLARKE: And that would be operated

1 under a long-term license, long-term control license,
2 or something like that?
3 MR. HOUSE: Yes, the -- there will be a
4 radioactive material license for the buried waste
5 during institutional control period, and it -- the
6 regulations envision it to be the custodial agency.
7 And in South Carolina the custodial agency is the
8 Budget Control Board.
9 That does not prevent or prohibit the
10 board contracting with other entities to do the work.
11 MEMBER CLARKE: To take it over and manage
12 it?
13 MR. HOUSE: Right. We would want to
14 continue doing that activity into the future. We have
15 other activities and facilities that go in the
16 Barnwell area. So we could very easily continue that
17 work.
18 MEMBER CLARKE: And if I could just ask you
19 a quick question again about your cap design. Could
20 you put up slide #30 again?
21 MR. HOUSE: This one?
22 MEMBER CLARKE: Yeah, that's the one. Now
23 if you take the compacted clay layer that's right
24 above the backfill above the waste, and you combine
25 that with the HDPE liner, that's the RCRA cap design,

1 now you have chosen to put a geosynthetic clay layer
2 in between those. I'm kind of curious about that.
3 Because it's not uncommon to see geosynthetic clay
4 liners, not in the seismically active areas where they
5 don't do well. But it's becoming a favored approach
6 because you can just roll them in. You don't have to
7 have naturally occurring clay; you can get the same
8 benefit, and the hydraulic conductivity of these
9 liners when they are performing well is very low; it's
10 like 10^-8th, it migh8t even be lower than that.
11 So I was just curious, so it's not
12 uncommon to see HDPE with clay, or geosynthetic clay
13 liner, but it seems uncommon to see HDPE with a
14 geosynthetic slay liner, and I was wondering is that
15 something the state wanted to see, or something your
16 folks came up with?
17 MR. HOUSE: No, that's our conservative
18 design, for the overall liner and protection of the
19 trenches.
20 MEMBER CLARKE: Because with the HDPE and
21 the clay, there is redundancy. And you keep the clay
22 from dessicating if you construct it right I guess.
23 But I was just curious about having two -- well, you
24 really have three hydraulic barriers in your design.
25 MR. HOUSE: Well, our clay we call it, I

1 mean it's compacted. It is maybe 10^-5th, possibly
2 10^-6th.
3 MEMBER CLARKE: Okay, so you would have
4 trouble --
5 MR. HOUSE: So it's not that much clay
6 content, and so the permeability is relatively low.
7 CHAIR RYAN: If I recall Dr. Ichimura, the
8 geohydrologist there, Jim, talking about there are
9 always questions about HDPE's life, one. It is seen;
10 it's tested; it's qualified.
11 MEMBER CLARKE: Sure, there are many ways
12 to go astray.
13 CHAIR RYAN: But the geosynthetic is almost
14 a belt-and-suspenders version of a capping scheme, and
15 the incremental cost isn't that much.
16 MEMBER CLARKE: No, it's about $280,000 an
17 acre. I mean it's more than a RCRA recovery would
18 cost.
19 CHAIR RYAN: But incrementally, over a
20 longer haul, over not a 30-year performance interval
21 but 100 years, I think the scheme was, and the state
22 felt that that is an added feature that adds in a
23 little extra layer of conservatism or confidence, and
24 as a system, it's more robust. MEMBER CLARKE: Sure, I
25 don't have any problem with that. I was just curious

1 as to how you got to that design.

2 MR. HOUSE: We have -- the incremental cost

3 of the geosynthetic layer is small compared to the

4 overall cost. And we have a number of trenches. Up

5 until 1996 there was essentially no vaults. So it's

6 waste trenches with just traditional drums, boxes,

7 those kind -- liners, those kinds of things in place

8 that may eventually deteriorate and cause subsidence.

9 MEMBER CLARKE: I understand the areas you

10 have already capped don't have this design though; is

11 that right?

12 MR. HOUSE: Say again, I'm sorry.

13 MEMBER CLARKE: the areas that you have

14 already capped --

15 CHAIR RYAN: Do have this design.

16 MEMBER CLARKE: They do have this design?

17 MR. HOUSE: Yes.

18 MEMBER CLARKE: You have always been using

19 this design?

20 MR. HOUSE: Yes. This is the same design

21 from Day One.

22 MEMBER CLARKE: Okay, thank you.

23 CHAIR RYAN: One other feature I've learned

24 that led this to be a good idea is the vertical water

25 transport is straight vertical to below the trench

level. So there is no intrusion from either the sides or the bottom. So this is basically a pretty good umbrella.

MEMBER CLARKE: No, I understand. Just curious.

CHAIR RYAN: Anything else?

MEMBER CLARKE: No.

CHAIR RYAN: Ruth?

MEMBER WEINER: You talked about when you decommission the site, or decommission part of it, is there any other use that can be made of that site? Do you just abandon it or what?

MR. HOUSE: Certainly we don't abandon it. But we are going to continue to keep the grass cut on the top of the caps; look for subsidences on those caps. And we cut the hay of grass to stress it a little bit, and it takes up more water; but also by cutting you prevent the growth of trees.

But it could be used. I mean the background radiation levels are going to be the same as other areas. It could be used. I mean it's a total of 235 acres; it's not that big a plot.

MEMBER WEINER: Well, the reason I'm asking is exactly what you just said, that if the surface radiation is background, you know, are there

1 recreational uses? Are the industrial uses?

2 CHAIR RYAN: This is a pretty rural part of

3 South Carolina.

4 MEMBER WEINER: Isn't there anything that

5 you can use it for?

6 MR. HOUSE: It was conceived to be a golf

7 course at one time.

8 MEMBER WEINER: Okay.

9 MR. HOUSE: But I'm not sure that'll pan

10 out. We've got an evolution of increased controls for

11 radioactive materials in this day and time, and we are

12 going to continue to have fences up, guards there

13 periodically, that kind of thing, and there's just

14 acres and acres of land and pine trees that are not

15 used down the acres is not a big deal.

16 MEMBER WEINER: I recognize that my next

17 question is purely hypothetical, given the whole

18 political and legislative situation, but would it be

19 possible to operate this as a national B and C

20 disposal site? I mean I recognize the political

21 barriers are enormous, and I'm not talking now about

22 overcoming those. But if this were the best of all

23 risk-informed worlds, would that be possible? Could

24 you present this so that those small generators that

25 have no place to dispose their B and C wastes after

1 you go only regional would have a place.

2 Is that --

3 MR. HOUSE: That certainly is technically

4 possible. We are essentially doing that now. We are

5 receiving the B/C waste from 39 states including the

6 sealed sources, the irradiated hardware, all the high

7 dose rate waste forms.

8 MEMBER WEINER: So technically you could

9 continue to do that?

10 MR. HOUSE: Sure.

11 MEMBER WEINER: For a very long time?

12 MR. HOUSE: That's correct. We could do it

13 for a very long -- for a considerable amount of time

14 with existing license property.

15 MEMBER WEINER: That's all; thank you.

16 CHAIR RYAN: Allen?

17 VICE CHAIR CROSS: This may be a really

18 dumb question, but what happens at the end of the

19 institutional control period, the 150 years or

20 whatever it is? Does -- do people just walk away from

21 the site or what?

22 MR. HOUSE: We are just starting to talk

23 about that with DHAC and with the Budget and Control

24 Board. And the closer we get to transferring the land

25 and eliminating our lease that we have for it, the

more concerned the Budget Control Board gets. But there is some discussions to provide financing and monies beyond the minimum amount of time for institutional control.

I don't envision walking away from the site in 150 years.

VICE CHAIR CROSS: Has there been any look at the risks at that time, or doses if somebody were to dig into it, or anything like that?

MR. HOUSE: No, only the performance assessments that we have done to evaluate the groundwater essentially. And we have eliminated the other pathways for meeting the performance standards.

We do have intrusion barriers, and the vaults are considered intrusion barriers for the high gamma long half life materials. But the remaining inventory at 100 years is probably about 5 percent of the three million that is there now.

CHAIR RYAN: So two-thirds of the inventory is cobalt-60, Bill, if I recall, roughly?

MR. HOUSE: Cobalt, and nickel-59.

CHAIR RYAN: So then there is a huge fraction of the inventory that is short lived?

Thanks. Professor Hinze.

MEMBER HINZE: Thank you.

1 Bill, while you are on this institutional
2 control period I assume that the monitoring is going
3 to continue through the institutional control period?
4 MR. HOUSE: That's correct.
5 MEMBER HINZE: And could you give me some
6 idea of where that monitoring will be? Will it be all
7 of the wells? Or will it be select, at the spring,
8 whatever?
9 MR. HOUSE: Right. We do hope to reduce
10 the number of sampling locations over time, during the
11 institutional control period, and also the frequency
12 of sampling.
13 Right now we have about 180 groundwater
14 monitoring wells that we monitor for radiological
15 purposes, and about 30 - 40 more in addition to that
16 that we use for quarter level data to determine the
17 height of the water table and so forth.
18 We are working with DHAC now as a matter
19 of fact to scale this monitoring program to what it
20 should be if you will at the time of closure.
21 MEMBER HINZE: Is that based on aerial
22 distribution, distance from the site, nearness to the
23 plume? What are the criteria that are being used?
24 MR. HOUSE: The primary basis that we go
25 back to is the knowledge of groundwater flow and

1 knowledge of where the plume is. Laterally from the
2 site certainly no contributions there for
3 radionuclides to migrate across the gradients in that
4 direction.
5 So we have been eliminating wells over the
6 course of the last couple of years that are up
7 gradient lateral to the movement of the groundwater.
8 But we still have that 160 - 180 wells.
9 MEMBER HINZE: I'm sure I've known this in
10 the past. But all the gradient, the groundwater
11 gradient, despite the surface water slopes, the
12 groundwater gradient is towards the spring?
13 MR. HOUSE: Correct.
14 MEMBER HINZE: Bill, how much of the
15 nonreactor wastes that you are receiving, when you
16 said this is a very small amount, what kind of
17 percentage are we talking about? A few percent?
18 MR. HOUSE: That's correct. Yeah, like
19 four or five hundred cubic feet out of this 16 -
20 20,000.
21 MEMBER HINZE: And that is all Class A?
22 MR. HOUSE: No, that's the -- probably all
23 Class C.
24 MEMBER HINZE: All Class C.
25 MR. HOUSE: Mostly sealed sources.

1 MEMBER HINZE: Mostly sealed sources, and
2 you are getting these from universities, hospitals,
3 research lab.
4 MR. HOUSE: Industry.
5 MEMBER HINZE: Industry, that sort of
6 thing.
7 MR. HOUSE: Yes, sir.
8 MEMBER HINZE: Let me ask you about any
9 safety concerns that you have dealing with the
10 scenario in which you are operational only a few
11 months of the year.
12 I'm interested in any safety concerns in
13 developing trenches. There is going to have to be a
14 cutback in personnel you were talking about half of
15 the 54, 55. This also means that the state
16 inspectors, will the state inspectors be on site year
17 around if you are only operating four months of the
18 year?
19 Have you thought through some of the
20 safety concerns that may develop as a result of this
21 kind of scenario?
22 MR. HOUSE: We certainly have, and that's
23 one of our big concerns.
24 MEMBER HINZE: Would you tell us what
25 you're doing?

1 MR. HOUSE: Sure. We will -- let me just
2 find this Manpower slide here.
3 MR. WIDMAYER: It's 26.
4 MR. HOUSE: Thanks. With the institutional
5 activities that we have to do, that's 14 full time
6 equivalents. That could be 16, 18, maybe even 20
7 folks or actual individuals. So that level of
8 personnel would be there independent of any additional
9 operations, and we are hoping that we get the
10 experienced operational folks to be part of that
11 minimal crew that we have there. Then as we build up
12 to receive and dispose of wastes, we have that base
13 cadre of experienced folks to be there and help train
14 and guide the others that we may have to bring in.
15 If we go to a two or three month operating
16 scenario, we have all the concerns of, number one,
17 finding those folks when we need them; and the vision
18 is that other energy solutions employees would come
19 from other locations to help with that.
20 We do have other activities at the
21 Barnwell complex, some rad waste processing and some
22 non-radiological work that we do there. So we've got
23 a broader set of staff that is there at the Barnwell
24 complex.
25 One of my big concerns as you say is the

1 safety and taking the time before you start the actual
2 receipt and disposal of waste to get the crew on at
3 the site, get them trained and experienced; go through
4 mock-ups; we have some equipment that we use to train
5 folks that help us with the irradiated hardware
6 offloads. That's the biggest potential hazard that we
7 have at the site. The dose rates on those liners are
8 up to 20,000 R per hour. We don't have a fuel pool to
9 play with them.
10 So that is a very critical operation, and
11 we have been concerned about that with this increased
12 level of effort that we are going through with
13 receiving all these hardware shipments.
14 MEMBER HINZE: As I understand, from what
15 you said, that the trenches are only going to be
16 essentially developed real time with the use? Or how
17 is that going to work?
18 MR. HOUSE: We will -- the plan now is to
19 stay with our traditional Class B/C trench design, and
20 we have done construction of slit trenches
21 historically in segments.
22 As we need space for six, eight or 10 more
23 liners, we will extend the trench. It's originally
24 approved by the state, each trench is, for its full
25 length, but we construct it in segments.

1 We can do the same with the bigger Class
2 B/C trench to accommodate the waste.
3 MEMBER HINZE: Is there some drying out of
4 the walls of the trench developing fissures that might
5 be rather rapid permeability routes as a result of
6 leaving it out in the open? Is there any effect from
7 that?
8 MR. HOUSE: We do get a little dessication
9 if you will on the walls that the large A trench 86
10 has been open, the section that is still open now
11 probably five years or so. And you can see little
12 erosional ripples on the walls.
13 What we do in the construction phase is to
14 eliminate the surfacial sands that are on the surface
15 of the site, and recompact clay up to the surface
16 again. So and then go in and actually excavate the
17 trench itself.
18 MEMBER HINZE: So it would be a useful
19 approach to consider only developing a segment at a
20 time?
21 MR. HOUSE: That's correct.
22 MEMBER HINZE: How about in terms of the
23 state --
24 CHAIR RYAN: Bill, we are past our break
25 time.

1 MEMBER HINZE: Can I ask one more question?

2 CHAIR RYAN: Sure.

3 MEMBER HINZE: What about the state? In

4 terms of going back to my visit to the site in early

5 '90s, it seemed to me there was a state inspector on

6 site. Will they maintain a state inspector on site?

7 Or will that be a person who will only be there during

8 the period of operation?

9 MR. HOUSE: Yeah, I'm not sure about that.

10 It seems that they are planning to be there full time

11 if they want to double the license fee.

12 MEMBER HINZE: Thank you.

13 CHAIR RYAN: Thanks, Bill, I appreciate it.

14

15 One last question, Bill, with all the

16 newspaper reports that you mentioned, there was some

17 discussion that the company is not going to seek any

18 further operation at the site past June 30, 2008. Is

19 that correct?

20 MR. HOUSE: That's correct; no change in

21 the Atlantic Compact law.

22 CHAIR RYAN: Yeah, I mean beyond the

23 Atlantic Compact commitments.

24 MR. HOUSE: Will go to the three states for

25 in-region operations, and we want to continue to

provide that disposal service for those generators.

CHAIR RYAN: Those three states. The commission in our last briefing basically came up with that as a point of discussion, and we indicated to them that seemed to be the case, but you have confirmed that is the case now, so we appreciate that.

MR. HOUSE: Yes.

CHAIR RYAN: With that we've just run a little bit over time. I am going to shorten our break to 10 minutes, and if we could come back at five minutes to 10:00 we'll get started very promptly at 10:00 and appreciate that very much.

Bill, thank you very much. We appreciate the update and all the detail. Thanks.

MR. HOUSE: Thank you.

(Whereupon at 9:43 a.m. the proceeding in the above-entitle matter went off the record to return on the record at 9:56 a.m.)

CHAIR RYAN: On the record. We are now going to hear from the Low-Level Radioactive Waste Program staff on their Strategic Assessment of NRC's Low-Level Waste Radioactive Waste Program. I guess it

1 will be led by starting off with Scott Flanders and
2 Jim Kennedy both and welcome, gentlemen.
3 Let me apologize to you and to the other
4 members. The commissioner one-on-one meeting that I
5 have scheduled got changed to 10:45 a.m. So I'll be
6 leaving not due to lack of interest but due to that
7 change in schedule. So I'll leave it in Allen Croff's
8 hands. I'll just slide out here in a few minutes. So
9 say all the important stuff first. Take it away.
10 MR. FLANDERS: Okay. I'm just going to
11 have a few opening remarks and I'm going to turn it
12 over to Jim. But, first, I would like to thank the
13 Committee for the opportunity to come down and brief
14 you on the strategic assessment. I know it's been
15 some time that we've been talking about this effort
16 and then your interest in having us come down and talk
17 to you about it.
18 We started this project maybe in early
19 2006 and a key piece early on was participation in the
20 workshop that was sponsored by the Committee which was
21 very helpful and provided a lot of good information
22 and at that time, what we tried to do was to really
23 set up and explain why we were taking on the strategic
24 assessment. And the purpose of the strategic
25 assessment was really to take an examination at how

1 best to utilize the resources that we had given the
2 role that the Commission identified for us going back
3 to a strategic assessment of a different kind that was
4 done in the late '90s, '96 timeframe, and a '97
5 Commission decision in terms of the scope of the low-
6 level waste program and what kind of program they
7 thought was appropriate for our agency given that
8 regulatory admission.
9 And in the context of that program, what
10 we wanted to do was to identify what areas we thought
11 were best to focus on and best to utilize our
12 resources as we move forward because the environment
13 is changing and there's lots of interest both
14 internally and externally and we wanted to examine how
15 best to utilize our resources to carry out that
16 mission that was provided to us in '96-'97 timeframe.
17 Before I start, I did want to also point
18 out that the Strategic Assessment Jim Kennedy is going
19 to walk us through the assessment. But it was really
20 led, developed, by a group of folks, Jim certainly,
21 and we also had Mike Tokar and Jim Shaffner also
22 played a significant role as well as Ryan Whited who
23 was a Branch Chief at that time in putting together
24 the Strategic Assessment.
25 So I'm going to let Jim walk through

1 Strategic Assessment, an overview of kind of the
2 methodology approach we used, some of the thinking
3 that went into it and the results that came out and
4 then Jim and I will be here available to answer
5 questions at the end. With that, I'll turn it over to
6 Jim.
7 MR. KENNEDY: Okay. Thanks, Scott. It's
8 a pleasure to be here today to provide the results of
9 our Low-Level Waste Regulatory Program Strategic
10 Assessment that we just recently completed. The
11 Assessment itself is contained in SECY-07-0180 in a
12 Commission paper dated October 17, 2007.
13 And there are three broad areas that I'm
14 going to cover today: the National Low-Level Waste
15 Program including things like generation rates;
16 disposal availability today and in the future; the
17 laws under which we operate; some current issues and
18 so forth. I'll cover this fairly quickly since you
19 likely know many of these topics and issues from your
20 past meetings and so forth. But understanding the
21 National Program provides context for the Strategic
22 Assessment itself and for our NRC Low-Level Waste
23 Regulatory Program.
24 With respect to the Regulatory Program,
25 I'll review what we currently do; our core

1 responsibilities; the specific kinds of things that we
2 do and, most importantly, some of the major
3 organizations and stakeholders that we interact with
4 routinely.
5 And, finally, I'll cover the Strategic
6 Assessment itself; the goal of the Assessment; how we
7 conducted it; and the results we came up with, mainly,
8 with respect to the results, those activities that we
9 determined we should undertake over the next couple of
10 years to contribute to the Agency goals. That's also,
11 by the way, consistent with the role defined for us by
12 the Commission back in 1997 when it completed an
13 overall agency strategic assessment. I'll talk more
14 about that later.
15 I think a key word here, though, is
16 context. Our program operates in the context of the
17 National Program, first of all, and all the issues and
18 problems that are associated with it. We also operate
19 in terms of an internal context which is defined by
20 the Agency authorities given to us under law and the
21 strategic goals and objectives defined by the
22 Commission and the Strategic Plan.
23 The primary laws, authorities rather, and
24 responsibilities that we have under law, two basic
25 laws that we operate under in the Low-Level Waste

1 Program, the Atomic Energy Act of 1954 and the Low-
2 Level Radioactive Waste Policy Amendments Act of 1985.
3 The Amendments Act itself gives responsibility to the
4 states for development of new disposal capacity in the
5 U.S. It enables them to form regional compacts
6 whereby a single state would host a facility and
7 provide for disposal of other states within the
8 compact and within the region. The Amendments Act had
9 incentives and penalties for states to pursue new
10 disposal facility development. The last of those went
11 into effect or was in effect in 1993. So they're not
12 really an issue anymore. And, finally, the Low-Level
13 Waste Policy Act, as we all know, enables compacts to
14 exclude out-of-region waste, an issue with the
15 Atlantic compact coming up next June 30th of next
16 year.
17 As far as NRC responsibilities go, we have
18 responsibility for the regulatory framework for the
19 low-level waste disposal contained in 10 CFR Part 61
20 and also in extensive guidance that we developed
21 primarily back in the 1980s. We also provide
22 assistance to the agreement states when we're asked
23 and, under the Low-Level Waste Policy Act, we have
24 responsibility for licensing the greater-than-Class-C
25 disposal facility which is to be developed by the

1 Department of Energy. We also would have
2 responsibility for licensing a Part 61 facility if
3 there were to be one in a non-agreement state, but
4 that hasn't happened thus far. Agreement states under
5 the Atomic Energy Act currently regulate all low-level
6 waste disposal sites in the U.S. and the majority of
7 low-level waste generators as well.
8 Others in the National Program that
9 operate under these two laws are generators, brokers,
10 processors and disposal facility operators, all of
11 whom are licensed under the Atomic Energy Act, most of
12 whom are licensed by the agreement states.
13 Here's a map showing the location of the
14 three operating disposal sites and the one that's been
15 proposed in West Texas. On the right is a table that
16 identifies the facilities, the waste it's authorized
17 to accept and the compact restrictions that apply to
18 the facility. Of particular note, I guess, is that
19 the Clive, Utah site operated by Energy Solutions
20 accepts Class A waste from most of the U.S. But the
21 Barnwell site which accepts the majority of Class B/C
22 waste in the U.S. right now is, of course, scheduled
23 to close out-of-compact generators next summer.
24 Now this slide shows what it will be like
25 for Class B/C disposal next summer when Barnwell

1 closes to out-of-compact generators. On the left are
2 the 11 states in the Northwest and Rocky Mountain
3 compacts that will continue to have access to the
4 Hanford U.S. Ecology facility. On the right is the
5 three Atlantic compact states, Connecticut, New Jersey
6 and South Carolina, that will continue to have access
7 to the Barnwell facility. And in the center are the
8 36 states that will no longer have access for Class B
9 and C disposal.
10 I think what's of particular interest is
11 that those are the coastal states. Those are the
12 states that are in the Midwest and the East where most
13 of industry is. I did some numbers on this and the 36
14 states contain 90 of the 100 for operating nuclear
15 power reactors. They contain 26 of the 33 operating
16 research reactors, four of the seven major fuel cycle
17 facilities and 18,500 of the 22,000 materials
18 licensees. So the great, great majority of licensees
19 are going to be affected by the Class B/C disposal.
20 I think the good news is that a lot of
21 those licensees, at least, the materials licensees, in
22 fact don't generate low-level waste. Only a fraction
23 of them do. And then an even smaller fraction of the
24 materials licensees actually generate B/C waste. I
25 think that's the good news in this picture here.

1 We did a chart of future need versus
2 existing capacity. The last slide was what's going to
3 happen on June 30th. But we wanted to look further
4 out than June 30th of next year. And so we looked at
5 past generation rates and compared it with existing
6 capacities for the facilities that were shown on the
7 previous slide. For the Northwest and Rocky Mountain
8 compacts that disposed of their waste and the U.S.
9 Ecology Hanford facility, they have assured access to
10 that facility for the next 50 years or so for all
11 waste classes.
12 For the Atlantic compact, I show the
13 generation rates there based on the last five years.
14 Actually, I think Bill House's numbers would be more
15 authoritative than that, but they aren't different.
16 I think the numbers that I have, some of the numbers
17 are on the high end. But on the low end, I think
18 we're in pretty good agreement. They're on the high
19 end because I was taking the last five years. In any
20 case, based on information that I got from, I believe,
21 the South Carolina Budget and Control Board, access to
22 Barnwell is expected through 2050. I guess that could
23 be a little bit different depending upon the
24 assumptions that you make about generation rates and
25 so forth as Bill described earlier.

1 Likewise, for Energy Solutions, where the
2 Atlantic Compact can dispose of their Class A waste,
3 there were numbers published by Energy Solutions six
4 months ago or so stating that there was 19 more years
5 capacity at Energy Solutions. Just last week, I saw
6 in the newspapers the president of Energy Solutions
7 saying there was 35 years capacity and I think that's
8 really a function of what you assume to be the
9 generation rates and how much processing is done and
10 so forth. Suffice it to say, it's not next year and
11 it's decades out.
12 For the rest of the U.S., we give the
13 generation rates there. Of course, the rest of the
14 U.S., the 36 states will have access to Energy
15 Solutions for 19 years or so, no access of B and C
16 anywhere and the two states in the Texas Compact,
17 Texas and Vermont, may have access if a license, when
18 a license, gets issued for the facility in West Texas
19 in 2009, maybe 2010, somewhere around there.
20 Here are some of the current issues in the
21 National Low-Level Waste Program. We'll talk more
22 about these later based on the public comments that we
23 got and some other studies that have been done. But
24 there's been consideration of major changes in the
25 National Program. The GAO, for example, has published

1 three reports in the last three years dealing with
2 low-level waste. There was one in 2004 in which they
3 looked at alternatives for the National Program
4 including disposal at DOE sites. In 2005, they
5 published a study on sealed source security including
6 low-level waste disposal issues. And earlier this
7 year, they published a study on international
8 approaches that are used around the world for low-
9 level waste management and disposal and how they might
10 be utilized by the U.S.
11 National Academies of Sciences did a
12 really good study in proving the regulation and
13 management of low activity radioactive waste. This
14 was published in March of 2006. It deals with a
15 portion of the low-level waste spectrum, just that
16 waste at the low end. But it had a lot of good
17 recommendations and we gave it a lot of consideration
18 in our Strategic Assessment.
19 The Health Physics Society has a position
20 statement on low-level waste which includes such
21 things as their recommendation to revise or rescind
22 the Low-Level Waste Policy Act and a number of other
23 major changes as well.
24 Generally, these studies talk about
25 establishing risk base rather than an origin base or

1 staying with the origin base system that we have in
2 the U.S. A number of folks and organizations argue
3 that we need to revise or rescind the Low-Level Policy
4 Act because it hasn't been successful in developing
5 new disposal capacity yet. And a number of folks also
6 argue as an alternative to the Policy Act that the
7 Congress ought to allow the use of DOE sites by non
8 DOE generators or commercial generators.
9 Of course, another issue is a lack of
10 disposal options for B and C waste. Barnwell is
11 closing to out-of-compact generators. Texas may get
12 a license or WCS down in Texas may get a license in a
13 year or two. But that would only be for Texas and
14 Vermont. And sealed sources are a particular issue
15 because there's been a lot of focus on sealed sources
16 ever since 9/11 and some of those can be Class B and
17 C and although a lot of those have been picked up by
18 DOE under a program that they have for sealed source
19 collection, they're still going to have to be disposed
20 of ultimately.
21 And, then finally, greater-than-Class-C
22 disposal continues to get attention. DOE is
23 responsible for developing disposal capacity for that
24 just as last summer they issued a Notice of Intent
25 about their efforts to begin working on an

1 environmental impact statement. They identified some
2 specific sites that they're going to be looking at and
3 evaluating and so that's getting some attention.
4 As far as the direction of industry, we've
5 had some really useful and productive meetings, I
6 think, with NEI over the last six months or so, I
7 guess, beginning back in May. We had one in October
8 and I believe one in November as well and they talked
9 to us about a number of things that they're doing and
10 we'll talk more about that later. But one is their
11 efforts to mitigate limited disposal availability and
12 high cost and an increased use of RCRA facilities for
13 low activity low-level waste disposal. NEI, in
14 particular, has talked about waste minimization and
15 process changes, for example, whereby they change out
16 ion exchange resins early before they become Class B
17 and C waste so that they can be disposed of as Class
18 A waste.
19 We've also talked with them and had a
20 meeting with them a month or two ago on extended
21 storage and some guidance that they've developed for
22 their industry on extended storage during operations
23 and they're paying attention to that. We intend to
24 review that and ultimately, hopefully, endorse that
25 guidance that they've developed.

1 NEI is also doing some interesting
2 research on risk-informing waste classification.
3 They're looking at the basic assumptions that were
4 made in the draft EIS for Part 61, concerning the
5 intruder scenario, looking at it from different points
6 of view, I guess, updated dosimetry, looking at
7 different intruder scenarios particularly for western
8 sites or arid sites rather and they'll be working with
9 us and submitting material to us on that in the
10 future.
11 I believe there's also a longer term
12 interest in rulemakings. They're doing a lot of sort
13 of foundation work now on looking at where Part 61
14 might be more risk-informed with perhaps, they said in
15 their public comments on the Strategic Assessment, the
16 goal of having a rulemaking revision to Part 61 in the
17 future.
18 There is also some even broader national
19 developments affecting low-level waste, in particular,
20 its generation. I wanted to talk about those. Of
21 course, there's license renewal for nuclear power
22 reactors. There are fewer reactors that are being
23 decommissioned now than we thought there would be five
24 or ten years ago. As far as I know, no operating
25 nuclear power reactors have plans to be decommissioned

1 anytime soon. As a result, there has been declining
2 volumes of low activity waste for disposal.
3 Decommissioned reactors generate low activity waste,
4 very large volumes, a half a million, a million, cubic
5 feet of slightly contaminated material. Because they
6 are not being decommissioned, there is much less of
7 that than we thought there would be.
8 There's also, of course, new reactors, new
9 nuclear power reactors. Nineteen combined operating
10 license applications are expected through 2009 for 28
11 new units. NRC has received applications in the past
12 couple of months for either four or five nuclear power
13 reactors. Is it four or five, Ralph? Four, I think.
14 Five. Okay. You know that's a factor. New reactors
15 generate waste during operations, but the volumes are
16 relatively small. The activity is large. But even
17 without disposal capacity, nuclear power reactors are
18 capable of storing safely the low-level waste that
19 they generate.
20 New fuel cycle facilities, I think, have
21 a larger effect on low-level waste generation. There
22 are two new enrichment plants that are being built in
23 the U.S., the LES facility out in New Mexico as well
24 as the American Centrifuge Plant in Ohio. Both with
25 be generating depleted uranium and large volumes of it

1 and they have a task from the Commission to look at
2 the classification of uranium and to see whether it
3 needs to be reclassified. We'll be talking more about
4 that later.
5 Another issue is the Global Nuclear Energy
6 Partnership. With reprocessing, there's a potential
7 for new waste streams that are different from the
8 waste streams that were assumed in the technical basis
9 for Part 61. We will to do additional analysis for
10 disposal if GNEP goes ahead and I will note that I
11 believe it was in your July of 2000 letter this year
12 you also noted the same thing and the need for the
13 staff to keep on top of this. So we're doing that.
14 There are also materials users. They've
15 been impacted by the loss of access for B/C disposal
16 or will be rather and they've also been impacted by
17 the high cost of disposal. We've heard in various
18 meetings around the country that there are fewer
19 materials licensees these days as a result, in part as
20 a result, of low-level waste, some of the issues with
21 low-level waste.
22 Before the meeting today, I looked at the
23 State of Michigan. There are a couple of states
24 around the country that require material licensees to
25 report each year on the amount of waste that they're

1 getting rid of and I noticed in Michigan in the last
2 three years they've gone from 28 materials licensees
3 down to 23 who are generating low level waste for
4 disposal.
5 Another factor with materials users, like
6 I said earlier, is the sealed source focus because of
7 9/11 and the Code of Conduct that was issued by IAEA
8 for the growing high activity sealed sources, there
9 has been a lot of interest. Materials licensees have
10 new requirements imposed on them. DOE has collected
11 a number of the sources that pose a hazard. So there
12 are some things going on there.
13 As far as the NRC Regulatory Program, it's
14 important to sort of tee it up and go back about ten
15 years ago when Chairman Jackson, I believe, it was
16 just after Chairman Jackson came with the Agency. She
17 had a strategic assessment paper conduct of 20
18 different direction-setting issues. These issues
19 included such topics of oversight of DOE, high-level
20 waste and spent fuel, decommissioning materials and
21 medical oversight. And so it was a broad look at a
22 lot of different agency programs, a strategic look, in
23 terms of how we might implement those programs. The
24 idea was to get public comments and stakeholder views
25 and to provide the Commission with different options

1 and for them to choose the option that they felt was
2 approach.
3 Low-level waste was one of those 20
4 direction-setting issues and in that 1996 issue paper
5 that we prepared for the Commission, we examined six
6 different roles that NRC could play in implementing
7 the National Program. One was to assume "a greater
8 leadership role" whereby we would become a strong
9 advocate for new disposal capacity. If we believe,
10 for example, that the Low-Level Waste Policy Act was
11 not leading to the development of new facilities by
12 the states, we would encourage Congress to explore
13 other approaches such as disposal of commercial waste
14 in Doe facilities or privatization of new facility
15 development.
16 At the other end of the extreme in these
17 six options that we presented to the Commission was to
18 turn the program over EPA and just get out of the low-
19 level waste business altogether. The Commission
20 choose not to take either of those and what they
21 instead chose was to maintain the program that we had
22 in place at that time. That was in a March 1997 SRM
23 that the Commission issued.
24 Now at that time, the staff levels in low-
25 level waste were about five to ten FTE. Through

1 various budget exercises that we go through each year
2 over the last ten years, our current level is five FTE
3 at the low end and most of those five FTE as I'll
4 discussed later are focused on sort of baseline work
5 that we have to do. You know, if somebody submits a
6 license to us, for example, to import radioactive
7 waste into the U.S. it's not something that's
8 discretionary. We have to act on that.
9 So that's where we are and that was an
10 important decision. It continues to remain in effect.
11 We haven't gotten any direction otherwise from the
12 Commission and this was really one of the fundamental
13 assumptions in our strategic assessment which was this
14 was decided by the Commission. This role that they
15 prescribed for us was where we started in our
16 strategic assessment.
17 As far as our Low-Level waste Regulatory
18 Program, we have core responsibilities under law. One
19 is to maintain the regulatory framework for low-level
20 waste disposal. Included in that is maintaining Part
21 61 and all the regulatory guidance that we have to
22 explain to licensees and agreement states how to
23 implement Part 61. Another is to provide assistance
24 to agreement states and other stakeholders on low-
25 level waste disposal. And, finally, as I've said

1 earlier, low-level waste licensing which in our case
2 it will be confined to licensing a GTCC disposal
3 facility someday perhaps if DOE doesn't choose a
4 geologic repository and it certainly will include
5 import/export licensing which we do as a matter of
6 routine now, say, half a dozen times a year. For low-
7 level waste, it either gets imported or exported out
8 of the country.
9 Here is some of the baseline work that we
10 do. This work we have to do. It's not discretionary.
11 It takes about three and a half FTE of the five that
12 we have budgeted. It includes import/export
13 licensing, support to NRC regions and other offices.
14 Of course, they come up with low-level waste issues
15 and problems all the time. It includes reviews of
16 agreement state disposal programs. That is IMPEPs or
17 In-graded Materials Performance Evaluation Program.
18 We support our Division of MSSA in our office. It
19 includes technical assistance to agreement states,
20 international work, particularly standards work, that
21 is reviewing international standards that are under
22 development and providing comments to Larry Kamper who
23 is on the IAEA Waste Standards Committee. It also
24 includes as I said earlier license in greater-than-
25 Class-C disposal and we've have a few conversations

1 and meetings with DOE on GTCC disposal over the last
2 few years and, finally, it includes case-by-case
3 approvals of low activity waste disposal under 10 CFR
4 20.2002.
5 Now this diagram depicts the various
6 organizations that influence the work we do, many
7 requesting assistance from our Low-Level Waste
8 Program. On the right, there's the Commission who
9 periodically, for example, will issue an SRM for us
10 directing us to take on a particular task, like to
11 look into DU classification. There is, of course,
12 this group, the Advisory Committee on Nuclear Waste
13 and Materials, the presentation that we're giving
14 today, participation in the Low-Level Waste workshop
15 that you had more than a year ago and then, like I
16 said earlier, there are other NRC programs, the old
17 State Programs Office, the regions, NRR and so forth.
18 On the left are the different external
19 organizations that either require assistance, ask for
20 assistance or influence what we do, ranging from
21 Congress who from time to time lately, I guess, have
22 asked us for information on particular issues like two
23 years ago there was a lot of interest in a proposed
24 20.2002 disposal from a nuclear power plant that was
25 undergoing decommissioning. So we had to write a

1 number of letters to Congress and engage them on that
2 process, what 20.2002 is, how we evaluate it and so
3 forth.
4 I mentioned earlier the Government
5 Accountability Office reports. There have been three
6 published in the last three years and we've had quite
7 a bit of engagement with them as they've been
8 developing the reports, giving them information on
9 what we do and so forth and then also responding to
10 the reports once they've been issued.
11 The National Academies, we worked quite
12 extensively for a number of years with the staff down
13 at the National Academies and with Committee itself
14 that conducted the Low Activity Waste Study.
15 Of course, there's industry, lots of
16 different industry groups. Most recently, it's taken
17 the form of meeting with the Nuclear Energy Institute
18 on some of the initiatives that they have underway for
19 risk-informing waste classification and developing
20 storage guidance for nuclear power reactors.
21 We have a close relationship with the
22 states, particularly the agreement states, the ones
23 who regulate low-level waste disposal especially but
24 also the states and compacts that are involved in
25 development of low-level waste disposal capacity.

1 Internationally, I talked about the IAEA
2 and, from time to time, we also meet with countries
3 from around the world and discuss their low-level
4 waste programs and ours as well.
5 And, of course, there are other folks. We
6 get inquiries from the public and the media and public
7 interest groups as well.
8 All of those organizations squeezing in on
9 these five FTE that we have, they all have advice for
10 us or they all want something and so all of that
11 suggests that some action is needed by us. In fact,
12 there are many more things, we think, that people
13 think we should do, want us to do, and we have
14 resources for and so it was very clear that we needed
15 to come up with a strategy to prioritize the resources
16 that we have and to work on the things that are most
17 important to the agency in terms of achieving its
18 strategic goals. Hence, we came up with the Strategic
19 Assessment.
20 We wanted to be sort of disciplined and
21 intentional and focused on working on the most
22 important things. Our objectives were to position our
23 program to meet current and future challenges to
24 ensure that our limited resources are used
25 effectively. Generally, we wanted to ensure that

1 there is safe and secure disposal. We wanted to
2 promote a reliable, stable and adaptable regulatory
3 framework. We wanted to address any gaps and
4 vulnerabilities in our regulatory program. Generally,
5 we wanted to improve effectiveness and efficiency of
6 using our limited resources as well.
7 Our approach was to define some
8 objectives, to scope the issues including gathering of
9 stakeholder views, to identify the potential actions
10 that we could take to address the issues, prioritize
11 them using a decision-making process, and to develop
12 an implementation plan.
13 This chart depicts the process that we
14 used to conduct a strategic assessment. We used both
15 stakeholder input and our own knowledge in identifying
16 the current environment as well as what the future
17 might look like. Some of the earlier slides address
18 both of these points, closure of Barnwell, the lack of
19 disposal capacity, the generation of new waste streams
20 from nuclear facilities like power plants, enrichment
21 plants and reprocessing plants, for example.
22 We then identified gaps, vulnerabilities
23 or shortcomings ranging from a lack of disposal
24 capacity for all types of wastes to not having an
25 internal procedure for reviewing import/export

1 licenses, for example.

2 We then evaluated all of these activities

3 that could be used to fill those gaps and address

4 those shortcomings and through a systematic process

5 came up with a list of prioritized work for us to

6 undertake. I want to elaborate on some of the steps

7 that we took.

8 First with respect to stakeholder input,

9 we relied a lot on the meeting workshop that you all

10 had on May 23 and May 24, 2006. I believe there were

11 more than 100 participants in that workshop. There

12 were transcripts. We got a lot of good information

13 out of that and a lot of good ideas that we considered

14 and evaluated in our Strategic Assessment.

15 We also on our own issued a Federal

16 Register notice on July 7, 2006 asking for stakeholder

17 comments on our Low-Level Regulatory Program. We

18 asked a number of questions. We also simply asked

19 people what their ideas were. But some of the

20 questions were what are the key safety and cost

21 drivers, what vulnerabilities are there, what's the

22 future of low-level waste disposal look like, what

23 actions might yield benefits to the National Program

24 and so forth.

25 We got comments from a wide variety of

1 stakeholders. Jim Shaffner of staff gave a
2 presentation to you all December 13, I believe, last
3 year summarizing the comments that we got and who made
4 them. We received 46 formal comments from the
5 organizations ranging from states, military, compact
6 commissions, industry trade groups, professional
7 society, environmental and public interest groups.
8 We also used outside of the ACNW workshop
9 and the Federal Register notice input that we saw in
10 other reports related to low-level waste including the
11 National Academies' report, the key AO reports
12 including the one on international practices, the ACNW
13 white paper that was published, I think, December 2005
14 and the letter reports that you've published since
15 then. We got comments from the agreement states, a
16 couple of agreement states that regulate low-level
17 waste disposal sites based on our July 7th Federal
18 Register notice. But we didn't hear from a couple.
19 So we called them on the phone and had conference
20 calls with them about what their views were on the
21 Low-Level Waste Program just to make sure that we
22 covered the four principal states, five actually, that
23 are involved in low-level waste. And we also
24 considered various position papers that have been
25 issued including the Health Physics Society position

1 paper and the American Nuclear Society position paper.
2 Like I said, Jim Shaffner talked to you
3 about some of the issues raised by the stakeholders,
4 but I'll summarize them again. These aren't all
5 independent. They're interrelated. But one was risk-
6 informing, particularly this group. The ACNW&M had
7 suggestions for risk-informing Part 61 in the December
8 2005 letter that you wrote. You questioned the
9 assumptions for intruder protection, the use of
10 outdated ICRP dosimetry in Part 61 and, I guess, some
11 of the site characteristics that are contained in Part
12 61 as well. We had a lot of comments on risk-
13 informing, risk-informing guidance in Part 61 as well.
14 It's noteworthy though that a number of
15 other groups, a fair number of commentors actually,
16 were very much opposed to risk-informing and saw it as
17 tantamount to deregulation and strongly opposed any
18 efforts to risk-inform our regulatory framework.
19 It goes without saying that the closure of
20 Barnwell is an issue that everybody needs to address
21 including us. Low activity waste disposal related to
22 risk-informing, the idea with low activity waste
23 disposal was that it's sufficiently low a hazard that
24 it doesn't need to be disposed of in a 10 CFR Part 61
25 facility and can go to a RCRP hazardous waste site,

1 for example.

2 There was on the one side a fair number of
3 stakeholders who encouraged us to develop a procedure,
4 a standard review plan, physical transparent criteria
5 for how we're going to evaluate these. There were
6 also a fair number of persons and organizations who
7 were opposed to any low activity waste disposal in an
8 unlicensed and what they saw as an unregulated
9 facility. So that low activity waste disposal was the
10 most frequently commented-upon topic by stakeholders.

11 Another issue that was commented on a lot
12 was folks encouraging us to urge Congress to pass
13 legislation to allow the use of DOE disposal sites for
14 commercial waste. Now there was waste classification,
15 particularly with the closure of Barnwell. The idea
16 is that there may be ways of risk-informing some of
17 the classification guidance that's out there now or
18 maybe some of the assumptions that are used in Part 61
19 and also use 10 CFR 61.58 which allows for alternative
20 waste classification and that would help mitigate the
21 impact of the closure of Barnwell for B/C waste.

22 There are also a number of organizations
23 that urged us to consider unintended consequences.
24 That is to try to think about what might happen to the
25 best of our ability. Economic consequences,

1 regulatory concerns. One issue was the effect on
2 licensing. You know, there is a facility that's
3 undergoing a license review now and I guess the point
4 was that you can improve Part 61 and make it more
5 risk-informed, but there's always a chance that that
6 might become an issue in the licensing of any new
7 facilities.
8 Folks also in addition to bringing up
9 issues and identifying gaps and vulnerabilities, they
10 also proposed some methods for addressing issues. The
11 obvious ones are legislative changes for the big
12 changes, for example, to amend the Low-Level Waste
13 Policy Act or to enable DOE to take commercial waste.
14 A number of folks talked about rulemakings ranging
15 from major revisions to Part 61 to coming up with a
16 Part 61 lite for low-level waste. Others recommended
17 that we restart the clearance rulemaking that the
18 Commission put on hold back in the summer of 2005.
19 And then, of course, there's guidance.
20 There's a lot of guidance out there for some of the
21 topics that were addressed particularly by the
22 stakeholders and these are where we're going to be
23 focusing our attention the next couple of years.
24 Now I think this is a really important
25 slide here because we've had a lot of ideas and a lot

1 of suggestions and a lot of things we can do that
2 people think we should do and we wanted to be
3 disciplined and objective about our decision-making.
4 And one of the inputs like I said earlier was the 1997
5 Commission decision for us to have a sort of
6 maintenance program. They made a strategic decision
7 at that time that we were going to become a national
8 leader and pursue, for example, legislative changes.
9 So that was one important criterion or piece of
10 direction that we had in conducting our Strategic
11 Assessment.
12 But we also had some other objective
13 criteria and contained in the Agency Strategic Goals
14 for Safety, Security, Effectiveness and Openness.
15 Those are in the Strategic Plan. They apply to all of
16 our programs. The Strategic Plan elaborates on what
17 they mean and how they're to be achieved and so forth.
18 So these were prominent in our evaluation of the
19 different activities related to what we should do in
20 the Low-Level Waste Program.
21 Some other criteria that we considered
22 though were the need for a particular activity to
23 solve a problem. That is whether it was near-term or
24 long-term, how long it might take to do it. For
25 example, rulemakings generally take a long time and

1 lot of resources, five FTE, maybe more than that, for
2 example, for a major revision to Part 61. So we gave
3 more credit to the things that could be done with a
4 smaller number of resources and could be done quickly.
5 We also, of course, looked at the benefit
6 both in terms of -- well, obviously in terms of safety
7 and security but also what benefit it might have on
8 low-level waste generation and disposal in the
9 country. We also looked at additional considerations
10 and by that, we mean sort of unintended consequences,
11 other things that might be pertinent to the decision.
12 And finally, we looked at scenario
13 applicability. We didn't just assume one future out
14 there or that Barnwell is going to be into Class B/C
15 waste for Atlantic compact generators for the duration
16 and 36 states will have to store indefinitely. We
17 also looked at sort of an optimistic, realistic and
18 pessimistic scenario as far as disposal goes,
19 pessimistic meaning limited or no disposal and for a
20 long period of time, optimistic meaning all different
21 types of low-level waste could be disposed of and
22 could be disposed of at a reasonable cost as well.
23 Those are all the factors that we used.
24 Some of those are givens. You know, they weren't
25 developed by us. They were developed by the Agency.

1 Some of them are common sense and for those, of
2 course, there is some subjectivity here in evaluating
3 each of the different activities again for this
4 criteria and so as far as that goes we wanted to be
5 transparent about how we considered each of these
6 factors in the evaluation of specific activities and
7 that's why we have that appendix attached to the
8 Strategic Assessment itself. It's a lengthy appendix.
9 It goes into fairly great detail about how each of the
10 activities stacks up against these different criteria.
11 Here are the 20 different tasks that we
12 evaluated, many suggested by stakeholders. Some we
13 developed on our own. I'm not going to walk through
14 each and every one of them but some of them are fairly
15 obvious. If DOE decides to choose a disposal facility
16 that's different from the geologic repository for
17 greater-than-Class-C disposal, we're going to need to
18 develop licensing criteria for them.
19 Another one that's obvious and that a
20 number of people asked for was developing guidance for
21 20.2002 low-level waste disposal in RCRA cells and so
22 forth. Like I said, I'm not going to walk through
23 each and every one of those. But those are the 20
24 that we evaluated.
25 These are the high priority tests that we

1 came up with after going through the evaluation
2 process. The first is to update our storage guidance
3 for material licensees and associated with that or
4 related to that is to review industry guidance that
5 NEI and EPRI have developed and are developing for
6 nuclear power reactors. I'm going to elaborate on the
7 storage guidance in a minute.
8 The second was developing guidance for
9 20.2002 disposals. We talked about that earlier.
10 The third was a Commission direction to us
11 whereby they asked us to investigate whether depleted
12 uranium from enriched plants because of the large
13 amounts that are generated by enrichment plants
14 whether that warrants reclassifying uranium in the
15 waste classification tables in 10 CFR 61.55. The
16 technical basis for Part 61 did not include that waste
17 stream. There were no enrichment plants at that time.
18 Now there are two in the U.S. that could be generating
19 commercial low-level waste and so we need to look at
20 whether uranium is appropriately classified.
21 Another is to update the branch technical
22 position on concentration averaging. We think that
23 could be more risk-informed. That could also help
24 mitigate the impact of the closure at Barnwell for B/C
25 waste.

1 Another one was to develop an
2 import/export procedure. It's not a big issue, but
3 the thing about this is it does not take much effort
4 to do it. We get about a half dozen of these each
5 year. We don't have a documented procedure right now.
6 We sort of do it because staff looked at it. It had
7 been around for awhile. But we think it's important
8 that we develop a procedure and a standard review plan
9 so that licensees on the outside who would like to
10 obtain a specific license for importing or exporting
11 waste know better and know precisely what's needed
12 from the staff. It will make our review more
13 efficient and it will make it more efficient for
14 licensees or license applicants as well.
15 The sixth item was to develop a guidance
16 on 61.58. I know that's the provision in Part 61 that
17 enables the use of alternative waste classification or
18 characteristics, different from the requirements that
19 are currently contained in Part 61. I know this is
20 one that you all have recommended, I think, in your
21 couple of letters and so we think it's important to
22 work on that as well. A large part of that, we
23 believe, in the near term will be working on intrusion
24 scenarios and we'll be learning, I think, and getting
25 some information from NEI in terms of the research

1 that they're doing and we'll be able to leverage the
2 work that they're doing in our consideration of 61.58
3 guidance.
4 Finally, the seventh high priority task
5 was to perform a scoping study of financial assurance
6 particularly for materials licensees and particularly
7 for sealed sources. That's gotten some attention. It
8 was in a major interagency report on sealed source
9 security that was issued a year ago and this scoping
10 study would look at sealed sources in lower
11 categories, not Category 1 or 2 under the IAEA code of
12 conduct, but Category 3 sources and lower to see if we
13 need revisions to our regulations to ensure that there
14 are funds available for disposal of sources by
15 materials licensees after the sources are no longer
16 needed.
17 We wanted to go over the storage guidance
18 just as an example and because it's timely. Our
19 guidance for materials licensees for low-level waste
20 storage is contained in Information Notice 90.09.
21 It's actually for fuel cycle licensees as well and we
22 have a project underway now to review and evaluate the
23 existing guidance. We've had contacts with a number
24 of state program representatives. We've coordinated
25 with our regional licensing and inspection personnel

1 and we're looking at what changes might be needed to
2 that information notice for these types of licensees
3 and we intend to publish revision 1 to that guidance
4 in early 2008 in March actually. That's needed, of
5 course, because Barnwell is closing and we want to get
6 that out there on the street so that our guidance is
7 current.
8 I guess there is a couple of things that
9 have changed since 1990 when it was published.
10 There's probably a little bit of work on risk-
11 informing that we can do. Also there is security
12 requirements that have come into play since it was
13 first published. And on top of that, it's a useful
14 thing to update it and put it out there because we
15 just want to heighten people's awareness about storage
16 issues and make sure that they're paying attention to
17 it for when Barnwell closes this summer.
18 At the same time, NEI and EPRI have an
19 effort underway to develop guidance for low-level
20 waste storage during operations for nuclear power
21 reactors. We've seen a draft of that guidance and
22 provided some informal comments to them about a month
23 ago. They'll be submitting it to us for formal review
24 and comment and ultimately endorsement in the near
25 future and we expect to endorse that or goals to

1 endorse that later in 2008.

2 Our longer term goal is to validate all of

3 the guidance into a NUREG, including materials and

4 fuel cycle licensee guidance and nuclear power reactor

5 guidance. It will be around 2010, 2011, something

6 like that. But to put all of the guidance that we

7 have in one place for all licensees, all types of

8 licensees, and at that time, we expect to have a few

9 years of experience under our belt as well. You know,

10 licensees will be forced to store in the next year.

11 We'll be inspecting those licensees. We'll be

12 coordinating with agreement states and finding out how

13 it's going and we expect to incorporate that

14 experience into our consolidated guidance that we will

15 be issuing later.

16 A final effort that we've just begun is to

17 update NRC's inspection procedures for storage as

18 well. We just started that effort and regional

19 inspectors need it in order to pay attention to it and

20 heightened their inspections of storage beginning next

21 summer.

22 As far as the future and the

23 implementation of the Strategic Assessment results,

24 we're going to implementing high priority tasks. We

25 have schedules that are identified in Commission

1 paper. A number of people have asked us about the
2 Commission direction. This was an information paper
3 that described to the Commission the resources that we
4 have and how we intend to use the discretionary
5 resources that we have. It's not a vote paper, but
6 the Commission may decide to give us direction and
7 tell us to do something different. We haven't
8 received any direction yet though.
9 As we implement these tasks, we expect to
10 have a lot of coordination with the agreement states
11 and other stakeholders. Each of the particular tasks,
12 if not all of them, all or most of them rather, we
13 expect to issue for public comment and also to
14 coordinate with the agreement states in advance of
15 that.
16 We, of course, expect to coordinate our
17 work with you as well. All major products we expect
18 to come down here and brief you on what we're doing,
19 what we propose and we look forward to your advice and
20 suggestions as well. We intend to do that as early as
21 we can. In the near term, we expect to come down and
22 present to you on DU disposal and the potential need
23 for reclassification of that 20.2002 guidance, low-
24 level waste storage issues and then the other top
25 priority tasks that we identified as well. Those will

1 be a couple years out.

2 The rest are the references. I would be

3 happy to take questions, Scott and me both.

4 VICE CHAIR CROFF: Thank you very much.

5 Great presentation. Bill, you got your two minutes.

6 MEMBER HINZE: Thirty seconds.

7 VICE CHAIR CROFF: Yes.

8 MEMBER HINZE: With the impending closure

9 of Barnwell and the dilemma it causes for people, it

10 would seem to me that they would open up some

11 opportunities for some international entrepreneurs to

12 export waste and I'm wondering if you see any policy

13 problems with exporting of waste and will these be

14 taken up in the study that you will be conducting in

15 early 2009 and I guess a parallel question is do you

16 see any interest in the part of international people

17 to export waste from our country.

18 MR. KENNEDY: From our country to their

19 country, to export waste, that's a really good

20 question. I remember 10 or 15 years ago, this goes

21 way back, there were a couple of proposals to export

22 U.S. waste to Africa. This is at the time of the Low-

23 Level Waste Policy Act. We were beginning to see that

24 it wasn't clear that we were going to get any new

25 sites or any new sites anytime soon and so there was

1 a couple of proposals briefly floated to export waste
2 to developing countries. Those didn't go anywhere.
3 But since then, in 1995, the Commission
4 put into play in 10 CFR Part 110 regulations that
5 implement the IAEA Transboundary Code of Practice, I
6 believe it is, which defines the terms and conditions
7 under which waste can be transferred from one country
8 to another for disposal. Our regulations for waste
9 require that someone who wants to export it or import
10 it has to get a specific license and kind of in a
11 nutshell they have to demonstrate that particularly
12 for export of waste that it's going to a country that
13 has a formal regulatory program in place that's
14 adequate to protect public health and safety in that
15 country. It includes coordination with the government
16 of that country, getting some assurance that there is
17 a program like that in place, and as far as importing
18 waste, it requires a fair amount of coordination with
19 different stakeholders in the U.S. who might be
20 involved in that decision like the states and compacts
21 and the agreement state organizations that would
22 regulate the waste that was coming into the country.
23 Now as far as history goes, there aren't
24 many applications so far for export of low-level waste
25 from the U.S. I don't know why that is. We get maybe

1 one a year. Usually it's a small quantity. Perhaps
2 that will change now that Barnwell is closing and we
3 no longer have access to B/C disposal.
4 MEMBER HINZE: Are we fortified with the
5 adequate policy to have a lease?
6 MR. KENNEDY: Yes, I think so. Part 110
7 has specific requirements for it. It implements the
8 IAEA guidance on it.
9 MEMBER HINZE: And your work in 2009 will
10 be to codify how you conduct --
11 MR. KENNEDY: How the staff does those
12 reviews, yes.
13 MEMBER HINZE: All right.
14 MR. KENNEDY: Because the regulation is
15 one thing, but there is no guidance underlying the
16 regulation like there is for Part 61, for example.
17 MEMBER HINZE: Okay. According to my
18 watch, that was 21 seconds. So let me take my
19 remaining nine seconds and ask if the -- Is there any
20 movement on DOE's part to look at accepting waste at
21 some of their sites from external sources and, if so,
22 how are you involved and should you be involved and so
23 forth?
24 MR. FLANDERS: As far as I know and from
25 our discussions with DOE, that's something that

1 they're not looking at right now. They are faced with
2 their own challenges in terms of using the facilities
3 that they have. There are some interactions they're
4 having with the State of Nevada in terms of the
5 purpose for the Nevada test site and questions around
6 the Land Withdrawal Act. So that's one issue in terms
7 of disposing of waste there, their own DOE waste, and
8 then the State of Washington has imposed limitations
9 that only waste can be disposed of that's generated
10 within the State of Washington, DOE waste.
11 So they're having challenges I think in
12 terms of just using their own facilities for their own
13 waste which is their primary focus at this point in
14 time and we haven't heard of them looking at any use
15 of other facilities for other commercial waste.
16 MEMBER HINZE: Thanks very much, Scott.
17 That's helpful. I'll yield my remaining two seconds
18 to the next person.
19 VICE CHAIR CROFF: Thank you. As a
20 retirement gift, we'll look into getting you a new
21 watch. Ruth.
22 (Laughter.)
23 MEMBER WEINER: Thanks for a very
24 interesting and comprehensive presentation. I have a
25 number of questions, but I'd like to preface it with

1 a comment taking off on what Dr. Hinze said. I have
2 been working in another life with the South African
3 utilities to develop the low-level waste site at
4 Vaalputs and also last year I went to the IAEA meeting
5 of the WATEC Committee and I would encourage NRC to
6 participate in WATEC. One of the things I came away
7 with is that the group doesn't really know very much
8 about the U.S. waste, the whole waste system, how we
9 handle waste in the United States and it gives you a
10 very good perspective, international perspective.
11 On the question of DU, when is a waste a
12 waste? DU has commercial applications and what's your
13 thinking along that line?
14 MR. FLANDERS: I'll take that.
15 MR. KENNEDY: Yes. Scott was involved in
16 that.
17 MR. FLANDERS: Depleted uranium, that's a
18 very good question and there are, I know, for example,
19 the Department of Energy doesn't necessarily consider
20 depleted uranium a waste stream. They say that it has
21 some practical purposes.
22 However, they are in the process of
23 developing de-conversion facilities, converted to an
24 oxide. Even when it's converted to an oxide, they
25 still talk about the issue of potentially having some

1 use. But at some point and given the volume of it,
2 they do recognize that there may be a need to dispose
3 of it. That's part of what they looked at in their
4 environmental impact state for these conversion
5 facilities.
6 And then the question becomes once you get
7 to the point you will dispose of some depleted uranium
8 and you're looking at disposing of it in an oxide
9 form, then the question becomes is it acceptable to be
10 disposed of in the quantities that are envisioned in
11 the near-surface disposal facility and that's a
12 question that we were asked to look into by the
13 Commission as a part of the LES proceedings. In the
14 LES proceedings, the Commission acknowledged that
15 depleted uranium could be considered. If it is a
16 waste, it would be low-level waste and look at
17 disposal of it from the standpoint of low-level waste
18 and whether it's adequate, where it can be safety
19 disposed in low-level waste. Certainly, in our EIS,
20 we looked at it and we concluded that based on what we
21 know it can be disposed of safely as -- in a near-
22 surface disposal facility.
23 The question then becomes and it centers
24 around if you read Part 61 right now, 61.55(A)(6)
25 essentially said if it's not in a classification

1 table, then it's Class A waste. And the question
2 essentially from the Commission is do we -- is that
3 appropriate recognizing that the reason why depleted
4 uranium is not in the tables is at the time we
5 developed the EIS for Part 61, they didn't envision
6 the large quantities of depleted uranium in terms of
7 waste stream.
8 So the question is that we were tasked
9 with by the Commission recognizing that you're going
10 to generate these large quantities of waste, is that
11 still an appropriate definition for depleted uranium.
12 That's one of the tasks that we're looking at now in
13 terms of whether or not that's an appropriate
14 definition for depleted uranium. There could be some
15 commercial applications. DOE continues to say that,
16 but they also recognize that given the amounts there
17 are going to be some need for disposal and then the
18 question then really for us is can it be disposed of
19 safely in a near-surface disposal facility.
20 MEMBER WEINER: Which brings me to the
21 other side of the DU question. If the DU is the
22 result of enrichment of natural uranium as uranium
23 hexafluoride or whatever, then what you're disposing
24 of is what's in the ground anyway only a little bit
25 less U-235 in it. It strikes me that if it's a waste,

1 it's a waste that does not differ technically from
2 soil from a lot of rock from stuff that's there anyway
3 and I'm sure that this is preaching to the choir and
4 I just want to encourage you to look at it from that
5 perspective and especially in your public utterances
6 to the public pronouncements to point out to people
7 that this is material that is present in nature and we
8 don't really worry very much about it.
9 MR. FLANDERS: Yes. As a part of our
10 work, we're looking at the characteristics of depleted
11 uranium and taking those into considerations in terms
12 of whether or not it can be safely disposed of in
13 near-surface disposal facilities.
14 MEMBER WEINER: Thanks. On another tack
15 which is a little bit connected, you mention, Jim,
16 that you get two opposing view from your stakeholders
17 on the question of release criteria or using RCRA
18 sites or whatever. How do you accommodate those two
19 totally opposing views?
20 MR. KENNEDY: Well, that's a good
21 question. You know, fortunately, I think the Atomic
22 Energy Act and the regulations that we have,
23 particularly Part 20, answer that question for us
24 already. Part 20 defines the radiation exposures that
25 are safe and we don't go back and revisit radiation

1 protection criteria in the Low-Level Waste Program.
2 Basically, our criteria are the same that are used for
3 regulation of nuclear materials throughout the NRC and
4 throughout the United States and throughout the world
5 actually.
6 So there are those who argue that there
7 ought to be no radiation exposure from a nuclear fuel
8 cycle and that's just inconsistent with the framework
9 that we operate under the Atomic Energy Act and the
10 NRC regulations which provide for adequate protection.
11 MEMBER WEINER: Surely, that was in place
12 when you discussed, when the Commission discussed, the
13 below-regulatory concern question.
14 MR. KENNEDY: Yes.
15 MEMBER WEINER: And that went down.
16 MR. KENNEDY: Right.
17 MEMBER WEINER: So I wish you better luck
18 this time.
19 MR. KENNEDY: And as far as, for example,
20 low activity waste disposal, we ranked the clearance
21 rulemaking or the disposition of solid materials as
22 low I believe because the Commission has already
23 decided to put that on hold. But as far as the low
24 activity waste procedure, for example, an important
25 part of that and will be coordination with

1 stakeholders, members of the public, members of the
2 local communities that are near these disposal
3 facilities and so forth. And so we have our
4 standards.
5 But at the same time, we need to engage
6 the public and talk about our standards and why
7 they're safe and why a particular disposal that we
8 might be considering approving is going to be okay
9 from a safety point of view.
10 MEMBER WEINER: So in your opinion what I
11 gather from what you said, in the past when you
12 haven't had success with these rules, that it was
13 largely a failure of adequate communication or at
14 least somewhat a failure of adequate communication.
15 MR. KENNEDY: I'll say that's a factor.
16 I think, for the most part, the low activity waste
17 disposals have gone uneventfully. Occasionally,
18 there's one that's controversial. I think it's fair
19 to say we can do better and we intend to do better in
20 the future in terms of engaging the public and
21 stakeholders regarding these types of disposals. In
22 fact, the Commission told us to do that. They told to
23 develop a communication plan, to put information on
24 the website, to meet with stakeholders for significant
25 low activity waste disposals in the future and that's

1 an important part of what we're going to be doing.

2 MEMBER WEINER: Finally, on the question

3 of greater-than-Class-C waste since NRC is going to be

4 licensing whatever site or sites there are for GTCC

5 waste, what's your schedule for developing format and

6 content guide, for example, for the licensing?

7 MR. FLANDERS: Right now, at this point,

8 we're waiting to see where DOE goes with their draft

9 EIS and once we see that and see what's potentially

10 considered in that document then from that point we'll

11 formulate and look at what kind of schedules and

12 actions that we need to take from that point. So

13 we're waiting for them to complete their, at least, at

14 the draft stage and then we'll start to do some

15 planning and again it will have to fall in.

16 One of the things that we're going to

17 continue to do with the Strategic Assessment is that

18 we have those lists of activities in terms of the

19 priorities and certainly rank those seven as the high

20 priorities and we're starting to initiate work on

21 those. But we're going to continue to examine not

22 only that list, but do we need to add other things to

23 the list to see how -- because priorities may change

24 as circumstances change. So if there is significant

25 movement by the Department of Energy of greater-than-

1 Class-C, then there may be a need to reevaluate the
2 priority of developing licensing criteria for that and
3 then we'll certainly move it into the appropriate
4 place. But at this point until we get a better
5 picture of what they may potentially propose in terms
6 of sites and look at their EIS, we're waiting to
7 establish any schedules.
8 MEMBER WEINER: Thank you. That was very
9 helpful.
10 VICE CHAIR CROFF: Jim?
11 MEMBER CLARKE: Thanks. Very interesting
12 presentation. A little more if I could on the low
13 activity RCRA facility issue. The Department of
14 Energy, as you know, has their own definition of low
15 activity waste. It's waste that results from a
16 particular separation process. But apart from that,
17 is there a clear understanding among the NRC, the EPA
18 and the public as just what is low activity waste?
19 MR. FLANDERS: The low activity waste,
20 I'll let Jim add to this, but low activity waste is
21 not necessarily defined in any one particular place.
22 I think one place that we see a fairly good working
23 definition was actually in a National Academies of
24 Sciences' document where they described and provided
25 a definition of low activity waste and that was a

1 document that was developed by the National Academies
2 of Sciences but certainly had input from EPA, DOE, NRC
3 and others around the content of it. So I think in
4 terms of a good working definition that might be the
5 best place.
6 MEMBER CLARKE: It strikes me that some
7 authoritative body might need to clarify that as just
8 what we are talking about when we say we would like to
9 put low activity waste into the RCRA license language.
10 MR. FLANDERS: I think generally when most
11 people speak of low activity waste and you look at
12 that definition in the National Academies of Sciences'
13 document where they're talking about the lower end of
14 what would be considered Class A waste and certain
15 naturally occurring radioactive material, etc., that
16 seems to be a pretty fair working definition that most
17 folks work with. Is that a fair statement?
18 MEMBER CLARKE: You know, RCRA has a
19 definition of hazardous waste and it's not simple.
20 But there are criteria that are less that they're
21 mixing rules and things like that. But at least you
22 know if you go through the process whether or not you
23 have a hazardous waste. You can always declare it to
24 be hazardous but at least you have a way of
25 determining it and it strikes me that that seems to be

1 missing.

2 MR. FLANDERS: Keep in mind and I'm not

3 sure if I -- correct me if I'm getting away from your

4 concern. When we look at our 20.2002 guidance and our

5 definition, 20.2002 doesn't establish a particular

6 definition of what can be disposed of under that

7 particular regulation. But certainly in the past

8 practices, what has been typically been disposed of

9 and what the NRC has agreed is appropriate to be

10 disposed of using the 20.2002 approach in disposing of

11 in a RCRA facility has been essentially what we would

12 call and what is consistent with the definition in the

13 National Academies of Sciences' report is low activity

14 waste.

15 But that's not to say that a proposal for

16 a 20.2002 disposal has to be limited to that. We

17 would evaluate whatever proposal for a 20.2002

18 disposal on a case-by-case basis to determine the

19 adequacy of whether or not it can be disposed of

20 safely in the alternate disposal facility whether it

21 be a RCRA facility or some other facility.

22 MEMBER CLARKE: I think you said you are

23 going to take a look at the guidance for that and

24 maybe that's an opportunity.

25 MR. FLANDERS: Right. And certainly in

1 that guidance, we'll discuss definitions and
2 understandings of typically what's been disposed of.
3 MR. KENNEDY: I think that needs to be
4 right up front in the guidance, what is this material.
5 MEMBER CLARKE: Right.
6 MR. KENNEDY: And some kind of definition.
7 MEMBER CLARKE: I agree. Thank you.
8 VICE CHAIR CROFF: Are you done?
9 MEMBER CLARKE: Yes.
10 VICE CHAIR CROFF: A few questions.
11 First, in your table of tasks, you list tasks six and
12 seven as being revisit in '09. Does that mean they're
13 sort of beyond current resources or what does that
14 mean?
15 MR. FLANDERS: That's exactly what that
16 means.
17 VICE CHAIR CROFF: Okay.
18 MR. FLANDERS: It's begun current
19 resources. I was waiting for someone to ask that
20 question. Right now based on our current resources,
21 what we have in our current budgets, we don't see
22 adequate resources to start those activities. But
23 again, we're going to reassess that as we're going
24 forward. Other activities may get done in a more
25 timely way. Some of the, as Jim talked about,

1 nondiscretionary work and the ongoing work that
2 consumes about 3.5 FTE, we may want to look at that
3 and see what the current inventory work is to see if
4 there's any margin there.
5 So we're going to revisit it. We may get
6 additional resources. We don't know. At the time,
7 we'll revisit it to see if we can start this sooner or
8 we may have to defer them further if we take further
9 resource cuts.
10 VICE CHAIR CROFF: Okay. Next, on the
11 greater-than-Class-C issue, I understand what you've
12 said so far and recognizing that you're going to
13 presumably license this thing one way or another. Do
14 you, does the NRC, have any involvement in the EIS
15 process itself? I think occasionally you've been a
16 commenting agency and a cooperating or collaborating
17 or something.
18 MR. FLANDERS: Yes. Allen, you may be
19 familiar with it. A few years ago, there was a
20 question on this particular topic which was what would
21 be the role of the NRC on the DOE greater-than-Class-C
22 EIS and DOE actually asked us and considered asking us
23 to be a cooperating agency and we engaged the
24 Commission on that topic and it laid out what the role
25 of a cooperating agency is, what the role of a

1 commenting agency is and they're different.
2 Cooperating agency you're actually participating in
3 the development of that EIS; whereas the commenting
4 agency, the other agency would develop it and you
5 would just provide comments basically on your
6 expertise on the subject matter.
7 And the Commission came back to us and
8 said, "We want you to play the role as a commenting
9 agency. Because you have this licensing role, we see
10 a need for you to stay at arm's length and we want you
11 to play the role as a commenting agency." So that's
12 the role we're playing. Once they -- You know, we
13 looked at the scoping Federal Notice they sent out and
14 once they develop a draft EIS, we'll certainly look at
15 that and provide comments that we have based on what
16 we see in that document and any questions or concerns
17 that we may have on what they're doing. So the role
18 we're playing is a commenting agency.
19 VICE CHAIR CROFF: Okay.
20 MR. FLANDERS: What's considered.
21 VICE CHAIR CROFF: And the last official
22 thing I saw projected of a draft EIS on that subject
23 like January or February of '08, fairly quickly. Do
24 you have any more current understanding?
25 MR. FLANDERS: I'm trying to recall. I

1 know this was actually discussed at the last low-level
2 waste forum in October and at that time, DOE provided
3 presentation and they had some dates which I think
4 were similar to what you said, but they also pointed
5 out that they were further evaluating the schedule and
6 they would put up some on their website what the most
7 current schedule is and I can't think of what that
8 most current schedule is off the top of my head. I
9 don't know if any of the staff knows.
10 MR. KENNEDY: I don't think they've issues
11 a revised schedule yet, but it's slipping.
12 VICE CHAIR CROFF: Okay. As usual. This
13 is maybe given our discussion of resources the last
14 question you want to hear, but concerning your
15 depleted uranium study, I know we're expecting to hear
16 from you in, I don't know, February or March or
17 something on the methodology. We're hoping to hear
18 from you.
19 MR. FLANDERS: Yes.
20 VICE CHAIR CROFF: Okay. But in going
21 through the recycle White Paper, there were I think
22 about three other nuclear materials or radionuclides
23 presently absent from the tables where in anticipation
24 of a possible future I'll say it might be useful to
25 consider their inclusion and as long as you're going

1 through the exercise for one, it might seem to be a
2 not-terribly resources intensive supplement. Those
3 were krypton-85, cesium-135 and recycled uranium which
4 is a different beast from depleted uranium. Let me
5 just leave it as a thought at this point that that's
6 something that might be considered and maybe when you
7 get in here to talk about the study the next time we
8 can talk about it more specifically.
9 Finally, following up on Bill's questions
10 about export and import of low-level waste, I seem to
11 remember reading in the last couple of months about an
12 ongoing case concerning import of waste from Italy, I
13 thought it was, and I guess two questions there.
14 First, what is the status of that? And, second, my
15 memory of one of the significant issues was that the
16 waste was so poorly characterized that it was not at
17 all clear whether it was importable or we didn't have
18 a real good idea of what we would be getting. Can you
19 elaborate that anymore?
20 MR. FLANDERS: We're still in the process
21 of reviewing that application. That is correct. It
22 was an application to import waste from Italy. We're
23 still reviewing that application. They had some
24 additional information we requested and we're looking
25 at that information. We got the first response back

1 and we're looking at that information to see if we
2 have further question.
3 Issues in terms of the characterization of
4 the waste and the classification of the waste
5 certainly were questions. If you look at the
6 regulations in 110, it requires you to provide
7 information for an import and that is information
8 we're continually to look for.
9 VICE CHAIR CROFF: Okay.
10 MR. FLANDERS: So that's part of the
11 additional information we're looking for. So we're
12 still evaluating that. But, yes, you're correct that
13 that was a question.
14 MR. KENNEDY: I should add that the
15 company in their response to our first set of
16 questions committed to send a team over to Italy to
17 characterize the waste before it's shipped to the U.S.
18 So that's something new. It wasn't in the original
19 application.
20 VICE CHAIR CROFF: Okay.
21 MR. KENNEDY: And we'll be characterizing
22 it much better than apparently was originally planned.
23 VICE CHAIR CROFF: Thanks. Mike Lee.
24 MEMBER WEINER: Can I ask one more?
25 VICE CHAIR CROFF: I'm going to go to Mike

first and then we'll come back.

MEMBER WEINER: Okay.

MR. LEE: Couple of questions. One, a number of times today there has been some discussion of the changes in the low-level waste stream since the original scoping calculations were performed for Part 61. Those scoping calculations are probably about 30 years old. On your list of 20 tasks, correct me, but do you have a plan to possibly revisit the original waste stream assumptions in Part 61 or do you see a need to do so because a lot of the actions that you've listed here are in reaction to new and emerging waste streams or adjustments to the existing regulation to accommodate these? Is there any value in that or do you see no need to do that?

MR. FLANDERS: There's certainly value in that in the sense that if you're having the waste streams, you have to figure out how they would fit into the classification scheme. However, as we acknowledge we see the potential for these things. I think there is still some work to be done before it becomes more of a realization and I think with the resources that we have in hand I think there's some work that we think that we need to focus on first before we look at that.

1 But again, as I've said, we're continuing
2 to reassess this. The environment changes. There is
3 new information that comes in. The prioritization for
4 those activities. Certainly, the point Allen made in
5 terms of the recycle potential waste streams which is
6 a major contributor to these new waste streams to
7 consider. It's information that we're going to take
8 to heart and look at. But we're going to consider
9 when it's the appropriate time to look at that and
10 that consideration would be how do you address them
11 and there's absolutely a need to require rulemaking
12 and, if so, what type of rulemaking, the breadth of
13 the rulemaking, all those things would be factored
14 into that consideration. But we are looking at that
15 and that is something we're keeping on our radar
16 screen. But right now, we see some other things that
17 are higher priority to address first before we get to
18 those waste streams.
19 MR. LEE: Okay. That kind of leads to the
20 next question. If you were to go ahead and if Donald
21 Trump or someone came down to the staff with a blank
22 check and said, "Here. How much money do you need to
23 do all 20 of these activities," would that address the
24 fundamental issue of access to disposal? And that
25 kind of leads to questions that both Allen Croft and

1 Dr. Hinze have talked about. To a certain extent,
2 there's been a market failure in that disposal
3 capacity hasn't emerged.
4 MR. FLANDERS: I think, if you look at all
5 20 of those activities, really to be able to answer
6 your question you would really have to be able to have
7 some prediction on what the outcome would be. For
8 example, one of those tasks is looking at potential
9 legislative changes and proposed potential legislative
10 changes. Certainly if we look at that we propose some
11 legislative changes and that's something that's
12 adopted, then that has one impact. We look at a lot
13 of technical areas in terms of guidance development
14 and risk-informing activities and certainly if we
15 implement those things, that has certain benefits that
16 are probably more predictable.
17 So it's hard to say for certain if you did
18 all 20 of these and the outcome was predictable, that
19 you would be able to have a better sense as to whether
20 or not it would address the disposal issue. But to
21 truly address the disposal issue, our role is somewhat
22 limited in that.
23 MR. LEE: Sure.
24 MR. FLANDERS: We have a regulatory
25 function. So what we focused on were those things

1 that really made sure that we had a sound regulatory
2 framework within the confirms of the existing national
3 structure and really to get to a lot of the disposal
4 issues with any degree of certainty, I think it goes
5 beyond the scope or the role of the NRC.
6 MR. LEE: And I understand that. That
7 kind of leads me to what Jim mentioned earlier and
8 you've certainly, Scott, made reference to is the
9 original direction setting initiative activities back
10 in the mid '90s. So in many respects the assessment
11 that you've conducted is to kind of look at the work
12 that's currently on your plate, consistent with what
13 the Commission told you to do previously. I'm just
14 raising that as an issue that in some respects that's
15 an issue that's kind of beyond this and still out
16 there for debate.
17 The last question I had is you made
18 reference to a number of guidance documents,
19 particularly one coming up in March that you intend to
20 issue to materials licensees. Is that -- Can you at
21 some point give us a timetable on when you're going to
22 bring that to the Committee and I think this is in
23 reference to your 90.09 letter.
24 MR. FLANDERS: Yes. Right now, we're
25 working on our schedule for that and we're briefing

1 some upper management. We should be able to get back
2 to you soon on that. But it should be fairly soon
3 when we're going to interact with you in one form or
4 another on that.
5 MR. LEE: Sure.
6 MR. FLANDERS: Whether it be a briefing
7 overview or a review and a briefing, a review of a
8 document and a briefing. We'll figure out when the
9 right time is to engage you on that.
10 MR. LEE: Okay.
11 MR. FLANDERS: One of the things to take
12 away from the storage guidance activities is that it's
13 something and this is some of the discussions that we
14 have with NEI in looking at this is it's something
15 that's going to right at the beginning of this process
16 in terms of dealing with the potential need to store
17 more waste as a result of the closure of Barnwell.
18 MR. LEE: Sure.
19 MR. FLANDERS: Potential storage of B and
20 C waste. So we're at the front end of this process
21 and it's going to be something that's going to be
22 going on over time. The first, as we said, we're
23 going to put some guidance out in 90.09. Later, we
24 want to consolidate guidance and we want to do that
25 after we've had the benefit of some time to see how we

1 might want to revise guidance, where the experience
2 has been learned, lessons learned. So there's going
3 to be an ongoing interaction at least in my mind with
4 the Committee on storage guidance.
5 MR. LEE: Okay.
6 MR. FLANDERS: So this is the very
7 beginning of the process. We're going to look to
8 engage you at the very beginning of the process. But
9 keep in mind we're going to be engaging you all along.
10 There will be more opportunities to --
11 MR. LEE: And I would assume then that
12 also applies to the guidance to the nuclear power
13 reactors that I believe NEI is talking to you about
14 and presumably there is some degree of coordination
15 between FSME staff and NRR and NRO staff on that.
16 MR. FLANDERS: We have joint review.
17 MR. LEE: Okay. So that's something
18 that's going to go to either ACRS or ACNW presumably
19 because that's going to be a generic letter to reactor
20 licensees for long-term storage, changes in long-term
21 storage or have you thought that far ahead?
22 MR. FLANDERS: If we get to the point of
23 endorsing it, we'll look at the method to endorse it
24 whether it be a RIS or some other form to endorse it
25 or a generic letter. But we'll certainly look to

1 that.

2 MR. LEE: Okay.

3 MR. FLANDERS: But that is something that

4 we would engage you and/or ACRS on that topic.

5 MR. LEE: Sure. Okay.

6 VICE CHAIR CROFF: Could I ask your

7 indulgence for just a second? Larry, you wanted to --

8

9 MR. KAMPER: I did.

10 VICE CHAIR CROFF: You can do it from

11 there. Just use the microphone.

12 MR. KAMPER: Okay. That's fine. Thank

13 you, Dr. Croff. Members of the Committee, thanks for

14 giving me a couple of minutes.

15 I want to first compliment Scott and Jim

16 and, in fact, the staff of the Low-Level Waste area

17 who worked long and hard on this assessment and I

18 think have done an excellent job today of giving the

19 Committee a good overview. I've been very proud of

20 this particular product, the amount of analysis that

21 went into it and I had a couple of comments about the

22 study itself.

23 I hope that the Committee comes away and

24 I believe you have judging from your questions that

25 this study in reading the press from some of the

1 articles about it has been incredibly mischaracterized
2 in my view. It has been characterized in certain
3 instances as a plan by the NRC to develop legislation
4 that would cause additional waste disposal capacity to
5 be generated. It has been characterized as early
6 efforts by the Commission to gain more authority in
7 the low-level waste area and usurp the role of the
8 compacts. It's none of those things.
9 It is frankly simply stated a management
10 tool that the staff has choose to develop principally
11 because as Jim so clearly pointed out with one slide
12 which I'm very fond of it shows you the pressures that
13 we face externally and internally and the limited
14 number of resources and this is what we want to tell
15 the Commission of the challenges that we face. This
16 is the work that we believe has the highest priority
17 and inform the Commission that's how we intend to
18 proceed and that's what we're going to do. Now the
19 Commission can certainly give us some direction as
20 opposed to simply reacting to informational paper.
21 But it is purely and simply a management tool to
22 establish a pathway to proceed down the road in the
23 years to come.
24 Regarding imports and exports
25 internationally, as Jim mentioned, I do serve in the

1 Waste Safety Standards Advisory Committee at the IAEA.
2 I go over twice a year and provide consultation over
3 there and I talk with a lot of international
4 colleagues and I query them and we have lots of
5 sidebars about waste disposal in foreign countries.
6 My general impression is while a lot of progress is
7 being made in foreign countries, we are much further
8 ahead than they are in ultimate waste disposal
9 answers.
10 Now there's an awful lot of storage going
11 on over there. There's an awful lot of contemplation
12 going on. There's an awful lot of interactions and
13 even collegial discussions about how to combine
14 certain countries waste and the like. But my point,
15 Dr. Hinze, is I would be surprised frankly at this
16 juncture if we saw much interest in other countries in
17 taking waste from the United States. I would be very
18 surprised.
19 If you look at the import/export license
20 that we evaluate under 110.32, more times than not
21 it's waste coming here for some sort of processing.
22 If I look at the waste disposal capacity in the U.K.,
23 for example, which is severe, if I look at the
24 consideration before us right now for the waste that
25 would come in from Italy, it's about 20,000 tons of

1 decommissioning waste, it tends to be the other way I
2 think rather than waste going from the United States
3 to foreign countries. Now things may change over
4 time. But I really don't see them being as far ahead
5 for the most part as we are. So I would be surprised.
6 On the depleted uranium analysis, Dr.
7 Weiner, your questions really point out the
8 sensitivity that we have, the staff is currently
9 weighing a very important decision. I've met twice
10 already with Scott and his staff. We've discussed the
11 charge that the Commission put before us. There's a
12 technical side of this and there's a policy side of
13 this and it is an extremely important decision and for
14 the obvious reasons in terms of the continuing utility
15 of some of this waste. When is it waste was an
16 excellent question. There's a lot of it. There are
17 waste streams that need to be considered and I think
18 Scott very aptly pointed out in his comments this
19 question of is it suitable for near-surface disposal.
20 It really is the challenging question before us. But
21 we do take that particular charge by the Commission
22 extremely seriously.
23 Low activity waste, Dr. Clarke raised the
24 question of low activity waste. We don't find a
25 definition of low activity waste. We don't find it in

1 the United States and we don't find it
2 internationally. There's not agreement really as to
3 what is this is low activity waste especially at the
4 very low end of the spectrum. At the IAEA, much more
5 progress has been made, for example, in clearance
6 values and exemption values if you will. But this
7 idea of low activity waste, it's really up in the air
8 and even with the ongoing effort at IAEA to change the
9 waste classification scheme in their document DS-379,
10 there's a qualitative discussion of low activity
11 waste, but lacking by comparison to certainly the
12 quantitative approach that we're accustomed to in the
13 waste classification scheme in Part 61.
14 So it is an area where there needs to be
15 national and frankly international line about just
16 what it is. I thought your question was an excellent
17 question.
18 Just the budget, one last thought, I mean
19 I've had some criticism levied at the Low-Level Waste
20 Strategic Assessment that the staff didn't necessarily
21 do the best job that it could have done of making the
22 argument to the Commission that you would need more
23 resources to do all of this. And I think it is
24 important and I think Scott alluded to this in his
25 comments. I mean, we have made efforts in the budget

1 process to achieve additional resources. But, of
2 course, every year the resources are difficult both
3 within our own organization as critical decisions are
4 made and then also in terms of oversight by OMB and
5 OMB pass-backs have more times than not reduced
6 resources. They don't increase them.
7 So again, this is a tool that we will use
8 to tackle these things, certainly the seven high
9 priority items on the timelines that Jim pointed out
10 in his remarks. But there is simply not enough
11 resources for this particular part of the program
12 which is why it's imperative that we have a game plan
13 for proceeding ahead.
14 But I really sitting here again compliment
15 Scott and Jim and the members of the staff. But I
16 also found I wanted to just kind of weigh in on some
17 of your questions. Your questions were excellent and
18 I appreciate the opportunity to do that. Thank you.
19 VICE CHAIR CROFF: Thanks. Ruth.
20 MEMBER WEINER: Very quickly. If the
21 Italian waste came to United States, where would it
22 go?
23 MR. KENNEDY: Energy Solutions in Utah was
24 where the waste would go. It would be processed in
25 Tennessee. Some of it would actually be recycled.

1 That's the proposal. Some of it would be disposed of
2 out in Utah.
3 MEMBER WEINER: Thank you.
4 VICE CHAIR CROFF: Larry, while I have
5 you, you mentioned the issue of this new IAEA waste
6 classification system. What's the status of it?
7 MR. KAMPER: The status is that it has
8 been discussed with the WASC. The member states and
9 WASC have provided a number of comments on it. It is
10 currently undergoing further adjustment by the IAEA
11 staff and I believe it will be on the agenda at the
12 WASC meeting in April. What I will do is make it a
13 point as we proceed closer to that time, I'll
14 communicate with you more specifically about just what
15 the status is.
16 VICE CHAIR CROFF: Okay. Thanks. Mike,
17 did you have questions.
18 CHAIR RYAN: No. Again, I apologize for
19 having to duck away a meeting up on the top floor. So
20 I appreciate your patience with me on that. I may
21 have some follow-up questions. I can talk to you
22 individually, but I'll certainly look at the
23 transcript and I have read the entire document and I
24 think it's a good piece of work. There is lots of
25 good stuff in there.

1 I'm going to guess that my colleagues will
2 say we need to write a letter about it to you and give
3 you feedback and insights that we might have gleaned
4 from looking at the document and sharing this time
5 with you today and maybe even some follow-up
6 discussions that we might have on various parts and
7 pieces. So it's again a lot of great, hard work. You
8 have a broad range of issues to deal with. I'm always
9 marveling about how much you can do with something
10 that's defined by exclusions.
11 (Laughter.)
12 CHAIR RYAN: It's everything else but. So
13 it's a big bowl of soup that you have to work in and
14 you make a good coherent stab at having it all make
15 sense. That being said, the hard work is ahead of us.
16 Right?
17 Thanks, Allen. I appreciate the chance to
18 make a comment.
19 VICE CHAIR CROFF: Any other questions
20 from staff?
21 MR. HAMDAN: Yes. First of all, I want to
22 say the exact same thing that Larry Kamper said. I
23 thought this was a excellent presentation and the
24 effort is equally important.
25 I just have one question. You mentioned

1 as one option, Jim, is to go to Congress with some
2 proposal. The question is what do we know about the
3 history of NRC going to Congress with proposals. Do
4 we know anything?
5 MR. FLANDERS: I'll just say, we ranked it
6 low in our priority list in terms of -- And part of
7 the reason why we ranked it low was, I think, part of
8 it is your return on your investment and do you think
9 the effort that you put in was actually -- what's the
10 benefit you're going to gain from it and there's a
11 high degree of uncertainty. There's a high degree of
12 uncertainty.
13 GAO's done a few studies on this topic for
14 members of Congress. There was a Congressional
15 hearing, I guess, back in 2004. From that, we saw no
16 further action. It's uncertain how that would be
17 received. In our comments back in that 2004 work, it
18 provides some comments on our views on the
19 effectiveness of the Low-Level Waste Policy Act at
20 that time. So it's clear what our views are on that.
21 We haven't seen where there's been any particular
22 request for any kind of legislative changes and with
23 that there's a fair amount of uncertainty as to
24 whether or not that would be significant benefit and
25 we really see that there's a number of other things

1 that could be done really and that we should focus our
2 resources on those other activities as opposed to
3 taking that path.
4 So for those reasons, we ranked it low.
5 CHAIR RYAN: Jim mentioned earlier, I
6 reacting to your comment, Scott, the National Academy
7 report which basically put that as the fourth thing
8 you do.
9 MR. FLANDERS: Right.
10 CHAIR RYAN: And I think that you have
11 them thrilled that you have 61.58 on the high priority
12 tasks because you can cover an awful lot of ground by
13 61.58.
14 MR. FLANDERS: Yes.
15 CHAIR RYAN: An awful lot of ground and I
16 think even the low activity waste issues and some of
17 the other things, it's a pretty powerful tool if you
18 really begin to think about what it actually says.
19 So if you went to Congress, I mean,
20 Congress might say, "If you read 61.58, you can take
21 care of this yourself. Why are you here?" Just a
22 thought.
23 VICE CHAIR CROFF: Great. Seeing nothing
24 further, thank you very much for a great presentation.
25 Very informative. I look forward to seeing you in the

1 future on the specific issues and we're adjourned
2 until 1:00 p.m. Off the record.
3 (Whereupon, at 11:37 a.m., the above-
4 entitled matter recessed to reconvene at 1:00 p.m. the
5 same day.)
6 CHAIR RYAN: All right. Well, welcome
7 back. We'll reconvene the meeting and open the
8 record, please. And with that, I'll turn over this
9 session to our Cognizant Member for these
10 presentations, Allen Croff.
11 VICE CHAIR CROFF: Thank you. The
12 Committee will remember we've had some previous
13 briefings on the mixed-oxide fab facility down at the
14 Savannah River site, more broadly scoped briefings.
15 And as a follow-up to some of our concerns, how they
16 manage the waste and whether they had adequate
17 capacity, staff has agreed to come down and talk to us
18 about that. So without further ado, David Tiktinsky
19 will talk about the waste at MFFF.
20 MR. TIKTINSKY: Thank you very much. I'll
21 just give a little bit of background of where we've
22 been on this project. This is a two-stage licensing
23 process. The first stage was the construction or
24 authorization stage. The construction or
25 authorization was issued by the NRC back in March

1 2005, which gave them the ability -- permission to
2 begin construction.
3 MOX Services submitted a license
4 application for the second part, which is to possess
5 and use the radioactive material, and in September
6 2006, staff did an acceptance review, and accepted it
7 for review in December 2006. We're currently
8 reviewing the license application.
9 In the meantime, at the actual
10 construction site, construction for -- nuclear
11 construction began on August 1st, so they're already
12 doing quite a bit of work out there of concrete and
13 rebar. And for the staff's schedule, we plan on
14 completing our safety evaluation report on the license
15 application by December 2010, assuming we don't have
16 a hearing. And if there is a hearing, by December
17 2011.
18 I'll just kind of give you a little quick
19 artist rendition and background of what this facility
20 will eventually look like. What you see in the middle
21 there is the main building, the protected area, plus
22 there's other supportive buildings, and there are just
23 some facts here of just how big the building is, and
24 then just kind of how much concrete and other
25 materials will be actually at the facility.

1 To kind of get into the meat of where
2 we're coming from, that's here. In that same process,
3 there's two things that are going on, the aqueous
4 polishing, which is the liquid processing of the
5 Plutonium into powder Plutonium Oxide, and the other
6 part is the MOX process, which takes that Plutonium
7 Oxide and makes it into the fuel assemblies.
8 In the aqueous polishing side, the steps
9 are dissolution, purification, and conversion. And
10 liquid waste is generated in the aqueous polishing
11 side. For the MP side, the products that are
12 generated that are waste are solid waste, and I'll get
13 into what those liquid and solid wastes are, and how
14 they're going to be dealt with.
15 I'll talk a little bit about the liquids
16 first. There is three main streams, then a solvent
17 waste stream. The main streams are the high alpha
18 activity waste stream, and what's different in this
19 facility compared to reprocessing facilities is that
20 the Plutonium from weapons grade has Americium. It
21 doesn't have any of the other products that you'd find
22 from reprocessed spent fuel, so you don't think
23 anything for -- vitrified glass, because of the types
24 of Plutonium that are here. Also, excess acids and
25 alkaline waste streams all make up the high alpha

1 activity waste streams.

2 The other part in the facility is the

3 stripped Uranium stream, and this contains less than

4 .96 percent U-235. And the third part of that is

5 called a low-level waste stream. These low-level

6 waste, low-level contaminations from the various

7 sources, including things like rinsing waters in the

8 labs, sanitaries, the condensates from the ventilation

9 system, distillates and chlorinated effluents. And

10 then the solvents which is used in the process has a

11 separate waste stream, and it's recovered from the

12 solvent recovery process, and it's slightly

13 contaminated.

14 MEMBER WEINER: Excuse me, David. What

15 are these things chemically? I mean, acids, alkaline,

16 what is it? What is the chemical compound?

17 MR. TIKTINSKY: Well, there's various --

18 the exact chemicals -- do you know the --

19 MS. MARKHAM: The acid that they use in

20 there is nitric acid. The alkaline that they would

21 use is a bicarbonate scrub for certain processes.

22 MR. TIKTINSKY: It's various -- just from

23 the whole -- basically, the reprocessing part of the

24 Plutonium. They use various chemicals, including the

25 acids and the organics, so that's where the solvent

1 organics come from, also.

2 MS. MARKHAM: The organics is TBP.

3 CHAIR RYAN: Where do they go? Oh, we're

4 going to get to that?

5 MR. TIKTINSKY: Well, we'll talk about

6 where they're -- this is just what's generated. We'll

7 talk about the storage capacities and where it's

8 eventually going to go.

9 Now this is kind of just a diagram from

10 the facility of all the different waste streams, where

11 they go, and how they're dealt with. Some of them I

12 just talked about, the liquids, Americium streams, the

13 solvent residues, the other low-level waste liquids,

14 and then some non-hazardous liquid waste, and how

15 they're treated. And I'll be talking more about these

16 individually, but this is a chart I thought would be

17 useful for you to kind of see the whole process of

18 what's coming out, and where it's all going to go.

19 Okay. For the high alpha waste stream,

20 the expected volumes of that is 10,300 gallons a year.

21 What they are going to be doing from the MOX facility

22 to the waste solidification building facility is

23 transfer liquid waste in batches. So in this case,

24 for the high alpha waste, the estimate is 25 batches

25 a year every other week. The stripped Uranium stream

1 is 44,000 gallons per year, and the plan is to have up
2 to 42 batch transfers a year, and the low-level waste
3 liquid waste stream has the largest volume, 285,000
4 gallons per year, and the plan is up to 80 batch
5 transfers per year.
6 On the storage side for the high alpha
7 waste, there's two tanks. The tanks are 10,500 liters
8 each, to provide six months of storage capacity for
9 that particular waste stream. Those tanks will be
10 agitating and recirculated to keep it mixed.
11 For the stripped Uranium stream, there's
12 four tanks. Those tanks are 11,000 liters each to
13 provide three months of hold-up capacity. And those
14 are also agitated and recirculated. And the other
15 tanks relate to the low-level waste liquid collection.
16 There's two tanks of those, 11,500 liters, and that
17 provides a seven-day hold-up capacity.
18 CHAIR RYAN: Could we take a minute here
19 just to talk about this hold-up capacity. Does that
20 mean that if the seven days, for whatever reason you
21 can't empty low-level waste tanks, you shut down?
22 MR. TIKTINSKY: Well, we'll talk a little
23 bit more about what they're going to do, but that's
24 the maximum that they would have at the facility.
25 CHAIR RYAN: That's not my question. Does

1 that mean you have to stop operation?

2 MR. TIKTINSKY: If you reach the capacity,

3 yes, you would have to stop before you got there.

4 CHAIR RYAN: These are kind of limiting

5 the process, the seven-day hold-up capacity. That's

6 the low-level tank.

7 MR. TIKTINSKY: Yes.

8 CHAIR RYAN: And then there's three months

9 and six months, which are a lot longer, so the low-

10 level is the critical --

11 MR. TIKTINSKY: The low-level waste is the

12 limiting void stream.

13 CHAIR RYAN: Okay.

14 MR. TIKTINSKY: So before seven days, you

15 would have to -- they would have to shut the facility

16 down if the waste solidification was not available.

17 CHAIR RYAN: So if the batch plant fails,

18 the cement batch plant, you're out of luck, too. I

19 mean, that's a real interesting critical path.

20 MR. TIKTINSKY: It's important for it to

21 be there for continued operation, yes.

22 CHAIR RYAN: That surprises me.

23 MR. TIKTINSKY: The other part, the

24 solvents, the excess solvents from the process, very

25 slight amounts of contamination of Plutonium there.

1 What this material has done, there's -- estimated
2 about 2,800 gallons per year generated, and it's
3 collected in 400-gallon holding tanks. They sample it
4 according to the waste criteria, Acceptance Criteria.
5 They batch transfer this in 300-gallon carboys or
6 other containers, and they transfer this to the
7 Savannah River site. This doesn't go to the Waste
8 Solidification building, but it will be handled by the
9 Savannah River site for disposal. And it's estimated
10 about 11 transfers per year of solvent waste material.
11 CHAIR RYAN: But this is probably a real
12 mixed waste.
13 MR. TIKTINSKY: Yes.
14 CHAIR RYAN: It's not chemical waste, it's
15 mixed waste. You have radioactive material, and --
16 MR. TIKTINSKY: Well, it's got radioactive
17 material in there, yes.
18 CHAIR RYAN: So it is mixed waste.
19 VICE CHAIR CROFF: No, it's not. TBP
20 isn't RCRA.
21 CHAIR RYAN: It's just TBP.
22 MR. TIKTINSKY: Slightly contaminated.
23 VICE CHAIR CROFF: Well, the nitric acid
24 is aqueous. This is the solvent.
25 CHAIR RYAN: Okay. All right.

1 MR. TIKTINSKY: Okay. The liquid wastes,
2 how they're transferred from the MOX facility to the
3 waste solidification building, it's done in dedicated
4 lines that go from the MOX facility to the waste
5 solidification building. And the waste solidification
6 building is operated by DOE, and it's regulated by
7 DOE, it's not regulated by the NRC.
8 These dedicated lines, or these pipes are
9 buried underground. They're double-wall stainless
10 steel. The high alpha transfer line is an IROFS, Item
11 Relied On For Safety. It's about 2,000 foot in
12 length. There's leak detection systems, and the lines
13 are designed to withstand seismic events and other
14 events.
15 For the solid waste side, which is from
16 the MP side, basically, this waste is loaded into
17 drums. There's two different kinds of waste, the TRU
18 waste, the transuranics, about 1,100 drums per year
19 for those. The storage capacity, about 180 days, and
20 these drums will be transported via the appropriate
21 transportation packages to WIPP.
22 The low-level waste that's generated,
23 about 1,500 drums per year, 30-day storage capacity,
24 and those will be transferred back to the Savannah
25 River site, or another vendor for disposition and

1 disposal.

2 CHAIR RYAN: Where? Do they have any idea

3 yet?

4 MR. TIKTINSKY: All we know right now it's

5 being transferred to the Savannah River site, and

6 they'll have to make whatever arrangements to dispose

7 of them at an appropriate low-level waste site.

8 MEMBER CLARKE: May I ask a question just

9 for clarification?

10 MR. TIKTINSKY: Yes.

11 MEMBER CLARKE: Isn't the MOX facility on

12 the Savannah River site?

13 MR. TIKTINSKY: It is on the Savannah

14 River site, yes.

15 MEMBER CLARKE: So when you say

16 transferred to the Savannah River site --

17 MR. TIKTINSKY: Well, transferred to the

18 control of the Savannah River site.

19 MEMBER CLARKE: Okay.

20 MR. TIKTINSKY: This facility is kind of

21 like an island in there. It's operated by --

22 MEMBER CLARKE: By a different group.

23 MR. TIKTINSKY: By MOX Services for DOE.

24 MEMBER CLARKE: Okay.

25 MR. TIKTINSKY: So it's on the site, but

1 the site entity will have to be the ones that will
2 deal with disposing of it.
3 MEMBER CLARKE: I understand. Thanks.
4 MEMBER WEINER: Is this included in the
5 inventory for the WIPP already, or is this additional
6 inventory? I mean, 1, 100 drums isn't much, but 1,100
7 drums per year can add up.
8 MR. TIKTINSKY: I'm not sure. Yes, it is.
9 MEMBER WEINER: It is already included in
10 it.
11 MR. TIKTINSKY: It is already included.
12 MEMBER WEINER: Thank you.
13 MR. TIKTINSKY: Okay. Moving on to the
14 interface control documents, there's a Waste
15 Acceptance Criteria for the waste that's consistent
16 with the waste streams that will be generated, and
17 consistent with the Integrated Safety Analysis that
18 was prepared and submitted to the NRC.
19 The interface controls provide for
20 notifications between the MOX Services and Waste
21 Solidification Building Management. Again, WSB is
22 controlled and operated by the Department of Energy.
23 The waste is sampled and analyzed prior to transfers.
24 CHAIR RYAN: Just a minute, if I may.
25 MR. TIKTINSKY: Sure.

1 CHAIR RYAN: On the low-level waste stuff,
2 you say you're going to transfer it to SRS or a vendor
3 for disposition. How do you transfer something from
4 an NRC licensee to a vendor?
5 MR. TIKTINSKY: Well, it's transferred in
6 drums.
7 CHAIR RYAN: No, no, no. I mean, I'm
8 talking about your license, I mean, there will be a
9 licensee, so the licensee is making a shipment via a
10 vendor. Right?
11 MR. TIKTINSKY: The licensee will be using
12 somebody to transport it, some type of vendor. I'm
13 not exactly sure which vendors they're looking at.
14 CHAIR RYAN: There's two paths here from
15 a regulatory perspective that are very different.
16 Transferring something to DOE is one regulatory
17 structure, and making a shipment via a vendor to a
18 disposal site directly from the licensee is another.
19 Am I understanding that both of those are possible?
20 MR. TIKTINSKY: That's the information I
21 have. Do we have --
22 CHAIR RYAN: You need to come up and tell
23 us who you are.
24 MS. MARTIN: I'm sorry.
25 CHAIR RYAN: Can you use a microphone for

1 us, please? I'm sorry. Thank you.

2 MS. MARTIN: I'm sorry. I'm Kathy Martin,

3 Department of Energy, and I believe, I'm not

4 absolutely certain, but I believe that the waste would

5 go to DOE for management, and then DOE would determine

6 whether or not to dispose of it on site, or to dispose

7 of it off site either at another DOE site, or with an

8 NRC licensee. If that helps.

9 CHAIR RYAN: Okay. That's different than

10 the licensee actually having shipments going out from

11 their license to somebody else.

12 MR. TIKTINSKY: That's correct.

13 CHAIR RYAN: Okay. Thank you. Sorry.

14 MR. TIKTINSKY: Okay. The question I

15 think that you're most interested in is what would

16 happen if the waste solidification building wasn't

17 working, and operations had to be suspended, what

18 would happen here at this facility.

19 MOX Service's response would be they'll

20 develop operating procedures to deal with whatever

21 these contingencies are, where they're having

22 different problems, where they can't transport waste

23 off the site, and resolve any of that particular event

24 that may occur.

25 The potential impacts, of course, stopping

1 the waste, the transfer of waste from the MOX facility
2 to the waste solidification building, storing the
3 waste in the holding tanks, and suspending waste-
4 generating operations.
5 Now as you saw from the low-level waste
6 thing, it has a seven-day capacity, so that's a
7 relatively short time frame if there's problems in the
8 receipt of this waste.
9 CHAIR RYAN: It seems relatively short,
10 you know, zero degrees of freedom in a seven-day surge
11 capacity.
12 MR. TIKTINSKY: Yes.
13 CHAIR RYAN: That's tight.
14 MR. TIKTINSKY: That is a small amount.
15 They will be able to maintain the facility
16 in a safe condition until the issue is resolved.
17 They've looked at the potential events involving the
18 inability to transfer waste in the Integrated Safety
19 Analysis, that Integrated Safety Analysis is still
20 being reviewed by the staff as part of our licensing
21 review. The storage tanks have agitators, and
22 recirculation capacity to insure mixing of the tank
23 contents, and they will be developing procedures, both
24 for MOX Services at the MOX facility, and at the waste
25 solidification building for procedures to -- for

1 contingencies related to disruptions of the facility.

2 A little bit about what the waste

3 solidification building is. Again, it's regulated by

4 the Department of Energy. There's two major steps in

5 their process that they call critical decisions, the

6 first one. Critical Decision Two was approved, the

7 baseline of the design of the facility. And three,

8 which is the construction which is planned in 2008.

9 Additionally, the plans are to construct -- the

10 construction of the facility in 2010, and begin

11 operations in 2013. And the construction schedule is

12 coordinated with the MOX construction schedules so the

13 waste solidification building will be available when

14 needed during the start-up of the MOX facility.

15 A couple of conclusions. The low-level

16 waste stream is the limiting factor, the seven days

17 related to curtailing operations at the MOX facility

18 in the event of the unavailability of the waste

19 solidification building, and MOX Services has

20 contingency plans to shutdown in a safe state if that

21 waste solidification building is unavailable.

22 VICE CHAIR CROFF: Thank you. I'll bet

23 you you don't have any questions.

24 CHAIR RYAN: I'm fascinated.

25 VICE CHAIR CROFF: Go ahead.

1 CHAIR RYAN: I've got to get back to seven
2 days here. If I decide on Monday morning I'm going to
3 shut the facility down, how much waste am I going to
4 generate in shutting it down, one day's worth, two
5 day's worth? My point is, seven days of capacity
6 doesn't mean you have seven days to shut a facility
7 down, necessarily.
8 MR. TIKTINSKY: That's correct.
9 CHAIR RYAN: So how much you produce
10 shutting it down, that's one question. The other is,
11 I guess I'm just a little bit baffled by why you would
12 not build more surge capacity for the low-level waste.
13 Why do you put your -- a size 14 foot in a size 10
14 shoe? I just don't get it.
15 MR. TIKTINSKY: Well, I can't answer
16 certainly why it was designed that way. And, also, I
17 don't have -- unless, Dealis, do you happen to have
18 information about --
19 CHAIR RYAN: Is it a seven-day operation?
20 Is it 24/7? I mean, how is the seven-day surge
21 capacity going to managed? Is it eight hours a day,
22 five days a week?
23 MR. GWYN: Dealis Gwyn with MOX Services.
24 I can't speak to the specifics there. The only thing
25 I'll point out is that the seven days is a very

1 conservative number. We did not take -- when we came
2 up with the seven days, that does not include some
3 intermediate tanks that are upstream of that. It
4 doesn't include any capabilities -- any other hold-up
5 capabilities. It's also conservative from a
6 generation standpoint. We've taken sort of the
7 bounding numbers from the ER.
8 CHAIR RYAN: That doesn't sound
9 comforting, either, because bounding numbers can mask
10 risk.
11 MR. GWYN: The only thing I'd point out,
12 that this is a waste stream that's either
13 contaminated, or has the potential to be contaminated,
14 so it's very low-level.
15 CHAIR RYAN: I understand all that. The
16 point is that if you have to shut the plant down,
17 you've got to have two things that happen. One is you
18 have to have capacity for all the waste, and you can't
19 have any condition that would cause you to have to
20 shut it down in a less than optimal way.
21 MR. GWYN: The only thing I would point
22 out, it doesn't necessarily mean that the whole
23 facility would have to be shut down. It would only be
24 the operations that would be generating the low-level
25 waste.

1 CHAIR RYAN: I'm really confused now.

2 MR. TIKTINSKY: You could continue pellet

3 and fuel fabrication, and shut off one part of the

4 feed that's --

5 CHAIR RYAN: Yes. We're focused on a

6 liquid processing here for the moment.

7 MR. NARATO: I may be able to shed a

8 little bit of light. I'm Michael Narato with the

9 Office of Nuclear Materials Safety and Safeguards.

10 This is not necessarily inconsistent with how

11 currently operating facilities are running. For

12 example, the Defense Waste Processing Facility has

13 about roughly the same surge capacity with their

14 recycle water tank. And what they usually try to do,

15 I can't speak for the MOX facility and how it will

16 run, but, for example, at DWPF, what they try to do --

17

18 CHAIR RYAN: So it's going to be hard for

19 me to transfer what you're saying over to MOX, but go

20 ahead.

21 MR. NARATO: Well, what they currently --

22 I think you may be able to. What they currently do

23 is, they don't necessarily wait until the -- when the

24 systems are functioning properly, they don't

25 necessarily wait until the tanks are full to transfer.

1 They will work operations so that they can -- they
2 transfer when they can. And then if the tanks are
3 full, then they will just have to wait until they can
4 make a transfer. But, usually, there's some warning.
5 They don't all of a sudden wake up one morning with
6 full tanks and say oh, the tanks are full. We have to
7 shut down.
8 CHAIR RYAN: I understand that. The point
9 I'm trying to make is, you've got very little degrees
10 of freedom with that kind of a surge capacity for
11 waste, it seems to me. I'm just trying to understand
12 why that makes sense to you. So far, I haven't heard
13 anything that tells me you understand that.
14 The other part from our perspective is, we
15 realize that DOE is taking care of the waste, but the
16 significant question is, what happens to the plant if
17 all of a sudden the waste guys call you up and say no
18 more waste today? And what is the shutdown condition
19 under three time horizons? One is if you shutdown for
20 a little while, like a week. Two, if you shutdown for
21 six months. And three, if you shutdown for three
22 years, what are the safety implications for the
23 licensed facility under those conditions? That's
24 really what we're interested in.
25 MR. TIKTINSKY: And part of that is, the

1 events that have been looked at in the ISA, I mean,
2 we're reviewing those as part of the license review.
3 CHAIR RYAN: Okay.
4 MR. TIKTINSKY: So we have not made any --
5
6 CHAIR RYAN: We'll be waiting to hear what
7 you think about those.
8 MR. TIKTINSKY: Yes. We have not made any
9 conclusions on those at this time.
10 CHAIR RYAN: I'm done. Thanks.
11 VICE CHAIR CROFF: Ruth.
12 MEMBER WEINER: Mike has asked most of my
13 questions, which was really about the volume of waste
14 you can have. But I'm also concerned about the
15 chemical reactions that are taking place in these
16 effluents. I mean, you've got acidic effluent, you're
17 mixing it with organic solvents. Are you looking at
18 the reactions that are taking place in your waste
19 streams, and in the streams as they go into the waste
20 stream? And you can get some unforeseen reactions
21 taking place.
22 MR. NARATO: That's part of our assessment
23 of these events that they have in the Integrated
24 Safety Analysis. They're saying what the consequences
25 could be, what the chemical reactions will be, and

1 that's just part of our chemical review. We'll look
2 at that. We have not made any conclusions on those
3 yet as of this time.
4 MEMBER WEINER: All right. What are you
5 seeing? I mean, it's -- you've presented here what
6 the streams are, what the production streams, and what
7 the waste streams are, so can you enlighten me as to
8 what sort of reactions you're getting, what sort of
9 reactions you would expect in your waste stream? I
10 mean, I recognize it's part of your review, but is
11 there any more you can say about it?
12 MR. TIKTINSKY: Well, Mike is our chemical
13 reviewer, Mike and Kelli, so maybe they can add a
14 little bit more to that.
15 MR. NARATO: Well, generally what would be
16 ---- I would expect is that if the -- for the waste
17 that would be transferred to another facility, the
18 receiving facility, in this case the WSB, would have
19 as listed here, a set of Waste Acceptance Criteria.
20 And those Waste Acceptance Criteria will be generated
21 from the safety analysis for that facility, so the
22 potential chemical reactions will be considered there,
23 and the Interface Control Document will generate the
24 requirements that must be met to prevent adverse
25 reactions from occurring.

1 MEMBER WEINER: And do you have any sense
2 of what those requirements might be, or is it too
3 early to tell?
4 MR. NARATO: At this point, I can't
5 speculate what WSB's Waste Acceptance Criteria will
6 be, no.
7 MEMBER WEINER: Not so much the Waste
8 Acceptance Criteria, but the sort of chemical
9 reactions that you're going to get in the liquid
10 waste. Are you going to get exothermic reactions, are
11 you going to get -- is the product dilute enough that
12 you don't expect much reaction? You're dealing with
13 a chemical mixture in your waste stream, and I'm just
14 interested in what the behavior of that mixture is
15 going to be, or just haven't you looked at it yet?
16 MS. MARKHAM: Can I?
17 MR. NARATO: Go ahead.
18 MS. MARKHAM: There are some events that
19 have been documented in the ISA process, such as Red
20 oil and things like that, through their safety
21 analysis that they've done. Those are documented in
22 there, and we are still in the process of reviewing
23 those.
24 MEMBER WEINER: Okay. That's --
25 MR. TIKTINSKY: Yes. I think it's just a

1 little early for us to give you the answers about what
2 we think about the reactions, whether we agree with
3 the events, whether they meet the requirements or not.
4 We just haven't gotten that far in the review.
5 CHAIR RYAN: If I could add on to Ruth's
6 thought, too. You know, I just did a quick
7 calculation from your Slide 7. That's roughly a batch
8 every other day, concrete.
9 MR. TIKTINSKY: For the low-level waste,
10 yes.
11 CHAIR RYAN: You add them all up, there's
12 147 batches, and just divide by 250 days, it's a batch
13 every 36 hours.
14 MR. TIKTINSKY: Yes.
15 CHAIR RYAN: You're going to have a real
16 big cool-down area, curing area for these concrete
17 monoliths or whatever you're pouring.
18 MR. TIKTINSKY: Yes. We can't speak for
19 the details of -- once it leaves the MOX side --
20 VICE CHAIR CROFF: I think there's maybe
21 a point of misunderstanding. These transfers are
22 batches of liquid.
23 CHAIR RYAN: Yes, liquid, but they're
24 going to have to be solidified somewhere along the
25 line.

1 MR. TIKTINSKY: They sent to the waste
2 solidification building to be solidified. That's the
3 DOE facility. That's the end of the -- the end of
4 these lines go to the waste solidification building.
5 VICE CHAIR CROFF: Okay. But not in this
6 facility.
7 MR. TIKTINSKY: Not at this facility.
8 VICE CHAIR CROFF: Okay.
9 CHAIR RYAN: No, no. I understand they're
10 going somewhere else to be solidified on the DOE side
11 of the DOE/NRC fence, but I just think you've got to
12 challenge it and see if that makes sense. That's an
13 awful lot of concrete to be -- in the winter time,
14 it's not going to do real well, even in South
15 Carolina. Just a thought.
16 VICE CHAIR CROFF: Ruth.
17 MEMBER WEINER: No, that's fine.
18 VICE CHAIR CROFF: Jim?
19 MEMBER CLARKE: Can you put Slide 5 up?
20 This and the next slide I think may be helpful in
21 helping us get a better handle on things. Can you go
22 back to 5? Okay. These are the liquid waste streams.
23 MR. TIKTINSKY: Yes.
24 MEMBER CLARKE: And if we look at the
25 third bullet, it says, "Very low radioactive

1 contamination or the potential for radioactive
2 contamination", and then you have a sub-bullet called,
3 "Chlorinated effluent", so why don't you have the
4 potential to generate a mixed waste?
5 MR. TIKTINSKY: Well, I can tell you what
6 the chlorinated effluents are. That's from the
7 alternate feedstock. There's two different kinds of
8 feedstock for this facility, the Plutonium from the
9 PDCF, Plutonium Disposition Facility, which will
10 basically a pretty pure material, and then the
11 alternate feedstocks, which are -- have other
12 contaminants, particularly unchlorinated stuff,
13 chlorinated material. And in the dechlorinization
14 process, that's where these chlorinated effluents will
15 come from. So it's a little different. It's only for
16 the alternate feedstock.
17 MEMBER CLARKE: Is the intent to recycle
18 the solvents?
19 MR. TIKTINSKY: Do we have any information
20 about it?
21 MS. MARKHAM: Recycling the solvents?
22 They're doing a scrub, I know that, for the TBP. They
23 will -- I thought they're recycling the solvents.
24 Yes.
25 MR. NARATO: They recycle the solvent for

a finite number of times. Eventually, it becomes unusable. Yes, they are intending to recycle the solvent.

MEMBER CLARKE: I'm concerned that if you have radionuclides in that solvent that you can't no longer use, you've got a mixed waste. Now where am I going --

VICE CHAIR CROFF: Only if the organic is a RCRA material, and it's not.

MEMBER CLARKE: Chlorinated?

VICE CHAIR CROFF: No, no, no. Like he said, the chlorine is coming from a different place. It's an organic chlorine.

MR. NARATO: Yes, the solvents are not chlorinated solvents.

MEMBER WEINER: It's chloride, then.

MEMBER CLARKE: Just hang on, Ruth. Can we go to 6, then? And this gives the disposition of all of those wastes that you looked at there. And I can't see the slide, so I don't know if it does.

MR. TIKTINSKY: Yes, sorry about that. It's hard to get that much information on a slide to project it.

MEMBER CLARKE: Well, your low-level liquid waste is the one that you've got the -- what

1 seems to us to be a relatively short holding capacity.
2 MR. TIKTINSKY: Yes.
3 MEMBER CLARKE: That goes to the waste
4 solidification building, and I guess the solidified
5 part would go to the landfill, although it doesn't
6 show that. It shows it going to MPDES outfalls.
7 MR. TIKTINSKY: That's -- again, that's
8 the National Pollutant Discharge Elimination System.
9 CHAIR RYAN: It's released to the
10 environment. That's what it is.
11 MR. SMITH: I'd like to say something, if
12 I could.
13 CHAIR RYAN: sure.
14 MR. SMITH: My name is Garrett Smith. I
15 work for the Department of Energy, also. You guys
16 have been talking a little bit about the low-level
17 waste, and it's treatment at the waste treatment
18 building. Communicating back to the office I was
19 sitting there back, the one million liters of low-
20 level waste are not going to be cemented at the waste
21 treatment facility. They go into the effluent
22 treatment system, current infrastructure of the
23 Savannah River site, the liquid, so it's not seven
24 days waiting for the cement plant to go down. It's
25 seven days of surge capacity for a waste that is going

1 into the liquid effluent treatment system, the
2 existing --
3 CHAIR RYAN: That's for operating waste.
4 MR. SMITH: Yes, but it's the existing
5 low-level treatment facility at the site, the entire
6 site, so it's not solidified. It goes into a liquid
7 treatment system, and I can't speak to the details of
8 what that is.
9 MEMBER CLARKE: This shows it's a liquid
10 stream going to an NPDES permitted outfall to a
11 surface water --
12 MR. SMITH: Correct.
13 CHAIR RYAN: So that's wrong, too?
14 MR. SMITH: No, that's correct.
15 Ultimately, that's where it goes. That's where it
16 ends up. See, if you look at the slide that's up
17 there, you see the low-level liquid waste, and it's
18 split. The arrow comes off two, so some percentage of
19 it, it appears, goes to the waste solidification
20 building, and the rest goes to the central sanitary
21 waste water treatment facility, the effluent treatment
22 facility at the Savannah River site.
23 VICE CHAIR CROFF: Jim?
24 MEMBER CLARKE: I'm missing a point here.
25 If it's solidified, how can it be released to the

environment?

CHAIR RYAN: Yes, that was my question.

MR. SMITH: The low-level waste is not solidified at the waste treatment --

VICE CHAIR CROFF: What is solidified in the waste solidification building?

MR. SMITH: The high alpha waste, I believe is going to be solidified at the waste treatment facility.

CHAIR RYAN: Well, it doesn't show it on your diagram. This is not a very accurate diagram here.

(Simultaneous speech.)

CHAIR RYAN: But that's the same building.

MEMBER CLARKE: Yes, it's the same building. My confusion was the liquid going into a solidification process, and coming out a liquid. I was confused.

MR. TIKTINSKY: Again, part of the confusion, maybe, is the fact that since NRC doesn't regulate the waste solidification building, pretty much the end of our regulatory jurisdiction is when it leaves the MOX facility, so we have not been involved in reviews and looking at the design details of the waste solidification building.

1 CHAIR RYAN: To me, that falls a little
2 flat, because you've got to at least understand what
3 accurately is happening, so you can understand that
4 the plant is safe, and can be shut down in a safe
5 condition if they guys shut the faucet.
6 MR. TIKTINSKY: Yes. So we look -- the
7 events that are in the ISA that relate to being able
8 to shut it down is what we're concerned about. As
9 long as we review that and we agree, we have
10 reasonable assurance that that's okay, then we can
11 make our findings.
12 CHAIR RYAN: And that is, you know, you
13 might get a phone call that says you have to stop
14 sending waste now, right now, or tomorrow, or a week,
15 and it will be shut down for some period of time, from
16 a day to years. And that's the question we've asked,
17 is where's the range of that analysis that says you
18 can shut it down safely? And, of course, the big
19 question is how do you restart it if it's down for a
20 long period of time? What do they have to do on that
21 end? But that's a separate question.
22 MR. TIKTINSKY: Yes. Well, part of --
23 then the procedures that we've talked about for these
24 different events, some of them have not been developed
25 yet, so we have not reviewed those either, so some of

1 it, it's a little early for us to give you an answer.
2 MEMBER CLARKE: Let me just suggest that
3 that chart could be clearer that we're looking at
4 right now. To me, it raises more questions than it
5 answers, so just a comment.
6 MEMBER HINZE: Briefly, I was pleased to
7 see that the waste stream piping is built to withstand
8 credible seismic events. What about the holding
9 tanks?
10 MR. TIKTINSKY: Anything that's an IROFS
11 would be designed for seismic. I'm not sure if the
12 tanks are considered IROFS. Dealis, can you --
13 MR. GWYN: I can't remember on the low-
14 level waste, but the high alpha waste tanks, those
15 would be IROFS tanks, so those would definitely be
16 designed to withstand seismic. I don't remember on
17 the other tanks. But we would have went through our
18 safety analysis, and based on - if we needed to take
19 credit, if the release or the rupture was such that we
20 needed to, that would be designed for seismic.
21 MR. TIKTINSKY: Again, these events, we
22 have -- as I mentioned, our Safety Evaluation Report,
23 we expect to complete in December 2010, so we have
24 quite a bit of review to do, so we can't really give
25 you any conclusions about the findings with ISA,

1 because the staff has not made those yet.

2 MEMBER HINZE: That's an area that should

3 be looked at.

4 MR. TIKTINSKY: Yes, and that's part of

5 something we will look at in the review.

6 MEMBER HINZE: That's it. Thanks.

7 VICE CHAIR CROFF: Could you back to 5,

8 the one before this. I'm not understanding the

9 stripped Uranium stream. What is that stripped from?

10 MR. TIKTINSKY: As part of the aqueous

11 polishing process, there's one step in the solvent

12 extraction to remove Uranium material.

13 VICE CHAIR CROFF: So the Plutonium coming

14 in has some amount of Uranium.

15 MR. TIKTINSKY: It has some amount of

16 Uranium.

17 VICE CHAIR CROFF: That's part of your

18 clean-up. Okay.

19 MR. TIKTINSKY: Yes.

20 VICE CHAIR CROFF: And the volume of that

21 would appear to be quite a bit of Uranium?

22 MR. TIKTINSKY: Well, we have the liquid

23 numbers. I'm not sure how that translates into --

24 VICE CHAIR CROFF: You don't have

25 concentrations. To follow-up on Jim's question a bit,

1 this chlorinated effluent, the chlorine from some of
2 the impure material, what form does that come out?
3 What chemical form is it, do you know?
4 MS. MARKHAM: It gets inputted -- in the
5 AFS, it's in the form of Sodium, or Potassium, or
6 Calcium Salt. It gets dechlorinated by the
7 electrolyzer, so you get oxidation to CL2. That gets
8 removed as a gas, and that gets in a scrubbing column
9 re-reduced to the chlorine, so it's all as a --
10 VICE CHAIR CROFF: Okay.
11 MS. MARKHAM: It goes through various
12 transformations, but ultimately, it's still in a
13 chloride form.
14 VICE CHAIR CROFF: Okay. A more general
15 question on, I guess, the overall flow sheet. How
16 stable is the flow sheet? And I mean in terms of the
17 functions it's trying to perform. And by way of
18 background, I've heard some recent DOE presentations
19 on the plant to the effect they're considering some
20 additional feed streams into the plant to be cleaned
21 up, and they would require some different processes
22 other than, I'll call this the baseline, that you've
23 shown here. Is the process stable, as far as you're
24 concerned, or are you seeing -- is this a moving
25 target during the review?

1 MR. TIKTINSKY: There is -- the alternate
2 feedstock that was approved in the construction
3 authorization is what we're looking at. That's what's
4 in the submittal. We have received no information of
5 any specific changes to any of that material.
6 VICE CHAIR CROFF: Okay.
7 MR. TIKTINSKY: So we would have to
8 consider it, if it came, but there has been nothing
9 submitted, and no information that we are expecting
10 anything.
11 VICE CHAIR CROFF: Okay. I notice later
12 on, the stripped Uranium collection tanks are agitated
13 and recirculated. Why? I mean, I certainly don't
14 expect that to be a heat-generating waste, and the
15 Uranium is in solution. Right? Acid solution?
16 MR. TIKTINSKY: Mike, can you give any
17 insight into that?
18 MR. NARATO: The Uranium will be in
19 solution, but it's my understanding, is it's good
20 practice to agitate the tanks just to be certain that
21 there's no precipitation or materials on the bottom of
22 the tank.
23 VICE CHAIR CROFF: Okay. Going on to the
24 -- where was I on here? There's a lot of what would
25 happen if operations were suspended depends on

1 procedures that, apparently, you haven't seen yet.
2 Right?
3 MR. TIKTINSKY: That's correct, yes.
4 VICE CHAIR CROFF: Do you expect to see
5 them before your review is completed?
6 MR. TIKTINSKY: We expect to see them
7 before we would issue any kind of license to operate.
8 VICE CHAIR CROFF: Okay. That's a fairer
9 question, I guess. I don't think I have any more
10 questions. Staff? I don't think we have any more
11 questions.
12 MEMBER WEINER: I have one brief one. Can
13 I ask?
14 VICE CHAIR CROFF: Okay. Yes, we've got
15 the time.
16 MEMBER WEINER: On your Slide 5. When you
17 say "Liquid Americium", do you mean an Americium
18 solution?
19 MR. TIKTINSKY: A solution with Americium
20 in it.
21 VICE CHAIR CROFF: Acid solution of
22 Americium.
23 MEMBER WEINER: That's a clarification.
24 Thank you.
25 VICE CHAIR CROFF: Okay.

1 MR. HAMDAN: May I?

2 VICE CHAIR CROFF: Yes.

3 MR. HAMDAN: Would you, would NMSS be
4 amenable to giving another presentation at some other
5 point during the license application review?

6 VICE CHAIR CROFF: That's what I was
7 coming to. I think we've learned a number of things
8 here today. It's been very interesting. I think
9 there's a lot of unanswered questions, and you're
10 still in the middle of your review with documents
11 apparently to come in yet. I'd suggest when you're
12 significantly further along, and have developed some
13 insights through review of the ISA and whatever, we
14 might like to have you back.

15 MR. TIKTINSKY: Sure. We can do that.

16 CHAIR RYAN: I guess one take-away
17 question might be this issue, it's very clear that our
18 interest is what could happen on the DOE side of the
19 fence that could have an impact on the safety of the
20 facility you're going to license. So you have to talk
21 to them and understand the hand-offs in a little bit
22 more detail than we got today. So if you can work
23 toward that sort of role, and maybe even have DOE come
24 and talk about their side of the fence, that would be
25 real helpful. That would give us the insight that

1 would help us in our letter writing.

2 VICE CHAIR CROFF: I'm guessing from the

3 schedule you presented on your first real slide there,

4 it might be a year or two years before you're in a

5 position to go into this --

6 MR. TIKTINSKY: That's correct, yes.

7 VICE CHAIR CROFF: Okay. Well, we'll put

8 it on the long-term calendar.

9 (Laughter.)

10 VICE CHAIR CROFF: Well, I really

11 appreciate your time and the insights. It's been very

12 helpful to get us on the same page, in terms of what's

13 going on, and I think we're at least far enough into

14 this that we've got a continuing concern, I guess.

15 And so we'll see what you make out of all the details,

16 and go from there.

17 MR. TIKTINSKY: Okay. Thank you.

18 VICE CHAIR CROFF: Thank you. Back to you

19 for what?

20 CHAIR RYAN: Why don't we take a 10-minute

21 break, and then we'll reconvene about 10 minutes of,

22 and get started. Okay?

23 (Whereupon, the proceedings went off the

24 record at 1:42:02 p.m., and went back on the record at

25 1:55:21 p.m.)

1 CHAIR RYAN: Okay. If I could ask the
2 meeting to come to order, please. Our Cognizant
3 Member for this portion of our afternoon session is
4 Dr. Clarke. So without further ado, Dr. Clarke.
5 MEMBER CLARKE: Thank you, Dr. Ryan.
6 Under the broad umbrella of decommissioning
7 activities, the Committee has been following Tritium
8 Task Force Report, and today we have two folks from
9 NRR's Division of Inspection and Regional Support.
10 They're going to tell us about revisions to the
11 Significance Determination Project, to address spills
12 and leaks in response to that report. John Thompson
13 and Elaine Keegan, and John, I believe you're going to
14 start. Is that correct?
15 MR. THOMPSON: Yes. I'm going to give the
16 overview of the ROP process.
17 MEMBER CLARKE: You're welcome both of
18 you. Thanks for coming.
19 MR. THOMPSON: I'll start. I'm John
20 Thompson. I'm with the Office of NRR in Inspection
21 Program Branch Division of Inspection Programs and
22 Regional Support. It's our branch that has the
23 responsibility for overseeing the Reactor Oversight
24 Process for operating reactors for all four regions.
25 And we're the Program Office, we maintain the

1 procedures, we implement it, insure the regions follow
2 the program.
3 As such, I'm going to provide you with a
4 high level overview of the ROP, which was implemented
5 in 2000, which was a significant departure of what we
6 used to have, which was the old core inspection
7 program.
8 This is a 20-minute presentation, and I
9 know we won't touch on all important points of the
10 ROP, but we picked out the key aspects, what makes the
11 ROP the ROP. And if you have any questions, we'll
12 certainly try to answer them. Slide one.
13 The principal aspects of the ROP is, of
14 course, it's baseline, supplemental inspections, but
15 those get filtered through a Significance
16 Determination process so we can use them in
17 assessment. And we also use performance indicators
18 equally with the output of the inspection program
19 through the SDP.
20 Providing a framework for how we use that
21 is the Assessment Program, which is the fourth key
22 attribute, along with aspects of safety culture, which
23 I'm sure you've heard of over the last couple of
24 years. Industry trends, which is an internal program;
25 that is, we don't rate licensees through the ROP, but

1 we use it internally, and it's part of the report we
2 send to Congress.
3 The Agency Action Review meeting, which is
4 the yearly Senior Management meeting, and this is the
5 meeting that we rate the poor performers, and what the
6 Senior Managers want to say in front of the Commission
7 at the Commission meeting at the end of the year.
8 Also, the Enforcement Program, which is
9 not a direct feeder on how we assess the operating
10 reactors, but it's certainly a part of the ROP. And
11 then at the end of it all, we will do a yearly self-
12 assessment on lessons learned, and what things we want
13 to change, and we put all that into a SECY and send it
14 to the Commission. So those, at a very high level,
15 are the key attributes of the ROP.
16 Now the framework for the ROP is the NRC's
17 overall safety mission, which you can see at the top,
18 which we all know. And then underneath that are the
19 strategic performance areas that we separate out,
20 which is reactor safety, the radiation safety, which
21 you'll hear a little bit more of throughout this
22 presentation, and what we have as safeguards, but that
23 will change to probably security to include some of
24 the things that NSIR wants to change over the next
25 year.

1 Now under that are the seven cornerstones
2 of safety which we've come to love, and they are the
3 initiating events, mitigating systems and barrier
4 integrity primarily dealing with operating reactor
5 events, the radiation safety, and emergency
6 preparedness. Radiation safety cornerstones, which is
7 the public radiation safety, and then the
8 occupational, which Elaine will talk more about, and
9 then the physical protections.
10 Now crosscutting that, and permeating
11 through this entire framework are the crosscutting
12 areas. These are the areas of human performance, a
13 safety-conscious work environment, and the problem
14 identification and resolution. Any questions on that?
15 Now at a functional level how this all
16 works, we take a typical cornerstone, mitigating
17 systems, and then any kind of inspections that are
18 done in that cornerstone and performance indicators
19 that relate to that cornerstone come out through a
20 significance that we can feed into the action matrix.
21 Either they will be a white significance, or a yellow
22 significance, or green, and they will come together,
23 and then that will determine what column of the action
24 matrix they are. And then we can take a regulatory
25 response once we've determined what column they're in.

1 Part of this action matrix concept is
2 starting with the left, with the licensee response,
3 which is the minimum NRC oversight that we provide for
4 a licensee in this column, which basically has no
5 significant, no risk-significant performance
6 indicators, or inspection findings.
7 Now as performance degrades, as a licensee
8 racks up inspection findings that are significant, and
9 performance indicators start to move up into the white
10 and yellow bands, based on that, we will move them
11 over in the action matrix, which is assessed on a
12 quarterly interval, so every three months we look at
13 the performance indicators that are sent to us, and
14 inspection findings, and decide what column of the
15 action matrix they're in.
16 There have been no plants in the
17 unacceptable column, though. And you can see from the
18 next, this is a much broader and more detailed picture
19 of that action matrix. And at the top it says, "What
20 determines where you are in the column", whether you
21 have all green inputs, which would be in the licensee
22 response column, or one or two whites, and so on as
23 you move over to the fourth to the right. And the far
24 right is the 0350 process, which is basically -- it's
25 part of the ROP, but it's outside of the Assessment

1 Program. And this is for plants that have performance
2 problems, that are going through an extended shutdown,
3 so we basically take them out of the assessment part
4 of it, and put them under the 0350 Program, which is
5 a very intensive NRC oversight, and we deal with them
6 until they're ready to come up operating. And then
7 they're eased back into the ROP Assessment Program.
8 Next slide. On a functional level, how
9 this works, the orange box, or yellow box is the
10 assessment process, which is central to this. And
11 feeding out of this, once we know what column they're
12 in, we can dictate what kind of communications we'll
13 have with the stakeholders, whether it be public
14 meetings. We'll issue a press release, and all their
15 reports, inspection plans and findings get output.
16 An Agency response will also come out of
17 this, depending on the column of the action matrix,
18 whether we do a supplemental inspection based on a
19 white finding, whether Senior Management gets
20 involved, whatever those actions are, that is dealt
21 with through the assessment process.
22 Feeding into it are the performance
23 indicators, and the inspection findings which go
24 through the significance. They're equally weighted.
25 That's very important. A white performance indicator

1 and a white SDP have the same weight in the action
2 matrix. And depending on what event may have
3 happened, we might do a supplemental inspection, we
4 might do an event response, which would be an
5 augmented inspection team, or an IIT, we might do
6 generic safety inspections, whatever it is. That can
7 be done through the program, and then fed up through
8 the significance determination process. And we'll
9 cover all the cornerstones of safety with this
10 overlay.
11 Now getting a little more detailed in the
12 performance indicators and the significance
13 determination process, there was an effort made to
14 standardize what we mean by a green PI and a green
15 finding. And they mean the same thing in the action
16 matrix; that is, a white performance indicator will
17 have the same assessment impact as a white inspection
18 finding.
19 Now the thresholds may be different, that
20 the threshold to a white in a performance indicator is
21 not linked, necessarily, to a white threshold
22 inspection finding, which would be risk-informed. The
23 SDP is risk-informed for a lot of the cornerstones,
24 not all, but a lot, and so there was an effort to
25 match up as best as we could in 1999 when this was

1 being developed to be consistent.

2 Now as time has gone on, we have developed

3 new Pis. You may have heard of the Mitigating Systems

4 Performing Index, which is the first set of Pis which

5 are risk-informed, so we are taking strides to make

6 the Performance Indicator Program risk-informed like

7 the Inspection Program.

8 Now there are nine SDPs currently that are

9 developed for the ROP, and I don't have to read down

10 all of them, but you can see the public radiation

11 safety is one being proposed for draft, and Elaine

12 will talk more about that. But we attempted to cover

13 all the cornerstones of safety with the SDPs. And

14 certainly since 2000, we have added to this. We

15 didn't start out with this many, but as we've gained

16 experience and lessons learned with the ROP, we've

17 added to them where we saw fit.

18 Now the baseline Inspection Program

19 underpins the SDP process. It is the minimum level of

20 inspection that we do for all plants when they're in

21 the licensee response column, and this is basically

22 regardless of where they are. So even if they're over

23 to the right in the action matrix, they're a poor

24 performer, we're going to do at least the baseline

25 Inspection Program.

1 Now part of that baseline Inspection
2 Program is, as I said, they will do the inspection and
3 findings that will come out of it will be fed up
4 through the significance. Where we have a performance
5 indicator, they will do the minimal in that area.
6 They may not do nothing in that area, but will do
7 minimal, and the idea is that the performance
8 indicator will provide some information, and then the
9 Inspection Program will complete that, so there's a
10 small amount of overlap so we fully cover the
11 cornerstone. The concept is not to spend resources
12 unnecessarily where a performance indicator would
13 serve optimally.
14 And then where we need to do a more
15 vertical look, we have the Licensee Problem
16 Identification Resolution Program, which is part of
17 the baseline, which we'll do, continually look at PI&R
18 efforts in the inspection process, but we will do
19 annual, more involved look at PI&R, and then we have
20 an inspection procedure that is done bi-annually that
21 is more detailed, and it's a team inspection approach.
22 So we tried to cover the PI&R area pretty well over
23 the course of three years, which is typically
24 involving procedures that are kind of completed every
25 three years.

1 Now the performance indicators which cover
2 the three areas of reactor safety, radiation safety,
3 and safeguards, you can see on this slide, all have
4 the cornerstones under them with the four under
5 reactor safety, the two under radiation safety, and
6 then the ones under security. Under initiating
7 events, you can see the mitigating systems in this PI,
8 which I mentioned there. One is missing, by the way,
9 the support cooling water system should be under the
10 mitigating systems. And, understandable, this is an
11 older slide. But you can see that performance
12 indicators cover broadly the areas that we want to
13 look at and cover for an operating reactor, and we
14 continue to enhance this, and revise this, as
15 necessary.
16 MEMBER HINZE: What's the significance of
17 the bold?
18 MR. THOMPSON: That was probably the MSPI,
19 the most recent performance indicators that we've
20 added. As I said, we missed one, so that would have
21 been in bold, as well.
22 Now this a typical performance indicator
23 that we show on the web site for the public. It's
24 meant to be as user-friendly as possible. You can see
25 in the green band the performance is acceptable, and

1 it's a flow trending chart, so you can see over the
2 quarters how performance trends. And if it crosses
3 the green-white threshold, then that would elicit
4 supplemental inspection response. And some of these
5 track three years, some of them track over two years,
6 and some of them are annually. This one is a rate-
7 type base which is 7,000 critical hours. It's one of
8 our scram indicators in initiating events.
9 Assessment Program. As I said, the Pis
10 and the inspection findings are equally weighted in
11 the Assessment Program, such that we can derive an
12 overall level of plant performance, and determine what
13 column of the action matrix the licensee should be in.
14 This is so that we can determine what regulatory
15 actions we need to take. And the action matrix
16 assessment, what column the licensee is in, is done
17 quarterly; that is, every quarter we look at the
18 performance indicators submitted, and look at
19 inspection findings that have been finalized, and we
20 feed that into where they should be in the action
21 matrix.
22 Now twice a year, on the mid-cycle and
23 end-of-cycle assessments we take another step. That
24 step is that we send assessment letters to licensee.
25 We look at the crosscutting issues at the mid-cycle

1 and end-of-cycle assessments. And this is the point
2 at which we determine whether or not a licensee has
3 met the requirements for a substantive crosscutting
4 issue. And if so, that is communicated in the
5 assessment letters to the licensee. Now that status
6 of whether they have a substantive crosscutting issue
7 stays with the licensee for six months, regardless of
8 whether they change other columns in the action
9 matrix, because that is the point at which we will
10 reassess whether they still have that substantive
11 crosscutting issue.
12 Now this action matrix summary, which is
13 from fiscal year 2005, which is that faint yellow
14 highlight shows typically where the licensees fall out
15 in the columns. And you can see most of the licensees
16 are in the licensee response column, as which you
17 would expect for a mature industry. Column two, or
18 the regulatory response column, is about 12 plants
19 degraded cornerstone, or column three, four, and so
20 on. And this has been typical over the years since
21 the ROP has been implemented in 2000.
22 And that is a high-level overview of the
23 ROP. The rest of the slides will get into the
24 radiation safety cornerstone that Elaine will present,
25 but I will stop here to pause to see if you have any

1 questions.

2 MEMBER CLARKE: Thank you, John. Let me

3 just ask one for clarification. Your Slide 9 shows

4 the areas which you currently have a significance

5 determination process. The response to the Task Force

6 report, if I understand that slide, any revisions you

7 make would be captured in Number Four, the Public

8 Radiation Safety. Is that what you said?

9 MR. THOMPSON: For the Radiation Safety

10 SDP that she's going to cover. For these other SDPs,

11 we captured them probably in a different means. It's

12 not part of --

13 MEMBER CLARKE: There could be revisions

14 to others as a result of this.

15 MR. THOMPSON: Yes, of course. And we've

16 had revisions of others.

17 MEMBER CLARKE: Okay.

18 MEMBER HINZE: Could I ask a question

19 regarding these colors. These are levels of the

20 performance indicators. Are these linear, are they

21 exponential? How do I consider those from green,

22 white, to yellow, to red?

23 MR. THOMPSON: Well, the SDP are orders of

24 magnitude, 1E to the minus 6, 1E to the minus 5, 1E to

25 the minus 4.

1 MEMBER HINZE: Okay. So they're
2 exponential.
3 MR. THOMPSON: Right.
4 MEMBER HINZE: Okay. Thank you.
5 MR. RICHARDS: This is Stu Richards with
6 the Division of Inspection and Regional Support. I
7 think John mentioned this, just to clarify. For some
8 issues we can use PRA information, and what John
9 described is correct. But for areas, such as Health
10 Physics, we really can't calculate a conditional core
11 damage probability, so those tools that we use tend to
12 be more deterministic for coloring findings. And
13 Elaine will get into that, I think, a little bit in
14 the example, what we're changing. But, typically,
15 when you get into Radiation Protection area, what we
16 did is, when the ROP was formed, there was a panel of
17 experts, including people from the industry, that got
18 together, and they looked at it more from what kind of
19 a regulatory response would be appropriate for certain
20 types of occurrences based on their experience. So
21 you can't necessarily say it's linear, because
22 sometimes it's hard to put a number on some of these
23 things. Sometimes, I guess, it's more clear-cut, like
24 for doses.
25 MS. KEEGAN: For some of the indicators in

1 the public dose area, and occupational, they are dose-
2 related. As the dose increases, then the level
3 increases, but some of them, they're just, like Stu
4 said, they're deterministic. We just had to decide
5 where they were.
6 MEMBER HINZE: So, I'm to take from that,
7 I think, that the colors are not -- do not have the
8 same relative position depending upon the particular
9 problem at hand.
10 MS. KEEGAN: Right.
11 MR. RICHARDS: That's true, but in a
12 relative sense, John has the definitions. It says
13 "inspection findings" there, and you can read the
14 definition. For instance, what is low to moderate
15 safety significance, so it's of interest, but it's not
16 a big deal. On the other hand, if a finding is red in
17 any cornerstone, generally speaking, that has to be
18 highly significant.
19 MEMBER HINZE: Thank you. Sorry to
20 interrupt.
21 CHAIR RYAN: Just as a follow-up point to
22 all that, if you did have, say, that red condition one
23 cornerstone, I guess there's got to be some
24 interaction or relationship among all the areas. Is
25 that right? For example, if you have a radiation

1 protection problem, where you're having a lot of
2 personnel contaminations, and higher readings, and the
3 ALARA practices tell you you might have, you might see
4 some other issues that aren't just a Health Physics
5 part of that, they're broader issues. I'm on Slide 9,
6 where the SDPs are listed. These aren't mutually
7 exclusive categories. There can be overlap among
8 them.
9 MR. THOMPSON: You can have a red PI or a
10 red inspection finding, and not necessarily have
11 anything else show up.
12 CHAIR RYAN: Okay.
13 MR. THOMPSON: Davis-Besse taught us that.
14 CHAIR RYAN: Okay.
15 MR. THOMPSON: At the time of Davis-Besse,
16 they were all green in the performance indicators.
17 It's not perfect.
18 MR. RICHARDS: Let me add to that. I
19 think one aspect that we didn't get into, and there's
20 a lot of detail that would take up time, but, for
21 instance, if you have a white inspection finding, our
22 follow-up inspection is pretty much to go out and see
23 how the utility dealt with that specific issue.
24 As the plant has more significant
25 problems, the NRC follow-up becomes broader. And to

1 the point where if you have a red inspection finding,
2 or a red performance indicator, that alone is going to
3 move you into the fourth column, and that results in
4 a very broad inspection effort, so that you might have
5 a problem with a pump in the plant, but this very
6 broad inspection may end up looking at Health Physics
7 as part of that inspection. So more significant
8 problems call for that broader inspection, because,
9 just as you said, what led to it could cut across
10 other areas.
11 CHAIR RYAN: That's a great answer,
12 because that really shows you are broadening out,
13 based on severity and so forth. That's helpful.
14 Thank you.
15 MEMBER HINZE: Broadening and deepening.
16 CHAIR RYAN: Right.
17 MR. RICHARDS: Just to put some numbers on
18 it, for a white finding, I think we estimate about 40
19 hours of NRC follow-up. If you end up getting the
20 larger inspection for a red finding, I don't know, the
21 hours must be well over 1,000. MR. THOMPSON: 95003?
22 MR. RICHARDS: Right. Maybe even 1,500,
23 2,000. I don't know. It's a lot of effort.
24 MR. THOMPSON: That's not including the
25 safety culture independent assessments that licensee

1 will do, and then we'll do our --

2 CHAIR RYAN: Thank you. That's real

3 helpful.

4 MS. KEEGAN: To give a little bit of

5 history as to why we're changing the public radiation

6 safety SDP, it goes back to the Tritium out in the

7 environment from plants such as Braidwood, and Indian

8 Point, Byron, Dresden. Most significantly was

9 Braidwood, and over a number of years, they released

10 over 6 million gallons from leakage of their

11 radioactive liquid from the vacuum breakers along the

12 circulating water blowdown line.

13 The inspection that followed those years

14 came up with a white finding, and a number of

15 violations for Braidwood's actions. The Commission

16 approved the white finding, but with reservations as

17 to why there's a white finding in this area. In the

18 Staff Requirements Memo to COMSECY-06-0023, the

19 Commission directed staff to make sure that the

20 cornerstone ROP for the public dose cornerstone was

21 consistent with the ROP program goals, which includes

22 risk-informed approach to RAD protection. And we were

23 directed to make a recommendation to the Commission to

24 either maintain the current SDP, or to change it with

25 appropriate justification.

1 That led to SECY-07-1112, which was the
2 Staff Evaluation and Proposed Revision to the Public
3 Radiation SDP. In that, we proposed three changes to
4 the SDP. One was to eliminate the white finding from
5 the environmental branch of the SDP; two, to modify
6 the radioactive effluent release branch to
7 specifically include spills and leaks. And the third
8 was to indicate that the white finding in the
9 Radioactive Effluent Release Branch of the Public RAD
10 Safety SDP is appropriate.
11 In this change to the SDP, we're actually
12 make three separate changes. One is to address the
13 leaks and spills, as directed from SECY-07-1112. The
14 second change is to remove the green finding in the
15 RAD material control branch. There's an aggregation
16 of greater than five occurrences results in a green
17 finding, and that's -- in the past, that had been
18 directed -- staff had been directed to remove that.
19 But due to budget constraints, staff constraints, that
20 was always low priority, and hadn't been done in the
21 past.
22 MEMBER CLARKE: Elaine, what's an
23 occurrence?
24 MS. KEEGAN: An occurrence is one finding.
25 MEMBER CLARKE: Does it have any magnitude

1 associated with it, or any other --

2 MS. KEEGAN: Yes, there is a level that it

3 has to reach. And if it passes that level, then it

4 goes on in the chain for determination. But if it

5 stops at that level, then that means that they're --

6 as long as there are five of those levels, not being

7 real clear.

8 MEMBER CLARKE: Well, just let me see if

9 I understand or not. If you have a liquid release, an

10 unplanned release, a spill, does it have to be of a

11 certain magnitude before it's an occurrence?

12 MS. KEEGAN: Yes. But that's something

13 that has been decided recently. This occurrence is

14 basically dealing with not liquid spills and releases.

15 It's not in the effluent chain, it's in the RAD

16 material control chain, so it's basically if

17 radioactive material gets out where -- I have to look

18 at this.

19 MEMBER CLARKE: That's okay. We can --

20 MS. KEEGAN: No, it's --

21 MEMBER CLARKE: When we get to spills and

22 leaks, we can come back.

23 MS. KEEGAN: Yes. No, you have

24 occurrences, and it's -- the liquid is for the

25 effluent release pathway. And this is the RAD

1 material control, which is usually associated with
2 solid RAD waste material. So it's equipment that gets
3 out in the environment, gets outside the RCA, but it's
4 low-level, then that's an occurrence. And if it has
5 a certain level of contamination on it that exceeds a
6 limit, then it goes further on. But if has the lower
7 level of contamination, that's an occurrence. And
8 they are considering that five of those occurrences
9 would relate to the higher finding. But we've been
10 directed years ago to get rid of the aggregation
11 findings while we're doing this.
12 MR. RICHARDS: This is Stu Richards, if I
13 could just make an additional comment. The changes
14 Elaine is discussing aren't all as a result of the
15 Radioactive Liquid Lessons Learned Task Force.
16 MEMBER CLARKE: I understand.
17 MR. RICHARDS: So we're kind of using this
18 opportunity to kind of clean up odds and ends. And
19 removing the five occurrences, one of the principles
20 of the ROP is that we don't aggregate small findings,
21 so you don't take 10 occurrences and say if you do
22 this 10 times, typically, that's going to give you one
23 white finding. The Commission had generally, and it's
24 not always the case, but generally speaking, they told
25 us don't aggregate small things into big things. So

1 this is just to follow through on that direction.

2 MS. KEEGAN: The third change we're doing

3 is in the transportation branch, is to remove the

4 decision branch for denial of access to the low-level

5 burial ground. The states where the burial grounds

6 are located are the ones that remove access, or deny

7 access. It's out of our control.

8 When it was -- this decision branch was

9 put into the SDP, it was assumed that there would be

10 a number of findings which would result in denial of

11 access. And, again, so we're trying to reduce the

12 aggregation of findings. And, also, being denied

13 access to a burial site was going to result in a

14 yellow finding, and there was nothing that was of a

15 substantial safety issue that would justify a yellow

16 finding for being denied access.

17 CHAIR RYAN: Could you help me understand

18 what do you mean by "denied access"?

19 MS. KEEGAN: If a licensee is, for

20 example, licensee receives a letter from the State of

21 South Carolina saying that they're no longer allowed

22 to send their RAD waste to the site.

23 CHAIR RYAN: What if their waste is off-

24 loaded, and they have a non-conforming load, and

25 there's a fine?

1 MS. KEEGAN: In that case, that would come
2 under -- we would, and our inspectors would be looking
3 at it, if it was non-conforming. But if it was just
4 something that happened at the site, at say Barnwell,
5 that we had no control over, and they were denied
6 access, we have really no control over that. But if
7 it's a shipment that goes there that exceeds our RAD
8 limits, our contamination limits, DOT limits, then we
9 would get involved with it.
10 CHAIR RYAN: You're talking about denial
11 because of the transportation unit, rather than the
12 waste itself?
13 MS. KEEGAN: Just any reason why the state
14 decides to write a letter to the licensee, and say
15 you're no longer allowed to send waste here.
16 CHAIR RYAN: So that could be any of the
17 things I mentioned, too.
18 MS. KEEGAN: It could be any reason at
19 all.
20 CHAIR RYAN: All right. Good. All right.
21 MS. KEEGAN: So the next - and I have to
22 apologize for this one, because I have no idea why it
23 does it. It prints out fine, but it just -- and I
24 tried just about everything to get this to work out
25 right. And this is the Public Radiation Safety Flow

1 chart as it stands now. And in the left most line,
2 you can see the transportation, and if it's not a
3 transportation issue, and it goes down to a public
4 exposure greater than, and if it's not, then that goes
5 over to the greater than five occurrences decision
6 block. And that's the decision block that we're
7 removing because of the aggregation of findings.
8 MR. WIDMAYER: You show that on the next
9 chart. Right?
10 MS. KEEGAN: Yes. And, unfortunately, the
11 last - the right-most line is the Environmental
12 Monitoring Program, and it shows how it stands now
13 with the failure resulting in a white finding. The
14 next one is the proposed, which shows that the
15 Environmental Monitoring Program can only result in a
16 green finding. And we believe this is appropriate
17 because anything that makes it to the environment,
18 that's measured in the environment that exceeds
19 limits, or exceeds what's expected, will be picked up
20 in the Effluent Branch.
21 CHAIR RYAN: The exceeds part is really a
22 different kind of a threshold than not expected.
23 MS. KEEGAN: Well, so far, we've never
24 exceeded our performance indicators in the
25 environmental area. We've not even actually come

1 close to it. So, basically, anything that exceeds is
2 basically more than what we expect, which is
3 background.
4 CHAIR RYAN: Well, let me try and sharpen
5 that question a bit. It seems to me that some of the
6 Tritium Task Force information that we got indicated
7 that you can be compliant, yet be in a bad place.
8 MS. KEEGAN: Yes. That's kind of
9 questionable, because the health risk from the Tritium
10 that was out in the environment was very minimal. The
11 dose was insignificant.
12 CHAIR RYAN: No question, but it's a very
13 significant national issue --
14 MS. KEEGAN: It's a public perception.
15 CHAIR RYAN: -- for the enter industry.
16 MS. KEEGAN: Yes, that's the main problem,
17 it's the public perception.
18 CHAIR RYAN: So that's a problem.
19 MS. KEEGAN: Yes. And we don't have a way
20 to measure that.
21 CHAIR RYAN: It's unexpected. The fact
22 it's unexpected, it was unanticipated. I don't know
23 what the right word is, but the licensee didn't expect
24 to find it when they went looking for it.
25 MS. KEEGAN: Yes. With Braidwood, they

1 kind of -- they didn't do things appropriately. They
2 -- you know, when you release 6 million gallons over
3 a number of years, and you don't expect to have it
4 have an impact, they failed in their Effluent Program.
5 They failed to monitor it, they failed to do an
6 evaluation. But, again, the Environmental Program,
7 and that's where the white finding came in --
8 CHAIR RYAN: No, and I appreciate that,
9 but certainly, the other plants said well, let's take
10 a head's up and see if we have any issues. And I
11 think, at least in some cases, issues popped up where
12 they weren't anticipated at all.
13 MS. KEEGAN: They weren't, but NEI has
14 come up the Groundwater Protection Initiative that all
15 the plants are instituting.
16 CHAIR RYAN: Right.
17 MS. KEEGAN: And that will be -- the final
18 report came out in September, and full implementation
19 by all the facilities will be in August of 2008. And
20 we have a temporary instruction that our inspectors
21 will go out and oversee to make sure that they done
22 what they said they were doing.
23 CHAIR RYAN: Sure. I mean, there's been
24 a lot of effort, geohydrologic examinations of sites,
25 and where do I put the wells, and all those kinds of

1 things have been addressed, so that's now on a track
2 where will that eventually be developed into a more
3 formal point of inspection?
4 MS. KEEGAN: I'm going to give that to
5 Stu.
6 MR. RICHARDS: Yes, a couple of things in
7 background, and maybe you already know this, but
8 first, Elaine mentioned that the Commission approved
9 us going forward with a white finding in Braidwood.
10 Normally, the Commission is not involved in the
11 significance determination process, so this was
12 unusual. The Commission understood where we were
13 headed with Braidwood, and one of the Commissioners
14 elected to turn it into an item that he thought that
15 the Commission should vote on. So they did, and the
16 Commission ultimately decided that the staff came out
17 in the right place, but they directed the staff to go
18 back and talk with industry, and reassess this
19 particular SDP tool. And that's what Elaine is
20 presenting today, is the results of that reassessment.
21 I think you're absolutely right.
22 Obviously, for the people that were involved with
23 Braidwood, it was a major public confidence issue. I
24 think the Task Force report discussed that, and the
25 industry acknowledges that because they have

1 undertaken this very, very large effort in their
2 Groundwater Protection Initiative.
3 But on the other hand, one of the
4 principles of the ROP is that we be objective in
5 assessing the risk impact, so that brings you back to,
6 if you have a release off-site, how do you assess
7 that? Do you assess it from its impact on public
8 confidence, or do you assess it based on its impact on
9 public health? And that was part of the Commission
10 debate on Braidwood, and they ultimately said a white
11 finding was okay, even though there wasn't an impact
12 on public health. And I think part of the argument
13 that the staff offered up was, you shouldn't be waning
14 until the public health is impacted to make an issue
15 out of something, and they accepted that. But I think
16 it's kind of an ongoing dialogue, how you deal with
17 this.
18 CHAIR RYAN: That's a really good point.
19 I mean, to me, the public health bar is pretty high
20 above places where you'd want to take action,
21 particularly with regard to effluents, so we've
22 commented previously that, for example, spills at
23 facilities can be noted in the spill logs. And if
24 they're properly noted, and they don't exceed a worker
25 dose, they don't exceed the fence line dose, you don't

1 have to do anything.

2 MR. RICHARDS: Right.

3 CHAIR RYAN: And we're on record as saying

4 that's wrong. If I spill something on my kitchen

5 table, I mop it up. I don't wait until the whole

6 table is covered with stuff. And, I guess, that's --

7 what I'm raising is kind of this question of, are all

8 the bars set at the right place for these leading

9 indicators, if you will? Spills out in the

10 environment are leading indicators. If I have a rain

11 storm and some radioactive material washes off a

12 truck, and I understand that, and I react to the fact

13 there's a collection of water, that's a good thing,

14 because I'm addressing it right away. But if I have

15 a drainage basin that runs into a drainage ditch out

16 into my north 40, and I do nothing for 10 years, I

17 could end up with a big problem out in the north 40,

18 at least a cleanup headache, if nothing else. But

19 what I'm trying to get at, which you've addressed

20 fairly well, is are there -- should we think about

21 leading indicators that are below the bars of public

22 health being impacted, and below some of these other

23 kind of bars where there are more measurable kinds of

24 levels of impact, or worker exposure, or whatever it

25 might be.

1 MR. RICHARDS: One thing, we had to go
2 back to the Commission with our proposal to change
3 this tool, and we made clear in the Commission paper
4 that if Braidwood were to happen again, it would come
5 out white again.
6 CHAIR RYAN: Yes.
7 MR. RICHARDS: So you can get to a more
8 significant inspection finding without exceeding an
9 off-site dose limit.
10 CHAIR RYAN: And, again, I'm asking just
11 for some more insight. For example, in the plant, how
12 many contamination events does it take in work spaces
13 that are unexpected before that's an issue?
14 MR. RICHARDS: That's a good question. I
15 think there's not a count. Again, we don't aggregate
16 the minor findings. You would have to, I believe,
17 have more of a significant impact.
18 MS. KEEGAN: Occupational is outside of my
19 area. Roger?
20 MR. PEDERSEN: My name is Roger Pedersen.
21 I'm the Cornerstone Lead in the Occupational
22 Cornerstone of the ROP. Stu's answer is right. We
23 don't count on-site in the plant spills in terms of -
24 unless they have a dose consequence - in the
25 occupational area. Dose is our measure of risk in the

1 ROP, in the two radiation safety cornerstones of the
2 ROP. We don't have a PRA. We measured the
3 significance of an event by its dose consequence, or
4 its potential dose consequence. So if it's an on-site
5 in the plant spill, obviously, we expect the licensee
6 to clean that up. But if it didn't result, or didn't
7 have a potential in resulting in a dose consequence to
8 a member of the work force, that doesn't meet a
9 threshold to either a PI, or a finding in terms of
10 inspection.
11 CHAIR RYAN: Interesting.
12 MEMBER HINZE: Shouldn't there be an
13 evaluation of this in terms of the safety culture,
14 even though it doesn't reach a level? I mean, if you
15 have a dozen of these occurring, it seems to me that
16 you have a safety culture which is going to eventually
17 lead to a problem.
18 MR. PEDERSEN: Well, I don't remember -- I
19 believe John covered that there are areas that are
20 crosscutting areas, that cut across the cornerstones.
21 They're handled not cornerstone-specific, but it's a
22 broader perspective of looking at the plant
23 operations. PI&R, and safety culture issues are
24 crosscutting issues.
25 MEMBER HINZE: Well, it's nice to say

1 they're crosscutting issues, or areas in this diagram,
2 but where is that in the NRC's evaluation?
3 MR. THOMPSON: Let me see if I could
4 address that, and this is for any cornerstone. In
5 order to get a crosscutting aspect inputted for the
6 counting purposes, you have to have a performance
7 deficiency. And you certainly can have a performance
8 deficiency in how the licensee handles a spill within
9 their boundaries for occupational. It may not be a
10 threshold issue, but if it's a performance deficiency,
11 and it's documented through the inspection process,
12 and it gets a more than minor assessment, it can
13 become a green finding.
14 At a green finding level, it can be
15 documented with a crosscutting aspect. You get more
16 than three of those, then you reach the next level,
17 which means you have a theme. And then if we don't
18 have confidence, and the NRC doesn't have confidence
19 in their ability to address that, then they can get a
20 substantive crosscutting issue.
21 CHAIR RYAN: I guess I'm just speculating
22 in my own mind, but if you had, for example, a number
23 of skin contaminations, and area contamination events,
24 that might be enough to catch your attention. How
25 many skin contaminations does it take to catch your

1 attention, personnel contamination events?

2 MR. RICHARDS: Well, I think -- Stu

3 Richards, again. John hit on the magic number. It's

4 more than three, it doesn't have to be the same exact

5 occurrence, but it's three issues that are considered

6 more than minor, that have a -- in this case let's say

7 a human performance element to it, and if you reach

8 that criteria, as part of our assessment letter we

9 send the licensee, we can say we think you have a

10 problem in the human performance area, as indicated by

11 what happened. And then the program allows kind of an

12 escalation of activities on that.

13 You give them six months to work on it on

14 their own. After the first six months, the program

15 allows you to say well, I think we need to have a

16 meeting on this, if you haven't fixed it. Another six

17 months goes by, if you haven't fixed it, there's more

18 activity, and it gets to the point where you can

19 request the licensee to do a safety culture kind of an

20 assessment of what's happening. So even if you only

21 have green level of findings, if you can --

22 CHAIR RYAN: Well, that's really the hook,

23 is you can write the letter and say why don't you take

24 a look at these? We think you might have something

25 you want to track. Now the onus is on the licensee to

1 respond to that. And if they're proactive, and dig in
2 and assess, and evaluate, and give you a real thorough
3 and competent view of all that, what they've done
4 about it, if they recognized anything, and so on, then
5 things are getting on the right track.
6 MR. THOMPSON: And it can be even a
7 double-edged sword, where we can start off in human
8 performance. Then there is a trend of not fixing it,
9 which can go into PI&R into a baseline program. They
10 can get another crosscutting issue assigned to them in
11 PI&R.
12 CHAIR RYAN: Yes.
13 MR. THOMPSON: And then, a licensee can
14 have more than one substantive crosscutting issue.
15 MR. PEDERSEN: The point I was going to
16 make is that at the level of skin contamination, that
17 significance of an event, we expect the licensee --
18 that's a green band, if you will. That's a licensee
19 performance band.
20 CHAIR RYAN: That would rise up --
21 MR. PEDERSEN: Yes. We expect licensees
22 to have procedures in place so people don't get skin
23 contaminations. If they experience skin
24 contaminations, and it's a performance deficiency
25 because their procedures aren't adequate, or they're

1 not operating per their procedures, we expect the
2 licensee to identify that in the Problem
3 Identification Resolution and solve it. If they don't
4 solve it, then it builds up one of those PI&R issues.
5 CHAIR RYAN: Okay. Back to the
6 environment. Why isn't there a similar kind of thing
7 for detections of small or not-regulatory-type levels
8 in the environment?
9 MR. GARRY: This is Steve Garry. I'm the
10 Health Physics Team Leader. I think that's one of the
11 improvements that Elaine was describing that we're
12 making in the SDP. We've replaced that decision
13 block, which was before specific to ability to assess
14 dose, and the failure to assess dose with a
15 substantial failure to implement the Effluents
16 Program. So if we find a substantial problem, no
17 matter if it's in training, or calibration of
18 radiation instruments, or no matter where the problem
19 is, if we feel like it's a substantial degradation in
20 the program, then it would move to the white band.
21 CHAIR RYAN: So the commitments really
22 aren't in regulation in that case, they're in their
23 program.
24 MR. GARRY: Right.
25 CHAIR RYAN: So that's the hook I'm

1 looking for, is that their program commitments are
2 where you start in the Effluent plan at this point.
3 MS. KEEGAN: Right.
4 CHAIR RYAN: That's a real big -- that's
5 a real important point.
6 MR. GARRY: So like for Braidwood, for
7 example, it would still come out white, because there
8 is a substantial failure to implement their Effluents
9 Program. They didn't get out there and sample, and
10 analyze, and assess, and report, and communicate to
11 the level we would have expected them to, so it would
12 still come out as white.
13 CHAIR RYAN: Gotcha.
14 MEMBER CLARKE: Let me just pick up on
15 that a little bit, and then we should let Elaine
16 finish her presentation, but we're notorious for this.
17
18 What we want you to think about, and what
19 we want to make sure your process captures, if it can,
20 there's a situation where you have releases to the
21 sub-surface. As the Tritium Task Force put it,
22 they're unmonitored pathway releases. Nobody was
23 looking for them, nobody found them until later.
24 Braidwood may be an exception, but you could have
25 releases to the sub-surface, depending on what it was,

1 obviously. Tritium may not be a good example, but
2 stuff coming behind it certainly could be. And if
3 that goes on, you would -- you could contaminate
4 groundwater, you could find yourself in a situation
5 where an unrestricted release might be jeopardized, so
6 you might -- and you might not have a public health
7 risk anywhere along this pathway, but you might have
8 a financial risk. And one of the Commission's
9 concerns is so-called legacy sites are sites that got
10 to decommissioning and didn't have the resources to
11 decommission.
12 It's not inconceivable to me that if you
13 have releases that go on long enough, or if they're
14 big enough, that you couldn't find yourself in that
15 situation. If the only driving force to clean it up
16 is the public health risk, then you're not -- you're
17 addressing that issue, but you're not addressing the
18 financial risk, and the decommissioning issues that
19 we'll be faced with down the road. So I guess I'm
20 trying to get you to think about it maybe a little
21 differently.
22 MR. RICHARDS: Elaine, can I take a shot
23 at that?
24 MS. KEEGAN: Sure, if I can follow-up with
25 it.

1 MR. RICHARDS: Sure, go ahead.

2 MS. KEEGAN: Well, the NEI Groundwater
3 Initiative, which is a voluntary program that the
4 licensees are implementing, they're putting in wells
5 in various sites throughout their plants. They're
6 looking -- they have hydrogeologists coming in
7 evaluating the site's groundwater flow, and I was down
8 at Watts Bar last week, week before last, and I was
9 talking to them about what they had done. And through
10 this Groundwater Initiative that they did, which is a
11 voluntary program, they identified certain areas that
12 they hadn't realized were contaminated. So the NEI
13 GPI I think is going to find areas that are
14 contaminated, and the licensees are going to be trying
15 to clean up.

16 It's pretty all-encompassing, what they're
17 actually doing out there. They just finished
18 inspection with Indian Point, which has a phenomenal
19 program. I guess they've characterized about every
20 square foot of that site. So the licensees are out
21 there looking at it. It's on us to re-evaluate our
22 performance indicator to make sure that we have the
23 right performance indicators at a low enough level to
24 find, to address it. We are actively trying to make
25 the program better.

1 MEMBER CLARKE: I understand, and from a
2 proactive standpoint you maybe have some new reactors
3 to look at. And that's a piece of it, too, closing
4 the loop, taking decommissioning lessons learned, and
5 bringing them back into the process. That's an area
6 of great interest to us, and I just wanted to kind of
7 frame it that way.
8 MS. KEEGAN: Yes. We're not going to
9 leave out the new reactors.
10 MR. RICHARDS: If I could just add to
11 that. I think you summarized the situation very well.
12 Of course, the NRC regulations don't require existing
13 reactors to do on-site monitoring, generally. And to
14 change that would require some kind of a backfit.
15 We've talked about the voluntary initiative on the
16 industry's part, which, of course, they could change
17 their mind and stop doing if they wanted. Every
18 indication right now is that they're fully committed
19 to doing this, but it is not an NRC regulatory
20 requirement.
21 On the other hand, there is a rulemaking
22 going on for 1406?
23 CHAIR RYAN: Yes.
24 MR. RICHARDS: Which has to do with
25 cleaning up the site when you're done, and should we

be allowing these contamination events to occur, and wait for 40 or 60 years to address. Would you like to comment on that?

MR. SHEPHERD: I'm Jim Shepherd in FSME Decommissioning Directorate, and leading the rulemaking effort. The current proposed rule to modify 1406, and, in fact, 20.1501, has been structured such that we take advantage of the NEI program in a way that does not trip the backfit. We've had many interesting discussions with NRR on how to avoid a backfit analysis, and we think we have a way where we simply say that what they're currently doing will comply with the intent of what we're requiring in the new rule for operating reactors.

In the SRM that we received last week, we're directed to start a new rulemaking that would mandate remediation at specified levels of contamination. That will be probably a couple of years in the future, and will certainly be a backfit-type analysis that will be very interesting.

MEMBER CLARKE: Elaine, back to you.

MS. KEEGAN: I just have two more slides, actually. One is the current transportation flow chart, which shows that the decision block of access denied to a low-level burial ground, which results in

1 a yellow finding. And like I said before, the
2 significance of it does not necessarily come to the
3 significance of a yellow finding. And we've proposed
4 to just take out that decision block, where it would
5 just go to whether it's a Part 61.55 waste
6 classification problem, and it would just proceed on,
7 and it would result, the highest finding would be a
8 white finding, which would be appropriate for that.
9 MEMBER WEINER: I'm confused, Elaine, as
10 to how this system applies to transportation, since
11 what NRC does with transportation is to inspect and
12 approve casks, approve the packaging. I mean, you
13 have no control over whether or not the vehicle is in
14 an accident. That's something outside of NRC's
15 control.
16 MS. KEEGAN: This isn't about accidents.
17 This is about whether the transportation package
18 exceeds radiation dose limits, or contamination
19 limits.
20 MEMBER WEINER: Okay.
21 MS. KEEGAN: Like if the waste is
22 misclassified by Part 61, it has nothing to do with
23 the actual --
24 MEMBER WEINER: Transport.
25 MS. KEEGAN: Transport.

1 MEMBER WEINER: So that a finding would be
2 - just to clarify, a finding would be some -- an
3 excursion from the external dose rate limit, or some
4 kind of leak.
5 MS. KEEGAN: Yes.
6 MEMBER WEINER: Some way that the package
7 itself has failed.
8 MS. KEEGAN: Yes. If the radioactive
9 material that's supposed to be contained in the
10 package leaks, that will be a --
11 CHAIR RYAN: It's not just that. It's if
12 the surface contamination limit changes above
13 requirements, too.
14 MS. KEEGAN: Right.
15 CHAIR RYAN: There are a couple of casks
16 that would sweat, for example, remember those, 355s?
17 MEMBER WEINER: Yes.
18 MS. KEEGAN: Or if the load shifts inside
19 the cask.
20 CHAIR RYAN: Yes, all that.
21 MS. KEEGAN: And all of a sudden the dose
22 rates are higher than the expected.
23 CHAIR RYAN: Different than the manifest.
24 MS. KEEGAN: Yes. Those would put you
25 into this flow chart.

1 MEMBER WEINER: If you're not -- if you're
2 inspecting the casks at the origin and destination,
3 wouldn't there be a number of those in-transit things
4 that would simply escape detection?
5 MS. KEEGAN: Well, yes and no. Sometimes
6 it's very obvious that an in-transit problem exists,
7 like there was a transport that they were leaking
8 liquid RAD waste on the road.
9 MEMBER WEINER: Yes. If you have a --
10 MS. KEEGAN: Those can be noticeable.
11 MEMBER WEINER: If you have an obvious
12 leak, I can see that.
13 MS. KEEGAN: Yes.
14 MEMBER WEINER: But something like the
15 load shifting inside the --
16 MS. KEEGAN: No, sometimes the load shifts
17 on the inside, and when it's surveyed at the site --
18 MEMBER WEINER: Okay.
19 MS. KEEGAN: -- it's within the dose
20 rates, but the load shifts, and something that's a
21 higher dose rate is now closer to the wall of the
22 shipping container.
23 CHAIR RYAN: Don't forget these shipments
24 go through snow storms, freeze/thaw cycles, all that
25 kind of stuff coming across the country.

1 MS. KEEGAN: Yes. It can within all regs.
2 CHAIR RYAN: There's a lot of stressors on
3 it.
4 MS. KEEGAN: Yes, it's amazing what can
5 happen in transit.
6 MEMBER WEINER: Well, this was what I was
7 trying to get to, not that these things don't happen,
8 but how they're detected, and when they're detected.
9 CHAIR RYAN: Survey on arrival.
10 MEMBER WEINER: And how this is -- and so
11 you've answered the question.
12 MS. KEEGAN: Survey on arrival.
13 CHAIR RYAN: Many of them I've done.
14 MEMBER WEINER: It's on arrival.
15 MS. KEEGAN: Yes.
16 MEMBER WEINER: Okay. That's fine.
17 Thanks.
18 MS. KEEGAN: And one last thing, from the
19 radioactive, the Liquid Radioactive Release Lessons
20 Task Force report, 26 recommendations came out of that
21 report. And just to give you a brief update on what's
22 going on, seven of them are completed at this time, 10
23 or 11 of those recommendations are going to be
24 completed with revisions to Reg Guides, specifically
25 1.21, which is measuring and evaluating, and reporting

1 radioactive materials in liquids and gaseous effluents
2 and solid wastes, and Reg Guide 4.1, Environmental
3 Monitoring for Nuclear Power Plants, so that's a long-
4 term effort, but we are actively working on all those
5 recommendations from the task force.
6 CHAIR RYAN: One of the interesting things
7 Jim's comment made me think about, is that the
8 Committee made the same comments to Jim, that dose
9 criteria is a bar that's very high up. Why couldn't
10 you use a groundwater concentration as a trigger,
11 instead of some dose criteria?
12 MS. KEEGAN: I guess we could, but for
13 Tritium, the dose -- the Tritium level in drinking
14 water is pretty high.
15 CHAIR RYAN: It's 4 millirem a year, so
16 that translates to 20,000 picocuries per liter.
17 MS. KEEGAN: Yes.
18 CHAIR RYAN: The background, the ranges
19 around the country that's 400 to 1,000, so maybe it's
20 5,000 as an investigation level or something. I don't
21 know. But in other radionuclides, for example,
22 fission and activation products should blow the
23 whistle right off the bat.
24 MR. PEDERSEN: Could I add a comment to
25 that?

1 CHAIR RYAN: Please.

2 MR. PEDERSEN: The basis for ROP was to
3 put things into a risk perspective. Again, I'll get
4 back to my statement of a minute ago, that our measure
5 of risk in radiation protection is dose, so a lot of
6 things are dose-based. You could figure out what
7 concentration --

8 CHAIR RYAN: But environmental releases is
9 not necessarily dose-based. I'm suggesting that's not
10 exactly a well-aligned criteria. I'm just trying --

11 MR. PEDERSEN: It sounds to me like the
12 public confidence issue is primary in your mind.

13 CHAIR RYAN: No, it's the lack of
14 detection and long-term undetected releases that could
15 end up being a multi-million dollar excavation during
16 decommissioning or some other time. It's not at all
17 public confidence.

18 MR. PEDERSEN: Decommissioning was not
19 considered when we put ROP into place. It's a
20 performance evaluation of operating plants. It's not
21 decommissioning facilities.

22 CHAIR RYAN: Okay.

23 MR. PEDERSEN: That's the disconnect that
24 you're looking at.

25 CHAIR RYAN: Yes. Again, I don't discount

1 the dose criteria from Health Physics perspective. I
2 mean, I appreciate that very, very well, but what I
3 think we're suggesting is that may not be a criteria
4 that lines up with environmental contamination issues
5 very well.
6 MR. RICHARDS: I think your comments are
7 consistent with where we've been, and that the Agency
8 did not require on-site monitoring, ground monitoring.
9 And, basically, said when you decommission, then you
10 can go see what's there, and address it then.
11 CHAIR RYAN: On-site monitoring for the
12 purpose of dose consequence, I agree with you. But
13 on-site monitoring for the purpose of understanding
14 where and if radioactive material is moving in an
15 unsuspected or uncontrolled way is the issue.
16 MR. RICHARDS: Right. But we didn't
17 require any of that, either way.
18 CHAIR RYAN: Yes.
19 MR. RICHARDS: We have demonstrated at
20 plants that have gone into decommissioning that when
21 you remove the building and look at the soil, almost
22 always there's material in the ground. Hopefully, Jim
23 Shepherd will back me up on that, but --
24 CHAIR RYAN: Yes, Jim has given us many
25 presentations pointing that out.

1 MR. RICHARDS: Okay. Well, that brings us
2 to the question of what can we do for operating
3 reactors?
4 CHAIR RYAN: Right.
5 MR. RICHARDS: That has the backfit issue
6 to it. What can we do for new reactors, which that's
7 going forward in the future. And I think Jim's group
8 is trying to address that, so I think your point is
9 well made. The hard part is, particularly for
10 operating reactors, what do you do about it, given the
11 cost benefit analysis results that would likely come
12 out.
13 CHAIR RYAN: I think I saw a hand here
14 from Ralph Andersen. Ralph, did you want to make a
15 comment?
16 (Off the record comments.)
17 MR. ANDERSEN: I just want to make one
18 simple point to your question.
19 CHAIR RYAN: All right.
20 MR. ANDERSEN: Ralph Andersen with NEI.
21 The Connecticut Yankee site, in fact, when it did take
22 up its reactor building found substantial
23 contamination of the water under the facility. And
24 many would argue, in fact, that they were probably a
25 design-basis case, because they had significant

1 leakage from a very old designed spent fuel pool of a
2 type that simply can't occur in new design spent fuel
3 pools. In fact, they estimate that they spent an
4 additional 10 or 20 million dollars in clean-up costs
5 to remedy that to the level set by the State of
6 Connecticut to the decommissioning.
7 Had they simply conformed to the NRC
8 requirements, they wouldn't have had to do anything.
9 You might recall that NRC did not adopt drinking water
10 standards as a clean-up standard. So, in effect, the
11 worst case that we've seen to-date, in and of itself,
12 would have had zero impact on the cost of
13 decommissioning under NRC regulations.
14 It is true, though, that when people
15 decommission a site, they recognize that upon
16 termination of the NRC license, then they're subject
17 to regulation by the states, which really is another
18 way of saying subject to regulation by the
19 Environmental Protection Agency, because they set the
20 standards that the states employ for clean-up. But I
21 would just comment that that became nowhere near the
22 topic of legacy sites, and we get very agitated when
23 we keep hearing this inference that any ground water
24 discovered anywhere to-date, and we are looking as
25 well or better than anyone else on the planet for it,

1 has any connection, even remotely, to legacy sites.
2 Whether it's prudent to do it or not,
3 we've already decided that. It's prudent, and we're
4 doing it. Whether it should be regulated or not,
5 different question. It will be up to the NRC to
6 decide, probably, ultimately, up to the courts to
7 decide. Personally, I view the current proposed
8 rulemaking effort as a backfit. It probably deserves
9 backfit analysis, but that's an issue that will be
10 settled over time.
11 But I just wanted to sort of break this
12 underlying assumption that one, we're having lots of
13 leaks and spills. We're not. And two, that they're
14 of a significance that they really impact
15 decommissioning, because what we're seeing to-date,
16 they really don't, not under NRC's regulations.
17 Anyway, that's an input I wanted to make.
18 MEMBER CLARKE: You know, the only one who
19 hasn't asked a question, or made a comment is Allen
20 Croff. Why don't we give him a shot at this?
21 VICE CHAIR CROFF: I'll pass. Thanks.
22 MEMBER CLARKE: Anyone else on the
23 Committee, questions?
24 MR. GARRY: I just wanted to also -- this
25 is Steve Garry, again, Health Physics Team. To answer

1 Mike's question about the reporting levels, or when
2 actions are reported. We have 10 CFR 50, Appendix I
3 for effluents that are measured and properly released.
4 And that effluent criteria essentially says for
5 liquids, namely Tritium, that if you reach a level
6 where your effluents are as low or lower than 3
7 millirem, you have, by definition, met the criteria
8 for ALARA.
9 Using kind of that as a background, we
10 have regulations that say that if levels are measured
11 in the environment that exceed roughly the same level,
12 3 millirem out in the environment, then that would
13 trigger what we call a reporting level, and licensees
14 then need to report to us that their effluents have
15 reached that level of 3 millirem or more off-site. So
16 there is a threshold, and that applies to Tritium, as
17 well as a list of particulates.
18 CHAIR RYAN: Okay. Thanks. That's
19 helpful.
20 MEMBER HINZE: This is regardless of what
21 the background is.
22 MR. GARRY: This is in addition to
23 background, yes.
24 MEMBER HINZE: In addition to background.
25 MR. GARRY: Byproduct materials.

1 MEMBER CLARKE: Okay. Anyone else on the
2 Committee? Anyone on the ACNW&M staff?
3 MR. GILLESPIE: Yes. I will say that I
4 think there's probably at least a move afoot, at least
5 some discussion, and John just mentioned it earlier,
6 for NMSS, particularly I'm going to guess as we get
7 more licensees and major fuel facilities, to try to do
8 something just as structured as what you've heard
9 today. It's a very structured system to try to grade
10 in public protection sense. And, so, I think you're
11 going to see something like this again in the next
12 couple of years, actually. It's almost inevitable
13 that it's going to overflow into facility regulation,
14 and facility inspection.
15 I think the other thing is the system went
16 in place, I was involved in it, in '99 and 2000. The
17 system they've described is actually very dependent
18 upon very good operation. It's actually very
19 dependent upon fairly clean operation. And I'll use
20 the one example, although, I think this applies to
21 Health Physics, when you look at the IMPO dose levels
22 and RAD waste generation levels, and how they've come
23 down and asymptotically approached a level.
24 And this really didn't come out in the
25 discussion, but in the 1980s, and I'll just use

1 scrams, they used to be on the average of something
2 like eight scrams a year per plant. And if you look
3 at that kind of performance today, it's like half, or
4 .4. And I think if you look at the RAD protection
5 levels, particularly for BWRs, the occupational dose,
6 it has come down --
7 CHAIR RYAN: Well, no. Ralph Andersen,
8 for example, shared with us the NEI industry-wide --
9 MR. GILLESPIE: So part of the disciplined
10 approach, and I really -- I'm glad they came, and
11 you're going to see this, I think, again in the
12 materials area, where they're going to be wrestling
13 with the same things, the same questions of spills,
14 environmental impact. But it takes good performance
15 to be able to be this disciplined, which is kind of an
16 interesting evolution for you to get there.
17 MEMBER CLARKE: Thank you. Well, if there
18 are no other questions --
19 CHAIR RYAN: I think we've got additional
20 comments.
21 MR. ANDERSEN: I just wanted to make a
22 more general comment. Like I said, I just wanted to
23 initially address Mike's question. Ralph Andersen,
24 NEI.
25 I was one of those people, too, along with

1 Mr. Gillespie and many others, Roger and quite a few
2 other people here working on the ROP originally. Now
3 we've had a lot of years of implementation. A couple
4 of underlying thoughts that were always put in front
5 of me when we developed it, is it should cause
6 licensees to be focusing on the things that are
7 important to safety, and it should also be helping NRC
8 identify folks that are having problems with that,
9 which a familiar word we all use is "outliers".
10 Our collective view, and my personal view
11 is that the ROP has been fantastically successful in
12 focusing NRC's attention where it really needs to be
13 focused. The distribution chart that John showed, in
14 my mind, was very revealing, and I almost chuckled
15 when he said it's pretty much the same numbers year-
16 to-year, but the good news is, it's not the same
17 people. When people distinguish themselves in a way
18 that's in the wrong direction, the effect of this
19 program is to gravitate NRC's attention towards them.
20 And then what we've seen is that that combination of
21 attention and the licensee undertaking their own
22 actions tends to move them back where they belong. So
23 it's -- generally, we view it as having been a great
24 success in the way that the program has played out.
25 CHAIR RYAN: And I think, Ralph, correct

1 me if I'm wrong, but I think one of the interesting
2 things that will come out of all the work that is
3 going on at plants across the country with their
4 groundwater issues, is you're looking at not only
5 groundwater concentrations, but geohydrology, and root
6 causes, and are there any trackable or trendable kinds
7 of things that we could fix, or do better, or improve,
8 or correct, and all those kind of things. So I assume
9 that somewhere down the line after a few years of
10 study and analysis that NEI maybe will be coming forth
11 with some analysis in that area.
12 MR. ANDERSEN: Yes, very much so. It was
13 alluded to, but the immediate benefit is its impact on
14 new plants.
15 CHAIR RYAN: Right.
16 MR. ANDERSEN: It's having an impact on
17 design, and it's having an impact on operational
18 programs, and it's also a requirement, because backfit
19 doesn't apply to new plants. So we're already seeing
20 a benefit in that regard.
21 I think that probably more importantly is
22 it's really helped us, from a radiation protection
23 point of view, taking more global, truly global view
24 on what we're there for. We've talked about issues of
25 environmental contamination versus dose impact, and

1 the relationship that both of those have on public
2 confidence, and what I've seen come out of this, more
3 than anything else, is that we've already adjusted our
4 own objectives within our -- the way that we do
5 business. It's not enough to only focus on the dose.
6 That's a decision we made for ourselves. If you don't
7 have the confidence of your neighbors, then you're
8 losing the battle.
9 A simple point on the contamination, and
10 where we drew the line. And I wanted to share this
11 with Jim, as well. We do discharge radioactivity
12 legally into the environment. And, in fact, those
13 discharges generally are much higher than the levels
14 at which we have seen in the leaks or spills. So
15 under our permitted, controlled process, we are
16 discharging into the environment, into the
17 groundwater, into the soil, into the lakes, into the
18 air, into the rivers, into the fish, you name it,
19 levels that are detectible.
20 Now part of that is a statement about our
21 detection capabilities, but we need to remember that
22 when we try to put these leaks and spills in
23 perspective. And I just wanted to make that comment,
24 that what we have found so far, even with Braidwood,
25 is that the levels that we are finding from these are

1 less than those levels which we are discharging in an
2 authorized and controlled fashion.
3 CHAIR RYAN: Absolutely. And what I took
4 away from your earlier talk was the fact that the only
5 real distinction was that the Tritium Task Force
6 findings were unexpected.
7 MR. ANDERSEN: Right.
8 CHAIR RYAN: All the permanent releases
9 were expected, known, and planned down to every
10 detail. It was just the unexpected aspect that really
11 was the attention-getter.
12 MR. ANDERSEN: Right. And put very
13 simply, and I offer to you that I think it's a shared
14 value, both of this Committee, of the NRC, and of the
15 industry, is an understanding that our public, and our
16 Congress really just doesn't expect us to spill
17 things, to have leaks, to drop things. Those words
18 just don't go with the advanced technology that we're
19 conducting. And I think that's the space that we're
20 working in, is it's not how big the spill is, or what
21 the dose is, or anything else. It's the fact of it.
22 CHAIR RYAN: Right.
23 MR. ANDERSEN: So that's the issue that I
24 think we're all trying to come to grips with, and
25 figure out where that fits. But, again, I didn't want

1 to get away without saying I really think the ROP is
2 really accomplishing its purpose, and that it is
3 causing attention to be focused where it belongs.
4 MEMBER CLARKE: Thanks, Ralph. John, I
5 want to thank both of you for very nice presentations,
6 and more than a little patience with us. And back to
7 you, Mr. Chairman.
8 CHAIR RYAN: All right. Thank you, again.
9 Let me second my appreciation for everybody coming.
10 We've probably learned a lot more than we expected to,
11 and it's been real enlightening for me, so thanks very
12 much. With that --
13 MEMBER HINZE: Excuse me.
14 CHAIR RYAN: Sorry.
15 MEMBER HINZE: Excuse me. I don't have
16 complete or most recent information, but it was my
17 understanding that Rob from NEI was going to call in
18 on the bridge regarding the appendix to the seismic
19 letter. I don't know where we are with that, but it's
20 my understanding that --
21 CHAIR RYAN: Well, that's a different
22 topic. I just want to finish this one.
23 MEMBER HINZE: Okay. I'm sorry. I
24 thought you were closing shop.
25 CHAIR RYAN: No, no, no.

1 MEMBER HINZE: Sorry.

2 CHAIR RYAN: I was just going to turn to
3 our letter writing business, and I was going to
4 suggest we take maybe a five-minute break.

5 MEMBER HINZE: Well, I don't know what
6 time he's calling in, and that's what I wanted to
7 bring to your attention.

8 CHAIR RYAN: Okay. So would you help us
9 figure that out?

10 MEMBER HINZE: If I could find someone
11 that knows more than I do on this.

12 CHAIR RYAN: Okay.

13 (Off record comments.)

14 CHAIR RYAN: Let me thank our presenters
15 again, and we're obviously moving on to other items.
16 We'll take a short five-minute break, and then
17 reconvene.

18 (Whereupon, the proceedings went off the
19 record at 3:12 p.m.)

20

21

22

23

24

25

**CERTIFICATE**

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission in the matter of:

Name of Proceeding: Advisory Committee on Nuclear Waste & Materials 185th Meeting

Docket Number: n/a

Location: Rockville, MD

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

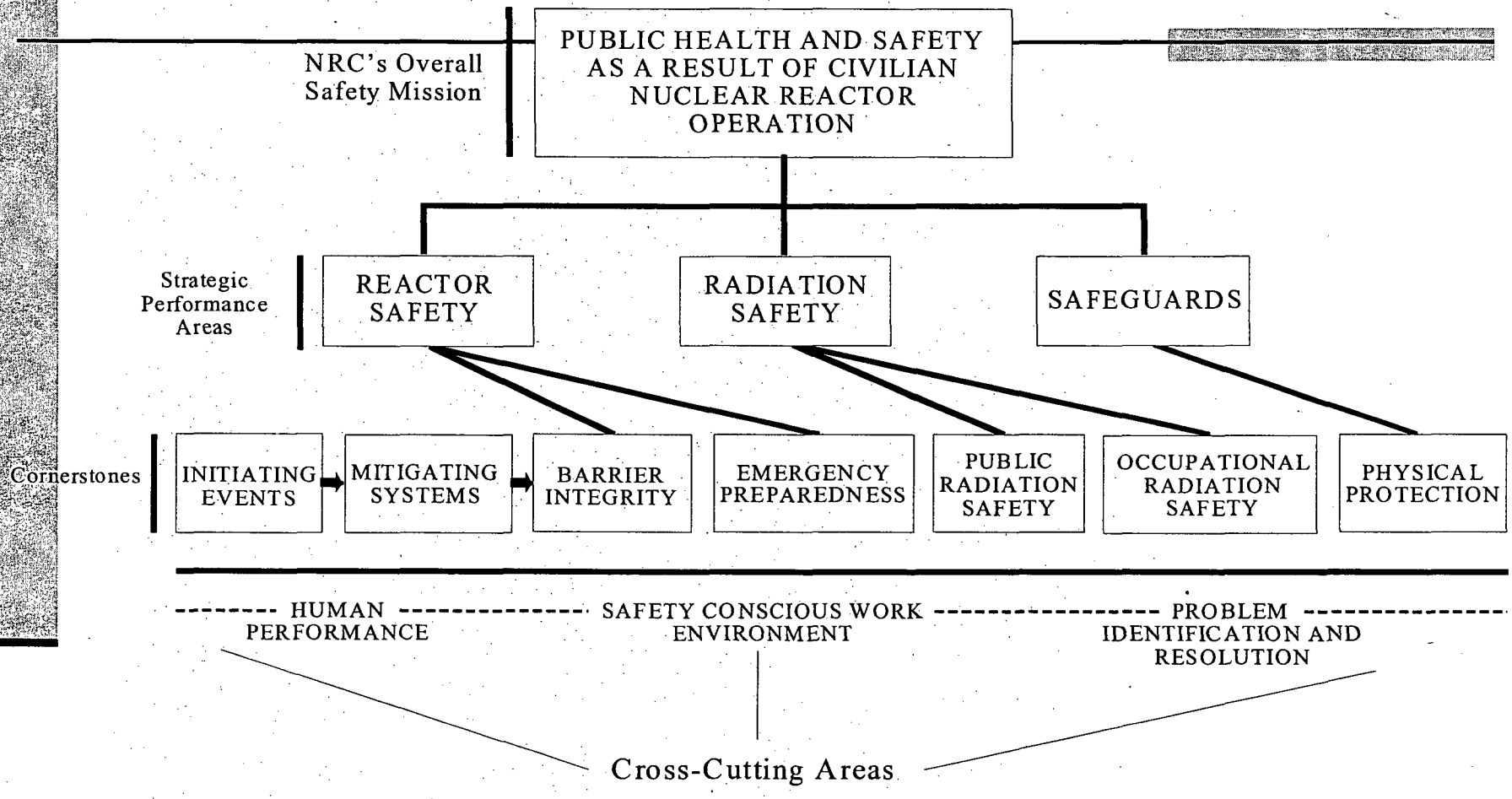
Charles Morrison
Official Reporter
Neal R. Gross & Co., Inc.

# Reactor Oversight Process Overview

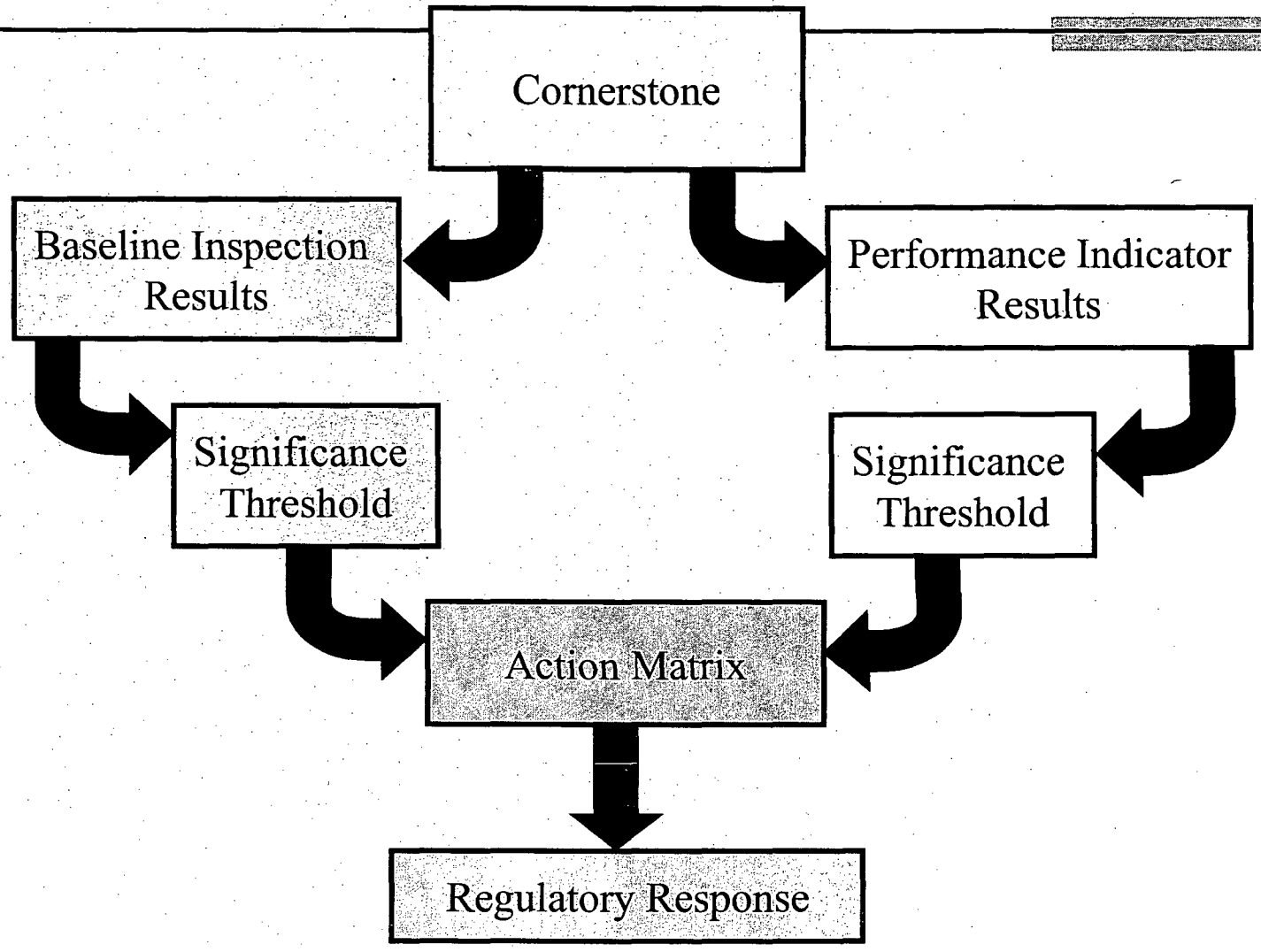
# ROP Overview - Key Attributes

- Baseline and Supplemental Inspections
- Significance Determination Process
- Performance Indicators
- Assessment Program
  - Safety Culture
  - Industry Trends Program
  - Agency Action Review Meeting
  - Enforcement
  - Self-Assessment Process

# REGULATORY FRAMEWORK



# Reactor Oversight Process



# Action Matrix Concept

| Licensee Response | Regulatory Response | Degraded Cornerstone | Multiple/Rep. Degraded Cornerstone | Unacceptable Performance |
|---|---|---|---|---|

Increasing Safety Significance

Increasing NRC Inspection Efforts

Increasing NRC/Licensee Management Involvement

Increasing Regulatory Actions

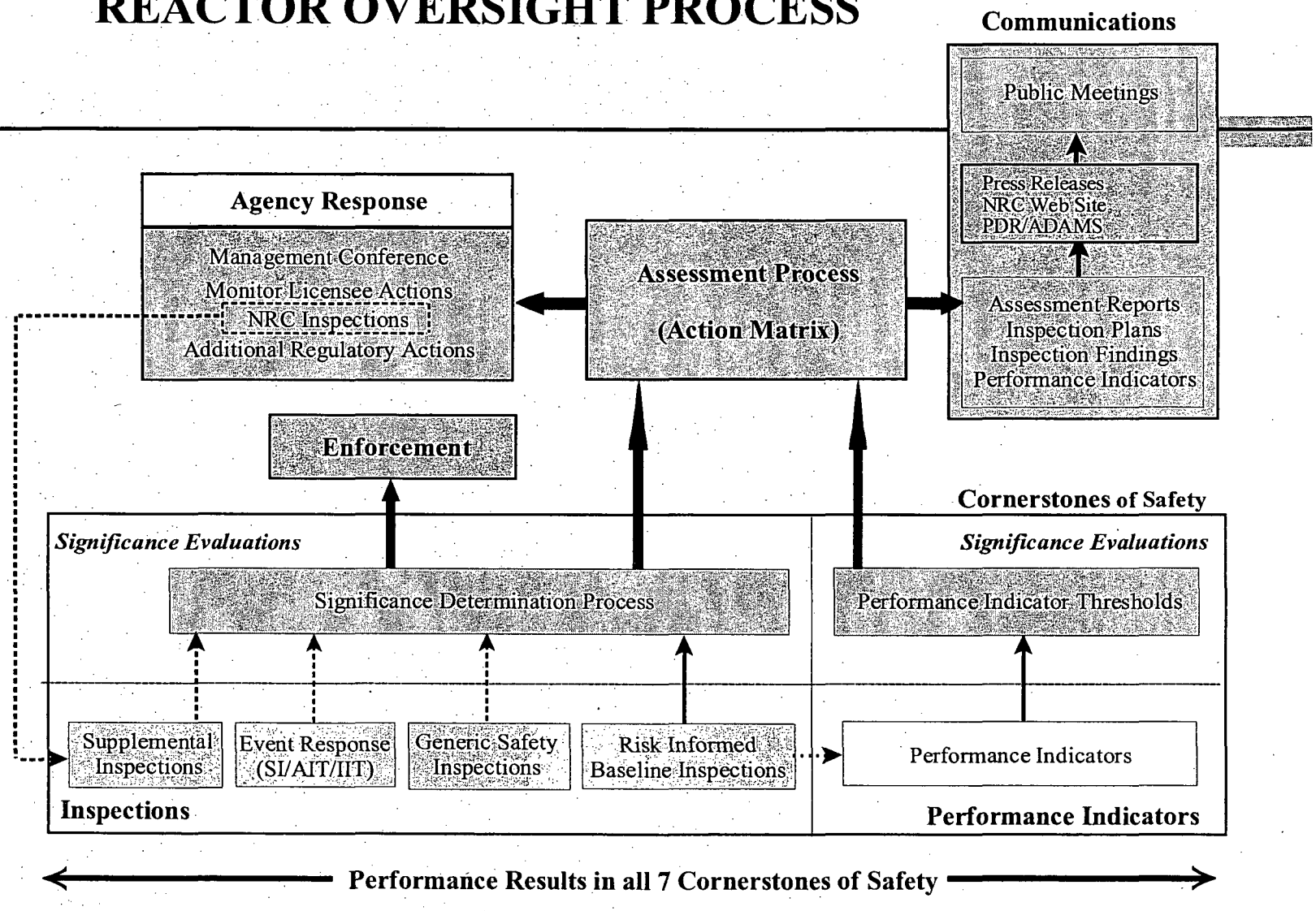
# Action Matrix

## Exhibit 5 - ACTION MATRIX

| | | Licensee Response Column | Regulatory Response Column | Degraded Cornerstone Column | Multiple/ Repetitive Degraded Cornerstone Column | Unacceptable Performance Column | IMC 0350 Process |
|---|---|---|---|---|---|---|---|
| RESULTS | | All Assessment Inputs (Performance Indicators (PIs) and Inspection Findings) Green; Cornerstone Objectives Fully Met | One or Two White Inputs (in different cornerstones) in a Strategic Performance Area; Cornerstone Objectives Fully Met | One Degraded Cornerstone (2 White Inputs or 1 Yellow Input) or any 3 White Inputs in a Strategic Performance Area; Cornerstone Objectives Met with Moderate Degradation in Safety Performance | Repetitive Degraded Cornerstone, Multiple Degraded Cornerstones, Multiple Yellow Inputs, or 1 Red Input; Cornerstone Objectives Met with Longstanding Issues or Significant Degradation in Safety Performance | Overall Unacceptable Performance; Plants Not Permitted to Operate Within this Band, Unacceptable Margin to Safety | Plants in a shutdown condition with performance problems placed under the IMC 0350 process |
| RESPONSE | Regulatory Performance Meeting | None | Branch Chief (BC) or Division Director (DD) Meet with Licensee | DD or Regional Administrator (RA) Meet with Licensee | RA (or EDO) Meet with Senior Licensee Management | Commission meeting with Senior Licensee Management | RA (or EDO) Meet with Senior Licensee Management |
| | Licensee Action | Licensee Corrective Action | Licensee root cause evaluation and corrective action with NRC Oversight | Licensee cumulative root cause evaluation with NRC Oversight | Licensee Performance Improvement Plan with NRC Oversight | | Licensee Performance Improvement Plan / Restart Plan with NRC Oversight |
| | NRC Inspection | Risk-Informed Baseline Inspection Program | Baseline and supplemental inspection procedure 95001 | Baseline and supplemental inspection procedure 95002 | Baseline and supplemental inspection procedure 95003 | | Baseline and supplemental as practicable, plus special inspections per restart checklist. |
| | Regulatory Actions[1] | None | Supplemental inspection only | Supplemental inspection only | 10 CFR 2.204 DFI<br>10 CFR 50.54(f) Letter<br>CAL/Order | Order to Modify, Suspend, or Revoke Licensed Activities | CAL/order requiring NRC approval for restart. |
| COMMUNICATION | Assessment Letters | BC or DD review/sign assessment report (w/ inspection plan) | DD review/sign assessment report (w/ inspection plan) | RA review/sign assessment report (w/ inspection plan) | RA review/sign assessment report (w/ inspection plan) | | N/A. RA (or 0350 Panel Chairman) review/ sign 0350-related correspondence |
| | Annual Public Meeting | SRI or BC Meet with Licensee | BC or DD Meet with Licensee | RA (or designee) Discuss Performance with Licensee | RA or EDO Discuss Performance with Senior Licensee Management | | N/A. 0350 Panel Chairman conduct public status meetings periodically |
| | Commission Involvement | None | None | None | Plant discussed at AARM | Commission Meeting with Senior Licensee Management | Commission meetings as requested, restart approval in some cases. |
| | INCREASING SAFETY SIGNIFICANCE ----------> | | | | | | |

Note 1: Other than the CAL, the regulatory actions for plants in the Multiple/Repetitive Degraded Cornerstone column and IMC 0350 column are not mandatory agency actions. However, the regional office should consider each of these regulatory actions when significant new information regarding licensee performance becomes available.
Note 2: The IMC 0350 Process column is included for illustrative purposes only and is not necessarily representative of the worst level of licensee performance. Plants under the IMC 0350 oversight process are considered outside the auspices of the ROP Action Matrix. See IMC 0350, "Oversight of Operating Reactor Facilities in a Shutdown Condition with Performance Problems," for more detail.

# REACTOR OVERSIGHT PROCESS



# PI/SDP Significance Threshold

**Performance Indicators**

| | |
|---|---|
| **Green:** | Acceptable performance |
| **White:** | Performance outside normal range |
| **Yellow:** | Significant reduction in safety margin |
| **Red:** | Performance significantly outside of design basis |

**Inspection Findings**

| | |
|---|---|
| **Green:** | Very low safety issue |
| **White:** | Low to moderate safety issue |
| **Yellow:** | Substantial safety issue |
| **Red:** | High safety issue |

# Significance Determination Process

There are 9 SDPs currently developed for the ROP.

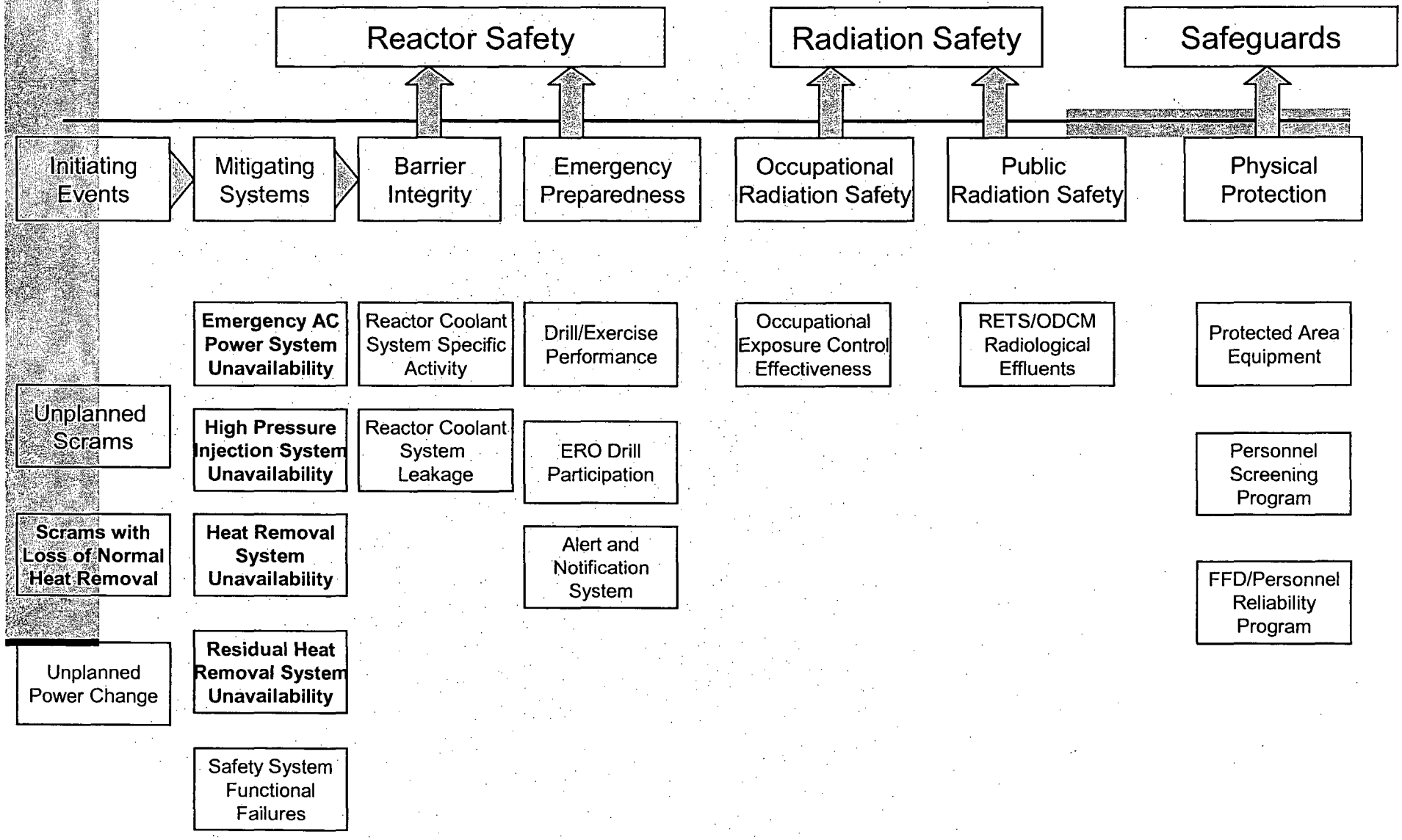
- At-Power Situations SDP
- Emergency Preparedness SDP
- Occupational Radiation Safety SDP
- Public Radiation Safety SDP – (proposed draft revision)
- Physical Protection SDP
- Fire Protection and Post-Fire Safe Shutdown SDP
- Shutdown Safety SDP
- Containment Integrity SDP
- Operator Requalification, Human Performance
- Steam Generator Tube Integrity SDP |
- Maintenance Risk Assessment and Risk Management SDP

# Baseline Inspection Program

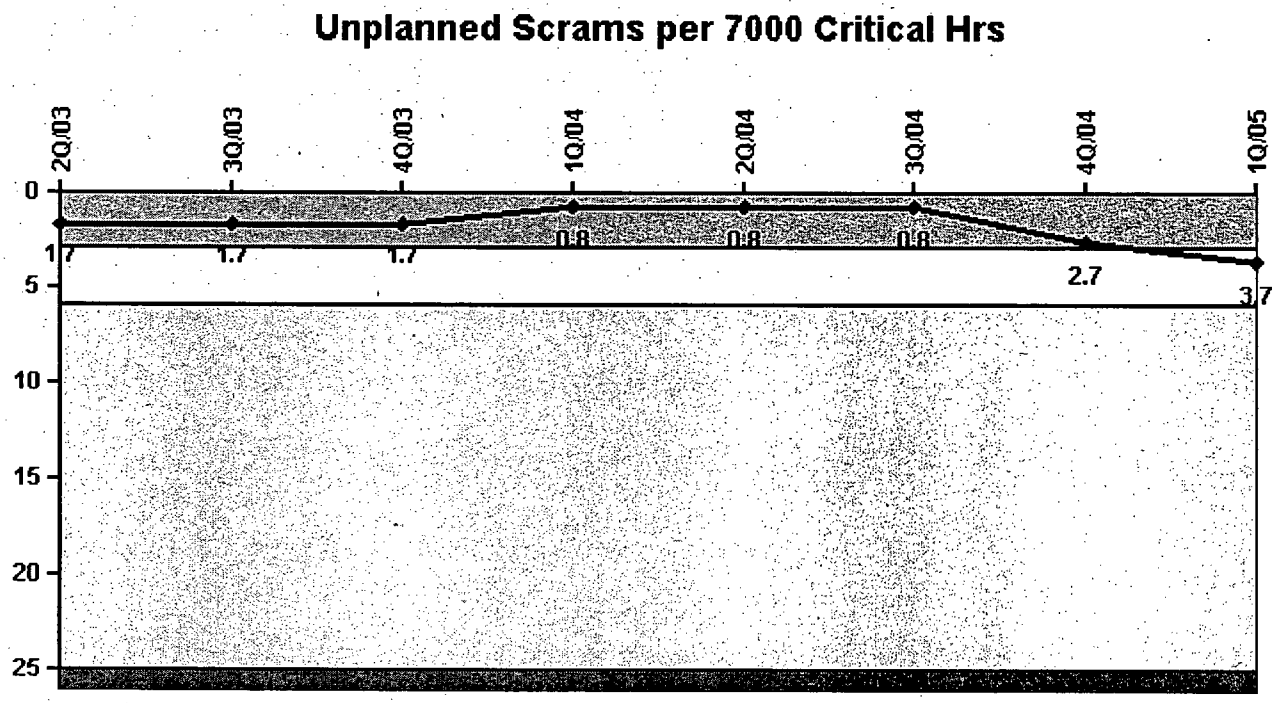
- Minimum Level of Inspection Conducted at All Plants Regardless of Performance

- Three Basic Parts:
  - Inspection in Areas Where Performance Indicators Are Not Identified or Do Not Fully Cover A Cornerstone
  - Performance Indicator Verification
  - Licensee Problem Identification and Resolution Program (PI&R)

# Performance Indicators in the Seven Cornerstones



# Typical Performance Indicator




Thresholds: White > 3.0 Yellow > 6.0 Red > 25.0

# Assessment Program

- Performance Indicators and Inspection Findings Are Equally Weighted to Arrive at an Overall Assessment of Plant Performance.
- Action Matrix Is Used to Assess Performance and Determine Regulatory Actions.
- Quarterly, Mid-Cycle and End of Cycle Assessments Are Performed for Each Licensee.
- Assessment Letters sent to all licensees after the Mid-Cycle and End-of- Cycle Assessments.

# Action Matrix Summary

Status at End of CY 2005

| | |
|---|---|
| Licensee Response | 84 |
| Regulatory Response | 12 |
| Degraded Cornerstone | 4 |
| Multiple/Repetitive Degraded Cornerstone | 3 |
| Unacceptable | 0 |
| Total | 103 |

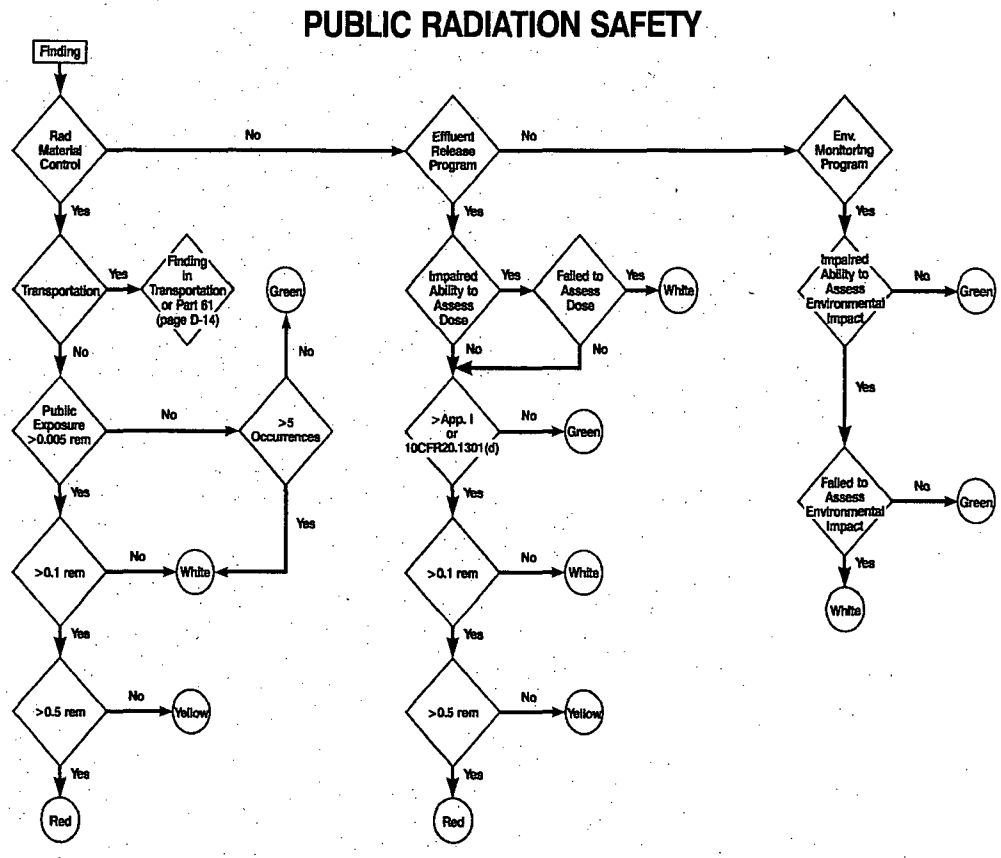
# SECY-07-0112

- Staff Evaluation and Proposed Revision to the Public Radiation Safety SDP to Address Radioactive Liquid Spills and Leaks, July 6, 2007
- SRM for SECY-07-0112, September 12, 2007
  - Approved the staff's proposed changes to the Public Radiation Safety SDP
  - ROP Basis Document (IMC 0308) should capture basis
  - Staff should update NRC's public web page on groundwater tritium issues with a summary of actions taken or planned to close out LLTF recommendations.

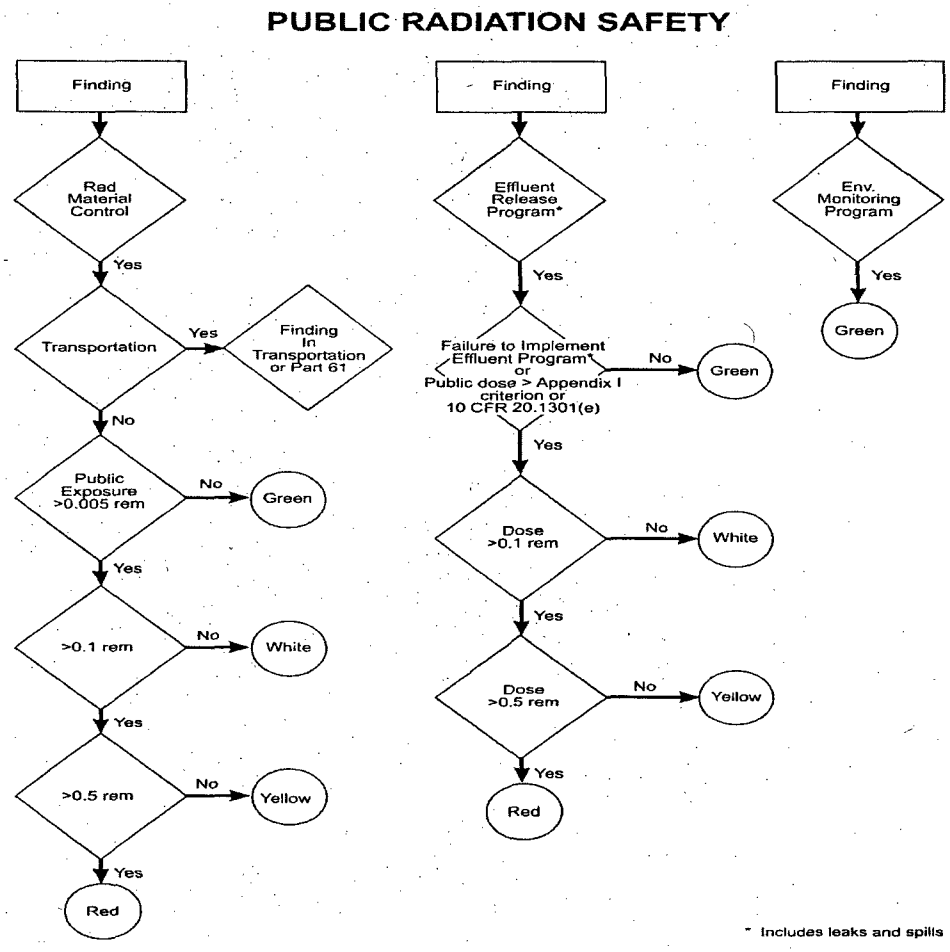
# Public Radiation Safety SDP Revision

- Address Radioactive Spills and Leaks
- Remove Green finding in Rad Material Control Branch for >5 Occurrences
- Remove denial of access to Low Level Burial Grounds

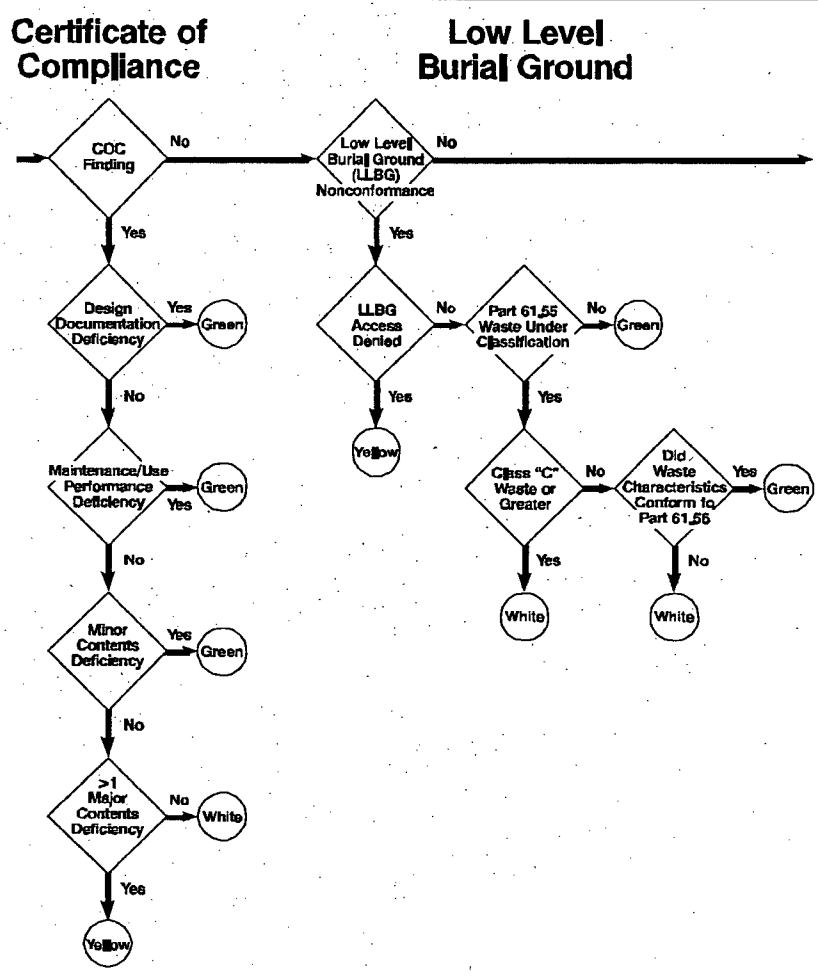
# Public Radiation Safety SDP Flow Chart



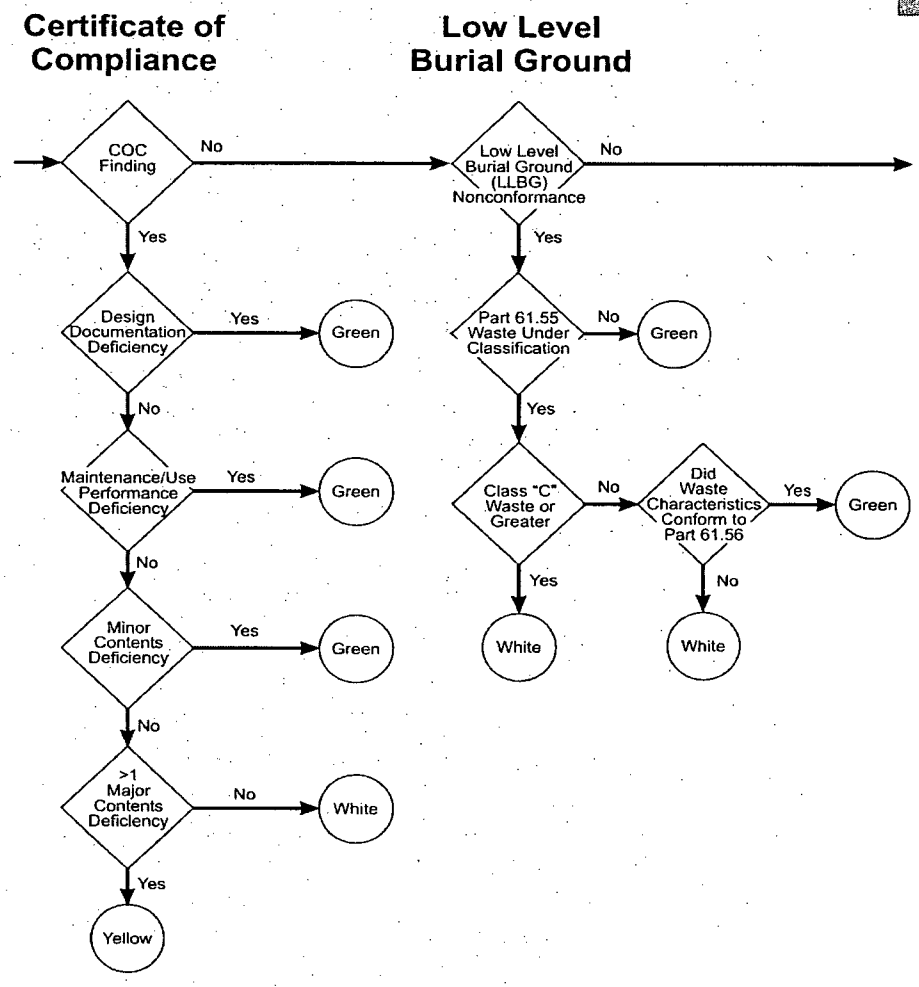
# Proposed Public Radiation Safety SDP Flow Chart



# Transportation Flow Chart



# Proposed Transportation Flow Chart



# Strategic Assessment of NRC's Low-Level Radioactive Waste Regulatory Program

Environmental and Performance Assessment Directorate

Division of Waste Management and Environmental Protection

Office of Federal and State Materials and Environmental Management Programs

December 18, 2007

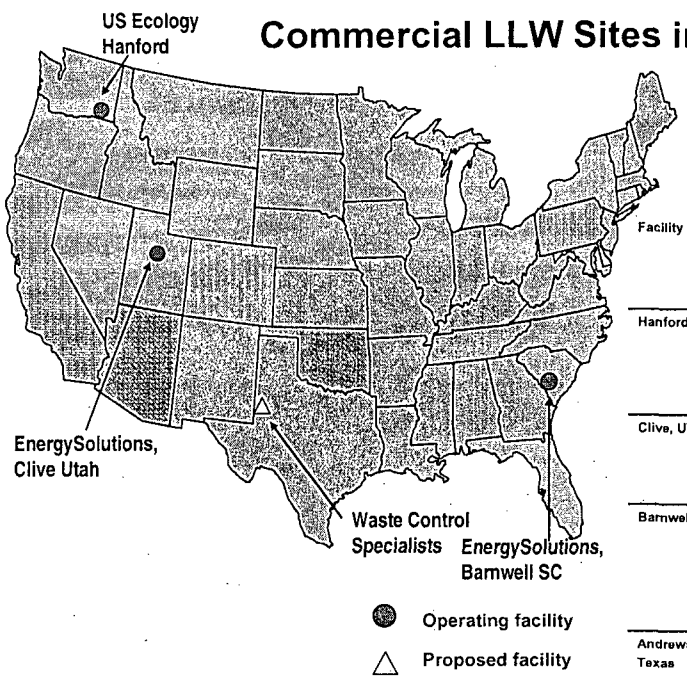
## Scope

- National LLW program
- NRC LLW regulatory program
- LLW strategic assessment

## Low-Level Waste Authorities and Responsibilities

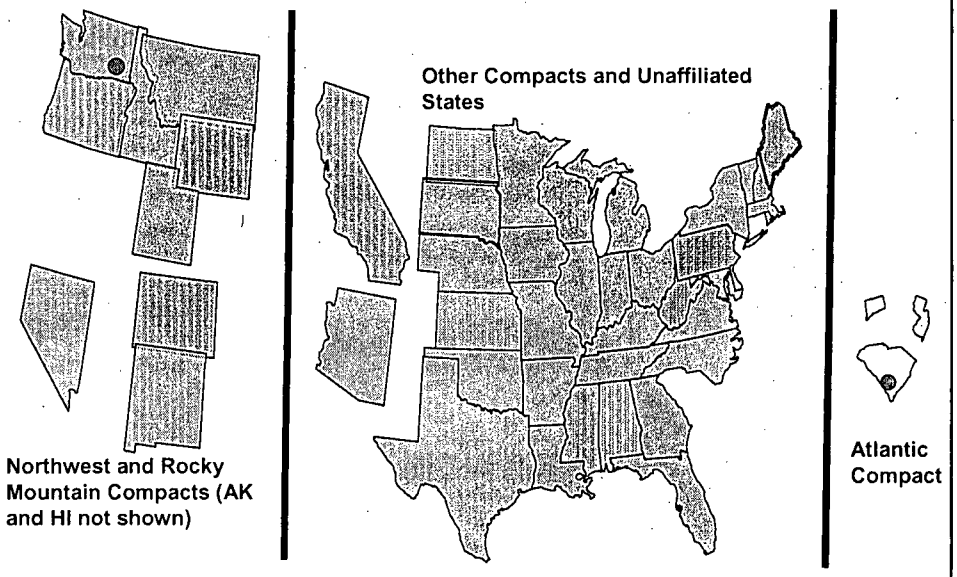
- Governing legislation
  - Atomic Energy Act of 1954
  - Low-Level Radioactive Waste Policy Amendments Act of 1985
- LLRWPA assignment of responsibilities
  - States responsible
  - Regional compacts
  - Incentives and penalties
  - Exclusion of out-of-region waste
- NRC responsibilities
  - Regulatory framework for LLW disposal
  - Assistance to NRC Agreement States
  - LLW licensing, as necessary, esp. for GTCC facility
- Agreement States
  - Currently regulate all LLW disposal sites in U.S. and majority of LLW generators
- Others
  - Generators, brokers, processors, disposal facility operators

## Commercial LLW Sites in U.S.




| Facility | Waste | Compact Restrictions |
|---|---|---|
| Hanford, WA | Class A, B, C | 11 western states in 2 LLW Compacts only |
| Clive, UT | A only | None, all US generators OK (NW and RM Compacts must approve) |
| Barnwell, SC | A, B, C | SC, NJ, CT only beginning *mid-2008* (Atlantic Compact) |
| Andrews Cty, Texas | A, B, C | Texas and VT only (Texas Compact) |

## Class B/C Disposal Access in U.S. (as of June 30, 2008)




## Future Need vs. Existing Capacity for LLW Disposal

| LLW Generators | Future Need[1] | Existing Capacity |
|---|---|---|
| Northwest and Rocky Mountain Compacts (11 States) | 20,000 – 86,000 $ft^3$/yr, all waste classes | Assured access to Hanford LLW facility for next 50 years for all waste classes |
| Atlantic Compact (3 States) | Class A: 300,000 – 800,000 $ft^3$/yr<br>Class B/C: 4000 – 12,000 $ft^3$/yr | Access to Barnwell through approximately 2050, and EnergySolutions for 19 more years |
| Rest of U.S. (36 States) | Class A: 2.5 – 3.3 million $ft^3$/yr<br>Class B/C: 10,000 – 35,000 $ft^3$/yr | Class A – 19 years capacity at EnergySolutions in Clive, Utah<br>Class B/C – after June 30, 2008, no options for disposal. Texas facility possible for TX and VT generators in 2009. |

1. Based on current LLW generation rates. Rates approximate per year over last 5 years.

## Current Issues in National Low-Level Waste Program

- **Consideration of major changes in national program**
  - GAO, NAS, HPS views
  - Establish risk-based rather than origin-based system
  - Revise/rescind LLRWPAA
  - Allow use of DOE sites by commercial generators
- **Lack of disposal option for B/C waste**
  - Barnwell closure to out-of-compact generators in mid-2008. 36 States affected. Need for possible long-term storage of B/C waste
  - Texas license application, but only for TX and VT
  - Sealed sources
- **GTCC disposal**

## Direction of Industry

- **Efforts to mitigate limited disposal availability and high costs**
  - Increased use of RCRA facilities for low-activity LLW
  - Waste minimization and process changes
  - Extended storage
- **Research on risk-informing waste classification**
- **Longer term interest in rulemakings**

## National Developments Affecting LLW Generation

- License renewal
  - Fewer reactors entering decommissioning
  - Declining volumes of low-activity waste for disposal
- New reactors
  - 19 COL applications through 2009 for 28 new units
  - Operational LLW – volumes small, activity large, capabilities to store
- New fuel cycle facilities
  - Depleted uranium
- Global Nuclear Energy Partnership
  - Potential for new waste streams
  - Technical basis for 10 CFR Part 61
  - Need for additional analysis for disposal
- Materials users
  - Impacted by loss of access for B/C disposal
  - Sealed source focus

## NRC LLW Regulatory Program

## Background/Recent History

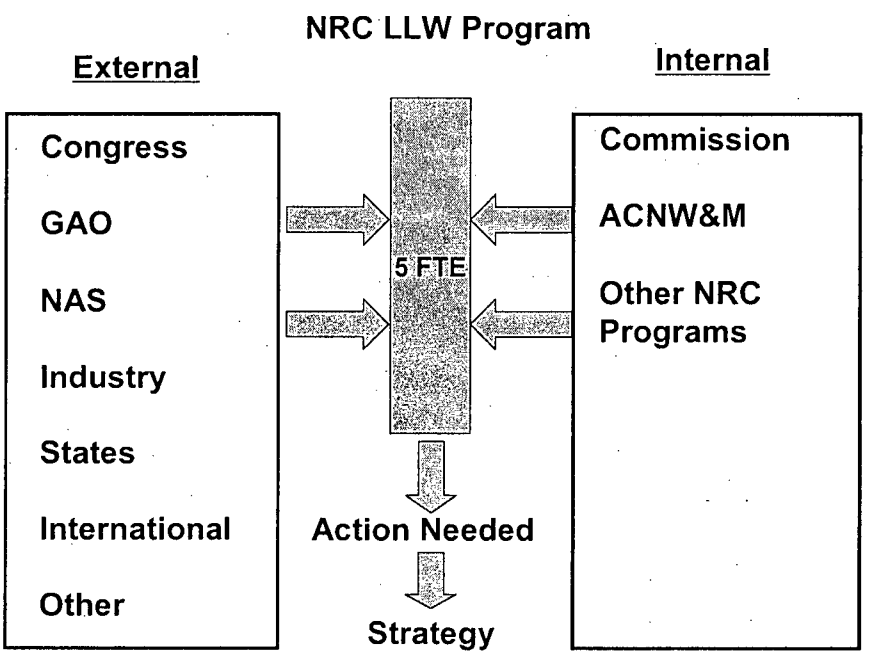
- September 1996 Strategic Assessment Issue Paper
- March 1997 Commission Direction to Staff: Maintain LLW Program at Current Level (5-10 FTE)
- Current (FY 2008) Program: ~ 5 FTE, primarily focused on maintenance tasks

## Core Responsibilities

- Regulatory framework for LLW disposal
- Assistance to NRC Agreement States and other stakeholders
- LLW licensing, as necessary, esp. for GTCC facility and import/export

## Some Internal LLW Activities (Baseline Work)

- Import/export licensing
- Support to NRC Regions, other Offices
- Reviews of Agreement State disposal programs
- Technical assistance to Agreement States
- International work (standards review, e.g.)
- Greater-than-Class C disposal
- Case-by-case approvals of low-activity waste disposals



## LLW Program Strategic Assessment

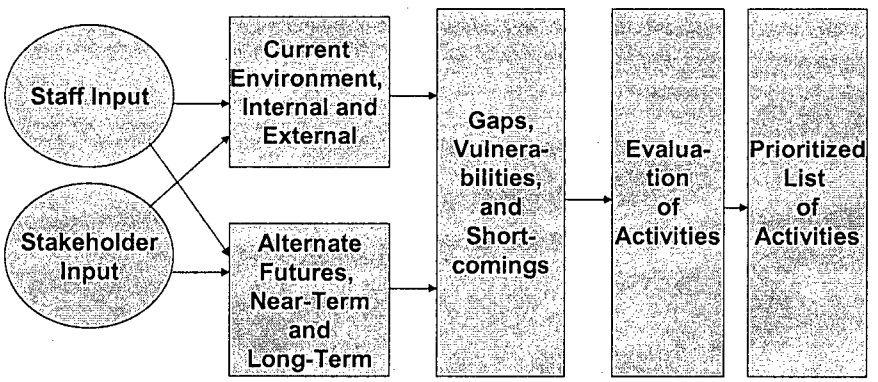
## Objectives

- Position the LLW program to meet current and future challenges
- Ensure limited resources are used effectively

## Approach

- Define objectives
- Scope the issues, including gathering of stakeholder views
- Identify potential NRC actions
- Prioritize
- Develop implementation plan

## Process



## Stakeholder Input

- ACNW Workshop May 23-24, 2006
- Federal Register Notice, July 7, 2006
- Broad Categories of Stakeholders
  - States
  - U.S. Military
  - Compact Commissions
  - Industry Groups/Trade Associations
  - Professional Societies
  - Environmental/Public Interest Groups
- Specific Input
  - NAS Report on LAW
  - GAO Report on International Practices
  - ACNW&M White Paper and Letter Reports
  - Supplemental Interactions with States
  - Various Position Papers

## Issues Raised by Stakeholders

- Risk-informing
- Closure of Barnwell to out-of-compact waste
- Low-activity waste disposal
- Use of DOE disposal sites
- Waste classification
- Unintended consequences

## Methods for Addressing Issues

- Legislative changes
- Rulemakings
- Guidance
  - Alternate waste classification
  - LLW storage
  - Concentration averaging
  - Waste minimization
  - Low-activity waste disposals in RCRA facilities

## Decisionmaking Criteria

- Agency strategic goals – safety, security, effectiveness, and openness
- Need (time frame)
- Level of effort
- Benefit
- Additional considerations
- Scenario applicability

## Summary of Tasks Evaluated by Staff

- Evaluate potential changes in LLW regulatory program to address curtailment of disposal capacity
- Promulgate rule for disposal of LAW
- Publish Standard Review Plan (SRP) for import/export license reviews
- Examine alternatives for DU disposal
- Update LLW extended storage guidance
- Develop licensing criteria for GTCC disposal facility
- Develop guidance for 10 CFR 20.2002 LAW disposals
- Identify and evaluate potential legislative changes
- Consolidate LLW guidance
- Implement major revisions to 10 CFR Part 61
- Coordinate with other agencies on consistency in regulating LAW disposal
- Develop guidance that summarizes disposition options for low-end materials and waste
- Identify new waste streams (GNEP, e.g.)
- Develop SRP for 10 CFR 61.58
- Develop criteria for LLW disposal in mill tailings impoundments
- Update Concentration Averaging BTP
- Develop Information Notice on Waste Minimization
- Examine need for guidance on defining when RAM becomes LLW
- Perform scoping study on financial assurance
- Develop and implement National Waste Tracking System

## High-Priority Tasks

| Task No. | Description | Schedule |
|---|---|---|
| 1 | Update storage guidance<br>Review industry guidance for reactors | 2nd quarter '08<br>4th quarter '08 |
| 2 | Develop guidance on 20.2002 | 4th quarter '08 |
| 3 | Investigate DU from enrichment plants | 4th quarter '08 |
| 4 | Update BTP on concentration averaging | Begin 2nd quarter '08 |
| 5 | Develop import/export procedure | Begin '09 |
| 6 | Develop guidance on 61.58 | Revisit '09 |
| 7 | Perform scoping study of financial assurance | Revisit '09 |

## LLW Storage Guidance -- Example

- **Information Notice 90-09 for materials and fuel cycle licensees**
  - Review and evaluation of existing guidance
  - Contacts with selected State programs
  - Contacts with Regional licensing and inspection personnel
  - Updated guidance to be published early 2008
- **NEI/EPRI guidance for nuclear power reactors**
- **Consolidated guidance in NUREG**
- **Inspection procedures**

## Future

- **Implementation of high priority tasks**
- **Commission direction**
- **Coordination with States and other stakeholders**
- **Coordination with ACNW&M**
  - **All major products**
  - **As early as practicable**
  - **Near-term**
    - **DU disposal**
    - **20.2002 guidance**
    - **LLW storage issues**
    - **Other**

## References

- LLW Strategic Assessment Commission Paper – SECY-07-0180, October 17, 2007 (http://www.nrc.gov/reading-rm/doc-collections/commission/secys/2007/)
- GAO reports on LLW
  - Disposal Availability Adequate in the Short-Term, but Oversight Needed to Identify Any Future Shortfalls (GAO-04-604), 2004
  - DOE Needs Better Information to Guide Its Expanded Recovery of Sealed Radiological Sources (GAO-05-967), 2005
  - Approaches Used by Foreign Countries May Provide Useful Lessons for Managing U.S. Radioactive Waste (GAO-07-221), 2007
- NAS report on LAW
  - Improving the Regulation and Management of Low-Activity Radioactive Wastes (2006)

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# Presentation to ACNW&M on Waste Management at the Mixed Oxide Fuel Fabrication Facility

**David Tiktinsky, NMSS/FCSS**

December 18, 2007

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## Background

- Construction Authorization issued by NRC for Mixed Oxide Fuel Fabrication Facility (MFFF) in March 2005
- License Application (LA) to possess and use radioactive material submitted in September 2006 and accepted for docketing by NRC in December 2006
- NRC is currently reviewing LA
- Nuclear construction began August 1, 2007
- Current schedule estimates for completion of Final Safety Evaluation Report by:
  - December 2010 - without hearing
  - December 2011 - with hearing

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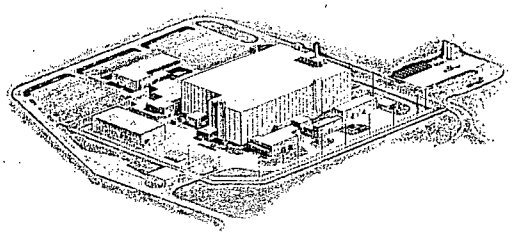
# MFFF & Support Buildings

## Construction Statistics



**Buildings:** **600,000 square feet**

| | | | |
|---|---|---|---|
| Concrete: | 170,000 cubic yards | Conduit: | 500,000 linear feet |
| Reinforcing steel: | 35,000 tons | Cable tray: | 47,000 linear feet |
| Excavation: | 980,000 cubic yards | Power/control cable: | 3,000,000 linear feet |
| Engineered fill: | 54,000 tons | Process piping: | >80 miles |

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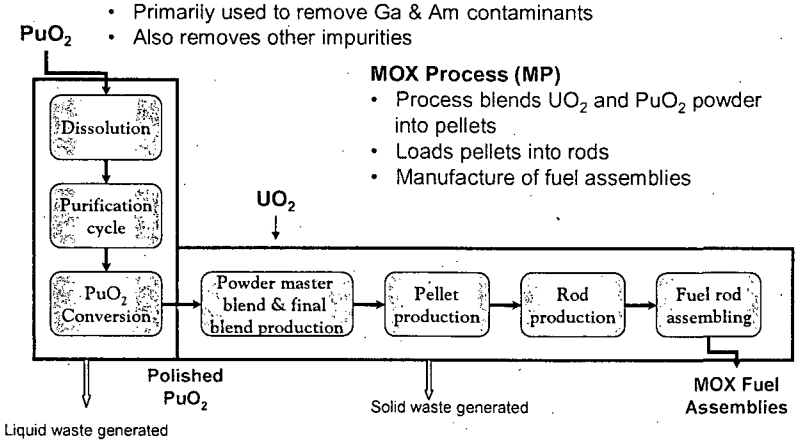
# MFFF Process Overview

**Aqueous Polishing (AP)**
- Primarily used to remove Ga & Am contaminants
- Also removes other impurities

**MOX Process (MP)**
- Process blends $UO_2$ and $PuO_2$ powder into pellets
- Loads pellets into rods
- Manufacture of fuel assemblies

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# Liquid Waste Generation in Aqueous Polishing Process

- High alpha activity waste stream
  - Liquid americium
  - Excess acid
  - Alkaline
- Stripped uranium stream
  - Less than 0.96 % uranium-235
- Low level liquid waste stream
  - Very low radioactive contamination or the potential for radioactive contamination
    - Lab rinsing water
    - Sanitaries rinsing water
    - HVAC condensate
    - Distillate waste
    - Chlorinated effluents
- Solvent waste stream
  - Generated from solvent recovery process
  - Slightly contaminated

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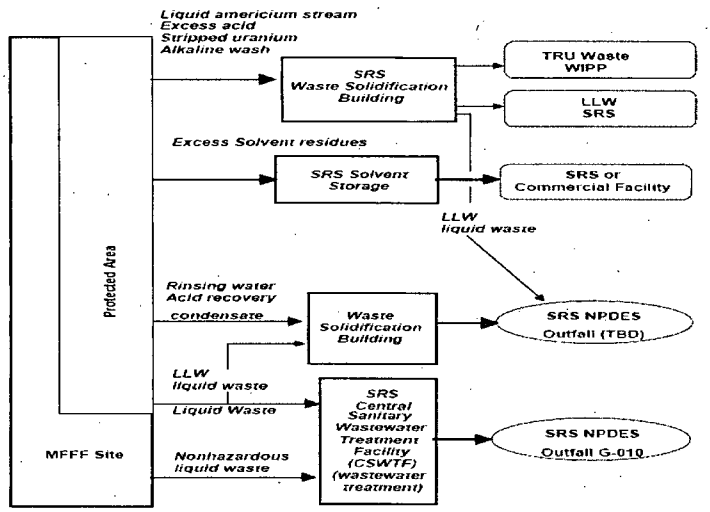
# Liquid Waste Generation at the MFFF



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## Liquid Waste Generation Basis

- High alpha activity waste stream
  - Maximum expected volume
    - 39,000 L (10,300 gal) per year
    - Up to 25 batch transfers per year
- Stripped uranium stream
  - Maximum expected volume
    - 166,600 L (44,000 gal) per year
    - Up to 42 batch transfer per year
- Low level liquid waste stream
  - Maximum expected volume
    - 1,078,000 L (285,000 gal) per year
    - Up to 80 batch transfers per year

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## Liquid Waste Holdup Capabilities

- High Alpha Waste Collection Tanks
  - 2 tanks
  - 10,500 liters each
  - More than 6 months holdup capacity
  - Agitated or recirculated to mix tanks
- Stripped Uranium Collection Tanks
  - 4 tanks
  - 11,000 liters each
  - More than 3 months holdup capacity
  - Agitated or recirculated to mix tanks
- Low Level Liquid Collection Tanks
  - 2 tanks
  - 11,500 liters each
  - 7 day holdup capacity

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## Solvent Waste Stream

- Excess solvent waste
  - Generated from solvent recovery process
  - Less than 17.2 mg Pu/yr
  - Approximately 10,600 L (2,800 gal) per year
    - Collected in 1500 L (400 gal) holding tank
  - Sampled to determine compliance with Waste Acceptance Criteria (WAC)
  - Batch transferred to 1000 L (300 gal) carboy or suitable container
  - Containers transferred to Savannah River Site (SRS)
  - Approximately 11 transfers per year

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## Liquid Waste Transfer Protocol

- Waste transferred in dedicated lines to Waste Solidification Building (WSB) (operated by DOE not MOX Services)
  - Buried underground
  - Double walled stainless steel pipe
  - High alpha transfer line is Item Relied on for Safety (IROFS)
  - Approximately 2000 feet
  - Leak detection system
  - Designed to withstand seismic events and other applicable events

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## Solid Waste

- Loaded into drums
- TRU Waste
  - Approximately 1100 drums/year
  - 550 drum storage capacity (180 days)
  - Final disposition at WIPP
- LLW
  - Approximately 1500 drums/year
  - 150 drum storage capacity (30 days)
  - Transferred to SRS or vendor for disposition

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## MOX Services – SRS Interface Control Documents

- Waste acceptance criteria
  - Consistent with MOX waste streams
  - Consistent with Integrated Safety Analysis
- Provides for notifications between MFFF and WSB management
- Waste sampled and analyzed prior to transfer

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## What would happen if operations at the WSB have to be suspended?

- MOX Services response
  - Follow operating procedures that will be developed with respect to this contingency
  - Resolve the event
- Potential impacts
  - Stop transfer of waste from MFFF to WSB
  - Store waste in holding tanks at MFFF
  - Suspend waste generating operations
  - Maintain facility in safe condition until issue resolved
    - Potential events involving inability to transfer waste have been evaluated in the Integrated Safety Analysis (under review by the staff)
    - Agitators and/or recirculation capability provided in storage tanks to ensure mixing of tank contents
- MOX Services and WSB procedures will provide for contingencies for any facility disruptions

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## Waste Solidification Building Status (regulated by DOE)

- DOE Critical Decision (CD) – 2 (approved baseline) and 3 (construction) in 2008
- Plan to start construction in 2010, operations in 2013
- Construction schedule consistent with MFFF construction and startup schedules

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## Conclusions

- Low level liquid waste stream storage capacity is the limiting factor, related to curtailing operations at MFFF, in the event of unavailability of the WSB
- MFFF has contingency plans to shutdown in a safe state if WSB is unavailable

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# Barnwell Low-Level Radioactive Waste Disposal Facility Transition

Presented to: ACNW&M
December 18, 2007
By: Bill House

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## Barnwell Site Transition Presentation Summary

- Barnwell LLRW Disposal Site Status
- In-Region Operations Transition
- Operational Scenarios Considered
- Post 2008 Cost Estimates
- Phase I Closure Transition

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# Volumes under Atlantic Compact

| | Volume Allowed | Actual Volume |
|---|---|---|
| FY 2000-2001 | 160,000 cu ft | 125,989 cu ft |
| FY 2001-2002 | 80,000 cu ft | 57,763 cu ft |
| FY 2002-2003 | 70,000 cu ft | 65,656 cu ft |
| FY 2003-2004 | 60,000 cu ft | 59,516 cu ft |
| FY 2004-2005 | 50,000 cu ft | 43,260 cu ft |
| FY 2005-2006 | 45,000 cu ft | 44,988 cu ft |
| FY 2006-2007 | 40,000 cu ft | 37,607 cu ft |
| FY 2007-2008 | 35,000 cu ft | (7/1/07 – 11/30/07) 11,674 cu ft |

•Members: SC, CT, NJ. No out of compact waste after FY 07/08.



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# Barnwell Site Class B/C Volumes

| | FY 2002/2003 | FY 2003/2004 | FY 2004/2005 | FY 2005/2006 | FY 2006/2007 |
|---|---|---|---|---|---|
| | (cu. ft.) | (cu. ft.) | (cu. ft.) | (cu. ft.) | (cu. ft.) |
| Atlantic Compact | 4,495 | 11,942[2] | 2,894 | 4,791 | 4,552 |
| Texas Compact (2 states) | 1,081 | 909 | 1,127 | 549 | 927 |
| 34 States w/o Access after 6/30/08 | 24,694[1] | 20,524[3] | 16,923 | 14,761 | 19,580[4] |
| Totals | 30,270 | 33,375 | 20,944 | 20,101 | 25,059 |
| Totals w/o RPVs | 20,734 | 23,038 | 20,944 | 20,101 | 21,929 |

[1] Includes 9,536 cu.ft. for the ME Yankee RPV
[2] Includes 7,507 cu.ft. for the CY RPV
[3] Includes 2,830 cu.ft. for the Big Rock RPV
[4] Includes 3,130 cu.ft. for the LaCrosse RPV

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# Atlantic Compact Waste Volumes

| Waste Class | FY 2003/2004 (cu. ft.) | FY 2004/2005 (cu. ft.) | FY 2005/2006 (cu. ft.) | FY 2006/2007 (cu. ft.) |
|---|---|---|---|---|
| Class A | 8,577 | 6,080 | 10,146 | 3,529 |
| Class B | 1,742 | 1,245 | 1,998 | 2,268 |
| Class C | 10,144 | 1,648 | 2,792 | 2,284 |
| Total | 20,463 | 8,973 | 14,936 | 8,081 |

FY 03/04 includes 7,508 cu. ft. Class C Large Component



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# Atlantic Compact Generators

- Dominion, Millstone (2), CT
- Duke, Catawba (2), Oconee (3), SC
- Excelon, Oyster Creek (1), NJ
- Progress, Robinson (1), SC
- PSEG, Hope Creek (1), Salem (2), NJ
- SCE&G, VC Summers (1), SC
- US Navy, New London, CT, Charleston, SC
- Others (non-fuel cycle)

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# Trench Design / Construction Options Considered for In-Region Operations

- Pre-staged Vault Array (single layer)
- Class A, B, C Progressive Trench
- Existing Class B/C Trench



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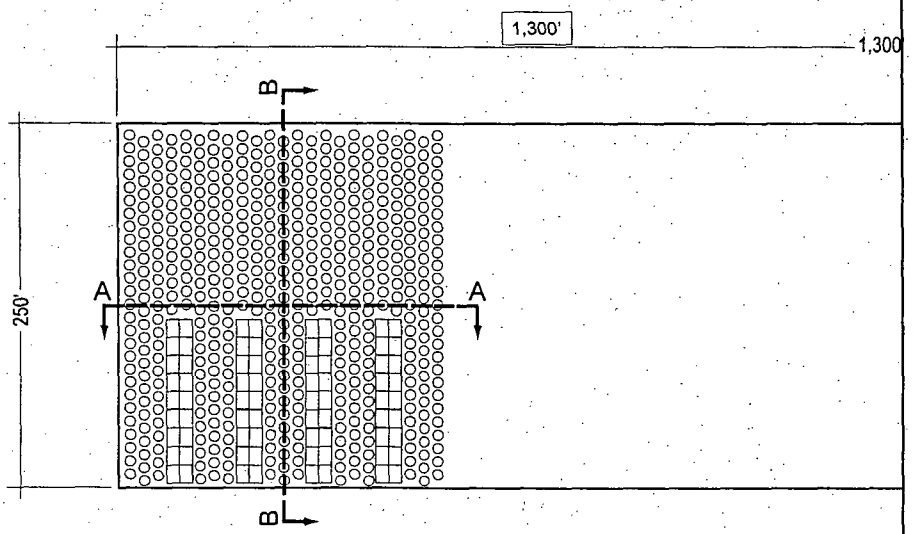
# Pre-Staged Vault Array



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# Trench Option Comparisons

| Parameter | Pre-Staged | Class A,B,C | Class B/C |
|---|---|---|---|
| Licensing Effort | High | Medium | Complete |
| Constructability | Potentially Difficult | Moderately Difficult | Already Established |
| Personnel Exposures | Potentially Low | Moderate | Low |
| Stormwater Management | Potentially Difficult | Potentially Low | Low |
| Enhanced Cap Costs | High | Low | Medium |



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# General Cost Estimating Assumptions

- Existing regulatory and license requirements
- Cost structure for scenarios except institutional costs based on PSC application structure
- Labor and material costs based on FY 06-07 rates
- License fees and other reimbursable costs beyond control of site operator based on FY 06-07 rates
- Waste volume scenarios include costs of trench construction, disposal vaults, and license maintenance

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# Operating License Costs (No Waste Accepted)

| Category of Costs | Annual Estimate |
|---|---|
| Fixed Costs | $2,548,427 |
| Variable Costs | $0 |
| Irregular Costs | $49,000 |
| Site Operator Costs Total | $2,597,427 |
| Statutory Margin | $753,254 |
| Reimbursable Costs | $353,466 |
| Total Operating Costs | $3,704,147 |



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# 4,000 Cubic Feet Costs

| Category of Costs | Annual Estimate |
|---|---|
| Fixed Costs | $3,862,618 |
| Variable Costs | $215,858 |
| Irregular Costs | $77,000 |
| Site Operator Costs Total | $4,155,476 |
| Statutory Margin | $1,205,088 |
| Reimbursable Costs | $595,466 |
| Total Operating Costs | $5,956,030 |

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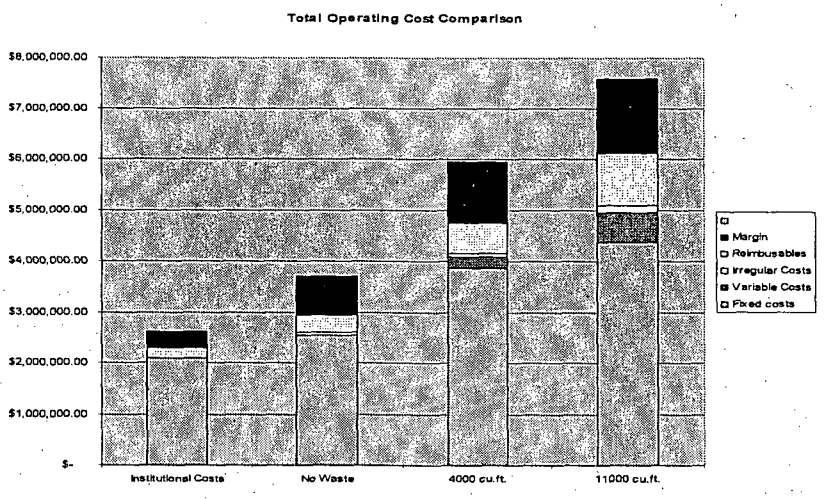
# Total Operating Cost Comparison



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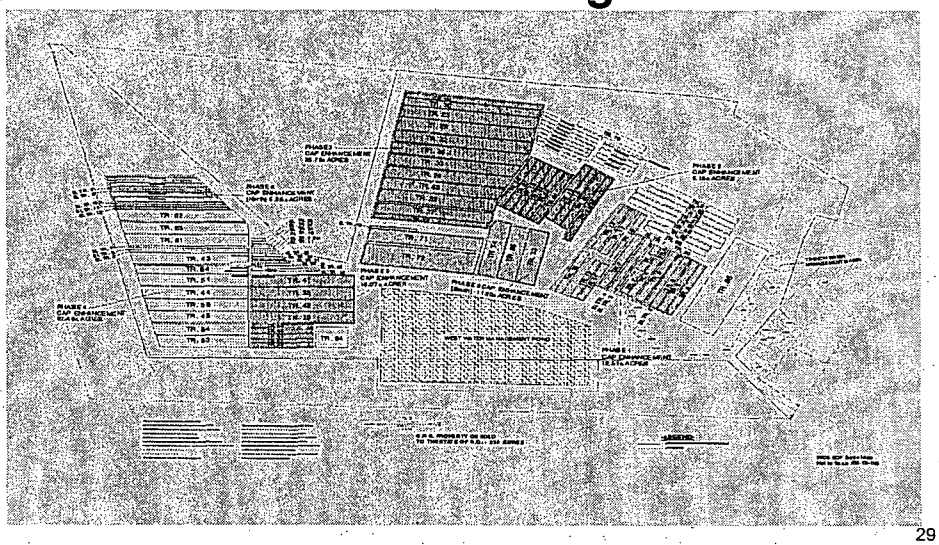
# Approximate Labor Resources
## (Full Time Equivalents – not staffing levels)

| Labor Categories | Institutional | No Waste | 4,000 cu. ft. | 11,000 cu. ft. |
|---|---|---|---|---|
| Management/Accounting/ Support Staff | 2 | 2 | 3 | 5 |
| Security | 4 | 4 | 5 | 5 |
| Environmental | 6 | 7 | 7 | 7 |
| Compliance & HP | 1 | 3 | 4 | 5 |
| Operations | 1 | 3 | 5 | 7 |
| Total | 14 | 19 | 24 | 29 |

ENERGYSOLUTIONS

# Barnwell Site Configuration





ENERGYSOLUTIONS

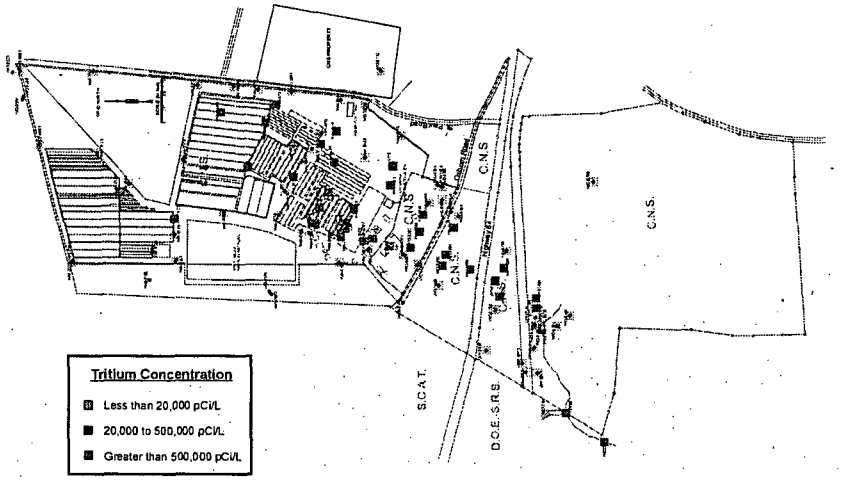
# Engineered Cap Components

- 2 feet soil cover and vegetation layer
- 1 foot sand drain layer
- 60 mil HDPE liner
- Geosynthetic clay layer
- 1 foot recompacted clay layer
- Compacted backfill / waste zone

ENERGYSOLUTIONS

# Tritium Migration Status

Barnwell Site Tritium Concentrations




For information, the approximate EnergySolutions/Chem-Nuclear Systems (CNS) property boundaries are shown.



ENERGYSOLUTIONS

# State Budget and Control Board

- Accepts break-even operating scenario, but must implement suspended operations if the condition arises
- Issued letter to Compact generators asking for commitment to support the Site
- Supports paying institutional costs from Extended Care and Maintenance Fund
- Hired contractor to evaluate adequacy of the Extended Care and Maintenance Fund