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1 UNITED STATES OF AMERICA

2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

5 (ACRS)

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7 RADIATION PROTECTION AND NUCLEAR MATERIALS

8 SUBCOMMITTEE

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10 MEETING

11 + + + + +

12 MONDAY,

13 JULY 6, 2009

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15 The Subcommittee met at the Nuclear
16 Regulatory Commission, Two White Flint North, Room
17 T2B3, 11545 Rockville Pike, at 1:00 p.m., Michael T.
18 Ryan, Chairman, presiding.

19 COMMITTEE MEMBER PRESENT:

20 MICHAEL T. RYAN, Chairman

21 DENNIS C. BLEY, Member

22 DANA A. POWERS, Member

23 JOHN D. SIEBER, Member

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

12:59 p.m.

CHAIRMAN RYAN: Okay. I guess we're ready. Let the meeting come to order, please.

This is a meeting of the Radiation Protection and Nuclear Materials subcommittee. I'm Michael Ryan, chairman of the subcommittee.

ACRS members in attendance are Dennis Bley, Jack Sieber and Dana Powers.

Derek Widmayer of the ACR staff is the designated federal official for this meeting.

The purpose of the meeting is to review and discuss two documents that implement the NRC requirements in 10 CFR 20.1406, minimization of contamination. The two documents are NEI-08-08, titled "The Generic FSAR Template Guidance for Life Cycle Minimization of Contamination" and draft ISG-006 on evaluation and acceptance criteria at 10 CFR 20.1406 to support design certification and combined license applications.

The subcommittee will hear presentations

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1 by and hold discussions with representatives of the
2 NRC staff and the Nuclear Energy Institute and other
3 interested persons regarding this matter. The
4 subcommittee will gather information, analyze
5 relevant issues and facts and formulate proposed
6 positions and actions as appropriate for
7 deliberation by the full committee.

8 The rules for participation in today's
9 meeting have been announced as part of the notice of
10 this meeting previously published in the *Federal*
11 *Register*.

12 We have received no written comments or
13 requests for time to make oral statements from
14 members of the public regarding today's meeting.

15 A transcript of the meeting is being
16 kept and will remain available as stated in the
17 *Federal Register* notice. Therefore, we request that
18 participants in this meeting use the microphones
19 located throughout the meeting room when addressing
20 the subcommittee. The participants should first
21 identify themselves and speak with sufficient
22 clarity and volume so that they may be readily
23 heard.

24 Copies of the meeting agenda and

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1 handouts are available in the back of the meeting
2 room.

3 We'll now proceed to the meeting and
4 I'll call on Mr. Timothy Frye of the NRO staff for
5 some introductory remarks.

6 Tim?

7 MR. FRYE: Okay. Thank you, Dr. Ryan.

8 As Dr. Ryan mentioned, my name is Tim
9 Frye and I'm the health physics branch chief in the
10 Office of New Reactors.

11 And the objective of this briefing is to
12 provide an overview and background on some of the
13 recent work undertaken by both Office of New Reactor
14 staff and also the industry to develop and implement
15 tools to review certified design and combined
16 license applications for compliance with 10 CFR
17 20.1406.

18 For the last three years significant
19 effort by both staff and industry has been expended
20 to understand the intent of the regulation and
21 develop guidance to ensure that is adequately
22 implemented.

23 As Dr. Ryan mentioned, the focus of this
24 discussion will be on two of these guidance

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1 documents, NEI-08-08, which is an industry-developed
2 template; and Interim Staff Guidance 006 which has
3 been developed by the NRO staff.

4 During these discussions we want to
5 explain why these documents were developed, how they
6 support the industry in preparing DCD and COL
7 applications and how they support the staff's
8 licensing review of new reactor applications.

9 Ralph Anderson and William Smith of
10 Nuclear Energy Institute will first discuss the
11 purpose and the objectives of the industry template
12 08-08. And NRO staff, including myself, Ed Roach
13 and Dr. Hosung Ahn will then discuss the staff
14 review of NEI-08-08 and the purpose and objectives
15 of ISG-006.

16 I'll just introduce the folks that are
17 with me real quick. And then after NEI is done, I
18 think we'll be going up front.

19 Ed, to my left, is a senior health
20 physicist in the NRO health physics branch and has
21 had the staff lead for the past two-plus years for
22 developing and implementing review guidance for
23 20.1406 to support new reactor licensing.

24 A key part of this work has been

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1 understanding site hydrology and Dr. Ahn has worked
2 closely with Ed as one of the staff's leading
3 hydrologists and developing guidance for site
4 conceptual models.

5 So with that, I'll turn it over to
6 William and Ralph.

7 MR. ANDERSON: Thank you very much, Tim.

8 Good afternoon. It's a pleasure, as
9 always, to be here talking to the subcommittee.

10 First of all, I'd like to start by
11 expressing appreciation of myself, NEI and the
12 industry for the very collaborative interactive
13 process that has existed for the last two years to
14 seek a common understanding of a new requirement
15 which had not previously been implemented, and
16 especially over the last six months to arrive at
17 guidance for staff review, as well as this generic
18 FSAR guidance template, which I believe that because
19 of the very extensive input that we've had from a
20 variety of parties puts us a long way down the road
21 to do this right the first time. It's always
22 interesting when you implement a new requirement for
23 the first time. It's very easy to go down that
24 process with different understandings of basic

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1 terminology and concepts and then you learn at the
2 end of the trail that you and your regulator have
3 ended up in two different places. In this situation
4 I don't think that will be the case.

5 So what I would like to do is give you a
6 brief overview of the template and then I'm going to
7 turn it over to William Smith, who is one of the
8 coauthors of the template, to talk about our
9 response to some of the requests for additional
10 information that we had in this very interactive
11 process.

12 I'd like to touch base first on a little
13 bit of chronology. 10 CFR 20.1406 was promulgated
14 in 1997 to apply to new applications for design
15 certification and construction and operating
16 licenses and really lay dormant for some long period
17 of time. In fact, so dormant that it really took a
18 group of us to recognize that the requirement
19 existed during the design certification review
20 process. And at that time really kicked into motion
21 a long series of interactions to determine how this
22 regulation could be used in a most beneficial manner
23 and what the appropriate methods for implementing it
24 might be.

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1 During that period of dormancy we
2 actually had a series of events arise at nuclear
3 power plants involving contamination of groundwater
4 at the plant sites, primarily with tritium, that
5 raised this issue to management visibility both
6 within our industry and at the NRC, as well as in
7 the public and with our Congress. And the industry
8 put a lot of attention on those issues, albeit the
9 concentrations of tritium were very small and except
10 with one exception did not actually get transported
11 off site. Nevertheless, we recognize that it went
12 to an issue of public confidence.

13 As a result of that, we developed a
14 voluntarily Groundwater Protection Initiative in
15 2006 that was implemented by all operating plants
16 and decommissioning plants. And it was a standard
17 approach program, but ineffectively it was to beef
18 up our means for preventing leakage of radioactive
19 materials into the groundwater, being able to detect
20 those early and to be able to respond promptly with
21 the overall objective of the material not being
22 transported off site and therefore not having any
23 impact on the public. The initial description of
24 that program was a preliminary document that

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1 described the objectives with some additional
2 guidance.

3 In parallel to that the NRC formed a
4 task force to review this issue and ultimately
5 issued a report on the topic, which I think plays an
6 important part as the technical basis for
7 understanding 20.1406. That report is the Liquid
8 Radioactive Release Lessons Learned Task Force Final
9 Report issued in September of 2006.

10 In 2007, through a series of lessons
11 learned workshops, we produced a final guidance
12 document for the voluntarily Groundwater Protection
13 Initiative , NEI-07-07. And implementation of that
14 was set for the middle of 2008. So we're now out
15 doing peer assessments of all the sites to assure
16 that we have effective implementation of that
17 document.

18 At the same time the Electric Power
19 Research Institute began developing robust technical
20 guidelines to define a method for implementing the
21 Groundwater Protection Initiative . And we carried
22 through with a draft document while we went through
23 a lessons learned exercise and then ultimately
24 published it as a final document, which we shared

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1 publicly with the NRC to get it into the public
2 document room and make it a publicly-available
3 document.

4 So what we had in place as of early 2008
5 was a industry document, NEI-07-07, that had been
6 reviewed, but it did not need concurrence of the
7 regulator because it was addressing issues that fell
8 outside of requirements and we had technical
9 guidelines for implementing same.

10 During this same period, the NRC was
11 developing Regulatory Guide 4.21 to cover
12 implementation of 10 CFR 20.1406. And so the
13 lessons learned, the information gained and the
14 perspective, I think greatly helped inform that
15 regulatory guide. That regulatory guide was issued
16 in 2008.

17 Between 2008 and this year, in our
18 frequent monthly interactions with the staff on new
19 plant licensing issues and radiation protection/
20 radioactive waste we recognized since all of the
21 currently operating and all of the new licensed
22 plants would in fact be implementing the voluntarily
23 groundwater protection initiative, that perhaps it
24 made sense to look at how we could build upon that

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1 experience and those documents and develop a
2 template guidance document that was specifically
3 aimed at conforming with 20.1406. It was understood
4 at the time that the Groundwater Protection
5 Initiative itself does not encompass the entire
6 breadth of 20.1406, but it does encompass a large
7 part of it because it focuses very heavily on
8 subsurface contamination and its ultimate effects at
9 the time of decommissioning a plant.

10 So we undertook at that time to commit
11 to the NRC that we would pursue developing a
12 template on this subject. In fact, this is our
13 fifth template in the area of radiation
14 protection/radioactive waste. So we've gained a
15 very good process for template development and
16 review, and finalization. And we issued Rev 0 to
17 NEI-08-08 in late 2008, and then as William will
18 describe, through a series of public interactions
19 obtained RAIs sort of in a dynamic interactive
20 process and ultimately revised NEI-08-08 and issued
21 Revision 1, which is currently under review by the
22 staff for the development of a safety evaluation.

23 The regulation itself, just as a
24 reminder, applies to both design certification and

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1 construction and operating licenses and basically
2 looks upon how to facilitate ultimate
3 decommissioning of the facility. In fact, for those
4 of you that know your numbering system, it was
5 promulgated as part of, and is located in the
6 license termination rule section of 10 CFR part 20.

7 So clearly it's emphasis is on minimizing
8 downstream effects associated with contamination of
9 facility, the environment.

10 Regulatory Guide 4.21 provides a risk-
11 informed approach to implementing 10 CFR 20.1406 and
12 it covers also an approach of prevention, early
13 detection and prompt assessment and response. It
14 provides detailed guidance on each of those areas.
15 And then it also includes an appendix with a list of
16 numerous examples of various measures to address the
17 requirements. And I should mention those in
18 themselves were captured through a very extensive
19 review of decommissioning lessons learned. So it
20 probably will serve well in the future as a good
21 bridge document for facilities approaching their
22 final shut down and decommissioning.

23 NEI-08-08, we called together resources
24 from both people focusing on new plants, as well as

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1 people with experience in the groundwater protection
2 initiative, which also included some folks that were
3 very involved in the decommissioning of facilities
4 that's occurred over the past several years. So we
5 had a very robust extended group of subject matter
6 experts in the industry working on this and found
7 that we had a large experience base within the NRC
8 itself. So through these processes, that's why
9 that's styled as a process of interactive
10 enhancement as we move through finalizing the
11 document.

12 As I mentioned, it builds upon the
13 Groundwater Protection Initiative and the EPRI
14 guidelines, and Regulatory Guide 4.21. The
15 Groundwater Protection Initiative and the EPRI
16 guidelines serve as a technical basis for the
17 document. And the way I would style this is that it
18 is consistent with Regulatory Guide 4.21. It's not
19 intended in and of itself to be a method for
20 implementing Reg Guide 4.21. In and of itself it's
21 intended to be an implementation document for 10 CFR
22 20.1406. But it is consistent, so nor would I style
23 it as a proposed alternative to Reg Guide 4.21.

24 Its focus is entirely on the operational

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1 procedures necessary to carry out that requirement.

2 It does not address the design issues. However,
3 the document itself is arranged in a way where you
4 take into account the design features that are
5 specifically aimed at preventing contamination, as
6 well as the site-specific aspects of a specific
7 site. And then basically you tailor the guidance
8 within NEI-08-08 to fit your specific circumstances.

9 CHAIRMAN RYAN: So just to clarify that,
10 Ralph, you tried to make it so that it can be
11 tailored to be site-specific, which is the
12 geohydrology or whatever it might be. And also; if
13 I'm saying this wrong correct me, design-specific
14 based on the reactor type and the particulars of the
15 arrangements of the reactor to that particular
16 geohydrology. Is that right?

17 MR. ANDERSON: Right. Exactly.

18 CHAIRMAN RYAN: Okay.

19 MR. ANDERSON: And in theory, moving
20 forward into actual implementation, I would look to
21 the design-centered working groups to work jointly
22 with each specific design, I think, to come out with
23 sort of a standardized application, then further
24 adapt that to the site-specific aspects.

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1 MEMBER POWERS: Do you assume that the
2 groundwater hydrology is known?

3 MR. ANDERSON: Beg your pardon?

4 MEMBER POWERS: Do you assume that the
5 groundwater hydrology is known?

6 MR. ANDERSON: Not to be cute, I assume
7 it is never really fully known. But I assume that
8 there has been a robust geohydrological analysis os
9 the site and what's called for in NEI-08-08 is a
10 baseline analysis and then a follow-up analysis
11 post-construction to establish a site conceptual
12 model for use in implementing the guideline
13 document.

14 MEMBER POWERS: Will you ask them to
15 prepare alternatives?

16 MR. ANDERSON: No.

17 MEMBER POWERS: How does the alternative
18 get factored in here?

19 CHAIRMAN RYAN: Well, to me, I think
20 Ralph mentioned one that's the key from my
21 perspective, is there's typically a pretty extensive
22 pre-construction site modeling for, you know,
23 understanding the physical environment.

24 MEMBER POWERS: Even so --

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1 CHAIRMAN RYAN: Okay. That's one. The
2 second one is at post-construction it will have an
3 impact, in my opinion, on about every site on the
4 geohydrology. Things that flow one way before hand
5 might flow the other way afterwards. And I'm not
6 saying that's always true, but you have to
7 understand the impact of this large construction on
8 the very local geohydrology for two reasons. One is
9 so you understand that geohydrologic behavior, and
10 two, so that you can frankly tailor your monitoring
11 program so you're at the right place at the right
12 time to detect small things rather than big things.

13 Is that a fair way to look at it?

14 MR. ANDERSON: Yes, exactly. And also,
15 it's --

16 CHAIRMAN RYAN: I'm sorry. Does that
17 answer your question, Dana?

18 MEMBER POWERS: No, I think you've only
19 framed the question here.

20 CHAIRMAN RYAN: Yes.

21 MEMBER POWERS: I mean is that -- yes,
22 you're absolutely correct. You put, you know, a few
23 hundred-thousand pounds of concrete in one location,
24 it's going to deform something, I guarantee you.

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1 CHAIRMAN RYAN: Absolutely.

2 MEMBER POWERS: Someplace.

3 CHAIRMAN RYAN: Right.

4 MEMBER POWERS: And going in, you know,
5 certainly in COLs or in ESPs we assume there to be
6 alternatives. For instance, in the Vogel site they
7 had fairly clear hydrology. We still asked them to
8 come up with alternatives to that.

9 CHAIRMAN RYAN: Sure.

10 MEMBER POWERS: And they have a plan
11 once they install something on the site to go
12 through. But I don't think you're hydrology is
13 particularly well known ever.

14 CHAIRMAN RYAN: That's where Ralph
15 started, yes.

16 MR. ANDERSON: Yes, and I think that the
17 interesting part here is, while we have reached some
18 level of acceptance to what we require to understand
19 potential off-site transport of radionuclides,
20 either during under postulated accident conditions
21 of routine operations, the focus ironically here is
22 what's going to be left on site? And by my
23 rudimentary understanding, and this is a health
24 physicist operating out of his league, when you have

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1 distance, you have the benefit of less impact of
2 uncertainties that you would have with local
3 modeling. And so I think that that was why I made
4 the initial comment that I don't think it will ever
5 be known, because you're really trying to understand
6 very close-in effects, which as both of you have
7 alluded to, would be very, very affected by the
8 excavation and construction process.

9 There are elements of NEI-08-08 and Reg
10 Guide 4.21 that in fact kick in during the period of
11 construction, so you're actually implementing the
12 program from the time that you do your baseline to a
13 hydrological assessment through construction. And I
14 could even imagine that through that process that
15 people might be affecting detailed design decisions
16 even at that late date, you know, based on what they
17 see when they do the excavation, based on decisions
18 that they need to make and what type of piping
19 layout and so forth that they might want to use for,
20 for instance, the liquid radioactive waste discharge
21 line.

22 CHAIRMAN RYAN: And it could be other
23 areas, too, Ralph. But I could see where, for
24 example, in a large excavation where a strata that

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1 would actually transmit water, laterally let's say,
2 over some gradient, you know, you can verify where
3 it is over a wide range as a
4 continuous/discontinuous. And it helps you, I think
5 maybe get at part of Dana's question, is where do
6 you put the monitoring points?

7 MR. ANDERSON: Right.

8 CHAIRMAN RYAN: You know, I've never met
9 a geohydrologist that didn't want one more well.

10 MR. ANDERSON: Right. Right.

11 CHAIRMAN RYAN: And then I say that a
12 little bit facetiously, but, you know, some of that
13 uncertainty in close-in localized monitoring which
14 you're now going to interpret on a wider, larger
15 scale, can be a little bit more certain if you pay
16 attention to it during that excavation and
17 construction phase. So, that's my understanding of
18 it.

19 MR. ANDERSON: Yes, and I would agree
20 with that. But I think the other element is that --
21 and this is really -- if you look at the statements
22 of consideration for 20.1406, it points out well,
23 why this new requirement? Because at the time of
24 design and then ultimately of construction you can

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1 make much more use of design feature for prevention,
2 which is really where we want to shift everything.
3 I don't want to just be the best kid on the block
4 for detecting leaks. Yes, I can detect them
5 frequently and fast. I'd rather be the kid on the
6 block that doesn't have leaks.

7 CHAIRMAN RYAN: Right.

8 MR. ANDERSON: So that's really where we
9 need to be pushing our whole future perspective, is
10 with emphasis on prevention backed up by a very
11 robust monitoring program.

12 MEMBER POWERS: What was that
13 definition, "robust," that I think I'm still
14 struggling with? I mean, it's one thing if you
15 design for your best estimate hydrology. It's a
16 different thing if you design under greater
17 presumption of uncertainty.

18 MR. ANDERSON: I think the approach that
19 is being taken fairly universally by the operating
20 plants is to consider the alternative as it might
21 affect off-site transport. Because the initial
22 impetuous of the Groundwater Protection Initiative
23 was to identify and respond to subsurface
24 contamination before it was transported off site.

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1 So I know that people have been evaluating
2 alternative models and in fact have been placing
3 wells based on that. But again, what I'll call the
4 risk-informing factor, if you will, was to minimize
5 the risk of off-site transport. So we're going to
6 be back to a new perspective with this new
7 requirement to consider how alternatives might
8 influence the ultimate residual contamination
9 situation that you would have at the time of
10 decommission. So it's going to have to be looked at
11 in a different way. But I do know that the current
12 process for operating plants is looking at
13 alternatives in terms of where to establish
14 monitoring for off-site transport.

15 And my simple comment was for on-site,
16 you know, my understanding of the uncertainty is
17 that it's much larger. You know, what I'm more
18 familiar with is meteorology and when you get to
19 local meteorology, I know how the error bars get
20 very, very large. So that might influence people
21 taking a more didactic approach along the lines that
22 you're talking about. You know, you can always put
23 one more well in. And I think that's going to be a
24 question, is, you know, do you load the place up

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1 with wells or do you really try to be selective?

2 CHAIRMAN RYAN: Well, I think part of it
3 is; and I'm responding I think to Dana's thought,
4 that my thought is that if you understand what is
5 constructed well and you understand earthworks that
6 have piled back in around it, you have a better
7 chance of putting a well in the right place earlier
8 on rather than later on.

9 MR. ANDERSON: Right.

10 CHAIRMAN RYAN: So I think, you know,
11 somehow that's got to come together. The sequence
12 of construction or reconstruction at the site, if
13 you will, has to factor into those geohydrologic
14 monitoring program designs.

15 The second step is, to me, you know,
16 once the water levels have settled down and, you
17 know, are at some nominal behavior, that you begin
18 to track the simple behavior of the water. Without
19 the water nothing moves. So if you understand the
20 water, then you can say, well, you know, the
21 gradient is this way half of the year, or all of the
22 year, or it's flat, or, you know, it's very steep or
23 whatever it is. So you can begin then to
24 preferentially focus your monitoring activities on

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1 the areas where stuff is more likely than not to
2 discount other checks on all areas of interest, but
3 to focus your resources on, you know, where it's
4 likely to be rather than finding something, you
5 know, a mile away and then trying to back up.

6 MR. ANDERSON: Right.

7 CHAIRMAN RYAN: So, I mean, that's what
8 I take out of the document and the strategies. It's
9 aimed at that.

10 MR. ANDERSON: Yes, the other piece is
11 the document refers to reliance upon other
12 maintenance and operations programs. And I always
13 need to point to that to help people understand that
14 that's not a reference to a minor thing. That's a
15 reference to a major thing. In theory, much more
16 robust, to use that word, than the groundwater
17 monitoring program. I see the groundwater
18 monitoring program as the third line of defense, not
19 the first line of defense, the first line of defense
20 being the design itself. For instance, use double-
21 wall piping or other materials that are unlikely to
22 erode.

23 The second line of defense really is a
24 corresponding, and I think that's where we're in the

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1 learning phase right now, but a corresponding
2 program for monitoring, testing and surveillance of
3 the tanks, the piping and the other structures that
4 might be involved so that your indication of leak
5 detection isn't finding a sample in a well. It's
6 finding it through your monitoring and surveillance
7 program. And that's why I say I think we all know
8 we're in a very high learning curve on that right
9 now. So a lot of attention being put on that at
10 EPRI and through INPO at this moment, those fairly
11 high priority items for the operating units.

12 But that to me is as important, if not
13 more important, than the actual well monitoring
14 program, which again I see as the third layer of
15 defense, that if somehow the materials you design do
16 fail, if somehow your monitoring and surveillance
17 program didn't pick them up, that you ultimately
18 find contamination in a sufficient time frame in the
19 groundwater that you can assess it and respond to it
20 in some timely manner.

21 MEMBER POWERS: You emphasized design in
22 the system and you've also invoked the idea of
23 defense in depth.

24 MR. ANDERSON: Yes.

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1 MEMBER POWERS: In your design, do you
2 design to defense in depth, or is design just an
3 element of defense in depth?

4 MR. ANDERSON: Let me go one step
5 further. Again, William Smith from Southern Nuclear
6 Company, we've been partners in crime on this
7 document for some time, but, William, feel free to
8 chime in at any time.

9 MR. SMITH: Okay. And the point of this
10 document is taken out with whatever design the
11 utility has picked. You know, we're not giving
12 directions and guidance on what they need to do in
13 design. We're starting at the point they've
14 designed it, it's certified, design is being placed
15 at a site. And now what do we need to do for that
16 particular design to monitor for it?

17 In the case of some designs, when you're
18 looking at the placement, you may need to do more
19 monitoring, some you need to do less. So we're
20 starting at the point the design has been reviewed
21 by the NRC, certified and those particular features
22 of the design is built in to stop monitoring.
23 They're already in there. At the point that we're
24 starting the monitoring in this program, you

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1 evaluate what design you have, what features they
2 have and now you're trying to determine, okay, where
3 do I need to monitor for this particular design and
4 include any design changes that the COL added to it?

5 Do I need to change my monitoring to this location
6 versus some other location? So this is not intended
7 to influence the design part of it.

8 MR. ANDERSON: Specifically though, I
9 would see this as an element of defense in depth
10 that go directly to your question.

11 But I was going to defer to Tim a little
12 bit.

13 Tim, were you all going to address the
14 RAI process you've had with the design?

15 MR. FRYE: Yes, we can. Yes, we can
16 talk about that a little bit.

17 MR. ANDERSON: Okay.

18 CHAIRMAN RYAN: Maybe we can hold that
19 to a little bit later on, Tim.

20 MR. FRYE: Okay. Yes.

21 MR. ANDERSON: There's been a very
22 interactive process also with the designers which in
23 itself surfaces a lot of good information for people
24 to use when they need evaluate how to adjust the

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1 operational program to fit into that.

2 CHAIRMAN RYAN: William, just one
3 follow-up question.

4 I guess, would you suspect that if you
5 have a given design, and I know there are several
6 out there, but let's pick one. I mean, to my way of
7 thinking it would be the site that would cause you
8 to think about things varying from place to place as
9 opposed to the design.

10 MR. SMITH: That's correct.

11 CHAIRMAN RYAN: You're really trying to
12 take a design of which you're fairly confident you
13 really know how it's going to be built and you're
14 putting it in a different environment. Just a
15 simple example, some, you know, parts and pieces of
16 the design may be in the saturate zone, some may be
17 in the unsaturated zone. Those are two different
18 situations in terms of the potential risks to
19 groundwater and to the monitoring strategies to
20 address it. So I'm must picking that one element.

21 Would you say that's a fair statement,
22 the environment would --

23 MR. SMITH: That's right, because there
24 you will look at the site-specific information. An

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1 AP1000 located at Belfonte would be different from
2 an AP1000 located at Vogel and what monitoring you
3 feel like you need to do because of other
4 situations. That's correct.

5 MR. ANDERSON: Another example is that
6 your program would be somewhat different for an
7 oceanside plant than it would be for a lakeside
8 plant, and for a recirculating coolant source plant
9 than it would be for a river-based plant. And we've
10 seen that already with the operating units, but the
11 same would play out here. Because again, you would
12 be considering the, I don't want to use
13 "downstream;" that's a pun, the longer term effects
14 that would occur at decommission.

15 CHAIRMAN RYAN: Okay.

16 MR. ANDERSON: And for instance, if the
17 water was not potable to begin with, the first thing
18 you would confront looking through this window would
19 be what the potential dose effects would be to that
20 critical group at the time of decommissioning. And
21 with groundwater not being available as a source of
22 drinking water, that wouldn't have much of an impact
23 on ultimately complying with the criteria, but
24 perhaps subsurface contamination in the soil would.

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1 So, you know, that's why I say it's not really just
2 about groundwater.

3 Also, by the way, we need to remind
4 ourselves 20.1406 goes to more fundamental design
5 issues to facilitate dismantlement and
6 decommissioning of the facility itself that really
7 have nothing to do with groundwater. So it's a
8 broader requirement than just groundwater
9 monitoring.

10 CHAIRMAN RYAN: Oh, yes, of course.

11 MR. ANDERSON: I'm just going to touch
12 briefly through for completeness the content of NEI-
13 08-08. Perhaps the main thing that I want to call
14 your attention to is we do offer up definitions in
15 NEI-08-08, which through our interactions with the
16 staff at least hopefully will help future
17 generations of people who think that words mean the
18 same thing. But, you know, I'll just comment that
19 we had very good dialogue and discussion to get to
20 commonly agreed definitions.

21 Additionally, I'll mention that the
22 template contains an Appendix A for applicant-
23 specific information. Think of it as a work sheet
24 that the applicant can use to develop the review

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1 basis of the design and site-specific features to
2 then adjust and tailor their program. Within the
3 body of NEI-08-08 itself there are sections that
4 within the application have specific information
5 that must be provided by the applicant. I mean,
6 that's common to all of the templates. But this
7 Appendix A is something slightly different. It's
8 not part of the submittal to NRC. It's really the
9 thing to help the applicant properly review the
10 existing design features and site-specific features
11 to know how they're going to need to adjust their
12 program. But it makes interesting reading and I
13 commend it to you.

14 That was all I had. I was going to turn
15 this over to William. We could just switch seats.

16 MEMBER POWERS: While you're searching,
17 I'll ask, in your document you use the word
18 "minimization."

19 MR. ANDERSON: Yes.

20 MEMBER POWERS: When I think you --
21 taken the reading, you really just mean reduction.

22 MR. ANDERSON: Yes, we use the word
23 "minimization" only because it's in the Regulation.
24 But I think reduction is a more accurate process

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1 description.

2 MEMBER POWERS: Even whenever I see
3 "minimization," then there's got to be something
4 going up, when something's coming down and you're
5 looking for a trough and you're finding -- of course
6 the only thing I can think of that's going up is
7 cost.

8 MR. ANDERSON: Yes, sir.

9 MEMBER POWERS: But you don't give me
10 any criterion --

11 MR. ANDERSON: Yes.

12 MEMBER POWERS: -- for driving to a
13 minimum when I look at that.

14 MR. ANDERSON: Right. It's interesting,
15 when the Reg Guide was under development, at that
16 time the Advisory Committee on Nuclear Waste had
17 some of us come in and talk about the requirement in
18 the Regulatory Guide. So Mike was present for that.

19 And we drew some analogies to the ALARA concept,
20 except that it's exactly what you say. What's in
21 the denominator? You know, in ALARA my denominator
22 is dose. In this particular case, the denominator
23 perhaps would be ultimate costs of decommissioning,
24 in which case it's dollars over dollars.

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1 I don't expect that the information will
2 be sufficiently complete at any meaningful time in
3 the process where people are actually going to be
4 able to do any kind of analysis like that. I have a
5 hunch that it's going to lend itself more to is it
6 practical and feasible to do something if it is than
7 do it.

8 MEMBER POWERS: You're appeal to ALARA
9 is misplaced. You're looking in -- if there are two
10 ways to do things, do the way that minimizes your
11 future costs of cleaning things up for prevention or
12 whatever it is, yes.

13 MR. ANDERSON: Right. I'll also say,
14 too, that the experience we've gained from the
15 currently operating units is that there are not that
16 many opportunities for near-term near-field
17 remediation because of the potential effects it
18 could have on the structural integrity of the plants
19 themselves. And you're not going to want to pump
20 all ALARA water out. You're not going want to be
21 doing a lot of excavation close into safety-related
22 buildings and structures. So in practice even the
23 best of programs might be aiming itself much more of
24 having an advance understanding of the challenges

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1 that will exist in decommissioning than actually
2 leading to actions that are going to be taken.

3 But where I do see value, and I think
4 we've got to continue to push this, is making sure
5 that we are taking lessons learned for making sure
6 that they're reflected in design of new facilities
7 and also in replacement activities at existing
8 facilities.

9 MEMBER POWERS: The best advice, if
10 things can leak, they will.

11 MR. ANDERSON: Yes.

12 MEMBER POWERS: If things can spill,
13 they have spilled.

14 MR. ANDERSON: Right.

15 MEMBER POWERS: And then your
16 observation, which is very good, is that near-field
17 remediation is a pipe dream. Even if you convince
18 yourself it's a good idea to do it, you can't afford
19 it.

20 MR. ANDERSON: Right.

21 MEMBER POWERS: Just from the time of
22 getting approval, you can't afford it.

23 MR. ANDERSON: Right.

24 CHAIRMAN RYAN: I think one of the

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1 points, too, from one of the earlier ACNW letters,
2 if I call right, Ralph, and please correct me if I'm
3 wrong, was that you really should take the view that
4 actions shouldn't necessarily be driven by something
5 that's a dose criteria at the fence, or at some
6 place way on out, you know, into the far field or
7 intermediate field. It ought to be based on the
8 criteria that you just listed, Dana. Can we do
9 something productive, meaning full and mitigative,
10 without, you know, getting overwhelmed with cost or
11 other risks to the plant and safety systems and so
12 forth.

13 So, you agree, Ralph, that's consistent
14 with some of the earlier letters?

15 MR. ANDERSON: Yes. Yes. And I think
16 that's why I'm really fascinated and interested to
17 see how this really comes into effect during the
18 construction phase and into the operational phase.
19 Like I said, it's yet another new way of thinking
20 that we haven't applied before. And so I'm keenly
21 interested to see how we approach this, especially
22 when it comes into decision making. Because again,
23 I'm still struggling with what's in the denominator.

24 CHAIRMAN RYAN: True. Thank you, Ralph.

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1 William?

2 MR. SMITH: Okay. My name is William
3 Smith and I've been working on contract to Southern
4 Nuclear Company the last two years for their new
5 plant development in the radiation protection area.

6 So I've been participating in the meetings with NEI
7 the past two years with the new plant.

8 Okay. And I'll talk about the response
9 we had to the RAIs. And in the response we had
10 industry representatives from the New Plant
11 Radiation Protection Task Force, and we also had
12 members from the Groundwater Protection Task Force,
13 which were part of the Groundwater Protection
14 Initiatives, NEI-07-07. And in addition, we had
15 members from EPRI that assisted. And the resolution
16 process evolved over about seven meetings with the
17 NRC on this topic. In the following, I provide the
18 RAI process that we went through and give you some
19 examples of the RAIs that we tackled.

20 In the response process, the industry
21 provided NEI-08-08 Rev 0 to the NRC for review and
22 the staff would review it and provide comments or
23 questions back to the industry. Then we would have
24 a follow-up meeting to clarify our understanding of

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1 the issue. And also during that period of time we
2 would get input from other industry representatives
3 through posting the document on the Nustart web site
4 and also contacting hydrologists within the nuclear
5 plants.

6 We started this process in September of
7 2008, and at that time we probably started with
8 about five pages of RAIs. And over the period of
9 different meetings we ended up with 28 pages of RAIs
10 that were resolved.

11 MEMBER POWERS: Is that all? Gosh, I'm
12 disappointed.

13 MR. ANDERSON: It was a small font.

14 CHAIRMAN RYAN: Two sided.

15 MR. SMITH: And I would mention we would
16 have draft documents that we were, you know,
17 discussing at the meetings to see if we were
18 resolving the issues related to the RAI.

19 I'll give a couple of examples of RAIs
20 in the different topic areas that kind of correspond
21 to the format of the NEI-08-08 document.

22 And I'll jump back and forth between the
23 comment and question and what the resolution to that
24 comment was, and I've reduced it to shorthand.

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1 One comment, and this is just an example
2 of some of the ones we dealt with, a comment related
3 to the use of reference documents. And that was in
4 particular related to how did the template plan to
5 implement 07-07? What parts of 07-07 were
6 applicable? And also use of the EPRI document and
7 how does industry plan on using that. So we had
8 several discussions on how to clarify that within
9 the document and identified a specific section of
10 NEI-07-07 that applied to 08-08, and also how we
11 would use the EPRI document in implementing the
12 program.

13 MEMBER POWERS: Do you presume that
14 every member of NEI, every partner in the NEI
15 initiative is a member of EPRI?

16 MR. ANDERSON: Yes.

17 MEMBER POWERS: Is there any likelihood
18 of a counter example to that?

19 MR. SMITH: The document that we use is
20 a public document that was made available on the NRC
21 web site also.

22 MR. ANDERSON: Yes, EPRI did release it
23 as a public document. So you can actually download
24 it from the public document room.

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1 MR. SMITH: The second issue related to
2 when the COL applicant site-specific will be
3 provided. Throughout the document there is certain
4 information that will be provided at a later date.
5 And that is tied into the radiation protection fuel
6 load milestone, which ties into the FSAR section for
7 the COL which gives it a hard date of when the
8 entire program would be available.

9 Facility contamination, we had a
10 question/comment related to movement of radioactive
11 material. And for resolving that, you know, we
12 tried to identify what existing programs are already
13 available at the site that would take care of that
14 type of item. And in this case, we refer to the
15 radiation protection program that a plant would have
16 on site that controls movement of radioactive
17 material outside areas, how you handle moving things
18 between clean areas and, you know, moving around
19 things on your site. But we were trying to
20 emphasize that, you know, we have existing programs,
21 radiation protection maintenance, that would relied
22 upon to implement parts of this documents.

23 CHAIRMAN RYAN: Could I just ask one
24 little question here?

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1 MR. SMITH: Yes, sir.

2 CHAIRMAN RYAN: One of the definitions
3 that you have is "radiologically significant." It's
4 on page 15 of the -- I think I've got the most
5 current version, May 2009. And it's "Unless already
6 defined in the application or licensing basis
7 document, this term refers to the presence of
8 radioactive material at levels which could result in
9 radiation exposures and doses in excess of 10 CFR
10 part 20 requirements for workers and members of the
11 public, or in excess of liquid or airborne effluent
12 concentration limits and releases to sewers under
13 Appendix B to part 20."

14 I'm curious where you think that bar is.
15 You know, I would think that if -- let's say for
16 example you have a spill that doesn't trigger either
17 of those results, is it okay to just leave it?

18 MR. SMITH: No, we --

19 CHAIRMAN RYAN: All right. Help me
20 understand, you know, on the context of where you
21 are in the slides here how that definition works.

22 MR. SMITH: We were actually trying to
23 be consistent with the Reg at 4.21 and how they
24 defined that. And we took that definition out of

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1 the Reg Guide in that section. But that is a pretty
2 high bar and we would expect --

3 CHAIRMAN RYAN: It's a very high bar,
4 yes. Is it by rem per year, or, you know, a 100
5 millirem per year at the boundary?

6 MR. ANDERSON: Given that the limit is
7 100 and that the concentration criteria in theory
8 equate to 50, of course there's a lot of
9 conservative assumptions built into that, it doesn't
10 define the line between action and no action. It
11 defines the line between action and significant
12 action. So I'll I'm trying to say is, in the way
13 it's used in either Reg Guide 4.21 or the way it's
14 used in NEI-08-08, is it meant to imply in any way
15 that it's not important? That's not it at all.
16 It's that there are explicit additional actions that
17 you would need to take if you have a radiological
18 significant issue. Because in effect you're in the
19 space of needing to assure compliance with the
20 regulatory limits.

21 CHAIRMAN RYAN: Yes, in a couple of
22 those it required notifications and all the rest.

23 MR. ANDERSON: Yes.

24 CHAIRMAN RYAN: So I guess --

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1 MR. ANDERSON: So, it's merely trying to
2 delineate where your discretion stops and where your
3 required actions begin.

4 CHAIRMAN RYAN: That would be nice to
5 say that. Because I think radiologically
6 significant in just sort of a generic way occurs a
7 whole lot lower than those bars, in my mind.

8 MR. ANDERSON: Okay.

9 CHAIRMAN RYAN: And, you know, I'm going
10 to back to Dana's example. If you think about ALARA
11 in the plant, and now we're trying to develop
12 something that is at least a cousin to ALARA outside
13 the plant. ALARA in the plant is if you spill
14 something clean it up, period. You know, you're
15 trying to keep worker dose low. And I recognize,
16 you know, in the template you've got all that. But
17 when you say "radiologically significant" as a
18 definition without any further clarification, it is
19 subject to potential misinterpretation by folks that
20 haven't been through the process in as much detail
21 as you have.

22 MR. SMITH: And it was also mentioned in
23 the containment and some other actions that you take
24 related to minimization of the leaks.

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1 CHAIRMAN RYAN: Sure.

2 MR. SMITH: And not just in the context
3 of any spill that you had.

4 CHAIRMAN RYAN: Okay.

5 MR. SMITH: And no action.

6 CHAIRMAN RYAN: Thank you.

7 MR. SMITH: Environmental
8 contamination --

9 MR. ANDERSON: Before you leave the
10 point, I just wanted to reinforce additionally what
11 William said. On page 6 of Reg Guide 4.21 is where
12 the NRC offers that definition. So in effect, we
13 were just trying to incorporate that into the --

14 CHAIRMAN RYAN: Yes, but it wouldn't
15 hurt to give the additional insights that you've
16 offered here as part of that.

17 MR. ANDERSON: Yes, your point is well
18 taken.

19 CHAIRMAN RYAN: Yes.

20 MR. SMITH: In the area of environmental
21 contamination, the comment was relative to the
22 periodic reviews of site conceptual models based on
23 substantial changes. And within that context we
24 included a note that the professional

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1 geologists/hydrologists familiar with the site would
2 make the call on what's considered substantial
3 relative to when you need to update a site
4 conceptual model for the site.

5 MR. ANDERSON: An example of this would
6 be if you're going to build a paved area on the
7 site. Should that cause you to update your site
8 conceptual model, then the answer is, is that
9 whoever your subject matter expert on that -- if
10 you're required to evaluate that and make that
11 determination.

12 CHAIRMAN RYAN: One of the things that I
13 think is really a good opportunity is the tritium
14 task force work that was done in a pretty
15 comprehensive way and a relatively, you know, sharp
16 order to look at a wide variety of plants and all
17 sorts of geohydrologic settings. You know, and
18 many, I think at least some utilities have posted
19 those geohydrologic reports on their web sites. You
20 know, all the technical detail. So, I mean, that's
21 a place where there's a real learning opportunity to
22 say, well, we did this one in a big hurry. Now that
23 we've got, you know, some time on the front end to
24 think, well, what are we going to do, you know, to

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1 get ready so that that's our end product? But we
2 don't have to do it in, you know, 20-hour days for
3 months on end, that kind of thing.

4 Could you talk a little bit about how
5 that tritium task force --

6 MR. ANDERSON: Well, the initiative
7 itself was born out of two workshops. They were
8 public workshops. But what the effect of the
9 initiative has been is actually to create a
10 collaborative network across the industry of site
11 hydrologists, of effluence and environmental
12 monitoring types that have health physicists linked
13 directly to senior industry management, because it
14 is an initiative. And we actually have periodic
15 conference calls and an annual workshop in which
16 there is a tremendous amount of information sharing.

17 But a key is, is within that are the simple thing
18 of emails and phone numbers. So it's been very easy
19 and we've seen quite a bit of where people just cast
20 out and say, hey, here's the situation I'm looking
21 at. Is anyone else has been in this same space?
22 What did you do, or what did you think? So there
23 really is already a tremendous amount of information
24 sharing created under this tent of the Groundwater

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1 Protection Initiative. So you kind of see this
2 interaction on an ongoing basis where people catch a
3 good idea from somebody else and then take it back
4 and apply it within their own program.

5 Additionally, EPRI really is carrying
6 forward what I would call the technical shared
7 resource via the guidelines document, which they are
8 committed to update. Each year when we have the
9 annual workshop one of the questions following the
10 workshop is have we heard or seen things that would
11 cause us to update the technical guidelines? So for
12 instance, this year when we have our meeting in
13 September, the day of the meeting is devoted to that
14 purpose with an expert group to say, well, given
15 what we've heard should we be thinking about making
16 updates in the guidelines going into the next year?

17 And probably we will, because we have acquired now
18 some additional experience. But that becomes sort
19 of the after-the-fact capturing of information in
20 case somebody missed in the real time interactions
21 that we have. But there is a very concerted effort
22 to make sure that we're doing a lot of information
23 sharing along those lines between the hydrologists
24 as well as the environmental and effluent

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1 specialists.

2 MEMBER POWERS: It always stuns me how
3 useful what you're describing really is. We saw
4 this in the fire protection area. Just getting the
5 guys that have to do the job together to exchange
6 information on, well, I ran into this problem.
7 Here's what I did. What are you thinking? Oh, my
8 God, I've got to do that sort of thing is just
9 amazingly helpful.

10 MR. ANDERSON: Yes, what we found is
11 that, and I would suppose this is true in any
12 topical area, is you have your bell curve of leaders
13 and followers. What we've aimed our assessment
14 process at is finding the followers and help them
15 get to the front of the line, because our
16 communication is directly with the industry chief
17 nuclear officer. So that's the only probably
18 difference we have since we're doing this under an
19 initiative. We can skip all the layers of
20 management and go right to the top. They created it
21 they own it. That's what's good. The initiative
22 itself came out of a group of senior executives, not
23 the technical people, that said we need to get our
24 hands around this. So at least so far it's created

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1 that opportunity to carry concerns pretty high
2 pretty fast.

3 MEMBER POWERS: Interesting.

4 MR. ANDERSON: And ultimately though
5 you're still left with it's up to the licensee, the
6 company to decide whether they're going to do it or
7 not.

8 MEMBER POWERS: Well, I still think
9 that's just an awfully good thing to do, because
10 some of these things that sound trivial, there are
11 good ways to do them and there are bad ways to do
12 them. Not everybody sees the good way first thing
13 out of the box.

14 MR. ANDERSON: I agree.

15 MEMBER BLEY: I'm going to take you back
16 to your little brief discussion on "substantial."
17 It seems a little interesting to me that --

18 CHAIRMAN RYAN: You mean "significant?"
19 "Radiologically significant?"

20 MEMBER BLEY: No, no, I don't. What I
21 was going to say, it seems a little interesting to
22 me that we had a definition for "radiologically
23 significant." For "substantial" changes, which key
24 when the hydrology gets updated, there's not only no

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1 definition, I don't see anything along the lines of
2 what you said, leaving it up to the expert who's
3 doing an evaluation. And I don't see anything in
4 the NRC guidance either about this. It just is a
5 floating word there that doesn't seem defined
6 anywhere.

7 MR. SMITH: Well, on page 11 when it
8 talks about the periodic reviews, and you have
9 certain things that take place, substantial on-site
10 construction.

11 MEMBER BLEY: Yes.

12 MR. SMITH: Substantial to serve site
13 property.

14 MEMBER BLEY: Right.

15 MR. SMITH: And then the note after
16 that, what I was referring to, that the professional
17 familiar with the site would help in that
18 determination on substantial. So, no, we could not
19 find substantial for those different situations.

20 CHAIRMAN RYAN: Just so I can
21 understand, William, and maybe I can help a little
22 bit, I think that if that note is the emphasis of
23 this particular section, and these are given as
24 examples of substantial changes, then, you know, to

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1 me the real key point is you've got to have
2 professional geohydro science folks review the
3 changes. Now, I'm going to guess that if there are
4 construction activities, let's say anywhere on the
5 site, I would suspect there might be a process where
6 even though, let's say we're putting in a new
7 sidewalk from building A to B, that might be
8 something that you hydrologists can look at in two
9 seconds and decide that's not a substantive change
10 or a substantial change. But there would be some
11 review process for almost anything except trivial
12 construction activities, let's say.

13 So the emphasis to me, Dennis, and
14 you're pointing out a good point, it ought to be on
15 -- that's the requirement is that they're reviewed,
16 not what the examples might be.

17 MEMBER BLEY: No, that would click to
18 me, but the other one just seems --

19 CHAIRMAN RYAN: Yes.

20 MR. ANDERSON: To tell you the truth,
21 our desire was to actually have that in the
22 definitions. And what we found was, is because it's
23 so dependent on the specific situation, we actually
24 couldn't arrive at a definition that even half the

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1 people would agree with.

2 MEMBER BLEY: And that's just going to
3 be pretty hard to be consistent in implementation
4 later, doesn't it?

5 MR. SMITH: We think that there's
6 current programs on sites that have if you move any
7 earth on the site, you evaluate digging that up and
8 what type of effects you have on it. And the
9 thinking is, okay, when you're doing that, you also
10 have to consider are you digging up something? Are
11 you doing something that will affect the model?

12 MEMBER BLEY: That makes a lot of sense,
13 and what you said kind of clicks to that now, Ralph,
14 that if you have so much disagreement to come up
15 with a definition, then how is the staff going to be
16 convinced that there's anything approaching a
17 consistency in how this is applied. And I don't see
18 anything in the Interim Staff Guidance that
19 addresses this either.

20 MR. ANDERSON: Yes, I think what I would
21 offer is this: Having living through the evolution
22 of ALARA, as many of us did, we were challenged very
23 early in the beginning to figure out what a
24 significant change to a procedure or a design was.

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1 And it really took a lot of years of information
2 sharing to kind of hone down to what are fairly
3 standard. But one backstop that we did, especially
4 post-TMI with the Association of DHP Appraisal
5 Program, is we simply put in a global checkpoint for
6 the ALARA reviewer to review everything. I suspect
7 that's probably where we're going to need to go with
8 this.

9 MEMBER BLEY: That wouldn't surprise me.

10 MR. ANDERSON: It's that at least for
11 cognizance the person knows it's occurring. And if
12 they're the subject matter expert, ideally they
13 would recognize it and they'd want to say, hey, I
14 need to know more on that. But I honestly think
15 that there's a learning curve involved there to
16 start arriving at a common practice. I'm not sure
17 it's something we can define in advance. What we've
18 concluded so far is we can't define it any better
19 than it is right now until we gain some experience
20 with it.

21 MEMBER BLEY: Well, this idea Dana
22 brought up with the sharing of information, I don't
23 know how that will work on NRC's side, but the
24 sharing among inspectors and others might lead us

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1 there quickly. Go ahead. But that one's leaving me
2 a little unsatisfied, I guess.

3 MR. ANDERSON: You're not alone.

4 MR. SMITH: In the area of facility
5 decommissioning, clarify what the applicant is
6 evaluating related to plant release. And we
7 discussed in this area relative to you're doing your
8 groundwater monitoring, what are you comparing it
9 to? And if you're a new site that doesn't have any
10 historical releases, you actually don't have
11 anything to compare it to. And so we talk about,
12 okay, if you use five years worth of effluent data,
13 then you should be able to have some gauge of do you
14 have a problem with a leak that you're picking up in
15 your groundwater monitoring from that.

16 If it's at a place that you have an
17 existing site, you already know what your background
18 levels are. You know what problems you have with
19 tritium or what problems you have with other types
20 of release. So that if you had a spike in your
21 activity in your groundwater monitoring, you know
22 that you need to evaluate that area, which you
23 wouldn't have that same information at a new
24 facility such as a Belfonte that doesn't have an

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1 operating plant there.

2 Waste generation, we were challenged
3 with clarifying the periodic assessments for on-site
4 storage and also what the assessments would be
5 looking at relative to waste stored on site. And in
6 this area we resolved it by referencing that section
7 to the NRC 2008 32 risks related to on-site storage
8 and the corresponding EPRI document that gives
9 information on performing on-site storage
10 assessments.

11 In conclusion, I believe we worked
12 through some difficult issues. We had several
13 meetings that involved a lot of industry people and
14 also NRC staff, and we did reach satisfactory
15 resolution to it. And the meetings were an
16 important part of this process. That's where we
17 could really face-to-face and talk about what it was
18 the other was looking for. And during this last
19 template, I think we improved the time line for
20 finalizing the template also by going through this
21 process of having the RAIs and the drafts and
22 working through that before submitting the final
23 revision to it. And we also believe that the NEI-
24 08-08 is in alignment with the NRC through the

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1 meetings that we had and the issues that we resolved
2 related to it.

3 CHAIRMAN RYAN: Thank you, William.

4 MR. SMITH: That's all I have.

5 CHAIRMAN RYAN: Any questions? Jack?

6 No?

7 Dana, anything else?

8 Dennis?

9 MEMBER BLEY: No more.

10 CHAIRMAN RYAN: Okay. All righty.

11 Tim, I will leave it to you perhaps to
12 -- and we've got a scheduled break at 3:10.

13 MR. FRYE: Okay.

14 CHAIRMAN RYAN: So I will leave it to
15 you and your team, bridge that 3:10. So I'll leave
16 it to you when you have a good stopping place.

17 MR. FRYE: 3:10? Okay. Yes, we might
18 be done by then.

19 CHAIRMAN RYAN: Yes, why not?

20 MR. FRYE: It's possible. All right.
21 Yes, we'll certainly figure out something about
22 that.

23 So, as I mentioned earlier, Ed Roach and
24 Dr. Ahn will be leading the discussion of the

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1 staff's review of any NEI-08-08 and the development
2 of the Interim Staff Guidance.

3 So, go to the next slide, please. This
4 is the purpose of the briefing and I think I covered
5 this up front in the introduction, so I don't think
6 there are any surprises there.

7 One thing I wanted to point out was the
8 substantial interoffice support that we received for
9 this. The NRO health physics branch did have the
10 lead for implementing 20.1406 for new reactors.
11 However, many other technical branches in the Office
12 of New Reactors and several other program offices
13 have provided tremendous support to us in this staff
14 review of NEI-08-08 and the development of the ISG.

15 And most of these organizations are listed here.
16 For example, the health physics staff has worked
17 closely with other NRO technical branches such as
18 hydrology, balance of plant, component integrity and
19 ventilation.

20 We've also worked closely with NRR and
21 FSME to make sure that the licensing guidance that
22 we're using for new reactors is consistent with the
23 power reactor fleet. That's very important to us,
24 because hopefully several of these plants will

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1 become operating reactors eventually and we want to
2 make sure, you know, for example, North Anna I and
3 II have a program -- that's Groundwater Protection
4 Initiative, Ed, and North Anna III is being licensed
5 against -- you know, we're doing that review. And
6 so in the end those two programs need to be as
7 consistent as possible, if not the same program.

8 And finally --

9 MEMBER POWERS: So you will give up the
10 possibility of having a better program at a --

11 MR. FRYE: Well, I don't think it's
12 going to be a better program. You know, I don't
13 think this is the meeting to get into it, but as I'm
14 sure you're aware there's new rule making,
15 20.1406(c), which applies this regulation to the
16 operating fleet. And as you heard, we have built
17 Reg Guide 4.21 and these other guidance documents
18 off of the operating reactor experience, off of
19 their Groundwater Protection Initiative. And so I
20 don't think -- our goal isn't for it to be better.
21 It's our goal for it to be consistent.

22 MEMBER POWERS: Yes, your goal is to be
23 consistent.

24 MR. FRYE: Right.

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1 MEMBER POWERS: And I'm saying if you're
2 going to enslave yourself to consistency, you're
3 giving up the option of having superiority in the
4 new program. And I'm just wondering why.

5 MR. FRYE: No, I don't think we're
6 giving up the option of superiority because, as I
7 said, we have developed a program that we feel we
8 need for new reactors, you know, the Reg Guide 4.21.

9 And as these power reactors, you know, there wasn't
10 a regulation for them. There was an industry
11 voluntarily initiative to develop a groundwater
12 protection initiative. So we're not looking to
13 compromising our program. The operating reactor
14 program is very robust and they're very close.
15 We've been working to keep them close. And, you
16 know, our goal is to be as consistent as we can.
17 But I can't think of any instance where we have
18 compromised on our guidance to be in line with the
19 operating reactor fleet.

20 MR. ROACH: I think a better term would
21 be "coordinated" with the operating reactor fleet.
22 So we've tracked what's happened with 10 CFR
23 20.1406, the Reg Guide 4.22 that's in development,
24 and make sure they understand where we're taking new

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1 reactors so at some point they'll all be operating
2 reactors and we'll have to make sure that the
3 guidance is the right guidance to be implemented.
4 And for us, what we saw -- or there's two facets to
5 it. One is the design aspect, so the certified
6 design. And the other part is the operational
7 programs that Ralph laid out the template for under
8 NEI-08-08. So between those two pieces, we take the
9 operating experience lessons learned, and some of
10 that is near-term from most recent operating
11 experience that's been in the NRC, within the last
12 month or so, and looked at that in the course of our
13 reviews to make sure we address these issues. So I
14 think we're timely and we're on top of the guidance
15 we should have.

16 MR. FRYE: Okay. So and the last
17 program office that we have worked very closely with
18 is Office of Research. They had the lead for
19 developing Reg Guide 4.21 which forms the basis
20 again for a lot of these design features and
21 operating programs that can be used to demonstrate
22 compliance with 20.1406, and they did a wonderful
23 job. I think, you know, it's a very good reg guide
24 that was prepared and issued very quickly. And what

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1 you're going to hear is some of the additional
2 guidance documents that we had to develop to help
3 the staff and the industry to implement, use that
4 reg guide.

5 CHAIRMAN RYAN: One of the challenges,
6 if I may, Tim, that I think is very important to
7 sort of have a common understanding of is the fact
8 that groundwater models of anywhere are never
9 static.

10 MR. FRYE: Oh, right.

11 CHAIRMAN RYAN: They always evolve and
12 improve over time. And so, you know, if you've got
13 five years of data for a plant that, you know, is
14 involved in the groundwater protection program and
15 then you have a new plant coming on line or a
16 conceptual model for a new plant site, you know,
17 both of those are going to go through evolutions.
18 And I think the challenge is, and correct me if you
19 don't agree, the challenge is how do you have the
20 all moving toward improvement over time, or getting
21 to be a more realistic representation of what's
22 there over time?

23 MR. FRYE: Right. I think that's
24 clearly --

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1 CHAIRMAN RYAN: No matter what stage
2 they're in.

3 MR. FRYE: That's clearly laid out in
4 the NEI-08-08.

5 CHAIRMAN RYAN: Yes.

6 MR. FRYE: And I know it's part of NEI-
7 07-07. I can't speak for the industry, but, you
8 know, whether they want to enhance some of the
9 review and enhance some of the guidance that's in
10 07-07 to better align with 08-08, I don't know if
11 that's necessary, but, you know, one of the
12 things --

13 CHAIRMAN RYAN: Well hopefully the
14 endpoints converge even if they're not, you know,
15 intentionally aligned in some specific language or
16 way.

17 MR. FRYE: But there's a lot of good
18 language in 08-08 about the need to continuously be
19 evaluating on some periodic basis your structure
20 systems and components, and your site hydrology to
21 look for the changes in the environment that could
22 affect the groundwater.

23 CHAIRMAN RYAN: And maybe you'll touch
24 on this later in the presentations this afternoon,

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1 but the next part is, okay, let's assume we all
2 agree and things are on the right track. What's the
3 inspection plan for those kind of things? How are
4 you going to --

5 MR. FRYE: Yes, well, that's a good
6 question.

7 CHAIRMAN RYAN: Okay. You don't have to
8 jump on it right now. I don't want to get --

9 MR. FRYE: Yes, if that's not called out
10 specifically in some of the end slides, we'll make
11 sure we make it, because that's a big part of how we
12 go forward.

13 CHAIRMAN RYAN: Okay.

14 MR. FRYE: Yes.

15 CHAIRMAN RYAN: All right. Thank you.
16 Sorry to interrupt.

17 MR. FRYE: That's fine. So next slide,
18 please? Okay. So Ralph covered a lot of this and
19 I'm just going to go through real quickly and
20 highlight some of the key things just to elaborate
21 on what Ralph mentioned.

22 So, he mentioned the regulation,
23 20.1406, that it does come from the License
24 Termination Rule.

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1 CHAIRMAN RYAN: And just for clarity
2 sake, the License Termination Rule applies to all
3 licenses, not just for --

4 MR. FRYE: Right. Yes, right. That's a
5 very good point.

6 So, and it applies to all applicants for
7 a license submitted after August 1997. And Ralph
8 also mentioned the two significant events that
9 happened about three years ago that were really the
10 catalyst for much of this work. And, you know, they
11 were the identification about three years of several
12 significant events at several operating power
13 reactors, mainly Braidwood and Indian Point, that
14 highlighted the occurrence of significant spills and
15 leaks that had caused site and environmental
16 contamination. So that was a significant event for
17 many reasons. And as Ralph mentioned, the Agency
18 initiated a liquid radioactive release lessons
19 learned task force, which I was actually part of.

20 CHAIRMAN RYAN: Did those significant
21 events meet this criteria and the definition on page
22 15?

23 MR. ROACH: For significant radiological
24 impact?

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1 CHAIRMAN RYAN: Yes.

2 MR. ROACH: No.

3 CHAIRMAN RYAN: No?

4 MR. ROACH: No.

5 CHAIRMAN RYAN: Okay. Just wanted to
6 make that point.

7 MEMBER SIEBER: They were significant.

8 CHAIRMAN RYAN: It was significant, but
9 not by that definition.

10 MR. FRYE: Right.

11 CHAIRMAN RYAN: Okay.

12 MR. FRYE: Right. And then of course
13 the NEI voluntarily initiative 07-07, Groundwater
14 Protection Initiative, and Ralph described the
15 genesis of that.

16 And then about the same time as that was
17 all occurring, and I think Ralph also quickly
18 mentioned, we realized that we had this regulation
19 and we didn't have any regulatory guidance on how an
20 applicant could demonstrate compliance with the
21 regulation. So that was a tough situation to be in.

22 And so again we worked with research quite a bit
23 and a lot of our other program offices and branches
24 within Office of New Reactors and research prepared

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1 and issued Reg Guide 4.21 June 2008, a very good reg
2 guide.

3 And so the next slide, I guess. So we
4 had those documents and as we were developing Reg
5 Guide 4.21 we quickly realized that demonstrating
6 compliance with 20.1406 and using Reg Guide 4.21
7 goes well beyond the expertise that the health
8 physics branch has. You know, it's not just rad
9 waste processing systems. It's numerous system
10 structures and components that carry or are involved
11 in handling radioactive effluents. And so realizing
12 that we needed to get the rest of the Office of New
13 Reactors involved, Ed took the lead over the last
14 couple of years to develop substantial awareness
15 training for other technical branches in the Office
16 of New Reactors to explain to them the regulation,
17 the Reg Guide, what we need them to look at to
18 support our review of DCDs and COLs.

19 And that was good because we got a lot
20 of good feedback from that identifying that, okay,
21 you have a Reg Guide 4.21, but that's not enough
22 guidance. You know, we had talked with again
23 balance of plant and component integrity and
24 hydrology, and you know, they quickly identified,

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1 well, we don't have enough guidance to know that
2 system structures and components should fall under
3 the scope of this and what is acceptable. I mean,
4 what is the right level? What is an acceptable
5 level of design and operating programs to meet the
6 intent of the regulation?

7 So that was excellent feedback that we
8 got from our technical staff. And that led to the
9 development of the Interim Staff Guidance-006. So
10 that is how that ISG will fit into our licensing
11 review. And Ed's going to talk about that later.
12 But that is to provide guidance not only to your
13 staff, but the industry as to what we're looking for
14 in an application and what's acceptable. And again,
15 it's to supplement the Reg Guide 4.21. But again,
16 it's interim staff guidance until we can formalize
17 that guidance.

18 And then the last thing which Ralph
19 mentioned and William Smith is that the industry
20 recognized that Reg Guide 4.21 was a good document,
21 but there would be value in developing consistent
22 and standard, and generic operating program
23 requirements that all COL applicants could commit
24 to. So that part of our licensing process is that

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1 we need to have a sufficient level of operating
2 program description in a COL to draw a reasonable
3 assurance of safety conclusion. And so the industry
4 saw that there would be benefit in developing 08-08
5 to ensure every COL applicant knew what the level of
6 detail for the operating program was that we were
7 looking for, and so we supported that. And so we
8 all, as an industry document, we are reviewing it,
9 writing a safety evaluation so it can then be
10 referenced in the COL applications.

11 Next slide?

12 MR. ROACH: Okay. I think is where --

13 MR. FRYE: With that I think, yes, I can
14 turn it over to you.

15 MR. ROACH: Good afternoon. I'm Ed and
16 I'm happy be here today and talk about NEI-08-08 and
17 some of the review issues that we came across in the
18 course of the interactions with NEI and the industry
19 in getting to a standard approach to implementing
20 the guidance of Reg Guide 4.21 and the regulation.

21 One of the things I'd highlight first is
22 the key issues that we discussed in our public
23 meetings in the NEI template. And the first one
24 would be the design features. And we looked at, I

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1 think our early attempts or the early attempts at
2 NEI-08-08 tried to drag all the design features and
3 design guidance into this template that would be for
4 COL applicants. And it was very difficult and we
5 weren't making much headway in that case. And so,
6 it became clear that reality was design features
7 need to be addressed within the design certification
8 process. And the RAI process for designs and this
9 template in meeting Reg Guide 4.21 for COL
10 applicants should describe the operating programs or
11 procedures for operation and address the site-
12 specific design features, because there are features
13 for each design and I think Ralph mentioned earlier
14 the liquid waste discharge piping that will be
15 specific to each site. And so, the COL applicant
16 does have some responsibility describing those
17 features. And so, the design features guidance came
18 down to address the site-specific design features
19 and then recognize which design features the
20 designer had built in and then what operating
21 programs you need to put in place to minimize the
22 release of contamination.

23 Probably this is a good point to take
24 the segue on the design, how we've handled design,

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1 if that would be all right. That question came up
2 earlier.

3 For each of the designs that are in
4 house under review, AP1000 ESPWR, USAPWR and EPR,
5 we've submitted an RAI under that process which
6 asked each of those applicants to fully describe
7 their design features which meet 20.1406. It was a
8 pretty complicated RAI with numerous sections that
9 describe the typical systems to consider and we
10 expected those to respond with that, and there's
11 been subsequent RAIs related to that. So, in the
12 overview, our design features, we asked each of
13 those applicants to describe that. Earlier
14 Westinghouse came with a technical report, TR98,
15 into the previous ACNW meeting, and so we asked them
16 that question after that. They reiterated some of
17 that, added additional information. So there's been
18 an ongoing dialogue in the DCD process for the
19 design features related to 20.1406.

20 MEMBER BLEY: Do you have other examples
21 of what's been submitted with the certifications?
22 And is that going as you expected? Are you getting
23 as much information as you --

24 MR. ROACH: Actually, I would describe

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1 it as each application comes in, certification
2 application, there's a learning curve in the design-
3 centered working groups. I believe they've learned
4 lessons from what the previous -- so the quality of
5 those areas addressing 20.1406 have improved, gotten
6 more detailed. Again, there's many design features
7 that you can take credit for in a plant for
8 minimizing contamination of the site, the facility,
9 the environment.

10 MEMBER BLEY: Is it leading to some
11 changes in design with those RAIs?

12 MR. ROACH: Actually, I think there are
13 some examples of that, yes.

14 MEMBER BLEY: Can you give us any?

15 MR. ROACH: I will say within the
16 AP1000, the one I'm most familiar with, the
17 questions led to your discharge pipe, the
18 description in the FSAR in chapter 11 for liquid
19 waste discharge system. It goes into where your
20 cooling tower blowdown is and then discharges. And
21 the question is, what are you going to do if it goes
22 there and then you have a leak downstream from that?
23 You still have the same issues with the groundwater
24 contamination, whether it's in the double-walled

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1 pipe or it's downstream. And so, their commitment
2 was to either have it in a vaulted chase or double-
3 walled pipe until the point of discharge to the
4 ultimate body of water.

5 MR. FRYE: Yes, let me just add to that,
6 Ed.

7 With the timing of when we realized that
8 we needed regulatory guidance, some applications,
9 some DCD applications were in-house already and
10 others were, you know, within six months of being
11 submitted. So we talked very closely with NEI and
12 the industry and we agreed that, you know, without
13 guidance you can't fully address this regulation.
14 So, if you put a placeholder in there, then that
15 will be acceptable for us for acceptance of the
16 application, because then we know that you are aware
17 of and you've addressed the regulation. And then as
18 we develop all this stuff, we will expect you to
19 revise your application. So, because of that, you
20 know, none of the applications really have addressed
21 either DCD or COL, especially the reference COLs,
22 compliance with 20.1406 and the Reg Guide.

23 Now, some of the later ones, EPR, for
24 example, we're able to do a better job because we

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1 had a draft Reg Guide 4.21 out at the streets when
2 they were a little bit later down the road. So they
3 were able to do a better job.

4 MEMBER BLEY: On the COLs that haven't
5 addressed it, is it being deferred to ITAAC or are
6 they going to have to finish that?

7 MR. FRYE: No, it's not ITAAC.

8 MEMBER BLEY: So they're going to have
9 to finish that before they get to COL?

10 MR. FRYE: Right. Yes, right now these
11 are all open items. So when you hear SER briefs
12 later in July and we discuss chapter 11 and chapter
13 12, you'll be hearing a lot about open items.

14 MEMBER BLEY: Okay.

15 MR. FRYE: So what we did as we had
16 these applications that just had placeholders and we
17 realized that the health physics branch was really
18 the only branch -- I mean, we have responsibility
19 for this program, but we need to get the rest of the
20 office involved. So we took the lead, we took the
21 initiative to write the initial RAIs for every
22 application, because we knew the most about it. So
23 they were broad comprehensive, everything we could
24 think of, just to get it on the table for what we

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1 understood at the time. And those went to the DCDs
2 and the reference COLs probably a year-and-a-half
3 ago, if not two years ago. And we were starting to
4 get RAI response in, and so we were reviewing those.

5 Now, to get your question about the need
6 to redesign the plants, one of the things that we
7 discussed with the industry and we also discussed
8 with your technical staff was, you know, they were
9 concerned that in a lot of cases they had already
10 done their technical reviews for a lot of these
11 certified designs. And so, you know, this new
12 review, is there, you know, new features in it? And
13 I think we realized up front that all of these
14 plants have taken the same operating experience that
15 we're looking at and have applied it. You know, all
16 these designs have taken decommissioning operating
17 experience. And so, we expect for the most part
18 that design features are there for other reasons
19 possibly and that we just need to re-review them and
20 the applicant needs to repackage them to demonstrate
21 how not only were they done for another regulation,
22 but now they also meet this regulation. So, we
23 don't expect a lot of design review; there could be
24 some.

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1 And then of course that was how we
2 explained it to our technical review staff. You
3 know, while we don't have good, you know, review
4 guidance in the standard review plan, and we're
5 working on it, that it's really just re-reviewing
6 what you've already done with a different mind set
7 for compliance with a different regulation. So, you
8 know, that is where we're at with the DCD reviews
9 that we're doing right now. And we haven't gotten
10 to the RCOL reviews yet because we're still
11 reviewing the NEI-08-08. And actually I think the
12 RCOLs need to wait to see what the DCDs have done,
13 obviously. So that's where we're at, I think, for
14 some of those questions.

15 MR. ROACH: Yes, the other point to make
16 is that in the RCOLs several of them have taken, in
17 a response to the RAI related to 20-1406 compliance,
18 have committed to meeting the guidance or adopting
19 the NEI-08-08 template. In the case of the AP1000
20 there were specific monitoring well locations to be
21 installed and there wasn't a lot of additional
22 detail to go with that.

23 CHAIRMAN RYAN: Did they give you a
24 basis why they chose these points?

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1 MR. ROACH: Those were actually COL
2 items, information items from the DCD.

3 CHAIRMAN RYAN: Oh, okay.

4 MR. ROACH: But because they were close
5 to the nearest likely source of groundwater
6 contamination, a source in the plant.

7 CHAIRMAN RYAN: As built?

8 MR. ROACH: As built. As built.

9 CHAIRMAN RYAN: Okay.

10 MR. ROACH: But they were relative
11 references. However, that's all they said about it,
12 so there wasn't sufficient --

13 CHAIRMAN RYAN: Yes, and I realize it's
14 hard for them for give you much more at this point,
15 but in a way that's something that could evolve over
16 time.

17 MR. ROACH: Yes. Yes.

18 CHAIRMAN RYAN: The example you gave, if
19 you don't have a double-wall pipe or a pipe inside a
20 culvert kind of thing, one or the other might be a
21 better choice for a given site based on how it's
22 constructed, for example.

23 MR. ROACH: Right. If you have a --

24 CHAIRMAN RYAN: Or, you know, one can be

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1 just as good based on the geohydrology. So that's
2 an interesting example. And a lot of those are very
3 site-specific.

4 MR. ROACH: And that I think was the
5 additional challenge we ran into with recognizing
6 the DCD design. It's an envelope and then you put
7 on the specific site. And then how does that system
8 interact with the geohydrology and the bodies of
9 water, and water intake, water outflow.

10 CHAIRMAN RYAN: Okay.

11 MR. ROACH: Okay. Thanks, Tim.

12 As we said, NEI-08-08 proposed a
13 standardized program to describe how a COL applicant
14 would meet Reg Guide 4.21 and comply with 20-
15 1406(a). Specifically, the industry intended to
16 address these regulatory concepts of Reg Guide 4.21.
17 And so that is one of the features there. If
18 you'll notice, the NEI-08-08 aligns with the
19 sections of Reg Guide 4.21.

20 One of the other staff concerns we had,
21 as Tim alluded to earlier, was we wanted to ensure
22 that there was coordination of NEI-08-08 with the
23 existing operating reactor sites, NEI-07-07, the
24 voluntarily program, the EPRI technical report, and

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1 IE Bulletin 80-10, although dated. There are many
2 people who bear scars from that experience and know
3 the difficulties of inter-system contamination. And
4 that is something that is occurring, review document
5 in the design process. Our key goal was for NEI-08-
6 08 to determine if adequate direction was provided
7 to implement the appropriate regulatory guidance.

8 I believe Ralph already hit this, as
9 well as William, but the major sections were
10 applicability and controls, minimizing facility
11 contamination, guides for minimizing contamination
12 of the environment, minimizing the generation of
13 waste and facilitation of decommissioning. And as I
14 said, they are aligned with Reg Guide 4.21.

15 What I'll do now is just go over each of
16 the sections where we had what we considered --

17 CHAIRMAN RYAN: What's your sense of the
18 alignment with this criteria in 4.21 that's the high
19 bar?

20 MR. ROACH: We wrestled with that. When
21 4.21 came out we wrestled with that. Just because
22 it could be dosed to an occupational worker, it
23 could be the dose to a member of the public of 100
24 millirem in a year. It could be two millirem in an

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1 hour.

2 CHAIRMAN RYAN: I'm still struggling a
3 little bit with the fact you've agreed that the bar
4 is actually bar any of those trip points.

5 MR. ROACH: The bar is aligned with
6 ALARA.

7 CHAIRMAN RYAN: It would be nice to say
8 that somewhere explicitly. I'll say it again. I
9 know I've said it twice. But I mean, that to me,
10 it's a standard of, you know, worker protection.
11 It's a standard of environmental protection. No
12 reason not to say it. I think. That's just my
13 opinion.

14 MR. ROACH: And actually there is one of
15 the questions there is on this page. Make sure we
16 captured the fact that early on this is an ALARA
17 concept and we view it as that in reviewing this,
18 when dealing with tritium.

19 One of our issues initially starting out
20 was we were inconsistent or NEI and the industry
21 were inconsistent in how they would use NEI-07-07
22 and the EPRI technical basis. So several of our
23 RAIs went around that and how we resolve that to get
24 it consistent throughout the document and those two

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1 documents become the technical basis for 08-08. And
2 the EPRI public document that we have access to
3 includes specific directions on wells, how to set
4 them up, monitoring, risk assessment for the
5 system's structures and components.

6 CHAIRMAN RYAN: And that's where I
7 applaud the linkage with your groundwater protection
8 task group work that the industry's been undertaking
9 on the tritium issues and the others. There's been
10 an awful lot of intensive work done and an awful lot
11 of very good geohydrologic evaluation done. And,
12 you know, I think Dr. Powers had the point that, you
13 know, that's a very fertile mine in which to
14 explore, because you can really from their
15 evaluation say, well, if I had it to do over again,
16 what would I do differently or how could I improve
17 the existing situation? So there's an awful lot of
18 good stuff in those reports to mine.

19 MR. ROACH: We have had members of our
20 staff attend the EPRI groundwater workshop.

21 CHAIRMAN RYAN: Right.

22 MR. ROACH: And we plan to have them
23 attend this year again. So we've just got to try to
24 stay tuned in and learn.

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1 MR. FRYE: Yes, I mean, we've been
2 working very closely with NRR. You know, for
3 example, Reg Guide 1.21 and Reg Guide 4.1, which I
4 think you heard about recently.

5 CHAIRMAN RYAN: Yes.

6 MR. FRYE: Which were updates that came
7 out of the Lessons Learned Task Force Report.

8 CHAIRMAN RYAN: Yes.

9 MR. FRYE: You know, we have a member of
10 our staff working side-by-side with NRR to help
11 develop and update those documents because we wanted
12 to make sure we understood what those programs were
13 going to be. Because again, our reactors eventually
14 will be responsible for implementing those programs.

15 CHAIRMAN RYAN: Sure. Okay.

16 MR. ROACH: Okay. The other area in the
17 introduction that we felt significant was the staff
18 had a concern that cost alone was not the
19 determining factor in implementing the ALARA
20 features. And in this case, the evaluation, that
21 needed to be stated more explicitly.

22 Next slide is applicability and
23 controls. The focus here was the RAIs that we were
24 engaged in, the design versus operating programs

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1 again. Site design and operating programs or
2 procedures for operation versus the design features
3 of the DCD. We discussed that several meetings and
4 ended up coming up with, I think, clarification
5 within 08-08 that captures that. Oh-eight-oh-eight
6 didn't address communication of off-site releases as
7 described in NEI-07-07, which is one of the items
8 out of the Lessons Learned Task Force. Currently in
9 the template is a note that says once plants become
10 operating, then we'll commit to the 07-07
11 voluntarily notification process, which the
12 threshold for that is much lower than significant
13 radiological impact.

14 Oh-eight-oh-eight needed to address
15 other mechanisms for release. We wanted to take a
16 more holistic look at contamination of the facility,
17 not just groundwater contamination, although that is
18 the main issue that we've wrestled with in NEI-07-07
19 and the industry. So we made sure that the other
20 aspects of how you can get contamination to the site
21 and the facility are addressed.

22 CHAIRMAN RYAN: Just a query on that
23 one. Do you consider things like -- and this is a
24 little bit outside of a design for a plant, but a

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1 lot of plants have rad waste service folks come in
2 that deal with resin or contaminated water and all
3 that. Do you deal with any of that, or is that
4 below the threshold?

5 MR. ROACH: Well actually, I think we
6 captured that within their radiation protection
7 program, because processors will come in and do a
8 campaign to do resin, say for a BWR to X number of
9 hits of resin. And otherwise, they'll bring in a
10 skid that we'll process.

11 CHAIRMAN RYAN: Sure.

12 MR. ROACH: A silica removal skid for
13 the spent fuel pool or a boron recycling skid or
14 something like that.

15 CHAIRMAN RYAN: Those are kind of
16 opportunities for, let's say spills --

17 MR. ROACH: Yes.

18 CHAIRMAN RYAN: -- on the surface that,
19 you know, if not tended. I'm just wondering if you
20 captured a little bit of guidance to say if you
21 have --

22 MR. ROACH: I believe in our discussions
23 we've captured guidance. Those fall under the
24 existing radiation protection program and in your

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1 work permits that when you form a process like that,
2 you have to look at those barriers that keep from
3 spilling that.

4 CHAIRMAN RYAN: You know, and nobody's
5 going to be careless in that regard, but I think the
6 question is if a spill does occur, that it is
7 captured in the same program for spill assessment as
8 anything else that's covered under this program.

9 MR. ROACH: Your records are maintained
10 in the 50.75(g) file.

11 CHAIRMAN RYAN: Right. And more
12 importantly something's done about them before it
13 gets to be a big headache.

14 MR. ROACH: Yes, that's correct.

15 And then the last item we negotiated or
16 discussed for a long period of time was about the
17 periodic evaluations of the site, the at-risk
18 systems or the structure systems and components, and
19 to make sure that there is a periodic reevaluation
20 of that.

21 CHAIRMAN RYAN: What period did you home
22 in on?

23 MR. ROACH: Well, it's actually -- each
24 site will set theirs, but it will be no -- I have to

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1 say, I stumbled over this earlier anyway, but it
2 will be not exceed five years. So a five year
3 period, you'll go back. But the words in the
4 guidance of NEI-08-08 deal with, you know, if there
5 are significant changes to the facility, aging of
6 structure and systems components. Your
7 infrastructure will age depending where you're
8 located at a faster rate or slower rate, if you're
9 near salt water.

10 CHAIRMAN RYAN: Sure.

11 MR. ROACH: Those are features to be
12 considered in that and we'll --

13 CHAIRMAN RYAN: Well then kind of a
14 maximum period with other features and factors being
15 accounted?

16 MR. ROACH: Would be five years.

17 CHAIRMAN RYAN: Yes. Okay. Thanks.

18 MR. ROACH: Sure. Minimizing facility
19 contamination. We've established the definition of
20 thresholds for credible mechanism and reasonably
21 expected discussion of examples for making inclusive
22 lists in SSCs in the document. We have a couple
23 references where we have tanks external to the
24 auxiliary building in contact with concrete. And we

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1 used different examples and we got to a close
2 alignment, but they're not perfect. They're not
3 intended to be all inclusive.

4 Inclusion of other programs with
5 responsibilities, we talked about four. And then
6 one of the keys from our perspective is when you
7 have a spill or a leak that you assess the cost and
8 the extent of condition when the material is
9 released and do what you can to identify how to
10 prevent recurrence. And whether it's an apparent
11 cause or a root cause evaluation depending on the
12 level and significance.

13 Okay. In minimizing contamination to
14 the environment, hydrology issues, Dr. Ahn attended
15 several of the meetings, along with his branch chief
16 Richard Raione. And actively several members of
17 their staff reviewed the document as it was evolving
18 and asked RAIs.

19 Guidance on the site conceptual model
20 use was one of our issues. How are they going to
21 use it? When is it going to be updated? The use of
22 the term "downgradient" when discussing monitoring
23 wells. Water doesn't always flow down hill, as some
24 of us know, as I've learned. And meaning of the

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1 term "site boundary" for contamination analysis and
2 clarify. The substantial change to hydrologic
3 conditions that we discussed earlier, we wrestled
4 with trying to get our hands around. We gave
5 examples of what would probably be substantial
6 changes, but we couldn't come up with a cohesive
7 definition of that.

8 CHAIRMAN RYAN: I'm still hanging on
9 that one.

10 MR. ROACH: Yes.

11 CHAIRMAN RYAN: How is that going to be
12 handled? Your inspectors who might follow the work
13 where the site's expert would make a decision
14 probably aren't hydrologists, so would they have a
15 good feel for whether the judgment was really solid?

16 MR. ROACH: Well, and I think that goes
17 to as we develop our construction inspection
18 program, our intent is to lay out what baseline
19 program looks like.

20 CHAIRMAN RYAN: Yes.

21 MR. ROACH: And between now and that
22 period when they implement that first milestone,
23 have our procedure for ongoing under the radiation
24 protection program established and give the examples

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1 and the standard format of an inspection procedure
2 for what are the typical -- what sites have seen.
3 We'll have enough examples I think by that point
4 from the operating fleet.

5 MR. FRYE: Yes, that's just what I was
6 going to say. You know, NRR, I believe, developed a
7 temporary instruction to inspect the implementation
8 of the groundwater protection initiative at all
9 sites. And so that's a great baseline for us to
10 develop our construction program, because the
11 objectives should be very similar. So, you know,
12 that will guide us in what we want to look at to
13 confirm that they've met their program commitments.

14 CHAIRMAN RYAN: It would be interesting
15 to think out loud for a minute about substantial
16 change near the feature, design feature and design
17 element, whatever it is as opposed to a change
18 somewhere downstream or sidestream, or wherever.
19 Because there's a number of different horizons where
20 changes in the structure can have a big change in
21 the geohydrologic environment. I'm seeing Ed
22 recognizing that. And how do you deal with that?

23 MR. ROACH: And I think that goes to the
24 heart of what Dr. Ahn and we wrestled with, is you

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1 could have a new development built for, you know, an
2 outlet mall built with a large well that takes a lot
3 of water out of the aquifer --

4 CHAIRMAN RYAN: There you go. Yes.
5 Okay.

6 MR. ROACH: -- and suddenly you've
7 substantially changed your hydrology of the site.

8 CHAIRMAN RYAN: Yes. Apart from your
9 own construction, yes.

10 MR. ROACH: I align it somewhat with the
11 emergency preparedness in that you have to be aware
12 of what's going around in the area around your site,
13 not just within the confines of the site boundary.
14 Because those things can have an impact on the
15 effectiveness of your program.

16 MEMBER BLEY: So if I understood you
17 right, you're going to develop guidance that will
18 work its way into the inspection program before we
19 get the first of these news plants coming through.

20 MR. FRYE: Well, just like any other
21 operating program, there are license conditions for
22 when they need to be established and ready, six to
23 12 months prior to fuel load, or whatever. And so
24 those commitments are in the combined license. And

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1 so we will be developing an inspection program along
2 with every other program we need to inspect with
3 ODCM, you know, RETS and REMP, ALARA.

4 MR. ROACH: Well, and the radiation
5 protection program. And this milestone -- yes, PCP,
6 process control program. So this milestone actually
7 is going to fall under the radiation protection
8 program for -- be implemented prior to fuel load.
9 So at that point you have to have the program, the
10 documents in place ready to go so we could assess
11 before you need to implement it. It's highly
12 unlikely you'd have either a low volume/high
13 activity or a high volume/low activity leak
14 occurring at that point that we wouldn't be able to
15 look at the quality of the program.

16 CHAIRMAN RYAN: And of course from the
17 fuel load there's a whole -- just for everybody's
18 benefit, a rigorous program to address just the
19 operation of the plant and you'll be looking at
20 waste systems and release points and all that stuff
21 as part of that.

22 MR. ROACH: Right.

23 CHAIRMAN RYAN: Right? Thank you.

24 MR. ROACH: And then the other item was,

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1 as we just talked about, the milestones for this
2 program coming into place and when it would be
3 implemented. That was one of our discussion points.

4 Dr. Ahn, did you want to add anything
5 relative to hydrologies?

6 DR. AHN: I think on NEI-08-08, page 11,
7 it describe what is the substantial change. There
8 are two component of the substantial change. One is
9 the structure design or construction change that
10 would impact on the groundwater region.

11 Second one is the water use or pumping
12 rate change. That is also change the groundwater
13 change. So those are good issues for the
14 substantial changes.

15 MR. ROACH: And as I wrestled with in
16 learning more about hydrology, I think the real
17 purpose of developing a conceptual site model is to
18 understand the fate and transport of the potential
19 groundwater contamination so that it can be used and
20 establish a monitoring plan for prompt detection and
21 remediation in the future event of leaks and spills.

22 It gives you a good idea of where things might go
23 and will help us in setting monitoring wells.

24 CHAIRMAN RYAN: Yes, I mean, that's

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1 quite frankly I think that (d), that one through
2 four, Dr. Ahn, is a pretty good list. I mean, it's
3 hard to envision something that doesn't fit into one
4 of those categories. So, that's a pretty good way
5 to think about it.

6 MR. ROACH: Under the topic of
7 minimizing degeneration of waste, our discussions
8 revolved around if plants are licensed, new reactors
9 are licensed, we've experienced, operating
10 experience-wise, replacement of major components and
11 some licensees have decided to store those
12 components on those site in a mausoleum or maintain
13 them. So we want them to look at how you will
14 remove that equipment thinking it will be replaced
15 at some point during the life of the facility and
16 how you will store it, and what the impact of that
17 is on potential impact for contamination.

18 The other item on this one was
19 assessment of the waste stored on site. And as
20 William alluded to, there's an EPRI guidance and
21 there's a risk that talks about on-site storage of
22 waste, which is kind of in the news right now, given
23 the Yucca Mountain and the Barnwell situations. So
24 they would have to assess safe storage of their

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1 radioactive materials and waste on their site in
2 accordance with those guidance.

3 CHAIRMAN RYAN: Okay. Thank you.

4 MR. ROACH: And the last word on that
5 line is establishing a waste management plan, all of
6 these facilities. We would expect to see them
7 having a plan for how they're going to manage both
8 large and Class A waste, and of course their
9 operation, because that affects decommissioning and
10 operating waste.

11 How we envision or I believe the
12 template could be used is that it provides a program
13 level description for COL applicants to implement a
14 program and the key aspects of that program that
15 they will have to implement prior to fuel load,
16 including procedures. If it's accepted by the
17 staff, the applicants can update the FSAR to
18 incorporate the program and it's milestone and that
19 would require a change to both chapter 12 in their
20 document, chapter 12 of the FSAR, and also chapter
21 13.4, which is the table license commitments.

22 We see this as a standard approach for
23 procedures for operations to meet the guidance and
24 assess the areas where is there is risk. And then

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1 they can put either additional monitoring or
2 additional surveillance, or possibly build a berm,
3 additional barriers to --

4 CHAIRMAN RYAN: Oh, prevent it?

5 MR. ROACH: Yes, prevent it. Yes.

6 CHAIRMAN RYAN: I think Ralph put that
7 very well. Not having the problem to track --

8 MR. ROACH: Yes, that's the best way to
9 do it.

10 CHAIRMAN RYAN: -- is the best way to
11 be, and prepared.

12 MEMBER POWERS: But you never succeed.

13 CHAIRMAN RYAN: Absolutely. So, and I
14 think as we've all said and agreed, that you have to
15 be prepared to do an effective job of monitoring and
16 mitigation if necessary. Of course.

17 MEMBER POWERS: You know, it's not our
18 job to design plants.

19 CHAIRMAN RYAN: Right.

20 MEMBER POWERS: But you got to design if
21 things screw up. One of the issues that's going to
22 get a lot more attention in the future is how do you
23 leak waste out as a result of natural hazards?

24 MR. ROACH: Oh, I didn't hear.

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1 CHAIRMAN RYAN: I'm sorry. Could you
2 repeat your comment?

3 MEMBER POWERS: Well, one of the issues
4 that going to get a lot of attention, especially in
5 the aftermath of the earthquake in Japan, is how
6 natural hazards lead to leaks into the groundwater.

7 I mean, it's coming and it's going to get a lot of
8 attention. And it's one that the public's going to
9 be extremely interested in.

10 MR. ROACH: As I mentioned at the
11 beginning of this, we can't overstate operating
12 experience.

13 MEMBER POWERS: We cannot overstate
14 operating experience.

15 MR. ROACH: And in our assessing this,
16 that's primarily what we've looked at. We've got
17 104 sites out there, 104 reactors out there, and
18 used the experience that they have to look at what
19 we need to do to help minimize that contamination.
20 And we currently review the daily events report
21 everyday to see what's in there and keep track of
22 that.

23 MEMBER POWERS: The trouble you run into
24 with the advanced plants of course is they don't

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1 look like the plants that we have now. And there's
2 a tendency to always assure that you never have the
3 events that the guy had before and then say I'm
4 done. There's an over-interpretation, an over
5 specificity in the interpretation of the past
6 experience.

7 MR. ROACH: Yes. Go ahead, doctor.

8 DR. AHN: Well, I have a response on
9 that scenario. On FSAR section 4.13, we postulate
10 extensive release scenario either by the -- or other
11 --, or the contamination go to the groundwater and
12 they put the transport to the receptor area. So I
13 think that is the most conservative bounding
14 extensive release. And any of the smaller leak or
15 spill, that may be below that even, so I think that
16 is covered on the extensive scenario.

17 MEMBER POWERS: Well, like large breaks
18 cut the contamination risk.

19 DR. AHN: Yes.

20 CHAIRMAN RYAN: This crowd is very
21 sensitive to the word "bounding."

22 MR. ROACH: If I use that word, smack
23 me.

24 Invariably one of the things that we see

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1 is there have been instances with the type of
2 material used in some of the components,
3 specifically underground piping. And that's where
4 we push out to the other technical branches, balance
5 of plant. To say, hey, you know, we've asked the
6 designers do you have underground piping containing
7 a radioactive material or could conceivably hold
8 radioactive material. Because ultimately if you
9 operate 30 to 40 years, there's probably a high
10 likelihood you'll have tritium.

11 CHAIRMAN RYAN: And my guess is balance
12 of plant is where a lot of the action is for your
13 particular issue. I mean, I would say it's there
14 rather than --

15 MR. ROACH: Yes.

16 CHAIRMAN RYAN: That's where the action
17 is.

18 MR. ROACH: They've got all the good
19 systems.

20 CHAIRMAN RYAN: Yes. Thank you.

21 MR. ROACH: Our summary here is that
22 NEI-08-08 describes a generic operating program for
23 COL applicants. We're currently reviewing it for
24 safety evaluation on the generic FSAR guidance. And

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1 if accepted, COL applicants will be allowed to
2 commit to NEI. They conform to other templates
3 right now and I believe it's chapter 1.6 of the FSAR
4 they'll say specifically that they conform to it.

5 CHAIRMAN RYAN: Ed, while you're on that
6 point, do you have a schedule for the SER?

7 MR. ROACH: Actually, my goal was to get
8 it out within the last week, but unfortunately when
9 you start down the road on ACRS presentation, I lost
10 a lot of time.

11 MEMBER POWERS: You told me at the
12 beginning you were just happy as punch to be here.

13 MR. ROACH: I am happy.

14 MEMBER POWERS: So not too far off.

15 MR. ROACH: Yes.

16 MEMBER POWERS: And you lie a lot.

17 MR. ROACH: No, I don't lie at all. Ask
18 my wife.

19 No, our goal is to get both of these --
20 later we'll talk about the ISG-006. Both of those
21 are documents we've been working on.

22 CHAIRMAN RYAN: So they're tracking
23 pretty close together?

24 MR. ROACH: Yes. Yes.

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1 CHAIRMAN RYAN: Okay.

2 MR. FRYE: Yes, the safety evaluation
3 report, we were writing in parallel with the
4 development of the template because, you know, we
5 didn't want to wait and start from scratch.

6 CHAIRMAN RYAN: Sure. Yes.

7 MR. FRYE: So, the safety evaluation
8 report is 90-95 percent ready to go. So we just
9 need to fine tune it and then get into concurrence,
10 including OGC.

11 CHAIRMAN RYAN: Okay.

12 MR. FRYE: So, yes, I mean, it's almost
13 ready to go into the review and concurrence.

14 CHAIRMAN RYAN: Very good.

15 MEMBER POWERS: Suppose I came in with
16 my spiffy new plant and say I have designed this
17 plant so well I don't need a monitoring program, and
18 every time you came up and asked me about something
19 I had triple-wall pipes, I had anything you could
20 think of,

21 MR. ROACH: Fundamentally,, you will
22 still have a monitoring program under the RETS and
23 REMP program. So you will have to do some
24 groundwater monitoring. You're required by chapter

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1 2 of the FSAR, or the SRP to develop a conceptual
2 site model, or a site model to tell you that. And
3 frankly, I don't think any of us -- I'll speak for
4 myself. I don't believe that there's a plan out
5 there that's leakproof. So I think we'd go into
6 RAI.

7 MEMBER POWERS: But my plant is
8 leakproof.

9 CHAIRMAN RYAN: Well, I think the first
10 point was the one, you still have a burden to prove
11 no leakage by measurement.

12 MR. ROACH: Yes. Right.

13 MR. FRYE: Yes, the thing is that the
14 operating programs are going to be very site-
15 specific depending on the design features that each
16 plant has. So it's possible that, you know, one set
17 of plants that have built a design will have
18 different operating programs and a different
19 groundwater monitoring program, and different, you
20 know, routine surveillance that they do, and
21 different preventative maintenance that they do that
22 another design would do. So, yes, it's going to be
23 very design-specific. And if it's such a robust
24 design, I would expect that they would have a less

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1 significant operating program. But I mean, and
2 you're trying to take that to the extreme where
3 their design is so robust that they don't need any
4 operating programs to supplement it, that seems
5 impossible.

6 CHAIRMAN RYAN: You can't get there.
7 You still have to show --

8 MEMBER POWERS: Yes, I think Mr. Roach's
9 response answered my question.

10 MR. ROACH: Okay.

11 CHAIRMAN RYAN: You end up doing it no
12 matter what.

13 CHAIRMAN RYAN: Right. And I agree with
14 Tim that it might have a different look to it.

15 MEMBER POWERS: Yes. But I mean that's
16 also true.

17 CHAIRMAN RYAN: You still have to show
18 that you're not having releases.

19 MEMBER SIEBER: I think you can put a
20 template like this on a variety of plants and still
21 fit in the template with both good designs and not
22 so good designs. And then you take the best design
23 or the average design and put different operating
24 crews and procedures and so forth on that. You're

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1 still going to get a variety. So this template in
2 itself is not going to set the boundary. It's all
3 the other regulations and practices that go around
4 that that determine who's a good operator, who's not
5 quite so good.

6 MR. FRYE: Yes, I think the template
7 provides the high level program guidance for what
8 needs to be considered and how you consider it --

9 MEMBER SIEBER: I agree with that.

10 MR. FRYE: -- to supplement your
11 particular design.

12 CHAIRMAN RYAN: I think, Jack, to me
13 that reflects well what you just said, reflects well
14 what Ralph Anderson went through and how the
15 industry's been involved across the spectrum of
16 issues over time.

17 MEMBER SIEBER: Well, it's a step up
18 compared to where we were 30 or 40 years ago.

19 MR. FRYE: Oh, I hope so.

20 CHAIRMAN RYAN: Are there any other
21 questions or comments? Dana?

22 MEMBER POWERS: Don't I ask enough
23 questions for you?

24 CHAIRMAN RYAN: Please. I mean, I don't

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1 want to finish eight minutes early again.

2 Dennis, do you have any other questions
3 or comment?

4 MEMBER BLEY: No.

5 CHAIRMAN RYAN: No? Okay.

6 Very good. Gentlemen, thank you very
7 much for your presentation. I think we're at a
8 point where we're scheduled for a 20-minute break.

9 MR. FRYE: Yes, we have more slides,
10 but --

11 CHAIRMAN RYAN: Oh, I'm sorry. Are
12 those backups or are those --

13 MR. FRYE: They're for the ISG-006
14 slides.

15 CHAIRMAN RYAN: And that's after the
16 break?

17 MR. FRYE: Yes, that's fine.

18 CHAIRMAN RYAN: Okay. So we'll take
19 about a 20-minute break and come back at, say 3:25.

20 (Whereupon, at 3:02 p.m. off the record
21 until 3:28 p.m.)

22 CHAIRMAN RYAN: Okay. We'll go back on
23 the record, please.

24 And, Ed, you up?

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1 MR. ROACH: Yes, I am.

2 CHAIRMAN RYAN: All righty.

3 MR. ROACH: Hi, this is Ed Roach again.
4 Good afternoon. And I'm still glad to be here.

5 MEMBER POWERS: We'll work on that.

6 MR. ROACH: It's just a matter of life's
7 too short and it better be enjoyed.

8 The next topic that we were going to
9 discuss just is the Interim Staff Guidance that we
10 developed to help provide evaluation of acceptance
11 criteria for 10 CFR 20.1406 to support the design
12 certification in combined license applications.

13 CHAIRMAN RYAN: Ed, can I just add a
14 different question? Because I haven't seen it
15 before. Everyone who comes before the Committee to
16 talk about their design cert reviews talk about
17 reviews to guidance and we've done all this. Before
18 there was guidance you still had to satisfy this
19 rule; it's been around for some years. Was it just
20 up --

21 MEMBER SIEBER: Only for --

22 CHAIRMAN RYAN: What?

23 MEMBER SIEBER: Only for plants to be
24 built after '97.

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1 MR. ROACH: Yes. Yes.

2 CHAIRMAN RYAN: But the ones that have
3 been certified --

4 MR. FRYE: AVR was before the rule was
5 effective. So that's not --

6 MEMBER BLEY: AP1000.

7 MR. FRYE: AP1000 missed it.

8 MEMBER SIEBER: Nobody's built one yet.

9 MR. BLEY: Well, they haven't built one,
10 but they've been through design cert. So they had
11 to certify it against that rule with no existing
12 written guidance, right?

13 MEMBER POWERS: It doesn't mean that
14 they did.

15 MEMBER BLEY: Well, that's kind of where
16 I was trying to get it, but I was taking a slower
17 path.

18 MR. ROACH: What happened in Revision
19 16, Rev 15, of the DCD for AP1000 was the certified
20 revisions. Rev 16 came in. They submitted a series
21 of different technical reports that were
22 describing --

23 MEMBER BLEY: Right. But back on the
24 rev that was certified --

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1 MR. ROACH: No, I think it was silent on
2 20.1406.

3 MEMBER BLEY: Even though there was a
4 regulation it just didn't review it?

5 MR. ROACH: Yes, it was not in any of
6 the standard review plan guidance.

7 MEMBER BLEY: So it doesn't get reviewed
8 unless it's in an SRP? Is that kind of the way our
9 regulations work?

10 MR. ROACH: I would say that I don't
11 think that's always the case, but I think it's a
12 question of who was reviewing it, the manpower at
13 the time probably. This rule went in a manner that
14 probably didn't fully engage all the offices. So I
15 think it got published in part 20. It's just
16 decommissioning, so they didn't recognize it in
17 1406.

18 MEMBER SIEBER: And if you look at the
19 rule, it's only two little paragraphs.

20 MEMBER BLEY: Well, there's a lot of
21 rules like that.

22 MEMBER SIEBER: It's extremely broad.

23 MR. ROACH: Initially it was just one
24 paragraph. With part 52 revision it went to two

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1 paragraphs to identify the DCD and all other
2 applicants.

3 MEMBER SIEBER: That's the part 20 part
4 of it.

5 MR. ROACH: Yes. Yes.

6 MEMBER SIEBER: It's four sentences, so
7 it's very broad.

8 MEMBER BLEY: Well, I know. And it's
9 got a lot of guidance now to say what those four
10 sentences mean. It's not the only rule like that.

11 MEMBER SIEBER: It's got an envelope
12 around it. I don't think the guidance is real
13 specific here either and it depends on design and --

14 MEMBER BLEY: Well, the NEI documents
15 are pretty --

16 MEMBER SIEBER: It depends on operation.
17 You're going to have a range of responses by
18 licensees.

19 MR. FRYE: Yes, I think it will. It's
20 not specific. It sets an envelope of possible
21 approaches.

22 MEMBER SIEBER: Right.

23 MR. FRYE: I think that's fair. And I'd
24 say we've seen that with radiation protection

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1 programs that have been submitted. Even though
2 they're under the template, there are people who do
3 things in addition to that template that add value
4 and it's the way their facility or license, or
5 utility decides to operate.

6 MEMBER SIEBER: But actually
7 improvements in effluents and radiological controls
8 and so forth by the industry have been pretty
9 consistently positive over the years. As long as
10 the right motivation and the right industry
11 participation is there, I have no reason to believe
12 that it wouldn't be the same for this situation.
13 It's just harder to quantify.

14 MR. ROACH: It's a performance-based
15 regulation and that leaves us all kind of foundering
16 at times.

17 All right. Any other comments or
18 questions before we start?

19 CHAIRMAN RYAN: Go ahead.

20 MR. ROACH: Okay. Again, this section
21 is to talk about the Interim Staff Guidance-006 that
22 we developed to describe how to meet 20.1406 and
23 provide the NRC staff position on information to the
24 level of detail to demonstrate compliance.

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1 The initial ISG was issued for public
2 comment May 31, 2008 and received on public
3 comments, and the comment period closed July 31st.

4 This initial version was based on the
5 guidance, very similar guidance to SRP 12.1. We
6 basically modeled the acceptance criteria after
7 ALARA, because ALARA again is somewhat of a
8 performance-based concept. And the goal here is to
9 minimize to the extent practicable.

10 After we published it and received on
11 comments, we had engaged our staff, as we talked
12 earlier, and the various branches with an NRO. And
13 we proceeded to get feedback and how to identify
14 which system structures and which ones to review.

15 The acceptance criteria we came up with
16 for this is that adequate design features exist
17 supplemented by operating programs. Reasonable
18 assurance that leaks and spills will be detected in
19 a timely manner. The site has adequately
20 characterized and conceptual site models developed.

21 Decommissioning features and their role are
22 described. And site will be operated in a manner to
23 minimize the generation of radioactive waste, both
24 during operation and during decommissioning such

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1 that when you go into decommissioning you plan on
2 the waste you're going to generate, how much is
3 going to be able to be buried at a typical landfill
4 as opposed to a low-level burial ground.

5 The Reg Guide 4.21 was issued in June of
6 2008. And the SRP sections 11 and 12 were revised
7 in March of 2007. So those sections don't reference
8 Reg Guide 4.21. And fundamentally we found
9 ourselves without review guidance or acceptance
10 criteria, other than the fact that 20.1406 was
11 referenced in chapter 11 and 12. The acceptance
12 criteria is based on design features and procedures
13 for operations and a consideration for
14 decommissioning.

15 What the Interim Staff Guidance as
16 revised states is that it identifies Reg Guide 4.21,
17 the regulatory positions C.1 through C.4, and those
18 are minimizing facility contamination and the
19 subsets of those, minimization of leaks of spills,
20 prompt detection of leakage, avoidance of
21 contamination from undetected leaks. I'm reading
22 through these so you -- they're not all on the
23 slide. Measures for reducing the need to
24 decontaminate equipment and structures. And those

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1 are design features such as sealing rooms with epoxy
2 paint. Periodic review of operational practices,
3 which goes to the heart of the issues you've
4 mentioned, in that the personnel practices can
5 result in the contamination of the site just as
6 quickly as the failure of a system.

7 Also, minimizing contamination of the
8 environment, as we discussed before, a conceptual
9 model. Final site configuration post-construction,
10 being able to identify what that looks like and
11 what the construction changes. And then provision
12 for early detection of leakage and contaminant
13 migration. We've looked at how to locate the wells.

14 How do deep do they go? What do you do to prevent
15 water from transferring from the intended level?
16 Your sampling, they don't get to another aquifer
17 above them by backfilling. There's any number of
18 pathways, and water takes the path of least
19 resistance. Another area we looked at as an
20 acceptance criteria is facilitation of
21 decommissioning and then minimizing the generation
22 of waste.

23 So the references, we've referenced Reg
24 Guide 421, Appendix A. And that appendix is what we

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1 call a risk-informed tool to determine the measures
2 considered. If you look at that, when the draft Reg
3 Guide came out, many of those features were listed
4 in the very front of that Reg Guide under each of
5 these design features. And designers might have
6 taken that as a checklist. Make sure you do this
7 for every design, and I don't think that would have
8 met the intent of the rule in that it says
9 practicable. There are opportunities in here for
10 you to do design features that can definitely
11 improve the likelihood of you not having a leak.
12 But there are other ones that won't be applicable to
13 your facility.

14 The Interim Staff Guidance revision was
15 based on staff comments questioning the system
16 structures and components to review. We met with
17 the balance of plant project managers, the branch
18 chiefs in containment and ventilation branches,
19 looking at different features, what's the best way
20 to get our hands around this? And I think operating
21 experience again became the point that we could hang
22 our hat on as far as if you look at the operating
23 experience we have as far as 20.1406, you can see
24 the most likely failures modes with the experience

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1 we have. And the hard part for us was getting to
2 what the cause was. And because some of these more
3 recent ones, the causes haven't been fully
4 communicated yet, so to speak. So we're trying to
5 stay on top of that and evaluate that.

6 The revision included what we decided we
7 needed to do to help our staff better grab which
8 systems fit and need to be looked at. We included a
9 screening approach for structure systems and
10 components and that would be in Attachment A to the
11 ISG, and then a list of operating experience events
12 from Table 1. That Table 1 is not intended to be
13 every event, because we've kind of frozen it in time
14 from about three or four months ago. And we also
15 sanitized it in a manner that it doesn't give up
16 information that's proprietary or specifically
17 internal for some of them. But the events clearly
18 convey what type of failures in systems that
19 occurred and what should be done.

20 An example of the screening is basically
21 each step through -- anyway, do you have a question
22 on that?

23 MEMBER BLEY: No, no. I'm sorry.

24 MR. ROACH: Okay. Okay.

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1 MEMBER BLEY: I just got lost.

2 MR. ROACH: The idea is to get into the
3 screening is to look at the systems that are
4 typical. And we wanted to have this going forward.

5 We did the screening for the systems on the design
6 certifications that have come in the door and worked
7 with the balance of plant and asked the RAI that was
8 all encompassing for all the systems, depending on
9 the design. So anything else that comes in, we ask
10 questions. Does the system contain or potentially
11 contain radioactive material? Is this system
12 separated from the environment by a single barrier,
13 a single-wall pipe located in a trench not
14 accessible for inspection? Or are portions of the
15 systems located out of the structure? Or has the
16 operational experience demonstrated that the system
17 or components has previously resulted in a release
18 of radioactive material? So that gets you to the
19 idea of what you need to look at in the course of
20 this.

21 And then the actual examples of systems
22 of structures are taken from the operating
23 experience. Spent fuel storage and transfer
24 systems, transfer canals, spent fuel pool, leak

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1 detection system, water treatment drains, floor and
2 roof drains, laundry system drains, tanks and
3 piping, cooling tower blowdown piping, circulating
4 water system piping, retention tanks, service water
5 and component cooling. So it attempted to, in
6 general terms, capture all those systems that are
7 most likely to become contaminated at some point in
8 the facility's life and ultimately leak to the
9 environment or the facility. Table 1 is the
10 operating experience, and we talked about some of
11 those related operating experience.

12 The point of the Interim Staff Guidance
13 was to provide acceptance criteria and some
14 direction to the staff to at least identify the
15 systems they needed to review. The specific systems
16 don't have to meet, for instance, ASME code. There
17 are codes that apply to various systems, but that's
18 system-specific. We don't get to the level of
19 detail in here, but we ask them to look at the
20 specific systems that are referenced and likely to
21 cause an error. And then basically if it doesn't
22 meet the acceptance criteria, request for additional
23 information of the applicant to clarify what they're
24 doing or how they're going to do it. That kind of

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1 is the thought process that got us there. Ad we
2 hinged it on operating experience and the fact that
3 it's a minimization concept and it parallels the
4 ALARA acceptance criteria in SRP 12.1.

5 So, our goal is once we have this in
6 place we will implement this and take that into the
7 standard review plan. Chapter 12 will have the
8 general description of the program and then we'll
9 put it in the appropriate sections of the SRP,
10 specifically chapter 9, chapter 13, chapter 10,
11 chapter 11. And so that there's actually a spot in
12 each of those areas where it clues the reviewers to
13 look at 20.1406 issues.

14 MEMBER BLEY: How is this concept that
15 this is a little like ALARA consistent with the
16 language in the EPRI document about radiologically
17 significant events?

18 MR. ROACH: Well, I think we recognize
19 that that is -- the radiologically significant
20 indicates you have no choice in taking action.

21 MEMBER BLEY: Okay. That's what you
22 said before, yes.

23 MR. ROACH: Yes, and in this case I
24 think this applies to both new DCDs and COLs. And

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1 so what we're looking at is these are new plants.
2 These are the best technology. They should be doing
3 things at such a level that they should be at or
4 below the current operating fleet standard.

5 MEMBER BLEY: So the ISG effectively
6 takes us beyond where the EPRI document takes us in
7 that regard?

8 MR. ROACH: You mean the NEI document?

9 MEMBER BLEY: I'm sorry. Yes, the NEI
10 document.

11 MR. ROACH: Yes. I think what happened
12 with that definition, and I'll segue to that, is
13 that that definition comes out of context. It's
14 just a definition.

15 MEMBER BLEY: I know, but it's used in
16 the document.

17 MR. ROACH: Yes.

18 MEMBER BLEY: I mean, where it says
19 radiologically significant leaks will be treated
20 this way and things like that. Where in the ISG
21 we're not talking just radiologically significant as
22 defined.

23 MR. ROACH: Right. We're talking about
24 the systems that are likely to --

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1 MEMBER BLEY: That really are putting a
2 turn on the EPRI document, on the NEI document.

3 MR. ROACH: Yes, because the SRP or the
4 guidance for review really takes us to look at both
5 design of the facilities and the COLs and where
6 their operating programs are going to be. So the
7 SRPs cover both of those, plus operating and
8 construction permits.

9 CHAIRMAN RYAN: Anything else?

10 MR. ROACH: Tim, do you want to add
11 anything on that?

12 MR. FRYE: No, I don't think so. Well,
13 just one thing, and I think Ed mentioned this a few
14 times. As we were working with all of our technical
15 branches one of the, you know, key things that
16 really helped them understand the scope of systems
17 to look at and what they should be looking for is
18 the operating experience. You know, giving them
19 Braidwood, circ water blowdown, you know, vacuum
20 breakers weren't maintained, they then understand,
21 okay, so that's a type of thing that you're looking
22 for. And, you know, the causes were the vacuum
23 breakers and so then they know -- that really helps.
24 We found that really helps them. And so, what

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1 we're doing is we are continuing to pursue. You
2 know, operating experience is not static. We have a
3 lot of operating experience in the Lessons Learned
4 Task Force Report that we used as a basis, but we
5 have continued to learn things, because there have
6 been and continue to be events at some of these
7 plants. You know, most recently there's buried
8 condensate transfer, you know, 10-inch aluminum
9 lines at Oyster Creek and other plants that have
10 failed. And so this is a new failure mechanism, so,
11 you know, we're trying to get that --

12 CHAIRMAN RYAN: I think, Ed, you
13 mentioned that you're still mining the daily
14 occurrence reports and the activities.

15 MR. ROACH: Right.

16 CHAIRMAN RYAN: I saw you pull it up.

17 MR. ROACH: Right. Yes, that's what
18 that is. Right.

19 CHAIRMAN RYAN: And so, you know, I
20 think that's an excellent way to keep it to be a
21 living and current document and guidance.

22 MR. ROACH: Yes.

23 CHAIRMAN RYAN: I mean, you obviously
24 can't update it every week, but, you know, there

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1 will be a periodic update I assume at some point.

2 MR. FRYE: Yes, our goal is to get the
3 significant operating experience that has occurred
4 at the operating fleet and make sure at a minimum we
5 have reviewed all of the new reactors for --

6 CHAIRMAN RYAN: Those kinds of issues.

7 MR. FRYE: For those kinds of things,
8 yes. That's a minimum. We have to do that.

9 MR. ROACH: And I think one of the other
10 aspects of it is, is we try to communicate these
11 learnings, specifically if it seems to be a
12 different mechanism than previously seen.

13 CHAIRMAN RYAN: Something new to
14 everybody.

15 MR. ROACH: And to the balance of plant
16 branches, containment, the other folks in NRO who --

17 CHAIRMAN RYAN: Does that later on
18 become somehow an inspection item where if you give,
19 you know, additional advice on things to check that
20 will have to be checked?

21 MR. FRYE: Well, eventually. I mean,
22 eventually that's the type of guidance that we're
23 developing as we go that ends up in the standard
24 review plan.

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1 CHAIRMAN RYAN: Okay. So it would be
2 caught formally whenever you update to the standard
3 review plans, right?

4 MR. FRYE: Right.

5 CHAIRMAN RYAN: But I would imagine
6 folks would implement a review of those things as
7 they come out, or no?

8 MR. FRYE: Right, that's our goal.

9 CHAIRMAN RYAN: Right. But there's no
10 requirement to do it? Or would you expect they
11 would just out of good practice?

12 MR. ROACH: Yes, my experience has been
13 that if you walk over and talk to the guy who's
14 reviewing the spent fuel pool and say did you see
15 this, or send him the email, he'll go back into the
16 one he's working on and say, okay.

17 CHAIRMAN RYAN: Make sure.

18 MR. ROACH: Yes.

19 CHAIRMAN RYAN: That would be my
20 expectation.

21 MR. ROACH: Yes. But again,
22 regulatorily right now the SRP references --

23 CHAIRMAN RYAN: Yes, and I understand
24 that formality, so there is a formality there as

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1 well.

2 MR. ROACH: The one other piece I'd add
3 is we gave our revised draft at a public meeting and
4 attached it to the minutes of one of our NEI-08-08
5 meetings, the revised. And we did subsequently
6 receive about six comments from Mitsubishi Nuclear
7 Energy Services. A couple of them we accepted. We
8 have the resolution there incorporated in the most
9 recent, in the final copy.

10 CHAIRMAN RYAN: Got you.

11 MR. ROACH: But basically to clarify
12 some statements within that. But I didn't find any
13 of those were significant, you know, change the
14 direction of the IST at that point. And NEI told us
15 that in lieu of their comments they agreed with the
16 MNES comments.

17 CHAIRMAN RYAN: Well, I guess that sort
18 of ends our formal presentation. We have a
19 discussion period now. And I guess I'd like to go
20 around to the members of the subcommittee and ask if
21 they have any specific observations or things that
22 would be recommendations.

23 PARTICIPANT: We have public comments
24 now.

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1 CHAIRMAN RYAN: Oh, excuse me. I'm so
2 sorry. Yes, are there any public comments from
3 anybody?

4 And you'll tell us who you are, please,
5 for the record? Yes, please.

6 MS. D'ARRIGO: Do I pull this out?

7 CHAIRMAN RYAN: Yes.

8 MS. D'ARRIGO: Okay. I'm Diane D'Arrigo
9 with Nuclear Information and Resource Service.

10 I had a question that may be too basic,
11 but back when the tritium was detected back at
12 Braidwood and several other reactors, it appeared to
13 me that if it had just stayed in the pipe that its
14 discharge would have been perfectly legal. But the
15 fact that it leaked out of the pipe, that's the
16 reason that we had the big concern. It's the same
17 amount of radioactivity, but it went into the soil
18 surrounding and was detected.

19 MR. FRYE: Right. Yes, I mean, the
20 licensed discharge path to the environment is going
21 through the entire discharge pipe and then be
22 diluted by whatever water body it's being discharged
23 to. And, you know, it was not released to the
24 environment by its licensed discharge path. So

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1 that's the concern.

2 MS. D'ARRIGO: Okay.

3 CHAIRMAN RYAN: I think that's an
4 important point, if I may, Tim.

5 To me, Diane, I appreciate your
6 question, because that is a point of confusion
7 often, is that the fact it was present where it
8 wasn't expected --

9 MS. D'ARRIGO: Right.

10 CHAIRMAN RYAN: -- is what drew all the
11 attention. The fact that it was below, way below in
12 fact, drinking water standards for the most part,
13 was, you know, we just sort of felt that it being
14 there and whatever processes it went through, but
15 the unexpected aspect of it, I think, is what drew
16 the attention.

17 MS. D'ARRIGO: Well, I don't know if
18 it's unexpected or just -- well, I guess unexpected
19 is not planned.

20 CHAIRMAN RYAN: Where they found it.

21 MS. D'ARRIGO: Right. Right. It didn't
22 go where it was supposed to go. But it wasn't that
23 it was a higher amount than is normally allowed to
24 go out.

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1 MR. FRYE: No, it was a normal
2 discharge.

3 MS. D'ARRIGO: Right.

4 MEMBER SIEBER: Yes, I think the
5 important point, when you talk about a normal
6 discharge, it's the dilution that makes the
7 difference. River flows are typically measured in
8 acre feet per minute, whereas a leak would be some
9 fraction of or maybe one or two gallons a minute.
10 And you compare a gallon to an acre foot, you know,
11 it's 10,000, 100,000 to one. And so the
12 concentration is really what makes the difference.
13 If you have a leak onto the ground, it's more
14 concentrated there than it would be in a large body
15 of water where it's mixed with thousands, tens of
16 thousands of gallons of other water.

17 CHAIRMAN RYAN: And again, that comes
18 back to the details of what was programmed and what
19 was expected to happen versus what actually
20 happened. So the unexpected location was really
21 what caught everybody's attention. And the fact
22 that it was a small concentration that was not in
23 violation of any concentration requirement was an
24 artifact. It really wasn't designed to be that way.

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1 It just turned out that way.

2 MS. D'ARRIGO: Okay. So my other
3 question is having to do with how the template is
4 going to be incorporated into the DCDs and the
5 portion on waste. So there's just one slide that
6 you had minimizing generation of waste. Significant
7 radioactive components. Examples: Assessment of
8 waste stored on site and establishment of waste
9 management plan.

10 CHAIRMAN RYAN: could you just tell us
11 the slide number?

12 MS. D'ARRIGO: I don't know.

13 MR. ROACH: Twelve.

14 MS. D'ARRIGO: Sorry about that.

15 MR. ROACH: It goes to section 6 of NEI-
16 08-08 Revision 1. And that really gets to waste
17 management with the whole facility and the approach
18 is there have been plants out there who have
19 replaced large components. So if they choose not to
20 dispose of those components because of availability
21 or it's cost effective for them to store them on
22 sites, what we put into the template or requested
23 that be incorporated into the template is that they
24 address that up front. And that if they're going to

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1 store those on sites, or replace those large
2 components, they have that in their life cycle plan
3 for radioactive materials.

4 MS. D'ARRIGO: So that's for large
5 components, but then you've also got the B and the C
6 and the greater than C that might not have a
7 destination?

8 MR. ROACH: Well, and I think the other
9 piece of that is the waste management plan should
10 consider the options to implement measures that
11 minimize the generation and levels of the life
12 cycle, including the decommissioning waste. So each
13 site will have to -- there are sites that are
14 located in states that can still use Barnwell. And
15 so those sites will have a different plan than a
16 site that may not have Barnwell available and have
17 to use someone who has Class A.

18 MR. FRYE: Yes, I'm sorry, I was just
19 going to clarify. You know, our slides really are
20 just the comments that we had on that section. And
21 so our slide is very brief.

22 MS. D'ARRIGO: Yes.

23 MR. FRYE: The NEI template 08-08 has
24 more detail about waste management. And in

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1 addition, there is a separate operating program
2 called the Process Control Program, which is a
3 separate template, which provides much more detail
4 about waste management.

5 MS. D'ARRIGO: Oh, so your RAIs though
6 on this piece of it, because that's in on this part
7 of it. So is this in there because of the potential
8 for leakage from this portion of the site?

9 MR. FRYE: Well, it's there because
10 that's part of the Regulation 20.1406. And so Reg
11 Guide 4.21 and the NEI template address it, but we
12 just didn't have a lot of comments on that section.

13 So that's why you look at our slide, there's not a
14 lot there.

15 MS. D'ARRIGO: Yes.

16 CHAIRMAN RYAN: I think the answer to
17 the question that Ms. D'Arrigo just asked is
18 probably yes. It's to address the accumulation of
19 materials on site over time. Is that right?

20 MR. ROACH: Yes.

21 CHAIRMAN RYAN: And what impact that
22 might have in this whole issue of hydrologic -- how
23 the system works.

24 MR. ROACH: Right.

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1 CHAIRMAN RYAN: Okay.

2 PARTICIPANT: (Off microphone.)

3 CHAIRMAN RYAN: Sure.

4 MS. D'ARRIGO: Sure.

5 CHAIRMAN RYAN: Would you just tell us
6 who you are and sit at a microphone for the benefit
7 of the --

8 MR. ANDERSON: Ralph Anderson with NEI.

9 For example, the regulation itself really came from
10 experience. At least one site over the years they
11 had stored radioactive waste in a particular
12 location and then stopped storing it in that
13 location. They picked a new location where they
14 would store it. And this wasn't an issue of not
15 having site access. It was just where they would
16 store waste to accumulate a sufficient volume to
17 make a shipment. And in fact that's exactly what
18 happened. Over the years some of that rainwater and
19 other things had leached through the waste material
20 and actually caused some residual contamination in
21 the soil. So when they did the characterization of
22 the site after shutting down the plant, they found
23 residual radioactivity at that location and were
24 sort of immediately nonplused with where did that

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1 come from?

2 MS. D'ARRIGO: The first place from
3 which they'd moved it?

4 MR. ANDERSON: Yes.

5 MS. D'ARRIGO: Yes.

6 MR. ANDERSON: And what had happened is
7 they had lost documentation that that's where they
8 had stored it 15-20 years ago. So what the rule is
9 aimed at in the waste area is -- one aspect of it is
10 to make sure that that's well documented so that
11 you're inspecting those areas and making sure that
12 you don't lose the memory of that. So that when
13 you're planning for your decommissioning, you're
14 aware of (1) if you have radioactive material there
15 and should you survey it more thoroughly; and (2) do
16 you in fact have residual contamination. So that's
17 one whole aspect of it, is knowing where you had
18 radioactive material on the site.

19 The other aspect is the general concept
20 of efforts that have the overall effect of reducing
21 the amount of waste that would need to be disposed
22 of at the time of decommissioning.

23 MS. D'ARRIGO: How does that -- I
24 mean --

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1 MR. ANDERSON: Because that translates
2 into cost issues, and into complexity of the
3 decommissioning. I mean, if you took it to the
4 extreme, obviously if you had large amounts of waste
5 that need to be disposed of, as opposed to lesser
6 amounts, it's going to be more costly and more prone
7 to human error, to industrial accidents, all of
8 those things. So that's why that's in the rule.

9 CHAIRMAN RYAN: And I think another part
10 of it, Ralph, correct me if I'm wrong, is that site
11 restoration is tougher if you've got a huge amount
12 of material to remove and replace, you know, to
13 restore the site to some acceptable condition.

14 MR. ANDERSON: So thinking about it
15 simply, it's looking 60 years in the future and
16 saying 60 years from now when I shut the plant down
17 and go to decommission it, what are all the things
18 that I wish I would have done? And I remember when
19 the rule was first proposed. That was really the
20 nature of the conversation, is talking to people who
21 are currently decommissioning and saying looking
22 back what do you wish you had done differently?

23 MS. D'ARRIGO: Yes.

24 MR. ANDERSON: That's what this rule is

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1 really trying to capture, is come up with all those
2 great ideas, make them requirements and project them
3 forward on all the new plants so they'll in fact do
4 those things.

5 MS. D'ARRIGO: So it's not necessarily
6 to accommodate the potential increased amounts that
7 might have to be accumulated for a while?

8 MR. ANDERSON: Not really.

9 MS. D'ARRIGO: Yes.

10 MR. ANDERSON: It has more to do with
11 things that would cause more waste to be present at
12 the time of decommissioning. The current issue that
13 we're dealing with of not being able to dispose of
14 all the waste could have that effect if we haven't
15 found an outlet for disposal by the time we reach
16 decommissioning. But the concern in the NEI
17 document was making sure you know where you're
18 storing things, inspecting it frequently to make
19 sure it's not leaking. And then if you ever move it
20 away, to be sure you've kept documentation that you
21 once stored material there and that when you shut
22 the plant down you should go back and survey that
23 very thoroughly to make sure you didn't overlook
24 anything.

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1 MS. D'ARRIGO: Okay.

2 CHAIRMAN RYAN: Thank you. That comes
3 to I guess the stage where we ought to go around and
4 see if any of the members have suggestions for
5 either an observation or a recommendation, something
6 specific.

7 Jack?

8 MEMBER SIEBER: Well, other than what
9 I've said before from time to time during the
10 meeting, I have nothing else to comment on or
11 suggestions to make.

12 CHAIRMAN RYAN: Dana?

13 MEMBER POWERS: Well, I've written down,
14 basically it seems like we've formulated a good
15 strategy here, a good guidance and things like that
16 for carrying out a relatively deterministic rule.

17 I am surprised that we're not seeing
18 pressure to bring risk information into this
19 activity in a more aggressive fashion. And it would
20 not surprise me if we're not revisiting this in the
21 next few years to make it more expectation values
22 rather than a deterministic rule. I mean, you asked
23 me for an observation and that's my observation. In
24 particular, I see that if there's any fallout, it's

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1 going to be directly applicable to U.S. reactors
2 coming from the experience of the earthquake in
3 Japan. It is going to be in the area of leakage and
4 spillage of radioactive material into the
5 groundwater. So I just think we're going to see
6 this all again with pressure to have more risk
7 information incorporated into the thinking on this
8 subject.

9 The thinking on the whole, I really
10 quite like the thinking. I mean, I'm a big
11 deterministic guy, so defense in depth is singing to
12 my heart here in fact.

13 MR. FRYE: I would just add to that, and
14 maybe we've glossed over it, but I think that the
15 NEI template 08-08 does have a lot of guidance about
16 using risk insights to select structure systems and
17 components that you want to include in your program.

18 We might not have focused on that, but that is a
19 big part of the program.

20 CHAIRMAN RYAN: Okay. Dennis?

21 MEMBER BLEY: Yes, I'd say the opposite
22 of what Jack said, don't take my earlier comments.
23 I think most of those were addressed pretty well and
24 I appreciate that.

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1 I sort of agree with Dana, and I'm more
2 of a risk guy, not a deterministic guy. But I think
3 there's a lot here that covers the areas of
4 uncertainty that are important. I'm not positive it
5 goes far enough and I suspect this will come back
6 for a little more, as Dana said.

7 One thing I would like to do is I'd like
8 to express my appreciation for the presentations and
9 the overall program. I think it's great. And
10 especially the fact that when I'd ask a question,
11 instead of responding to that particular issue,
12 you'd expand on it and generalize it, which I think
13 too few people do. I appreciate that very much.
14 And that addressed other comments that --

15 MEMBER POWERS: You're in trouble, Ed.
16 We're going to bring you back.

17 MR. ROACH: We like you, too. I
18 shouldn't have been so darn cheery.

19 MEMBER BLEY: That's all, Mr. Chairman.

20 CHAIRMAN RYAN: Thank you very much.

21 I would add my thanks, too, both to NEI
22 and to William from industry, and to the NRC staff
23 for a very robust briefing this afternoon.

24 And I agree with the comments that have

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1 been said. I think I've picked on my favorite, the
2 definition of radiologically significant. I do
3 think that needs some attention, because to me that
4 is a bar that's out of alignment with the rest of
5 your thinking. And I know you're trying to align
6 with another place where that's used, but I really
7 think that needs to be changed. You know, worker
8 dose and 100 millirem at the fence is a bar that, to
9 my way of thinking, is somewhere way up higher than
10 the bar that you've built into the guidance on we
11 need to detect a leak with it occurs in a pipe.
12 That's way before 100 millirem.

13 So somehow you need to get that aligned
14 so that radiologically significant -- and, you know,
15 this isn't going to be the right way to say it, but
16 to me, if you said, okay, smart guy, it's your job
17 to figure out what we want to look at, it would be
18 to somehow identify radiologically unexpected or
19 abnormal circumstances where I had leakage where I
20 didn't expect it, or where I had radionuclides show
21 up that I wasn't anticipating. You know, I mean, I
22 can understand tritium and, you know, that's a
23 valuable lesson from the modeling aspect at existing
24 plants, but if strontium, cesium and three other

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1 fission products showed up, I'd be thinking what
2 happened here?

3 So I think it's not the how much. It's
4 the what and where that you can focus on first. And
5 then the how much is something you just figure out
6 as you go along to say do I have something that I
7 can easily address, or do I have something I can
8 report, like right now? So I would try and get away
9 from how much and get to the what and where as the
10 definition.

11 MEMBER BLEY: Can I sneak something in?

12 CHAIRMAN RYAN: Yes, please.

13 MEMBER BLEY: I like everything Mike
14 just said. And I'd say nobody jumped on me for
15 this, but in fact the NEI document does have a fair
16 number of places where it talks about an ALARA-like
17 approach. I don't know what's gained by putting in
18 the couple of statements that are in there on
19 radiologically significant events. It doesn't
20 qualify them in a way that you have verbally. It
21 just doesn't seem to do anything except obscure the
22 main thrust that it's more an ALARA-kind of program.
23 Both places.

24 CHAIRMAN RYAN: And I guess in my mind,

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1 and the subcommittee will have to think a little bit
2 more about it, but that's the only thing that might
3 rise to a recommendation to formally advise on from
4 what our opinion is. Of course, we'll have to
5 report to the full committee and the full committee
6 will write a letter, which we're going to do --

7 MR. WIDMAYER: Thursday morning.

8 CHAIRMAN RYAN: -- Thursday morning.

9 MR. WIDMAYER: First thing.

10 CHAIRMAN RYAN: First thing.

11 MR. ROACH: And I believe we'll come
12 back again?

13 PARTICIPANT: He gets his wish.

14 CHAIRMAN RYAN: From what I heard, I
15 don't sense a lot of disagreement that there's a
16 chance that we'll approve the document by maybe
17 addressing that issue.

18 And, Dr. Ahn, thank you for your
19 insights on the modeling aspects. As somebody
20 that's done a good bit of groundwater modeling, I
21 appreciate the challenges that you face when you're
22 try and -- just one more hole. That's all we need.

23 We'll just keep drilling. We'll figure it out.

24 But it is a challenging thing to have a

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1 dynamic groundwater model, and to have it evolve
2 with your facility over time and address all the
3 influences both in the plant itself and the
4 environment, and what happens in it over 30, 40 or
5 50 years. So again, laying the foundation that
6 you've laid for guidance in that area seems pretty
7 reasonable and I'm sure that will evolve over time.

8 But thank you for that effort.

9 So with that, if there are no other
10 comments, questions or observations, let me thank
11 all the staff and other members from industry and
12 we'll close the subcommittee meeting.

13 Thank you all very much.

14 (Whereupon, the meeting was adjourned at
15 4:08 p.m.)

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ACRS Subcommittee Brief on Staff Review of NEI 08-08 Template and DC/COL ISG-6

July 6, 2009

Presented by:

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Dr. Hosung Ahn, NRO/DSER/RHEB

ACRS Presentation

- Purpose

- Brief the Subcommittee on the staff's review of revisions to NEI 08-08 and DC/COL ISG-6
- Explain the intended role of these documents in the licensing process.
- Discuss future activities incorporating this guidance

NRC Staff Engagement

– NRO

- Health Physics Branch
- Hydrologic Engineering Branch
- Balance of Plant Branches
- Containment and Ventilation Branches
- Rulemaking and Guidance Development Branch

– NRR- Health Physics team

– RES-

- Radiological Health Effects Branch
- Regulatory Guide Development branch

– FSME- Reactor Decommissioning Branch

Introduction/Background

- Subpart E- Radiological Criteria for License Termination Rule [i.e., 10CFR 20.1406(a) and (b)]
- Liquid Radioactive Release Lessons Learned Task Force Final Report, 9/1/2006
- NEI 07-07[Final] Industry Ground water Protection Initiative- Final guidance Document August 2007
- Regulatory Guide 4.21, Revision 0, “Minimization of Contamination and Radioactive Waste Generation: Life-Cycle Planning” June 2008

Introduction/Background

- NRO actions Re:10CFR 20.1406
 - Conducted awareness training on RG 4.21 guidance for NRO technical branches.
 - Identified need for scoping, evaluation and acceptance criteria
 - Developed ISG-6 based on reviewer needs.
 - Industry developed NEI 08-08 template to support standard implementation of RG 4.21.

NEI 08-08 Issues

Key issues discussed in the NEI 08-08 template public meetings:

- Design Features- certified design features necessary to address 10 CFR 20.1406 (b); and Site-specific design features.
- Operating Programs- how NEI 08-08 proposed a standardized program for COL applicants
- Ensure coordination of NEI 08-08 with the existing operating reactor sites. (NEI 07-07 voluntary program, EPRI Technical report, and IE Bulletin 80-10)

NEI 08-08 Template Overview

- Major sections include:
 - Applicability and Controls
 - Minimizing Facility Contamination
 - Guides for Minimizing Contamination of the Environment
 - Facilitation of Decommissioning
 - Minimizing the Generation of Waste
- The sections of NEI 08-08 are aligned with the sections of RG 4.21

NEI 08-08 Staff Review Issues

- Introduction

- Staff questions related to the technical basis for the program.
- Staff concern that cost alone is not the determining factor when implementing the ALARA features

NEI 08-08 Review Issues

- Applicability and Controls
 - Clarify comments related to NEI template and application. (Operating programs/site specific features)
 - NEI 08-08 did not address communication of offsite releases as described in NEI 07-07.
 - NEI 08-08 needed to address other mechanisms for release of radioactive material, not only ground water contamination.
 - Clarify if program would involve both initial and periodic evaluations.

NEI 08-08 Review Issues

- Minimizing Facility Contamination
 - Establish definition of thresholds- e.g., “credible mechanism” and “reasonably expected”
 - Discussion of examples or making all inclusive list of SSCs in document.
 - Inclusion of other programs with responsibilities for safe handling or containment of radioactive materials.
 - Ensure evaluation of cause and extent of condition when material is released.

NEI 08-08 Review Issues

- Minimizing Contamination of the Environment
(Hydrology issues)
 - Guidance on Site Conceptual Model (CSM) use
 - Use of term “downgradient” when locating monitoring wells,
 - Meaning of term “site boundary” for contamination analysis,
 - Clarify a “substantial change” to hydrological conditions
 - Program implementation timing (milestones)

NEI 08-08 Review Issues

- Minimizing the Generation of Waste
 - Significant radioactive components-examples
 - Assessment of waste stored on site-
 - Establishment of Waste Management Plan

NEI 08-08 Review Issues

- NEI 08-08 template usage:
 - Provides a program level description for COL applicants
 - If accepted by staff, COL applicants can update the FSAR to incorporate the program and its milestone.
 - Establish a standard approach for procedures for operation to meet the guidance of RG 4.21.

NEI 08-08 Summary

- NEI 08-08 describes a generic operating program for COL applicants.
- NRC Staff is currently conducting a safety evaluation to complete an SER on the generic FSAR guidance.
- If accepted COL applicants may commit to NEI 08-08 in the FSAR as the program description to be implemented.
- Questions?

DC/COL ISG-6-Interim Staff Guidance

- Background/Overview:
 - ISG-6-”Interim Staff Guidance on Evaluation and Acceptance Criteria for 10 CFR 20.1406 to Support Design Certification and Combined License Application” was developed to provide the NRC staff position on information and level of detail to demonstrate compliance with 10 CFR 20.1406.
 - Initial ISG issued for public comment on May 31, 2008 and received no public comments. Comment period closed July 31, 2008.

DC/COL ISG-6-Interim Staff Guidance

- Acceptance Criteria:
 - Adequate design features exist, supplemented by operating programs.
 - Reasonable assurance that leaks and spills will be detected in a timely manner.
 - Site has been adequately characterized and conceptual site models developed.
 - Decommissioning features and their role are described.
 - Site will be operated in a manner to minimize the generation of radioactive waste (during operation and decommissioning).

DC/COL ISG-6-Interim Staff Guidance

- Identifies the RG 4.21, Regulatory Positions C.1 –C.4 as providing guidance for compliance with 10 CFR20.1406.
- References the RG 4.21 Appendix A as a risk informed tool to determine applicable measures to consider.
- Interim staff guidance revision was based on staff comments questioning SSCs to review.
- Revision included a screening approach for SSCs (Attachment A); a list of operating experience events (Table 1).

DC/COL ISG-6-Interim Staff Guidance Summary

- The DC/COL ISG-6-Interim Staff Guidance will provide interim guidance to assist the review of certified design applications and combined license applications.
- The guidance will be incorporated in upcoming NUREG-0800, Standard Review Plan revisions.
- Questions?

NEI 08-08 – Generic FSAR Template for Life Cycle Minimization of Contamination

**Advisory Committee on Reactor Safeguards
Radiation Protection and Materials Safety
Subcommittee Meeting – July 6, 2009**

**Ralph Andersen, CHP
Director – Radiation Safety & LLRW**

Chronology

- **1997: 10 CFR 20.1406 Promulgated**
- **2005: Groundwater Issues Arise**
- **2006: Groundwater Protection Initiative (GPI)**
- **2006: NRC Task Force Report Issued**
- **2007: NEI 07-07 - GPI Issued**
- **2008: EPRI GPI Guidelines Issued**
- **2008: Reg Guide 4.21 Issued**
- **2009: NEI 08-08 Issued**

10 CFR 20.1406

- **Applies to new DC and COL applicants (after Aug 20, 1997)**
- **Describe how facility design and operating procedures will minimize, to the extent practicable:**
 - **Contamination of the facility & environment**
 - **Facilitate eventual decommissioning**
 - **Generation of radioactive waste**

Regulatory Guide 4.21

- **Risk-informed approach to implementation of 10 CFR 20.1406**
- **Focuses on prevention of leaks, early detection, & prompt assessment/response**
- **Includes numerous examples of measures to address the requirements**

NEI 08-08

- **Developed jointly by NEI task forces on new plant radiation protection/radwaste and groundwater protection**
- **Builds upon the GPI (NEI 07-07), EPRI guidelines (TR 1016099), & RG 4.21**
- **Describes operational procedures adjusted to design and site-specific aspects**

Content

- **APPLICABILITY AND CONTROLS**

- **MINIMIZING FACILITY CONTAMINATION**
 - **MINIMIZATION OF LEAKS AND SPILLS AND PROVISION OF CONTAINMENT**
 - **PROMPT DETECTION OF LEAKAGE**
 - **MINIMIZE THE POTENTIAL OF THE RELEASE OF CONTAMINATION FROM UNDETECTED LEAK**
 - **REDUCING THE NEED FOR DECONTAMINATION OF EQUIPMENT AND STRUCTURES**
 - **REVIEW OF OPERATIONAL PRACTICES**

Content

- **MINIMIZING CONTAMINATION OF THE ENVIRONMENT**
 - **SITE CONCEPTUAL MODEL DEVELOPMENT**
 - **EARLY DETECTION OF LEAKAGE AND CONTAMINANT MIGRATION**
 - **FINAL SITE CONFIGURATION**

- **FACILITATION OF DECOMMISSIONING**
 - **DESIGN AND OPERATIONAL FEATURES THAT FACILITATE DECOMMISSIONING**
 - **DECOMMISSIONING RECORDS**

Content

- **MINIMIZING THE GENERATION OF WASTE**
 - **WASTE MANAGEMENT**
 - **ONSITE STORAGE OF RADIOACTIVE WASTE**
- **DEFINITIONS**
- **REFERENCES**
- **APPENDIX A – Applicant-specific information**

**NEI 08-08, "Generic FSAR Template Guidance
for Life-Cycle Minimization of Contamination"
Responses to NRC RAIs**

**Advisory Committee On Reactor Safeguards
Radiation Protection and Materials Safety
Subcommittee Meeting –July 6, 2009**

**William E. Smith, MSHP
Southern Nuclear Company**

Introduction

- **Industry Representatives**
 - **New Plant Radiation Protection and Radioactive Waste Task Force**
 - **Ground Water Protection Task Force**
 - **EPRI**
- **RAI Resolution Process**
 - **Seven NEI – NRC Meetings on This Topic**
 - **NRC Comment or Question**
- **RAI Examples**

Response Process

- **Industry provided NEI 08-08 for NRC Review**
- **NRC Staff Developed Comment or Question**
- **Industry –NRC Clarify Understanding of Issue**
- **Document revised and cycle repeated**

Example RAIs by Topic

- **Introduction, Applicability, and Controls**
- **Minimizing Facility Contamination**
- **Minimizing Contamination of the Environment**
- **Facilitation of Decommissioning**
- **Minimizing the Generation of Waste**

Introduction, Applicability, Controls

- **Comment/Question**
 - Use of referenced documents
 - When COL applicant site specific information would be provided
- **Resolution**
 - Identified specific section on NEI 07-07 and EPRI TR1016099 technical basis
 - Identified Radiation Protection Fuel Load

Facility Contamination

- **Comment/Question**
 - **Movement of radioactive material onsite**
 - **Applicant use of template with design features**
- **Resolution**
 - **Identified existing site program**
 - **Evaluation of SSC's to include COL described design features**

Environment Contamination

- **Comment/Question**
 - **Periodic reviews of Site Conceptual Model based on ‘Substantial’ changes**
 - **Is ‘current site conditions’ post construction**
- **Resolution**
 - **As defined by professional geologist/hydrologist familiar with site**
 - **Current reflect the need to keep model up to date**

Facility Decommissioning

- **Comment/Question**
 - Clarify what applicant is evaluating related to planned releases
- **Resolution**
 - Applicant to use first 5 years of effluent release data and on-site ground water monitoring samples for identifying potential contamination from planned releases

Waste Generation

- **Comment/Question**
 - Clarify ‘periodic assessments’ of the waste stored onsite and the guidance for performing
- **Resolution**
 - Section revised to reference NRC and Industry guidance for on-site storage

Conclusion

- **Worked through difficult issues**
- **Satisfactory resolution**
- **Meetings important part of process**
- **Improved timeline for final template**
- **NEI 08-08 is in alignment with NRC**