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NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS (ACRS)

508th MEETING, DAY 2

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THURSDAY, DECEMBER 4, 2003

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ROCKVILLE, MARYLAND

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The committee met at the Nuclear Regulatory Commission, Two White Flint North, Room T2B3, 11545 Rockville Pike, at 8:30 a.m., Mario V. Bonaca, Chairman, presiding.

COMMITTEE MEMBERS:

MARIO V. BONACA, Chairman

GRAHAM B. WALLIS, Vice Chairman

GEORGE E. APOSTOLAKIS, Member

THOMAS S. KRESS, Member

GRAHAM M. LEITCH, Member

DANA A. POWERS, Member

VICTOR H. RANSOM, Member

STEPHEN L. ROSEN, Member

WILLIAM J. SHACK, Member

JOHN D. SIEBER, Member

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ACRS STAFF PRESENT:

JOHN T. LARKINS, Director

SHER BAHADUR, Associate Director

RALPH CARUSO, Senior Staff Engineer

SAM DURAISWAMY, Technical Assistant

MEDHAT EL-ZEFTAWY, ACRS Staff

HOWARD J. LARSON, Special Assistant

MICHAEL SNODDERLY, Senior Staff Engineer

MARVIN D. SYKES, ACRS Staff

MAGGALEAN W. WESTON, Senior Staff Engineer

ALSO PRESENT:

MARY ANN M. ASHLEY, NRR

SUZANNE BLACK, NRR

JOE BIRMINGHAM, NRR

JAMES BONGARRA, NRR

SUSAN COOPER, RES

JOHN HANNON, NRR

PAUL LAIN, NRR

PAUL LEWIS, RES

GARETH PARRY, RES

J. PERSENSKY, RES

STUART RICHARDS, NRR

JOSEPH SEBROSKY, NRR

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

(8:30 a.m.)

CHAIRMAN BONACA: Good morning. The meeting will now come to order. This is the second day of the 508th meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting the committee will consider the following: draft final 10 CFR Part 52 Construction Inspection Program framework; proposed revisions to the SRP Chapter 18, Human Factors Engineering; draft final revision to 10 CFR 50.48 to endorse NFPA 805 Fire Protection Standard; recent operating events; and proposed ACRS reports.

A portion of this meeting will be closed to discuss a proposed report on safeguards and security.

This meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act. Mr. Sam Duraiswamy is the Designated Federal Official for the initial portion of the meeting.

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

A transcript of portions of the meeting is

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1 being kept, and it is requested that the speakers use
2 one of the microphones, identify themselves, and speak
3 with sufficient clarity and volume so that they can be
4 readily heard.

5 Before we move to the first presentation,
6 I would like to point your attention to this document,
7 Items of Interest. There are a number of speeches --
8 actually, two -- from Chairman Diaz, some issues on
9 operating plants, and in the back you have the NRC
10 Strategic Plan 2004-2009. There is a copy of it, and
11 that's an interesting one to familiarize yourself
12 with.

13 I have an announcement also to make, which
14 is Ms. Carol Ann Rowe, who has been with ACRS for 32
15 years, is retiring on January 2, 2004. Her
16 dedication, hard work, professionalism, and attention
17 to details have been much appreciated by the ACRS
18 Executive Director, the ACRS/ACNW staff, and the ACRS
19 members.

20 We would like to thank her for her
21 contribution to the ACRS and wish her good luck in her
22 future endeavors.

23 MS. ROWE: Thank you.

24 CHAIRMAN BONACA: Thank you.

25 (Applause.)

1 And we will have a celebration for her
2 tomorrow.

3 I have another announcement. Mr. Noble
4 Green has joined the ACRS/ACNW staff as of December 1,
5 2003. He will be Secretary to the Executive Director
6 effective January 5, 2003. Prior to joining the
7 ACRS/ACNW office, Mr. Green was Secretary to
8 Commissioner Dicus.

9 Throughout the month of December, Carol
10 Ann Rowe will be working with Mr. Green to ensure a
11 smooth transition.

12 Welcome aboard.

13 MR. GREEN: Thank you.

14 (Applause.)

15 CHAIRMAN BONACA: With that, we are
16 through with the announcements and introductions. And
17 so we move to the first item on the agenda, which is
18 Draft Final 10 CFR Part 52 Construction Inspection
19 Program Framework, and Dr. Kress will introduce the
20 presenters.

21 MEMBER KRESS: Thank you, Mr. Chairman.

22 I remind the members that the background
23 information for this can be found under Tab 5 of your
24 notebook, in case you want to refresh your memory.

25 This is about a framework. That's a key

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1 word in this. And it's a framework on which to base
2 development of inspection manuals, inspection manual
3 chapters, related to what you do mostly about
4 finalizing the certification and COL process. It
5 requires an inspection program, and this is the basis
6 on which that inspection program will be developed.

7 So, and I also remind you that this is a
8 joint endeavor by Steve Rosen and myself. We work on
9 this -- we worked on this issue together, so, you
10 know, I'm just leading off is all.

11 So with that as almost a non-introduction,
12 I'd like to turn it over to staff. And I'm not sure
13 whether we start with Ann or with someone over here
14 or --

15 MS. ASHLEY: No. I have the lead for
16 this.

17 MEMBER KRESS: You have the lead. So
18 we'll start with Ann. Could you introduce yourself,
19 because I think this is the first time we've seen you
20 here.

21 MS. ASHLEY: My name is Mary Ann Ashley,
22 and I'm the team leader for the Construction
23 Inspection Program development.

24 The purpose of my presentation to you
25 today is twofold -- one, to provide information on the

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1 development of this program, and secondly to obtain
2 any insights you might have on where we may have
3 missed something, and generally about our overall
4 approach.

5 In the audience today I have a number of
6 members of the team who are -- have been on this
7 project for much longer than I have. And the most
8 important part of this is to note that we have
9 individuals, not only from the regions but also from
10 headquarters, who are supporting this effort.

11 We have a number of years of construction
12 inspection experience. We have individuals from the
13 New Reactor Licensing Group. We have individuals from
14 the Organizational Effectiveness Branch in NRR. We
15 have folks from the Inspection Program Branch.

16 We also have a diverse Steering Committee.
17 Charles Casto from Region II, who is the Division
18 Director in the Division of Reactor Safety. We have
19 Stu Richards, who is a Branch Chief and my boss from
20 the Inspection Program Branch in NRR. We have Jim
21 Lyons who is the Program Director for new research and
22 test reactors.

23 So this is a combined effort, has a wide
24 variety of staff expertise involved with it, and we
25 believe that will be key to the overall success of

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1 this.

2 As I've indicated, the development uses a
3 team approach with regional and Steering Committee
4 members. And also, the most important point here I'd
5 like to stress is it builds on work that was begun in
6 1996.

7 One of the issues that came up in previous
8 construction was the need to have an understanding of
9 where things worked well and did not work well in
10 previous construction inspection programs. And in
11 1996, a document was drafted that identified what the
12 lessons learned were from the construction of
13 Seabrook, Comanche Peak, South Texas, Watts Bar, and
14 Bellefonte.

15 Several of the lessons included ensuring
16 that inspection programs are properly completed. We
17 found ourselves in many cases having to go back,
18 searching through paper records, inspection reports,
19 doing word searches, to ensure that we had, in fact,
20 completed all we said was necessary in the
21 construction inspection.

22 The second lesson was that we needed to
23 have a plan for the transition from construction
24 inspection to operations inspection well in advance of
25 that point. A third was that we needed to be prepared

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1 as an agency to address late-filed allegations.

2 Inspectors also needed to be able to have
3 a simple method for recording inspection results. And
4 last but not least, we needed to ensure that
5 inspection requirements were made as objective as
6 possible.

7 MEMBER LEITCH: Mary Ann, just help me.
8 With the scope of the program, we're talking here
9 about new construction, obviously. But is there ever
10 a time when this program would cut in for repairs or
11 modifications to existing plants?

12 For example, we heard of a plant recently
13 that is planning to replace I think it was steam
14 generators, pressurizer, and reactor head in one huge
15 outage next year or the year after. I forget exactly
16 when. Might this program be involved in that kind of
17 an activity, or is it only brand-new construction?

18 MS. ASHLEY: The overall approach to
19 construction under Part 52 licensing requires a
20 different template for inspection. But when you get
21 down to the last point here, the inspection
22 procedures, they may be common to both.

23 Joe Sebrosky, do you have any insights?

24 MR. SEBROSKY: Yes. The only thing that
25 I would add to that is this framework document is very

1 specific for new construction, if you look at the way
2 the manual chapters are set up.

3 MEMBER LEITCH: Right.

4 MR. SEBROSKY: There has been some
5 discussion as the prospects of new construction come
6 forward that we may be able to use lessons learned
7 from activities such as you just mentioned -- MOX fuel
8 fabrication facilities, construction -- to help to
9 update our inspection procedures.

10 So it's more us getting lessons learned
11 from the construction activities that are taking place
12 today to inform this. It is not -- this document is
13 not meant to go the other way.

14 MEMBER LEITCH: Yes, okay. Okay. Thank
15 you.

16 MS. ASHLEY: Stu, did you have something
17 also to add?

18 MR. RICHARDS: I'm Stu Richards. I'm the
19 Chief of the Inspection Program Branch. And I guess
20 the straight answer is, no, that the modifications you
21 were talking about are covered under the Operating
22 Reactor Inspection Program and not this program,
23 although, you know, we do share lessons learned.

24 MEMBER LEITCH: Sure. Okay. Thank you.

25 MS. ASHLEY: Okay. Continuing on, the

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1 program overview for the overall inspection program
2 has a hierarchy of documents, one being a framework
3 document, which will establish the rules going in
4 about how we're going to use the various inspection
5 manual chapters and inspection procedures.

6 We see the framework document as an
7 opportunity for public involvement and discussion, and
8 when it is done will provide general guidance and
9 general assumptions that we've made for the
10 development of the subsequent manual chapters and
11 inspection procedures.

12 We did have an industry workshop to
13 discuss the framework document in August. We have
14 also had a public comment period to provide
15 opportunities for the public to send in written
16 comments about the document.

17 We anticipate that the final document will
18 be issued in March or April of next year, once we've
19 resolved all of the outstanding comments.

20 I want to stress that this is a work in
21 progress. We have not yet resolved all of the issues,
22 and we recognize that the nature of this document, and
23 the fact that it pulls from other aspects of the
24 construction program, may result in us not being able
25 to resolve every issue.

1 For example, the applicability of Part 21
2 to applicants is a point of discussion. That's not
3 necessarily an integral part of how you inspect, but
4 it also is an important aspect of the program that
5 will need to be ultimately resolved. So --

6 MEMBER POWERS: In your introduction you
7 mentioned several challenges that you wanted to
8 address as you went through and prepared this
9 document. Not the only one, but certainly one of
10 them, was late-arising challenges and contentions, and
11 things like that, and the ease of recordkeeping and
12 what not.

13 Could you discuss with us just a little
14 bit on how you viewed the rather major revolutions
15 that have occurred in electronic methods of
16 recordkeeping? And I'm thinking not only of entry
17 into computers but the ability of -- to carry around
18 digital cameras and things like that, and how that is
19 factored into your program.

20 MS. ASHLEY: In general, what we have
21 identified is a need to have an electronic
22 recordkeeping system that will combine not only NRC
23 inspection information but also will tie that
24 information to the applicable ITAAC, which is an
25 integral part of the Part 52 licensing.

1 And I have further discussion that I plan
2 on going through in one slide I think it is.

3 MEMBER POWERS: That's fine. I can wait.

4 MS. ASHLEY: Okay. Thank you.

5 MEMBER ROSEN: Are you also thinking about
6 the new challenges for inspection of these new
7 generation of plants which will have equipment in them
8 that is different than -- very different than existing
9 plants, particularly digital instrumentation,
10 multiplexers, data highways, sometimes with safety-
11 related functions. All of that will be new challenges
12 for the staff inspection program.

13 MEMBER KRESS: I think those will show up
14 in the new plant ITAACs.

15 MS. ASHLEY: That's correct. That's
16 correct.

17 MEMBER KRESS: And your plan is to inspect
18 the ITAACs.

19 MS. ASHLEY: You're absolutely correct.
20 And if you look at the structure of the manual
21 chapters, what you will notice is that they are very
22 much tied to the constructions that will be necessary
23 to support licensing under Part 52, one of which is
24 2503, which is the ITAAC. So there is a large portion
25 of the inspection program that is designed to ensuring

1 ITAAC completion, successful ITAAC completion.

2 MEMBER ROSEN: So the details of the
3 question I was asking about would be covered in a
4 specific ITAAC.

5 MS. ASHLEY: What would be covered is our
6 approach to inspecting ITAAC, and then the details
7 about the individual inspections to support inspection
8 of digital systems or to support other kinds of
9 equipment inspections would be covered in the
10 individual inspection procedures which support these
11 manual chapters.

12 MR. RICHARDS: If I can jump in for a
13 minute, I think a couple of points -- you know, some
14 of the operating reactors have retrofitted their
15 plants to bring some of the digital technology in. So
16 the staff, you know, has been looking at some of the
17 new technology as these things come into plants and go
18 through licensing amendment. So we have some
19 experience.

20 And then I think as part of the licensing
21 review the new reactor licensing organization will be
22 looking at new technology as it applies as part of
23 their review.

24 When it comes to the actual construction
25 inspection phase, you know, probably for the

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1 electronic components, because they typically come in
2 modules or in cabinets that are landed in place,
3 what's going to be important is, you know, the
4 inspection aspects, to make sure they're wired up
5 correctly to the rest of the plan and properly
6 attached and, you know, mounted in their location.

7 But I don't --

8 MEMBER ROSEN: And the testing.

9 MR. RICHARDS: And the testing, that's
10 correct. But, you know, when you -- you get into the
11 testing and pre-op phase -- well, that's part of what
12 we're going to do. But, you know, the fabrication of
13 the cabinet and its applicability or its applicability
14 in the design I think will be captured largely by our
15 review here in NRR.

16 Joe, is that correct?

17 MR. SEBROSKY: Yes. This is Joe Sebrosky
18 with the New Reactor Section. And as Dr. Kress knows,
19 part of the standard certification review is a review
20 of the ITAAC. So we, for the AP600, the APWR, and the
21 System 80 Plus, which all use digital I&C, there was
22 agreement and it was codified in our regulations on
23 what those ITAAC are, what are the acceptance criteria
24 for the digital I&C.

25 The issue that Mary Ann alluded to is we

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1 know what the top level requirements are. How we go
2 about doing our independent inspections is something
3 that we're working on.

4 MEMBER KRESS: With respect to these
5 ITAACs, your framework document suggested that you
6 probably would not be able to inspect in detail all of
7 them, and that you're considering a statistical
8 sampling process to at least limit some of the ITAACs
9 that you have to look at.

10 I'd be interested in knowing whether or
11 not you -- what kind of ITAAC you think would be
12 amenable to that, or if you've come up with the
13 statistical process that tells you how many samples
14 you have to take, and the details of that.

15 MS. ASHLEY: Certainly, Inspection Manual
16 Chapter 2503, which deals with the ITAAC, presents
17 some major challenges for us, because it does
18 represent the majority of the work. And it's -- we
19 recognized early on that inspecting everything was not
20 possible.

21 The sampling process is still very much
22 one of those things that is a work in progress.
23 Statistical sampling will only work with a homogeneous
24 large population. So one of the things that we have
25 identified is the need to come up with a process that

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1 will consider all of the important aspects and help us
2 to identify what's most important to inspect.

3 And one of the things that we're looking
4 at is risk, if there is a PRA associated with it, what
5 is the risk associated with a particular component or
6 a particular system.

7 We're also looking at opportunities for
8 inspection. If there is only one time -- and it's
9 important -- we need to make sure that we get our
10 individuals there to inspect it. We're also looking
11 at difficulty of inspection, where is it located
12 within the plant, is it something that we actually
13 have to see being put in place, or can we go back
14 later and look at it.

15 MEMBER KRESS: Would you ever rely on just
16 reviewing the -- what the licensee submits as a
17 document for why they put something in or the QA or
18 their drawings of a component or --

19 MS. ASHLEY: What we've discussed within
20 the team is that that will probably be part of the
21 mix, and there will be some things that will be of low
22 enough risk, of low enough consequence, that it would
23 be acceptable for us to do the review.

24 MEMBER KRESS: Now, I guess I was naively
25 thinking if it ended up in an ITAAC it already was a

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1 high enough risk to be worried about. But maybe I'm
2 wrong.

3 MS. ASHLEY: I think --

4 MR. SEBROSKY: This is Joe Sebrosky with
5 the New Reactor Section. The ITAAC, when they were
6 developed, are risk-informed. But you have to go back
7 to the requirement that's in Part 52, and the
8 requirement that's in Part 52 is the ITAAC -- if you
9 complete the ITAAC, you've demonstrated compliance
10 with all of the NRC's regulations.

11 So there are some ITAAC in there that are
12 more risk-significant than others and --

13 MEMBER KRESS: It could fall under the
14 category of an IT --

15 MR. SEBROSKY: Yes. And one of the things
16 that we mention in the framework document is the
17 concept that we will have touched every ITAAC. Some
18 of it may simply just be a record review, but we'll
19 try to predetermine that as much as possible in
20 advance.

21 And we will also use techniques such as if
22 you go with the modular construction, if a shipyard is
23 welding piping for the CVS and the RHR, we may just
24 look at RHR welding and say, if they welded that
25 properly, chances are they welded the CVS piping

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1 properly:

2 So our regulatory footprint in the
3 Construction Inspection Program Information Management
4 System, the basis for us finding the ITAAC acceptable,
5 is that we did look at the welding that was done at
6 the shipyard. They welded more than just RHR piping.
7 They welded a bunch of different --

8 MEMBER KRESS: Well, did you actually go
9 to the shipyard and watch them weld or wait until they
10 delivered the product or --

11 MS. ASHLEY: Absolutely. One of the main
12 challenges with the ITAAC and the anticipated
13 construction methods to be used with Part 52 licensing
14 is that there will be modular construction, that it
15 will be very aggressive schedules, that things will be
16 happening in multiple locations.

17 The estimates are that 60 to 80 percent of
18 past on-site construction will actually be moved to
19 other locations. Fabrication will occur wherever,
20 perhaps offshore, and then be brought to the site as
21 modules and installed there. So, yes, we have looked
22 at that, and we believe that what we come up with will
23 be sufficient because the inspectors will follow the
24 construction wherever it happens to be.

25 MEMBER KRESS: Does that mean you would go

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1 to the firm that's doing the construction and review
2 their QA program, QC program, or -- I'm not trying
3 to --

4 MS. ASHLEY: Well, that --

5 MEMBER KRESS: I'm looking at how much,
6 you know, is -- it sounds like a lot of work if you're
7 going to go to that much --

8 MR. RICHARDS: That's one of the
9 questions, you know, we're challenged with answering
10 is how much is enough, and how far do you go. I think
11 you're aware that, you know, presently there is a lot
12 of components being fabricated in foreign countries
13 for reactor head replacements and steam generators.
14 And, of course, these same components for new plants
15 may be fabricated overseas also.

16 So to what degree should we be looking at
17 that work and their programs, those are just exactly
18 the questions that Mary Ann's team is struggling with.

19 MEMBER ROSEN: Well, of course, you
20 recognize, Tom, that it's the applicant's job to make
21 sure that his supplier's quality assurance programs
22 are adequate and meet Appendix B. He has to be fully
23 convinced that that's happening, and, if not, to take
24 -- to work with his supplier to correct the weaknesses
25 in that supplier's corrective action program.

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1 MEMBER KRESS: Well, it's the applicant's
2 job to satisfy all of the ITAACs. But I think the NRC
3 has a role in validating or verifying it.

4 MEMBER ROSEN: That's right.

5 MR. SEBROSKY: This is Joe Sebrosky with
6 the New Reactor Section.

7 MEMBER ROSEN: But only in a validation or
8 verification role. That's --

9 MR. SEBROSKY: Well, we have to find --
10 the Commission has to -- it's in the Atomic Energy
11 Act. The Commission has to find that the acceptance
12 criteria has been met. It's in 10 CFR 52.103(g). And
13 the thought is that that finding is not that much
14 different than the finding that had to be made in the
15 10 CFR Part 50 process before you gave them an
16 operating license.

17 MEMBER KRESS: Somebody like the EDO would
18 have to sign something that says, "These ITAACs" --

19 MR. SEBROSKY: Well, it's a Commission
20 finding. So the Commission may -- may delegate that.
21 We suspect that we had some discussion about how that
22 was all going to work. But in the past, the way it
23 worked was the inspection results were given to the
24 Director of NRR.

25 The Director of NRR then informed the EDO

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1 and the chain of command that he was going to make
2 that decision. We suspect on the first couple of
3 plants that the Commission will not delegate that, but
4 that's up to them.

5 But the point that I was trying to make,
6 the bottom line point, is this inspection process that
7 we're developing feeds into that decision that the
8 Commission must make that the acceptance criteria have
9 been met.

10 CHAIRMAN BONACA: Some of the foreign
11 suppliers do not have a quality assurance program like
12 we have in the U.S. I mean, they have -- so,
13 therefore, you have to establish equivalency
14 judgments.

15 MEMBER KRESS: I think most of them have
16 ISO 9000.

17 CHAIRMAN BONACA: Hmm?

18 MEMBER KRESS: Most of them have ISO 9000.

19 CHAIRMAN BONACA: Yes.

20 MR. SEBROSKY: But if you look at --

21 MEMBER KRESS: Which I think has been
22 deemed equivalent.

23 CHAIRMAN BONACA: So there is already an
24 equivalency established there.

25 MEMBER KRESS: Yes, I think so.

1 MR. SEBROSKY: This is Joe Sebrosky. If
2 you look at the way the ITAAC are structured, though,
3 and you look at the AP600 as an example, most of the
4 large component manufacturing, the acceptance
5 criteria, is that it meets the ASME requirements.

6 So that -- Westinghouse and General
7 Electric and System 80 Plus, they knew ahead of time
8 what their supplier list was going to be, and what
9 commitments they were going to have to meet.

10 CHAIRMAN BONACA: Yes. Okay.

11 MEMBER KRESS: This framework document is
12 supposed to be framework and guidance for developing
13 manual chapters, and we should actually flesh it out
14 more and put more detail in. Do you have a schedule,
15 or will you people be the ones that develop these
16 manual chapters also?

17 MS. ASHLEY: Yes, we will. The team is
18 actually -- has many of the manual chapters already in
19 draft to reflect some of the original thinking for the
20 framework document. Those documents will be finalized
21 once the framework has been finalized.

22 MEMBER KRESS: Do they go out for public
23 comment?

24 MS. ASHLEY: They do not. Manual chapters
25 are an internal document within the NRC that guides

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1 our effort. So rather than put the manual chapters
2 out, we use the framework document to get that public
3 involvement in establishing the framework.

4 As you've all been noting, QA, of course,
5 is an integral part of the success of this. We have
6 talked to the industry at public workshops about their
7 need to have good QA, good problem identification and
8 resolution, and good records. That's an integral part
9 that they can serve in the process as well.

10 We've also talked --

11 MEMBER LEITCH: Mary Ann, this Chapter
12 2503 entails the inspection of ITAAC commitments,
13 but --

14 MS. ASHLEY: That's correct.

15 MEMBER LEITCH: -- I have a question back
16 on the previous one, 2502, which I guess is the
17 combined license phase. And in the document it says
18 that the application must also describe the ITAAC that
19 are necessary to ensure that the plant has been
20 properly constructed and will operate safely.

21 So it seems to me that back at that stage
22 the ITAAC is established. What you're doing in the
23 next phase is inspecting that those commitments are
24 met.

25 Now, establishing of that ITAAC is no

1 small job, it seems to me, and I'm trying to picture
2 what that is. Does that become something like an
3 FSAR? I mean, does it describe pre-op and startup
4 test programs, operator training programs, maintenance
5 activities, procedures? All of those types of things
6 that we were used to seeing described in the FSAR, is
7 that basically what the ITAAC is? Is it that
8 detailed?

9 MS. ASHLEY: Joe, would you like to talk
10 about this?

11 MR. SEBROSKY: I guess Mary Ann is putting
12 up an example ITAAC for the AP600. And as part of the
13 design certification review for the AP600, this is the
14 ITAAC for the normal residual heat removal system, one
15 of the ITAAC, one of several ITAAC.

16 And it's meant as a representative example
17 of what an ITAAC would typically look like. You have
18 a design commitment in the left column, inspections
19 test and analysis in the middle column, and in the
20 right column you see the acceptance criteria, which in
21 this case is the RNS pump provides at least 925
22 gallons per minute to the in-containment refueling
23 water storage tank.

24 Now, this was agreed to and approved by us
25 as part of the design certification review for the

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1 AP600. And if you go back -- Mary Ann, if you could
2 throw up the slide on the Part 52 licensing process.
3 This is also in the framework document.

4 You see early site permits, standard
5 design certifications, combined license, and then you
6 see the reactor construction, verification of the
7 ITAAC, and reactor operation. The ITAAC are
8 established prior to granting the combined license.

9 What we don't know at this point is when
10 a -- a licensee can choose to reference in a combined
11 license, an early site permit standard design, both or
12 neither. It's their option. So the review that's
13 done at that combined license stage, if we -- if they
14 want to reference the AP600, for example, they would
15 say, "We're referencing this certified design."

16 The ITAAC -- the review that we did as
17 part of that certification does not get relooked at by
18 us. What would get relooked at -- would get looked at
19 us -- looked at by us would be issues that were not
20 resolved during that standard design certification.

21 Westinghouse are the people that did that.
22 They did not know, for example, what the licensee's
23 programs were going to be for fire protection, that
24 kind of thing. So that would be reviewed at the
25 combined license stage -- issues that we had not

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1 previously reviewed. And there is a possibility that
2 ITAAC would be developed from that review.

3 But when we get the combined license, the
4 combined construction permit and conditional operating
5 license -- that's what it stands for -- one of the
6 conditions is ITAAC. It's attached to the license
7 just like tech specs, and the condition of being able
8 to load fuel is that you have demonstrated that the
9 acceptance criteria have been met.

10 That's high level how the process works.
11 So the inspections that we have in Inspection Manual
12 Chapter 2502 are a little different than what you had
13 suggested earlier. There's a mandatory hearing
14 associated with the combined license, and we believe,
15 just like what we're currently doing with the early
16 site permits and the Inspection Manual Chapter 2501,
17 that to support the granting of an early site permit
18 we'll go out and look at, inspect how that application
19 was developed, the quality assurance that went with
20 that application, and we'll issue an inspection
21 report, and that will feed into the Commission's
22 decision on whether or not to grant an early site
23 permit.

24 So there are inspections associated with
25 early site permits -- that's 2501 -- with combined

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1 license, which is 2501. The generation of the ITAAC,
2 though, is really based on inspections as much as it
3 is review, and what, based on that review, the staff
4 believes is appropriate for the ITAAC.

5 MEMBER LEITCH: Is the term "final safety
6 analysis report" passe, then, or --

7 MR. SEBROSKY: No, it is absolutely not.
8 If you look at the --

9 MEMBER LEITCH: When does that come into
10 play?

11 MR. SEBROSKY: Yes. If you look at --

12 MEMBER LEITCH: I didn't see that referred
13 to in the framework document.

14 MR. SEBROSKY: I don't think that we put
15 it in that framework -- in the framework document
16 specifically. There is, for example, a final safety
17 evaluation report that's associated with the early
18 site permits, with the standard design certifications.

19 MEMBER LEITCH: So if I come in and say I
20 want to build this certified design on this early site
21 permit approved, I've got an early site permit and I
22 want to build this standard design, certified design
23 on it, do I then have to submit with that application
24 something that looks like a final safety analysis
25 report, absent those features related to the site

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1 permit and the certified design?

2 MR. SEBROSKY: The short answer is yes.

3 And we would review --

4 MEMBER LEITCH: So I think that --

5 MR. SEBROSKY: The scope of our review is
6 dependent on what they choose at a combined license
7 stage. The scope of our review would be broader if
8 they didn't reference a certified design in an early
9 site permit.

10 MEMBER LEITCH: So things like the startup
11 test program, the power accession program, and so
12 forth, that -- it would be described in that --

13 MR. SEBROSKY: Well, there's portions --
14 if you go back to the AP600 and the AP1000, which
15 currently the ACRS is involved with reviewing the
16 design certification, you will see -- and I think it's
17 in Chapter 14 -- you'll see a description that
18 Westinghouse puts in there of what the startup program
19 and power accession program should be. They give the
20 high-level tests that need to be completed.

21 So the types of information that you would
22 expect in an FSAR --

23 MEMBER LEITCH: Would be --

24 MR. SEBROSKY: -- are already -- yes, as
25 part of the AP1000 review, that's something that we're

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1 looking at. The details -- there are things in those
2 standard design certification reviews that are called
3 COL action items. The actual specific test procedure
4 -- development of the specific test procedure, the
5 detailed test procedure, Westinghouse did not do.
6 That's a COL applicant's responsibility.

7 So they'll -- they have a thing called a
8 design control document. That portion of it, the
9 Tier 2 stuff, looks like the final safety analysis
10 report. And we have a corresponding final safety
11 evaluation report associated with it.

12 MEMBER LEITCH: Okay. Thanks.

13 VICE CHAIRMAN WALLIS: Can we go back to
14 your previous slide about RHR?

15 MS. ASHLEY: Yes.

16 VICE CHAIRMAN WALLIS: It seems to me that
17 the flow rate you get in the system depends upon the
18 conditions, and you have to have the reactor up to
19 temperature, and you can't have it up to temperature
20 without having it up to pressure. Flow depends upon
21 the temperature of the water and all kinds of things.

22 So you've got to be more specific than
23 just saying pump provides a certain flow rate.
24 There's got to be at -- a whole lot of conditions.

25 MR. SEBROSKY: Yes. Dr. Wallis, this is

1 Joe Sebrosky again. This is just a sub-ITAAC. You
2 see, it's 9.d.

3 VICE CHAIRMAN WALLIS: Yes.

4 MR. SEBROSKY: If the design commitment in
5 this particular case is that it provides heat removal
6 from the in-containment refueling water storage tank,
7 and it -- in the inspections test and analyses it
8 gives you the high-level lineup, that the flow through
9 the RNS heat exchangers when the pump suction is
10 aligned to the IRWST and the discharge is aligned to
11 the IRWST.

12 VICE CHAIRMAN WALLIS: But then the whole
13 -- the reactor has got to be up in temperature and
14 pressure.

15 MR. SEBROSKY: That's not in this -- the
16 way the EP -- there's another test that does that for
17 the --

18 VICE CHAIRMAN WALLIS: Okay. So it does
19 925 gpm when it's cold, and then it does something
20 else when it's --

21 MR. SEBROSKY: This is at recirc. This is
22 in recirc to the IRWST. You're basically removing
23 water from the IRWST and demonstrating that the pump
24 provides sufficient flow back to the IRWST.

25 VICE CHAIRMAN WALLIS: Under what

1 conditions for the rest of the circuit, though?

2 MR. SEBROSKY: Well, this -- I guess from
3 a high level, what we probably need to do is show you
4 the entire RHR system. The only aspect -- it does not
5 matter, because the reactor is not involved in this
6 particular test, what the reactor conditions are.

7 VICE CHAIRMAN WALLIS: Doesn't it affect
8 the flow rate, just on the temperatures around the
9 circuit for the --

10 MR. SEBROSKY: In this particular
11 condition, it's recirc back to the IRWST. So it does
12 not.

13 VICE CHAIRMAN WALLIS: Okay. So it's all
14 pretty cold, right? It's all pretty cold?

15 MR. SEBROSKY: Yes, that's correct.

16 VICE CHAIRMAN WALLIS: Okay. So this
17 particular -- it doesn't -- even that depends on the
18 temperatures. It doesn't make any difference whether
19 it's 50 degrees Fahrenheit or 120.

20 MR. SEBROSKY: That's a true statement.

21 VICE CHAIRMAN WALLIS: So I think you've
22 got to be careful that the thing isn't tested under
23 some conditions, and then it won't meet the
24 requirements under the real condition.

25 MR. SEBROSKY: I agree with the point and

1 understand the point. The ITAAC are meant to be high
2 level. This particular ITAAC is looking at one aspect
3 -- the pump capability -- and flow in recirc mode for
4 the IRWST. There's a discussion in the Tier 2
5 document -- ITAAC are high-level commitments. The
6 Tier 2 document will tell you specifics on how the
7 test would be performed, the conditions that are
8 assumed.

9 VICE CHAIRMAN WALLIS: I just want to make
10 sure you're aware of these things. You have to be
11 curious about whether the test is fully defined,
12 realistically defined.

13 MR. SEBROSKY: That's something that the
14 staff, the systems experts for the particular -- in
15 the review of the ITAAC is part of the design
16 certification review. The reviewer is responsible for
17 looking at the FSAR material and also the ITAAC that
18 come out of that. So it's taken in context, and the
19 system experts look at that.

20 This particular example, I understand the
21 concern. But if you look at the RHR system in total,
22 you will see other testing that is done, and it's more
23 specific on the exact conditions that you expect.

24 VICE CHAIRMAN WALLIS: Okay.

25 MR. SEBROSKY: One of the things that you

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1 will not see in ITAAC, though, is ITAAC are done prior
2 to fuel load. So you don't see any testing that's
3 done with fuel in the reactor vessel.

4 CHAIRMAN BONACA: Now, these ITAACs, I
5 mean, they are derived from the vendor's plan for how
6 it's going to test the reactor, right?

7 MR. SEBROSKY: That's correct.

8 CHAIRMAN BONACA: So --

9 MR. SEBROSKY: The vendor -- part of the
10 requirements of the regulation is when the vendor
11 submits the design certification application they
12 provide the ITAAC.

13 CHAIRMAN BONACA: And you are going to
14 define specific elements of that to determine or to
15 validate certain criteria. Like in this case you want
16 to validate the heat exchanger capacity, really. And
17 then, of course, then, typically the vendor defines
18 the temperature at which the test has to be done, and
19 then provide the range of value for acceptability.

20 I mean, typically it is not just an
21 absolute value. This must be a minimum value that you
22 are using.

23 MR. SEBROSKY: It is. It says pump
24 provides at least 925 gallons of fuel.

25 MEMBER ROSEN: This doesn't prove the heat

1 exchange capacity. All it proves is that the flow is
2 adequate.

3 CHAIRMAN BONACA: The flow is --

4 MR. SEBROSKY: And there's another aspect
5 associated with the heat exchange. It's one small
6 portion, and the reason that we put it up there was to
7 just give you an example of how -- what an ITAAC looks
8 like. You can't take out of --

9 VICE CHAIRMAN WALLIS: The test components
10 -- it's very tricky, because when you've got actually
11 heat transfer occurring in the heat exchanger, this
12 affects the frictional pressure drop. So it affects
13 the flow rate, so it's very tricky to do sub-tests of
14 just one part of the system without realistically
15 modeling the whole system or making sure everything is
16 representative of the operating conditions.

17 MR. SEBROSKY: I understand.

18 MEMBER ROSEN: Would you go back to the
19 slide --

20 MEMBER LEITCH: I'm still concerned -- go
21 ahead, Steve.

22 MEMBER ROSEN: Could you go back to the
23 slide again that you had just before this, the one
24 that shows the overall process?

25 MS. ASHLEY: Certainly.

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1 MEMBER ROSEN: Joe, in your remarks, you
2 talked about the ITAAC stuff on the upper right, and
3 you said that the ITAAC and the tech -- are like the
4 tech specs in the license. They are mandatory
5 completion kind of things.

6 But are the ITAACs like the tech specs in
7 the sense that the tech specs live on with the plant
8 as it goes into its lifetime? What happens to the
9 ITAACs?

10 MR. SEBROSKY: It's banned at fuel load.
11 After the Commission makes its determination in
12 accordance with 52.103(g) that the acceptance criteria
13 have been met, the ITAAC -- and there is no
14 requirement that lives on.

15 There is, as part of the ITAAC, a portion
16 of the design control document that's called Tier 1,
17 and the Tier 1 material contains a design description.
18 That design description lives on, but the ITAAC
19 themselves do not constitute regulatory --

20 MEMBER ROSEN: So there are no
21 requirements from the ITAACs that live on with the
22 plant?

23 MR. SEBROSKY: That's correct.

24 MEMBER LEITCH: I'm still concerned about
25 the interface between the scope of supply that is in

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1 the certification package and the rest of the
2 powerplant equipment. In other words, a design is
3 certified, but there's a lot of associated systems
4 that are not part of that certification package that
5 are, nonetheless, important to support the operation
6 of the plant.

7 MR. SEBROSKY: The way Part 52 is arranged
8 it's for the -- it's for the complete design. So you
9 see a discussion of the turbine building, for example,
10 in the design certification reviews for the AP600,
11 AP1000. What --

12 MEMBER LEITCH: So, then, at that stage
13 all of the ITAACs, even including --

14 MR. SEBROSKY: Something like --

15 MEMBER LEITCH: -- if there is some
16 turbine building cooling water, for example, is -- the
17 acceptance criteria for those kinds of systems are
18 agreed upon at that phase?

19 MR. SEBROSKY: Yes. And for many systems
20 there are no ITAAC, because there are no regulatory
21 requirements associated with that. So if you looked
22 in the turbine building, for example, on the AP600, I
23 think there's a fire pump that's in that turbine
24 building. There is ITAAC associated with that, but
25 very few ITAAC came out of the review of that turbine

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1 building:

2 MEMBER LEITCH: Okay. But it --

3 MR. SEBROSKY: But it was part of the
4 review.

5 MEMBER LEITCH: -- it was part of the
6 review.

7 MR. SEBROSKY: And it was something that
8 was looked at, and has the -- I guess the term is
9 "issue preclusion" at the time that they go for a
10 combined license.

11 MEMBER LEITCH: Okay. Okay. Thanks.

12 MS. ASHLEY: One of the challenges that we
13 have is to prepare the people who will be conducting
14 the inspections to actually do that work. We have
15 been using the strategic workforce planning initiative
16 in the Office of Human Resources to identify our
17 current resources associated with history -- the
18 history of the construction inspection program.

19 And what we have identified is that
20 there's a limited number of staff who have had any
21 experience in implementing a construction inspection
22 program. And many of those are late in their careers.

23 But one of the problems that we have is to
24 prepare those individuals who are remaining to do new
25 construction inspection, and we're using existing

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1 construction activities at the MOX fuel fabrication
2 facility, enrichment facilities, and, of course,
3 Browns Ferry Unit 1 restart, as a way of introducing
4 new inspectors to construction activities as well as
5 to refresh existing inspectors with processes that
6 they may have seen once long ago in their career.

7 We also recognize that there's the need to
8 implement formal training. The program that was
9 previously in place to prepare inspectors has been
10 mothballed for a number of years. And what we have
11 done is to determine that the most likely scenario for
12 preparing new inspectors will be to use commercially
13 available programs offered by the Concrete Institute
14 or other commercial -- commercial companies who
15 provide components, and get that training from them.

16 And it has several advantages. One, it
17 will provide an opportunity to have small numbers of
18 inspectors trained rather than having a critical mass
19 of 20 or 30 all at the same time. It will also have
20 better timing for our purposes in that those courses
21 are available currently, and we can begin to send
22 individuals to that training if the need is
23 immediately there.

24 One of the things that you asked about,
25 Dr. Powers, is programs and processes in a computer

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1 system. And we have -- that was one of the lessons
2 learned from the previous implementation of the
3 construction inspection program, and so we have been
4 working to develop a construction inspection program
5 information management system called CIPIMS.

6 The framework for this was laid out back
7 in 1996 when all of that construction experience was
8 fresh in everyone's mind, and they have identified
9 what this program would need to do. And we actually
10 have that information for the framework of the program
11 loaded into a computer.

12 One of the key areas is that this
13 information needs to be tied to ITAAC, so that we can
14 look at the sum total of information that we've
15 collected in inspections about a particular ITAAC.
16 And that's necessary so that at the end we will be
17 able to say, "Yes, we have looked at what is necessary
18 and sufficient with regard to a particular ITAAC or
19 series of ITAAC."

20 We also believe that this will help us to
21 address one of those other issues that was identified,
22 which is late-filed allegations. We will be able to
23 use our recordkeeping as a primary source of
24 information to research issues related to a particular
25 allegation.

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1 MEMBER LEITCH: In the discussion you talk
2 about some meetings you've had with architect-
3 engineers and equipment suppliers regarding the
4 interface between this program and their program. Do
5 you see this as being primarily an NRC program using
6 the same software as the architect-engineer would use
7 or -- and how do you assure that those programs are in
8 lock-step, that he doesn't -- you're using one
9 software package and --

10 MS. ASHLEY: Right.

11 MEMBER LEITCH: -- and a couple of years
12 down the road the architect-engineer changes his
13 software package, and you're going in different
14 directions? How does that --

15 MS. ASHLEY: In talking with the
16 architect-engineers, and in talking with utilities,
17 what they have told us is their primary vehicle for
18 scheduling -- and that's what we would be dependent
19 upon, both the industry and the architect-engineers,
20 to provide to us -- is a program called Primavera.

21 MEMBER LEITCH: Primavera, yes.

22 MS. ASHLEY: And so we're working with
23 them, and they understand our needs. Part of it is
24 schedule that we would get from them, but another
25 aspect of this is the recordkeeping side. So

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1 certainly that is independent of the schedule.

2 MEMBER LEITCH: So you would probably be
3 using Primavera as well?

4 MS. ASHLEY: Yes.

5 MEMBER LEITCH: But maintaining the system
6 -- the NRC would have its separate system from the
7 architect-engineer?

8 MS. ASHLEY: That's correct.

9 MEMBER LEITCH: But using the same
10 software.

11 MS. ASHLEY: That's correct. It would
12 provide information to us about schedule. We would
13 download that information into our CIPIMS program, and
14 would then use that to help us identify the timing for
15 -- and perhaps location where particular fabrication
16 is going to take place on a particular item related to
17 a specific ITAAC.

18 MEMBER ROSEN: I'm somewhat familiar with
19 Primavera at least, but it is only one of several
20 different critical path construction techniques -- a
21 schedule management technique. So are you going to
22 stay flexible? What if an architect-engineer is hired
23 by one of these applicants that doesn't use Primavera,
24 he uses something else?

25 MS. ASHLEY: We're not locked into that,

1 although that is apparently the preference right now.
2 The most important part of this is -- interestingly
3 enough, I don't believe it's the schedule so much, or
4 rather the program so much -- it's ensuring that
5 what's in the program and the schedule is consistent.

6 One of the main problems that we have
7 identified is that there is a need to have a
8 consistent coding schedule, so that when licensees get
9 information from their fabricators, a particular
10 component, particular piece of equipment always needs
11 to be referred to the same way, or it doesn't matter
12 what program we're using.

13 Our resources here at headquarters feel
14 fairly confident that it's very easy to do the
15 transfer with Primavera. They feel confident that
16 they can also do it should other programs be used, but
17 that the underlying problem is one of consistent
18 coding is more important and more challenging.

19 MEMBER POWERS: One of the problems that
20 we face in today's electronic era is that hardware and
21 software systems for recordkeeping tend to evolve
22 faster than the records decay and their utility. And
23 you quickly end up with electronic media that you
24 can't read. What do you do about that? I mean, you
25 have -- for any given installation you have gigabytes

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1 of inspection information, and your software systems
2 are just going to evolve out from under you.

3 MS. ASHLEY: The most important part of
4 this is that the actual results of inspections will be
5 in inspection reports, and will be part of ADAMS. So
6 will be retrievable through that vehicle.

7 What CIPIMS is going to do for us is going
8 to allow us to pull information from the inspection
9 reports and record it into database table form, so
10 that we can say, where are the various inspection
11 results related to a particular ITAAC? So we
12 shouldn't -- as long as ADAMS is in existence, we
13 should be able to pull the base information out.

14 Does CIPIMS need to be -- live forever?
15 I'm not sure about that.

16 MR. RICHARDS: I think your concern is is
17 that the utility or the -- they might be upgrading
18 their software, and we don't, or the two systems don't
19 communicate. Is that the question?

20 MEMBER POWERS: I mean, that's one aspect
21 of it.

22 MR. RICHARDS: It's a good question, and,
23 you know, I'm not sure we have an answer. On the plus
24 side, I think the -- you know, the industry is looking
25 at constructing these plants in a relatively short

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1 timeframe compared to past history. But we would have
2 to enter into some kind of understanding with a
3 utility to make sure our two computer systems would be
4 able to talk to each other.

5 MEMBER POWERS: The other aspect of it is
6 20 years from now, 20 years from the completion of
7 construction, you may well need to go back and look at
8 those inspection reports. And can you be able to do
9 so? And what you're saying is that, yes, as long as
10 ADAMS is around, I can. ADAMS presumably will evolve.
11 God, I hope it evolves. But not that --

12 MEMBER SIEBER: It can only go up.

13 MEMBER POWERS: Oh, no. Oh, no. There's
14 lots of down side potential here. It's just that we
15 have -- I mean, among the national laboratories, we
16 just have mountains of data that cannot be read by
17 existing systems.

18 MS. ASHLEY: I understand your point, and
19 it's a good one, and we'll have to take that into
20 consideration as to how we would ensure that through
21 the framework.

22 MEMBER KRESS: Do you have a program or a
23 way to test this CIPIMS before you have to go
24 through --

25 MS. ASHLEY: We are, in fact, working with

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1 Westinghouse, GE, and the folks at TVA to have them
2 provide to us some schedules, so that we can ensure
3 that the information can be transferred into the
4 CIPIMS system and will -- and that the CIPIMS system
5 will be able to hold the volume of information that's
6 anticipated will go through it.

7 One of the issues now is -- it's a good
8 one -- is when they provide information to us, some of
9 that information on schedules is considered
10 proprietary. So how do we protect that proprietary
11 information that they're providing as part of a
12 schedule update?

13 MEMBER LEITCH: The framework document
14 refers to a pilot that will be run in the summer of
15 '03. Was that pilot actually run or -- and, if so,
16 what were the results? Is that what you're referring
17 to?

18 MS. ASHLEY: That's what I'm referring to.
19 We have not had an opportunity to do that, because
20 some issues -- those issues about proprietary
21 information were raised.

22 MEMBER LEITCH: I see.

23 MS. ASHLEY: In the development of the
24 detailed inspection procedures, we recognize that
25 those inspection procedures in many cases will have to

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1 be design specific. So by the very nature of the
2 inspection procedures, they may have to wait until the
3 specific application is received.

4 However, our intention is to make as many
5 of the procedures technology neutral as possible, look
6 for opportunities to complete development, and have
7 those procedures ready to go as we are able. One of
8 the estimates that was put in the SECY paper on future
9 licensing indicated that the level of effort to
10 actually complete the inspection procedure revision is
11 between 10 and 12 FTE. So we'll have a lot of work to
12 do when the application is actually submitted.

13 What we also know is the lead time for
14 unique designs, such as gas-cooled reactors, because
15 it represents a newer type of technology that we may
16 not have any experience with, may take even longer
17 than the 10 to 12 FTE.

18 MEMBER KRESS: With respect to gas-cooled
19 reactors, one of the ITAACs are likely to be
20 specification on the fuel quality. How would you
21 inspect for that? Would you go to the plant that
22 makes the fuel, which would be somewhere different
23 than the site -- than the plant that's going to use
24 it, and would you just audit their processes, or would
25 you --

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1 MR. RICHARDS: I hate to speculate on what
2 we're going to do in the future. But I know in the
3 past that some members of our technical branch in NRR
4 that are -- you know, oversee the fuel aspects have
5 made site visits to fuel fabricators. They have
6 looked at not only the fabrication process but also at
7 the --

8 MEMBER KRESS: The final product.

9 MR. RICHARDS: -- design and engineering
10 work that goes into it. So we've done that in the
11 past. We've gone to fuel fabricators, and we've
12 provided them feedback on what we think they're doing
13 right and wrong and gotten responses from them.

14 MEMBER LEITCH: There seems to be an
15 implication in some of the framework document that
16 some long lead time modules could be actually started
17 to be manufactured prior to the issuance of the
18 combined license. And I guess I'm wondering, is there
19 a possibility that some important inspection
20 opportunities may be missed if that is the case?

21 MS. ASHLEY: The answer to that is yes.
22 In our discussions with the industry, we have talked
23 to them about the need to inform us as soon as they
24 possibly can, and their current thinking is that at
25 least for the first reactor to be built under Part 52

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1 that they're not going to get too far ahead of the
2 licensing process, and that they will probably wait.

3 However, they do indicate that once they
4 have been through the process and feel comfortable and
5 know how it's going to work, that the possibility that
6 they could order large components ahead of time is
7 there. And their indications to us now is that they
8 recognize that keeping us informed is to their
9 advantage. How that will actually play out, and to
10 what extent they will keep us informed, and how they
11 will do that, remains to be seen.

12 MEMBER ROSEN: It seems to me that's not
13 the agency's problem. If a licensee or applicant
14 chooses to do that, that's his problem. He takes on
15 all the new risk. And if you want to --

16 MS. ASHLEY: That's exactly correct.

17 MEMBER ROSEN: -- inspect something that's
18 already buttoned up, he just has to open it up. And
19 I don't see that that is a problem that falls on your
20 side of the table.

21 MR. RICHARDS: Well, I think we would like
22 to work the details of how we'd approach that out on
23 the front end, so if a utility wants to go forward and
24 do that there's no surprise. I think we have an
25 obligation to try and talk about that and see if we

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1 can come to some agreement.

2 MEMBER ROSEN: I agree with that, but --

3 MEMBER POWERS: I sure encourage you to do
4 that, because even if you -- you have the right to
5 demand they open it up as you say, you know there's a
6 cat fight associated with that that --

7 MEMBER ROSEN: I just don't feel that the
8 staff should be mousetrapped by that.

9 MEMBER POWERS: Okay.

10 MR. RICHARDS: Or you could have a
11 situation where components are fabricated, and maybe
12 a reactor vessel or a head is fabricated before they
13 decide to, you know, come in for a license.

14 MEMBER POWERS: Just don't use high
15 nickel/low copper alloy.

16 (Laughter.)

17 MR. RICHARDS: There are a lot of
18 challenges about the timing of things that we don't
19 have any answers for.

20 MS. ASHLEY: That's correct.

21 MR. RICHARDS: You make good points.

22 MS. ASHLEY: I just wanted to summarize a
23 few of the issues that came up during the public
24 comment that we received from the industry. One of
25 them that was a topic that was reflected in the

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1 framework document but is not unique to the framework
2 document is the applicability of Part 21 to
3 applicants.

4 MEMBER KRESS: Who did you get comments
5 from?

6 MS. ASHLEY: We got comments from NEI.

7 MEMBER KRESS: NEI, okay.

8 MS. ASHLEY: Other specifics had to do
9 with public communication. The industry, by and
10 large, would like to have as much specifics as we can
11 possibly provide at this point. Included in that are,
12 what is your protocol for inspection going to be?
13 What are inspection reports going to look like? How
14 are you going to record negative inspection results?
15 What are they going to be called?

16 Those kinds of information is what the
17 industry is seeking, and we're working on that. We
18 don't know to what extent we're going to be able to
19 legitimately provide that at this point, but we
20 understand that there is a need to have that
21 information.

22 And our current intent is to recognize in
23 the framework document that we just don't have enough
24 information to make a judgment at this time, but that
25 in the future that information will be provided, and

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1 identify where that information will be made publicly
2 available and in what form and format.

3 MEMBER ROSEN: Mary Ann, this may be the
4 time for me to ask my question about negative results.
5 You raised the issue in response to the public
6 comments. On page 16 of the document, the framework
7 document, there is a discussion of negative SAYGO
8 ITAAC conclusions.

9 And it is clear that a negative conclusion
10 would have to be corrected by the licensee if
11 something was -- if you couldn't make a positive
12 conclusion, the licensee would have to go in and
13 correct what it is that deficiency was.

14 It seems to me that -- and such a
15 condition could only happen if the licensee's
16 corrective action program hadn't fixed it before you
17 got to the point where you were trying to make a
18 conclusion. So it seems to me there's two issues
19 here. One is to correct whatever the deficiency is,
20 but more broadly -- and I don't see this -- more
21 broadly, to correct the licensee's corrective action
22 program deficiencies that led to that -- you being
23 forced to make a negative SAYGO conclusion.

24 And, furthermore, having said that, not
25 only requiring the licensee to correct the corrective

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1 action program weaknesses that led to the negative
2 conclusion, but to examine the extent of the generic
3 implications to the whole process that that corrective
4 action program weakness or weaknesses reveals.

5 And so I don't -- on page 16, under
6 negative SAYGO ITAAC conclusions, I don't see anything
7 about the broadening -- the need to broaden that
8 important -- I mean, if you're going to make a
9 negative SAYGO ITAAC conclusion, that ought to -- the
10 earth ought to move. I mean, it really shouldn't
11 happen.

12 MEMBER KRESS: Does that imply that the
13 corrective action program has to be an ITAAC before
14 you --

15 CHAIRMAN BONACA: Well, that's a good
16 question. That was -- because, I mean, many licensees
17 did not build their plants under the corrective action
18 programs. I mean, it was really under the AE or/and
19 the vendors' programs, which were not --

20 MEMBER KRESS: It's not part of the
21 licensee's corrective --

22 CHAIRMAN BONACA: -- part of the
23 licensee's, that's right. I think it's a good
24 question insofar as the corrective -- somebody, I
25 mean, has the responsibility for correcting those. I

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1 believe, however, it falls into the AEs and vendors'
2 structures, and they don't have a formal corrective
3 action program. I mean, they --

4 MEMBER ROSEN: Vendors? Sure. They are
5 Appendix B suppliers. They've got to have --

6 CHAIRMAN BONACA: At least be sure. But
7 I'm talking about --

8 MR. RICHARDS: I think you've made a very
9 good point, and it's something that we've flagged as
10 a, you know, critical element in our construction
11 inspection program -- is the role of quality
12 assurance, both from -- the utility has quality
13 assurance over all of their contractors and the
14 vendors and how they implement that.

15 So if their program is robust and
16 functioning well, I think you're right, it -- you
17 know, it shouldn't happen. And if it does, it brings
18 into question how come their oversight and their
19 quality assurance program allowed that to happen?

20 MEMBER ROSEN: Right. And how broad is
21 this problem?

22 MR. RICHARDS: Yes. What do we do if we
23 get in that situation? So that's a very good
24 observation.

25 MEMBER ROSEN: So you might want to go

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1 back to that page 16, Section 2, that talks about
2 these negative SAYGO ITAAC conclusions and
3 substantially beef it up in that area in terms of the
4 broader implications.

5 MR. RICHARDS: We appreciate the comment.

6 MEMBER KRESS: Yes. Well, I -- on the
7 same token, I don't think it's realistic to believe
8 that there will always be only positive findings.

9 MR. RICHARDS: Of course.

10 MEMBER KRESS: Even if they have a good
11 corrective action program. So it may -- it may be --
12 a metric might be how many of these you have as to
13 whether you go back and look at it. I mean, if you
14 have one or two of them, maybe it's not a sign it's a
15 bad corrective action program, it's just things happen
16 when --

17 MEMBER ROSEN: Because there may be
18 something very unique about the particular deficiency.
19 But the fact that it wasn't corrected by the
20 corrective action program --

21 MEMBER KRESS: They didn't find it
22 themselves.

23 MEMBER ROSEN: -- that they didn't find
24 it, that it had to be found by an inspector and then
25 forced you to make a negative -- into a position where

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1 you're making a negative SAYGO ITAAC conclusion.

2 MEMBER KRESS: Yes. For the benefit of
3 some of the members, could you give us an explanation
4 of what SAYGO is?

5 MS. ASHLEY: Yes, I can. SAYGO stands for
6 sign as you go. And the idea was is that, if you look
7 at the ITAAC, some of the ITAAC, particularly for
8 large components, may span a long time. And the idea
9 was that we would be able to go and look at the
10 activities as they are occurring and would be able to
11 sign off as we complete a particular section of the
12 inspection, which would connote that we would not be
13 going back to relook at that unless we got some
14 additional information that would cause us to
15 reexamine our finding.

16 And it was viewed as a vehicle for us to
17 be able to say that's complete, we can move on, and
18 know that we've come to some degree of closure on that
19 aspect.

20 MEMBER KRESS: Would that be part of your
21 CIPIMS input then? Or you would track that and --

22 MS. ASHLEY: That's correct. It would
23 allow us to sign -- we've signed off on this, and the
24 CIPIMS would have an ability -- would have a
25 capability to record that we had reached a conclusion

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1 to that point.

2 MEMBER KRESS: However, it would be the
3 role of the inspector to sign off on the SAYGO?

4 MS. ASHLEY: That's correct. The
5 inspector would have to sign off and say everything is
6 fine to this point.

7 MEMBER KRESS: When everything else, then,
8 is done on that ITAAC, who signs off on a given ITAAC?
9 The inspector goes in or --

10 MS. ASHLEY: The licensee sends us a
11 determination letter that says, "We believe we're
12 complete," and then we would have to reexamine what we
13 have done and would have to either not concur or
14 concur with that. And then that would be -- the SAYGO
15 record would be a record that would help us to make
16 that determination whether or not we agree or not.

17 MEMBER ROSEN: Do you have a specific
18 differing professional opinion or differing
19 professional view process built into this process
20 separate from the overall agency's? Or would you rely
21 on the overall agency's process? I mean, I'm thinking
22 of an inspector who doesn't like something, and
23 everybody -- the licensee, the applicant, and the rest
24 of the staff don't agree with him or her. And you
25 need to have a process to resolve those kinds of

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1 things.

2 MS. ASHLEY: We do not -- the answer to
3 your question is we do not have a separate program for
4 that. We had not considered it and --

5 CHAIRMAN BONACA: I think it's an
6 important area, because from what I've seen it's
7 peculiar here. You have a vendor that built the
8 plant, and you have a project that belongs to the
9 utility. That really should hold them accountable for
10 delivering, you know, within spec.

11 However, the project often times gets so
12 much under pressure within its own house that they
13 tend to accept barely conforming components or systems
14 or tests, because they are pressed for time. So you
15 have a buyer that accepts somewhat, you know, marginal
16 tests or things of that kind. There are other
17 possibilities.

18 I mean, I have seen it, and so that's
19 important -- that there is an opportunity for what Mr.
20 Rosen is referring to.

21 MR. RICHARDS: I see that as kind of two
22 issues. One is for NRC inspectors that have an
23 opinion that their supervisor doesn't agree with, how
24 is that addressed? And I think that the -- you know,
25 the existing agency program for DPVs and DPOs would

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1 take that on board and deal with that.

2 For licensees, it's one of the points that
3 Mary Ann touched on at the very beginning of the
4 presentation. But we need to talk with the industry
5 about what they are going to do with their employees
6 to ensure that they are open to employee concerns. We
7 would much rather have the utility dealing with those
8 issues rather than having those people having to come
9 to the NRC. So --

10 CHAIRMAN BONACA: Yes. Because I've seen
11 many resolution of issues like this with statements
12 from the AE's acceptance. I mean, they go back to the
13 AE when you have a non-exact conformance, and the AE
14 makes a determination. He documents it. Often times
15 there isn't a significant basis behind why acceptance
16 is acceptable. And so it's an area that is open to --
17 at least in the past has been open to a lot of
18 questions.

19 MR. RICHARDS: I think, you know, the
20 inspection program will have elements in it to go out
21 and check how corrective actions are dealt with and to
22 see what -- that they're answered. So that will be
23 part of the inspection process.

24 And on the utility side, I think what we
25 would like to see is that they have some kind of a

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1 hotline program or employee concerns program, like
2 most operating reactors do, so that, you know, if
3 construction personnel feel that something is not
4 going right they have a venue to go to to bring up
5 their concerns.

6 And, of course, if -- you know, if the
7 utility doesn't respond, then there's always the NRC
8 allegation process.

9 MEMBER ROSEN: Yes. Well, the takeaway
10 from this discussion I think for you ought to be that
11 you ought to think about and review the existing
12 processes and see if they are adequate for this new --
13 you know, for taking on a significant -- as
14 significant thing as new construction.

15 MR. RICHARDS: Okay. We'll do that.

16 MEMBER ROSEN: It may very well be, but,
17 you know, it certainly would pay -- pay back a pass or
18 two through that, through the OGC perhaps, and through
19 the senior management, to have another look at that.

20 MR. RICHARDS: I agree. It's -- you know,
21 both with NRC inspectors having concerns that weren't
22 addressed in a timely fashion in past construction,
23 and with craft concerns that came up late in the
24 project, both caused a lot of trouble with the --

25 MEMBER ROSEN: Right.

1 MR. RICHARDS: -- construction path.

2 MEMBER ROSEN: Safe team approaches and
3 all those things that ended up having to be put in
4 place. It was quite a difficult time for the industry
5 and the agency. The point of all this is to try to
6 get out ahead of that if you can.

7 MR. RICHARDS: We agree. It's a good
8 comment.

9 MEMBER RANSOM: Is there still an N-stamp
10 program for qualifying suppliers of nuclear grade
11 equipment?

12 MR. RICHARDS: I think under ASME all of
13 those requirements are still in effect.

14 MEMBER RANSOM: So does your inspection
15 include verifying that all of the suppliers are
16 qualified under that program?

17 MR. RICHARDS: Maybe Joe can respond to
18 this a little more. But I think in their application
19 the licensee has to identify what codes they're going
20 to build various components to. For something that's
21 built under ASME, I think the -- you know, the
22 requirements to qualify a vendor are pretty stringent.

23 When you get into some other components
24 like cables or, you know, something that isn't a
25 mechanical component, it might not be quite as rigid,

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1 and we'll have to look at, you know, what our
2 inspection process is to look at those vendors.

3 Joe, can you add to that?

4 MR. SEBROSKY: What you said was correct,
5 Stu, that as part of the design certification reviews
6 they -- Westinghouse, GE -- say what those various
7 components, what code criteria they're built to. And
8 in some cases the ITAAC contains a specific code.

9 MEMBER RANSOM: So not all components
10 would necessarily be built by --

11 MR. SEBROSKY: No.

12 MEMBER RANSOM: -- people holding an
13 N-stamp.

14 MR. SEBROSKY: As a matter of fact, if you
15 look at the passive safety systems, which we're
16 starting to review, a much smaller portion -- the RHR
17 system, the emergency diesel generators -- are not
18 safety-related on the AP1000. So there are criteria
19 for what they're constructed to, but there's not a
20 requirement to have an N-stamp.

21 That's one of the things that the vendors
22 have told us with the passive designs is they build a
23 plant, it's going to be global, it's not going to
24 necessarily come from vendors that we have experience
25 with in the past. A lot of the components don't

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1 require N-stamps.

2 MEMBER RANSOM: But some do I guess,
3 right?

4 MR. SEBROSKY: Yes. And those are --
5 again, getting back to your original question, and
6 what Stu indicated is true, the criteria to what they
7 are constructed to is part of the design certification
8 reviews. And some of the components --

9 MEMBER RANSOM: All of the pressure
10 boundaries and --

11 MR. SEBROSKY: Yes. For the AP600,
12 AP1000, there are still plenty of N-stamp components.

13 MEMBER LEITCH: Most of your discussion
14 this morning concerns ITAAC, the Inspection Manual I
15 guess 2503. You also briefly touched upon 2504,
16 preparation for operation. I guess the thinking there
17 is perhaps not quite as well developed yet?

18 I mean, when you read the framework
19 document, it talks about emergency plans and technical
20 specifications. But it seems to me there is much,
21 much more necessary in that preparation for operations
22 than just those two documents. There are many things
23 -- the radiological environmental monitoring program,
24 the training program, the maintenance program,
25 emergency procedures, many -- I mean, there's a whole

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1 litany of things that are not mentioned here.

2 So you're still doing more work in that
3 area, is that correct? In other words, 2503 is top of
4 the Hit Parade at the moment, and this will come
5 later, is that a correct perception?

6 MS. ASHLEY: That's correct. And that
7 will -- 2504 will address inspections after fuel load
8 but prior to transitioning to the reactor oversight
9 process.

10 MEMBER LEITCH: Right.

11 MS. ASHLEY: It will be inspections in
12 support of non-ITAAC activity and programmatic
13 inspections.

14 MEMBER LEITCH: But there are many
15 categories of issues other than just emergency plans
16 and technical specifications, which are the only two
17 specifically mentioned in the framework document.

18 MS. ASHLEY: You're correct.

19 MEMBER LEITCH: Okay.

20 MS. ASHLEY: We anticipate -- I think that
21 you -- the issue that you've brought up, also I want
22 to make sure that I highlight for you that these
23 plants are not covered by the ROP, will not be covered
24 by the ROP until such time as they are operational.

25 MEMBER SIEBER: Commercial, yes.

1 MS. ASHLEY: And we have some experience
2 that we're drawing from to address one of those
3 lessons learned I mentioned earlier, which is, how do
4 you get from construction to operation? And how do
5 you translate that inspection program?

6 And we're looking to our experiences with
7 D.C. Cook right now and Davis-Besse and Browns Ferry,
8 and their return to operation, to help us to
9 understand what the best path is for that.

10 MEMBER LEITCH: Yes. All of those plants,
11 though, have staff that are familiar with operations.
12 I mean, the challenge here is going to be, you know,
13 a completely new utility staff, perhaps a new type of
14 powerplant, a new design, and so the transition to
15 operations can be a very challenging time. And it
16 just looks to me like this whole section is not
17 thoroughly fleshed out in that regard yet.

18 MR. SEBROSKY: I think that's a good
19 point, and we'll take another look at that.

20 Correct me if I'm wrong, Joe, but I think
21 that the three applications we've gotten for early
22 site permits are all for existing sites. So that
23 there will -- you know, there's the challenge of
24 having perhaps, you know, new designs, maybe a
25 different technology.

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1 On the other hand, it looks like it's
2 likely that there will be people on site who have
3 experience operating plants, and they'll have a
4 trained department, and they'll have, you know, people
5 that have background in those areas. They just --
6 they have to come up to speed on this -- the new
7 design and new technology. So it --

8 MEMBER LEITCH: For example, I -- we
9 talked a bit earlier about the quality assurance
10 program. We had a quality assurance program for the
11 construction phase, and then there was a different
12 quality assurance program for the operations phase.

13 How that transition occurs is just one of
14 those things that needs to be managed during that
15 period of time.

16 MR. SEBROSKY: That was clearly a lessons
17 learned I think from before. Hopefully, we won't have
18 quite the challenge. I think you're aware there were
19 some utilities that they built their first nuclear
20 powerplant, and they had no operational experience
21 when they went into operation 20 or 30 years ago.

22 I don't think we'll be faced with quite
23 that challenge, but there are elements of that that
24 we'll have to face.

25 MEMBER LEITCH: Yes, okay.

1 MS. ASHLEY: So the only thing that I have
2 left to tell you is what comes next for us, what do we
3 still need to do. On the top of our list is to
4 finalize the framework document by resolving the
5 outstanding issues that were brought up by the public
6 comment and by our own discussions in-house.

7 A major challenge for us is to test
8 CIPIMS. We have recognized its importance to our
9 overall success, and so we're going to be working on
10 that aggressively.

11 We're also looking for additional
12 opportunities to observe construction in progress,
13 both here and abroad. We particularly want to be able
14 to look at modular construction. We have no
15 experience with that on a large scale, so we need to
16 be very familiar with that.

17 We need to complete our manual chapters,
18 and that will flow naturally from the completion of
19 the framework document. And our goal, if we can't
20 complete the revisions to inspection procedures, and
21 we know that in some cases we won't until we have a
22 design, we want to be able to identify what needs to
23 be changed.

24 The challenge that faces me as the leader
25 of this group is that I have a team of people, many of

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1 whom are going to be retiring soon. And the challenge
2 is to get as much information out of their heads and
3 onto paper before they leave as possible.

4 So the desire that I have is to at least
5 have them tell and record what needs to be done, so
6 that if they retire I still have the value of their
7 thinking and their experience over the years that
8 they've been doing inspection.

9 MEMBER ROSEN: You know, EPRI has worked
10 on this issue with knowledge management and has done
11 some interesting things with just exactly that
12 problem. You might want to talk to some people there.

13 MS. ASHLEY: Thank you.

14 MEMBER ROSEN: I have one more comment on
15 -- and this is on Appendix C, which is inspection
16 sampling, talking -- where you talk about inspection
17 sampling. And in that appendix there's a discussion
18 of the ITAAC for AP600. And I'm not -- you know, I
19 wasn't responsible for AP600 licensing. I wasn't on
20 ACRS at the time it was, so I can feel free to
21 criticize what happened.

22 And I'm not sure what the history is, but
23 what we have here in front of us is a statement that
24 the emergency diesel generators -- for example, an
25 AP600 -- are non-safety-related.

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1 MR. SEBROSKY: Right.

2 MEMBER ROSEN: However, it says here,
3 there are ITAAC associated with the emergency diesel
4 generators, because of their risk significance. So
5 what we have is highly -- assuming risk-significant
6 equipment that's not -- that are not safety-related in
7 the AP600. Do you follow me so far?

8 MR. SEBROSKY: I think we follow you.

9 MS. ASHLEY: Yes.

10 MEMBER ROSEN: They are risk-significant,
11 but they're not safety-related. What is it about this
12 picture that bothers me? I just don't get it, and
13 you're being forced to deal with that. You make ITAAC
14 up for non -- for risk-significant systems, which is
15 a good thing.

16 But it's -- but they're not safety-
17 related, so my -- my feeling is that risk-significant
18 systems ought to be safety-related, or maybe you
19 should do away with the whole safety-related concept
20 and not have that, just have what's risk-significant
21 and what's not. And the things that are risk-
22 significant should be carefully dealt with.

23 CHAIRMAN BONACA: I think the important
24 thing here may be, you know, the quantitative
25 statement. I mean, what does it mean in the context

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1 of AP1000 risk significance? I mean, I believe
2 that --

3 MEMBER ROSEN: AP600. Because we haven't
4 gotten to this problem on AP1000 yet.

5 CHAIRMAN BONACA: Okay. But, yes, anyway.
6 If I understand it, I mean, because of the reliance on
7 passive systems, there was no idea -- this is just a
8 backup, and I don't know quantitatively how they
9 estimate this.

10 MEMBER KRESS: You're exactly right. They
11 certified AP600 under the adequate protection route.
12 They didn't certify it under risk regulations, and
13 they didn't need these to meet their design basis
14 accidents. And they relied on only passive systems.
15 But when they went to the PRA, they showed that it had
16 some risk significance and --

17 MEMBER ROSEN: In fact, they are risk-
18 significant.

19 MEMBER KRESS: Yes.

20 MEMBER ROSEN: That's what their PRA says.

21 MEMBER KRESS: Yes.

22 MEMBER ROSEN: So now --

23 MEMBER KRESS: Yes. So the question is:
24 how do you -- I mean, they meet all of the licensing
25 requirements without making it risk-significant.

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1 CHAIRMAN BONACA: So they still have value
2 because it may be either 10 to the minus I don't know
3 what, but --

4 MEMBER ROSEN: What I think you're saying
5 -- we're having a discussion here that has very little
6 to do with the construction inspection program. But
7 it has to do with how AP600 may have been licensed --
8 certified, rather.

9 MEMBER KRESS: Yes.

10 MEMBER ROSEN: And what I gather from this
11 is that the discussion is that these diesel generators
12 don't need -- aren't needed to meet any design basis
13 accidents. However, when you get into severe accident
14 space, they have important functions to reduce the
15 severity of the accident.

16 MEMBER KRESS: And we recognize this, the
17 staff recognizes this, so they came up with what was
18 called RTNSS, regulatory treatment of non-safety
19 systems. This was one of the components with that,
20 and they have a whole procedure for what they're going
21 to do about these things. And they're not going to
22 forget about them.

23 And they will get inspected, they will get
24 tested, they will get -- etcetera, etcetera, under
25 this RTNSS program.

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1 CHAIRMAN BONACA: But if you measure it
2 quantitatively, I don't -- I'm not familiar now with
3 the members. Probably they are -- except in maybe
4 terms of quantitatively, it is not a large
5 contribution. It's simply because the core damage
6 frequency for the plant is so far -- so low.

7 MEMBER KRESS: It's so low.

8 CHAIRMAN BONACA: It's so low. So,
9 therefore, they --

10 MEMBER KRESS: But still, it's risk-
11 significant in terms of that low --

12 CHAIRMAN BONACA: That's right.

13 MEMBER KRESS: -- you know, it contributes
14 a significant amount to that low CDF.

15 CHAIRMAN BONACA: And the whole concept
16 there of a passive system is the one of --

17 MEMBER KRESS: It's a different measure of
18 risk significance.

19 CHAIRMAN BONACA: -- measure of active
20 components you have to qualify under a nuclear
21 program.

22 MEMBER SIEBER: Well, the design
23 certification process is deterministic.

24 MEMBER KRESS: It's deterministic,
25 exactly.

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1 MEMBER SIEBER: Yes. And so you need to
2 develop a design basis that meets a certain set of
3 criteria. Once you do that, then you need to go out
4 and do a PRA and say, "I can enhance the safety of the
5 plant having these other systems, but the design basis
6 says you don't need them." Okay? And so that's why
7 you end up with -- in this sort of never never land
8 where you have risk-important systems out there that
9 are active that are not relied upon to meet the design
10 basis accidents.

11 MEMBER ROSEN: Well, I appreciate my
12 colleague's explanations for this, because I -- it's
13 very helpful to me. I feel much better about that,
14 but I feel -- I still feel pretty awful about the
15 whole idea --

16 (Laughter.)

17 -- that you end up with risk-significant
18 systems that are not safety-related. I mean, it just
19 -- I mean, it just seems a way of contorting the whole
20 process, the whole thing. It makes it much more
21 difficult to --

22 MEMBER SIEBER: Well, you have my sympathy
23 for --

24 MEMBER ROSEN: This is an irrational
25 process made for irrational --

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1 CHAIRMAN BONACA: But you could keep
2 adding layers of these, and still they will be risk-
3 significant. The only issue is, what does it mean
4 quantitatively? Maybe, you know, contributing to a
5 sequence to reduce it from 10^{-7} to 10^{-8} is still risk-
6 significant. But, you know, so you have to stop at
7 some point I think.

8 MEMBER ROSEN: But see, Mario, I wouldn't
9 call that risk-significant.

10 CHAIRMAN BONACA: Well, because --

11 MEMBER ROSEN: When you -- it's only risk-
12 significant when you're talking about -- when you get
13 your microscope on and looking at the individual
14 ADAMS.

15 CHAIRMAN BONACA: Because you're implying
16 a cutoff point and --

17 MEMBER ROSEN: Yes.

18 MEMBER SIEBER: There is a practical
19 difference, too, in the AP600, or the AP1000 even more
20 so. You have a small break LOCA, and you use the ADS
21 system, you know, you're going to have a messy
22 containment when you're done. It would be far better
23 to employ an active system where all you really had to
24 do in the cleanup was deal with what the small break
25 LOCA was.

1 MEMBER KRESS: That's their plan. That's
2 their plan.

3 MEMBER SIEBER: And so, you know, it's
4 nice -- if I had one, I'd like to have those active
5 systems there, even though I might not rely on them.

6 MEMBER ROSEN: For your safety case, to
7 make the safety case.

8 MEMBER SIEBER: Yes, right.

9 MR. SEBROSKY: This is Joe Sebrosky. If
10 you'll look at the AP600 final safety evaluation
11 report, and the draft safety evaluation report for the
12 AP1000, there's a chapter dedicated to regulatory
13 treatment of non-safety systems. It's either
14 Chapter 21 or 22, and it provides the background on
15 the staff's philosophy on how they determined what
16 systems needed regulatory treatment and what that
17 regulatory treatment was.

18 MEMBER SIEBER: Right.

19 MEMBER ROSEN: Well, if I was king of the
20 world, I would just reclassify them as safety-related
21 and get on with it.

22 MEMBER SIEBER: Okay.

23 MEMBER ROSEN: And then the whole thing --
24 problem goes away, but that's why I'm not the king.

25 MEMBER KRESS: Then you wouldn't have this

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1 chart with four different categories.

2 MEMBER ROSEN: Right. I wouldn't have a
3 chart at all. I'd actually have the PRA before you --
4 once you get the design, then you decide what's risk-
5 significant, and you apply your QA programs to that
6 and make sure those come out right, work fine, and
7 you're done.

8 MEMBER KRESS: Did you call him a
9 rationalist, Dana?

10 MEMBER ROSEN: Don't answer.

11 MEMBER POWERS: In a kind mode, yes. And
12 I think you're doing violence to defense-in-depth with
13 your autocratic approach there.

14 MEMBER ROSEN: No, not really. I have the
15 highest regard for defense-in-depth, because I know I
16 don't know everything. And the things that I don't
17 know --

18 MEMBER POWERS: Now that's a revelation.
19 (Laughter.)

20 MEMBER ROSEN: I think I'll just reference
21 Donald Rumsfeld's remarks about knowns and unknowns.

22 MEMBER KRESS: At this time, we're going
23 to -- I think you're basically finished?

24 MS. ASHLEY: I am.

25 MEMBER KRESS: Yes. I wonder if an NEI

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1 representative wants to make any comments. You're
2 welcome to.

3 MR. BELL: Thank you, Dr. Kress.

4 Good morning. My name is Russell Bell.
5 Hello, again. I appreciate the committee's interest
6 in this important topic. It's clear from the
7 discussion that you appreciate the importance of the
8 construction inspection program, and in particular the
9 ITAAC verification element of it. I mean, this is for
10 the Part 52 rubber meeting the road.

11 I just wanted to underscore the priority
12 that the industry places on this -- these issues for
13 just a moment. It came up somewhat today, but just to
14 remind ourselves, the whole reason for ITAAC -- or a
15 fundamental purpose of ITAAC is that questions
16 material to whether or not an ITAAC acceptance
17 criteria is met formed the scope of the post-
18 construction ITAAC hearing.

19 Now, the intent of that hearing -- the
20 intent of Part 52 is to resolve as many issues up
21 front at the COL as possible, and to have a very
22 narrowly focused hearing, if necessary, at the end
23 focused on, again, whether these -- this set of
24 acceptance criteria was met or not.

25 You bet we're pressing Mary Ann and the

1 staff for as much clarity on the key aspects of the
2 construction inspection program and the ITAAC
3 verification process as we can. I mean, just to be
4 perfectly frank, the predictability and the certainty
5 that's expected of Part 52 derives from this whole
6 process.

7 So you bet we're very interested, and we
8 provided substantial comments to the staff on
9 October 30th on their framework document and look
10 forward to followup discussions on that. I can
11 certainly -- if the committee doesn't have that, I can
12 certainly provide -- provide that to you.

13 And just for a couple of minutes I could
14 underscore what I think are -- there are a number of
15 comments that we made back, but they all relate to a
16 central concern, that I'd just like to paint that
17 picture for you.

18 If you say that questions material to
19 whether an ITAAC acceptance criteria form the scope of
20 the post-construction hearing, it becomes critical
21 what you consider material to the determination that
22 an ITAAC has been met.

23 Now, the CIPIMS is going to be a powerful
24 tool that -- take the RHR pump example. I have no
25 doubt it will be able to spit out all of the NRC

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1 inspections related to that RHR pump. Okay? Now, in
2 addition to the flow rate test that showed it pushed
3 925 gallons per minute, I have no doubt that the
4 CIPIMS could print out vendor audit results, receipt
5 inspection, storage warehousing issues, the routing of
6 the cables to the pump, the qualification of personnel
7 running the test that we're talking about. These are
8 all important things.

9 CIPIMS is going to be so powerful I guess
10 our caution to the staff has been you need to be
11 careful how you use it. The concern is that while,
12 you know, vendor audits, receipt inspection, how you
13 store the pump while it was waiting to be installed,
14 how you routed the cables, the qualifications of the
15 guy routing the cables, while those things are all
16 very important, they are not directly material to that
17 test and the result that shows that the 925 gallons
18 was moved by that pump against a certain head.

19 So those other matters are relevant, but
20 not directly material -- relevant to the pump, but not
21 directly material to the ITAAC. And this distinction
22 is the one that we think needs to be carefully
23 sustained.

24 Now, so we need to be careful in designing
25 the ITAAC verification program and in documenting the

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1 bases for ITAAC conclusions. If we're not careful, we
2 may find ourselves litigating the post-construction --
3 the critical post-construction phase issues that are
4 not material to the ITAAC conclusions and were never
5 intended to be part of that carefully-focused
6 opportunity at the end of the process.

7 The NRC and ITAAC verification process
8 needs to distinguish between the large number of
9 inspection activities that, while important and
10 worthwhile, are not inspection activities that are
11 directly material to the ITAAC. That distinction
12 needs to be made.

13 Put simply, the ITAAC verification process
14 needs to respect and sustain the distinction between
15 Tier 1 and Tier 2. That was recognized in the
16 certifications.

17 I'd like to have more discussions with the
18 staff -- and we will -- on whether this is an
19 administrative recordkeeping issue in terms of
20 distinguishing between how, you know, inspection
21 reports are characterized when CIPIMS spits them out.
22 Is this administrative, or is it a deeper
23 philosophical difference?

24 I mean, do we not agree that receipt
25 inspection process is relevant but not material to

1 that ITAAC example you showed? If we have a
2 philosophical or substantive issue there, that's what
3 we're trying to get at as quickly as possible and
4 resolve that.

5 MEMBER ROSEN: You know, Russ, you're
6 confusing me a little bit --

7 MR. BELL: Okay.

8 MEMBER ROSEN: -- with your use of the
9 word "relevant." If you said "related," I would be
10 more comfortable.

11 MR. BELL: I'd be happy to. That's my
12 intent. I think that's the right interpretation.

13 MEMBER ROSEN: Because if it's relevant,
14 then I think you probably have to deal with it. But
15 if it's related, it may not be. You know, the way you
16 stored the pump, you might be embarrassed and
17 surprised -- and wish you hadn't done it that way.
18 But once you put it in the plant and it meets the
19 ITAAC, the discussion should be over I think.

20 MR. BELL: There would be a number of
21 thing related to that pump that are not material to
22 the conclusion that that ITAAC was met. I'd be happy
23 to amend my rhetoric. I think it's clearer that way.
24 And that is -- but if you're getting that, you're
25 getting our concern.

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1 I didn't think that that concern -- I
2 wanted to be sure to put that concern before you while
3 you were -- had this on your radar screen. The staff
4 has been doing exactly the right thing in preparing
5 the framework document, putting it out in draft,
6 holding the workshop.

7 We had a discussion -- continue to have
8 discussions on this issue. We met just last month.
9 And so we are happy with that thought process, and we
10 look forward to continuing to work on these issues,
11 which are just so important to the predictability and
12 the certainty that Part 52 is intended to provide.

13 Thank you.

14 MEMBER SIEBER: I might just point out
15 that when you use the pump storage as an example, you
16 know, there is a requirement you rotate the shaft
17 through a quarter turn every so many weeks to keep the
18 bearings from getting messed up. That probably is not
19 particularly relevant to whether the pump will pump
20 when it's finally installed and tested.

21 But there are other situations -- for
22 example, the storage of cable. If you store the cable
23 outside and don't bother to keep the covering on the
24 cable reel, the cable will probably function when you
25 install it. But you've already taken some life out of

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1 that cable by the way that you store it.

2 So each one of these things, in my
3 opinion, has to be judged on its own individual merits
4 and not necessarily saying, you know, it's related but
5 not relevant. And I think the inspectors in the
6 agency need to be able to view each one of these
7 situations on its own merits. So that would be my
8 only comment. But I agree with you that some of these
9 things -- the relationship is -- is remote.

10 MEMBER KRESS: Okay. Any other comments
11 from members? If not, I'll turn it back to Mario.

12 CHAIRMAN BONACA: Thank you.

13 MEMBER KRESS: Thank the speakers for a
14 good presentation.

15 MS. ASHLEY: Thank you.

16 MR. SEBROSKY: Thank you very much.

17 CHAIRMAN BONACA: Thank you. Any
18 additional questions or comments from the public?

19 Thank you very much for the presentation.

20 Before we take a break, since we are ahead
21 of time, I would like to look at the reconciliation of
22 ACRS comments and recommendations. The evaluations
23 are all saying that there are -- the answer is
24 acceptable, but let's go through them one by one.

25 The first one has to do with Draft Final

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1 Regulatory Guide XXXX, "An Approach for Determining
2 the Technical Adequacy of the PRA Results." We have
3 Mike Snodderly here that has performed an evaluation
4 of that.

5 Mike, do you want to tell us as to the
6 acceptability of the response? Dr. Apostolakis is not
7 here yet.

8 MR. SNODDERLY: Yes. As you said, Mario,
9 George isn't here yet, but I found the response to be
10 acceptable. The key is if you look at the last
11 sentence, they committed to developing guidance for
12 performing uncertainty and sensitivity studies, and
13 we're awaiting that -- that guidance. That's really
14 the key scheduled in the future activities, and we
15 should expect that in early 2004.

16 CHAIRMAN BONACA: Okay. But they have
17 agreed to our recommendations in general.

18 MR. SNODDERLY: Yes.

19 CHAIRMAN BONACA: And they have included
20 also comments in their document --

21 MR. SNODDERLY: Yes.

22 CHAIRMAN BONACA: -- so fine.

23 The second response we got was regarding
24 the review standard for extended power uprates, and I
25 believe Ralph Caruso performed an evaluation of that.

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1 MR. CARUSO: It was a positive letter to
2 the staff, and the staff responded appropriately. And
3 we'll get a chance to see how well it gets applied
4 with Vermont Yankee. And as I pointed out here, there
5 are some early indications that the staff got the
6 message in terms of the fact that Vermont Yankee took
7 a very -- are we on the record?

8 MEMBER SIEBER: Yes.

9 MR. CARUSO: They took a position about
10 testing which was not as rigorous as one would hope,
11 and the staff responded --

12 MEMBER SIEBER: Appropriately.

13 MR. CARUSO: -- appropriately to that lack
14 of rigor. So I think that they got the message.

15 The issue of the test -- the independent
16 analysis, though, is open. And I've not heard much
17 about any development of any analysis program. That's
18 a non-trivial effort, and it has never gotten much
19 support. But other than that, I think we're fine.

20 CHAIRMAN BONACA: And the third letter
21 response to us is regarding Generic Issue 186, heavy
22 load. And, Jack, you were the author of the letter,
23 and I don't know who performed --

24 MS. WESTON: Magg. And I'm here. Yes.
25 The -- as you know, the committee's conclusion and

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1 recommendation was to support the staff's
2 recommendations. And there were four action items
3 that the staff recommended that they thought would
4 enhance current guidance, and the committee supported
5 that.

6 The EDO's response indicated that the
7 first three items would be dealt with with NRR in
8 terms of evaluating the capabilities of these rigging
9 components, endorsing the ASME code, and reemphasizing
10 the need to follow and reinforce NUREG-0612. And the
11 other will be looked at in the Office of Research.

12 So the response was satisfactory. They
13 are going to follow through with the staff
14 recommendations.

15 CHAIRMAN BONACA: Okay, good. All right.
16 We're done with this. I think we should take a break.
17 Come back at 10:45.

18 (Whereupon, the proceedings in the
19 foregoing matter went off the record at
20 10:18 a.m. and went back on the record at
21 10:45 a.m.)

22 CHAIRMAN BONACA: Okay. We are back into
23 session, and we now are going to hear a presentation
24 on proposed reviews to SRP Chapter 18, Human Factors
25 Engineering. And Mr. Rosen will lead us in the

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1 presentation.

2 MEMBER ROSEN: Thank you very much, Mr.
3 Chairman. We had an interesting subcommittee meeting
4 earlier this week, and we'll -- I've asked the people
5 who were at the subcommittee meeting from the staff to
6 come back here and talk about a couple or three
7 different things to highlight for the full committee
8 what the issues were. And I'll turn it over to J to
9 lead the -- to J Persensky to go through that
10 discussion.

11 MR. PERSENSKY: Thank you.

12 Good morning. My name is J Persensky. I
13 am the senior technical advisor for human factors in
14 the Office of Research. We're here today to talk
15 about a very large package, as you all know, but it's
16 a package that has taken many years to come by. And
17 actually, if you look at the very last two -- they're
18 not slides, but attachments to your slide package,
19 there's a series of NUREG/CRs which served as the
20 technical basis for a lot of this work.

21 This work has been done on a very
22 cooperative basis with our colleagues from NRR. It
23 wasn't just a research product. Also, we spent -- we
24 worked hard with our contractors. Our primary
25 contractor on this has been Brookhaven National

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1 Laboratories as far as putting together the guidance
2 documents and a lot of the NUREG/CRs.

3 Some of it is based on work that was done
4 at Halden, some -- actually some original research
5 that we did at the Halden simulator. The people that
6 are here today that are -- have been involved with it,
7 of course, are the speakers at the table, but also our
8 colleagues from BNL are John O'Hara and Jim Higgins.
9 Dick Eckenrode is here from NRR. Who else? Jill
10 Kramer from Research, Gareth Parry. As I said, it's
11 been a cooperative and long-term project on many of
12 these.

13 The documents do contain a great deal of
14 information. That was one of the things that came up
15 at the subcommittee. But it is, again, based on a
16 good deal of research, as well as use. Since these
17 are revisions to existing documents, we made use of
18 the information and feedback we've gotten from their
19 use, both from our internal use as well as use by
20 others.

21 And as I said, there was some original
22 research. Some of it is based on stuff that we've
23 taken from other agency standards, from international
24 standards, but it has been distilled and adapted for
25 use in the nuclear community as well as the -- outside

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1 of the nuclear industry many people have been using
2 it.

3 Oops. Let's go back one.

4 Our agenda, the introduction I'm doing
5 now, we'll have a brief overview of the entire
6 package, the SRP and the related documents that came
7 with it. The subcommittee asked us to focus on some
8 particular elements of this package, particularly
9 NUREG-1764, and the risk-informed screening process
10 that's part of that document, as well as some of the
11 human factors engineering review criteria and how we
12 made some selections and where things fit in the whole
13 thing.

14 They also asked us to address some of the
15 remarks that were made in the September 24th letter
16 from the ACRS -- the September 24, 2002, which was a
17 presentation that I was involved with as well as some
18 of our HRA colleagues from Research.

19 Also, we received some public comments.
20 Particularly, a speaker came to the subcommittee, an
21 individual -- Dr. Rob Fuld, Robert Fuld -- and he made
22 some comments that the ACRS -- the subcommittee asked
23 us to address. We do have some slides to that effect.

24 And they were related in part also to your
25 1995 letter on NUREG-0700. Mr. Fuld's comments were

1 primarily related to 0711.

2 And I'll make some closing statements, and
3 then we'll have ACRS discussion. Not that I'm
4 discouraging any discussion during the presentation,
5 but we do have a lot of material to cover in a
6 relatively short period of time.

7 The next slide gives you -- basically, our
8 purpose is to ask for your endorsement of the four
9 documents -- the SRP Chapter 18, NUREG-0711, NUREG-
10 0700, and 1764. These documents will be used -- are
11 intended for use by the staff to review applications
12 for new reactors, applications for modifications to
13 the control room, and also for changes in operator
14 action.

15 The presenters -- myself, Jim Bongarra
16 from NRR will be presenting next, and the overview of
17 the package. Susan Cooper from RES, one of our HRA
18 colleagues, will be talking about the screen -- risk
19 screening method, and Paul Lewis will respond to the
20 comments that were made from Dr. Fuld and from others.
21 And I'll talk to the September 24th letter.

22 With that, Jim, you're on.

23 MR. BONGARRA: Thank you.

24 MR. PERSENSKY: Unless there are any
25 questions over this part of it.

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1 MR. BONGARRA: Good morning. My name is
2 Jim Bongarra, and I'm the -- have been the NRR
3 technical coordinator for the material that we're
4 going to be presenting to you today. I'm also one of
5 several users of the materials.

6 And, indeed, what I'd like to do is
7 quickly just give you a brief overview of the standard
8 review plan Chapter 18 itself and the several
9 supporting documents that we have to discuss today.

10 Chapter 18 has been around since, really,
11 at least the early 1980s. And it was originally
12 formatted really to cover two -- the two major areas,
13 two major topics that the agency was involved in at
14 that point in time -- detailed control room design
15 review and safety parameter display system.

16 We, of course, finished the reviews of
17 those two areas back in the early '90s. Chapter 18 is
18 the agency's principal human factors engineering
19 guidance. It's a high-level source document. It also
20 cross references to other chapters of the standard
21 review plan that are related to human factors
22 engineering. For example, Chapter 13 is referenced in
23 Chapter 18, because there's a good bit of information
24 in Chapter 13 that relates to training and staffing
25 and qualifications.

1 The most recent revision to Chapter 18,
2 prior to the one that we're talking about today, was
3 done in 1996. And the staff at that point revised
4 Chapter 18 essentially to align it with the work that
5 we were doing at that point in time related to
6 advanced reactor design certifications.

7 The 1996 version of Chapter 18 was
8 published as essentially a draft. It was a work in
9 progress, and, therefore, really, to the best of my
10 knowledge, was not reviewed by the ACRS at that point
11 in time. It did, however, receive public comment.

12 Since 1996, there have been numerous
13 updates to several of the documents that are
14 referenced in Chapter 18. For example, we upgraded --
15 NRR upgraded sections in Chapter 13 a few years ago to
16 address issues related to license transfers. That was
17 a topic that we were involved in a few years ago, and
18 we had to make modifications related to that issue.

19 Also, since 1996, there has been much in
20 the way of progress made to upgrading the guidance in
21 both NUREG-0711 and NUREG-0700 to better address
22 changes in technology that have occurred with
23 relationship to human system interfaces.

24 The revisions to all of these documents,
25 by the way, have been sent out or were sent out back

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1 in 2002 for public comment. And as J mentioned, I
2 think we indeed did receive public comments on the
3 standard review plan and the related NUREGs, and those
4 public comments were part of your package.

5 VICE CHAIRMAN WALLIS: Are these reviews
6 essentially performance based? Do you have to have
7 some measure of performance that has to be attained by
8 the people?

9 MR. BONGARRA: To some degree, I would say
10 that they are performed based. There are different
11 criteria, really, to assess different aspects of the
12 areas that we're looking at. It's not totally
13 performance based. There are -- well, for example,
14 there are some very, as the committee knows, detailed
15 guidelines essentially in NUREG-0700 that are
16 essentially -- again, it's guidance, but we do review
17 to those guidelines -- human system interface design
18 guideline.

19 VICE CHAIRMAN WALLIS: That would seem to
20 be the guiding principle. And whether you need five
21 people or four people to do a job is really based on
22 how well four people can perform compared with five
23 people. So that performance would seem to be the key
24 thing, and the thing that's difficult is how to
25 characterize, measure, and control, monitor, and

1 everything, that performance.

2 MR. BONGARRA: I think I have a comment
3 from John O'Hara.

4 MR. O'HARA: If I might. John O'Hara from
5 Brookhaven Lab. Just to maybe say this a little
6 differently than Jim said it. I think as the review
7 proceeds earlier in the design, the evaluations are
8 more based on comparison to guidelines and that type
9 of material.

10 And then, as the design matures, there is
11 more and more performance-based evaluation, so that
12 actually the culmination of that is an integrated
13 system validation which is performed, you know, prior
14 to design certification. And that is performance
15 based, using performance criteria and using
16 simulations and things like that.

17 VICE CHAIRMAN WALLIS: Thank you.

18 MR. BONGARRA: Next. Second slide.

19 Okay. What changes have we made to the
20 standard review plan? Essentially, we have revised
21 the draft from 1996, and we've modified review
22 elements and acceptance criteria to agree with the
23 latest changes that have been made to NUREG-0711. We
24 added review criteria for plant modifications, and we
25 added a risk-informed, graded approach to address

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1 amendment requests to credit human actions. These are
2 the major changes essentially that have been made to
3 Chapter 18 since 1996.

4 Next?

5 Why did we make the changes? Well, in
6 addition to wanting to make the -- make certain that
7 the staff is prepared to meet the future challenges of
8 -- to human factors engineering posed by digital
9 technology, the changes also reflect feedback
10 essentially that we received from the public and
11 stakeholders.

12 Over the years also since we were involved
13 in the -- in completing the evolutionary reactor
14 reviews, we have also learned some lessons, and we've
15 attempted to incorporate the results of those lessons
16 learned into our guidance document.

17 We have also received feedback from
18 experience with foreign countries that have used the
19 standard review plan and the related guidance
20 documents in upgrading their plants or in designing
21 new ones. We have also incorporated results from
22 various research efforts into the revision -- research
23 in the area, for example, of hybrid control room, soft
24 control design and development, and computerized
25 procedures.

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1 The Halden reactor project, for example,
2 has been a source of information for us over the
3 years, and we have been attempting to reflect that
4 input from Halden into our --

5 MEMBER POWERS: Is there something that I
6 can look at that summarizes the utility of the Halden
7 project for your effort?

8 MR. BONGARRA: J, do you want to --

9 MR. PERSENSKY: Well, it depends on what
10 level of detail you're talking about. We have a --

11 MEMBER POWERS: Not very detailed.

12 MR. PERSENSKY: -- list of those Halden
13 reports that have been incorporated into the various
14 guidelines documents.

15 MEMBER POWERS: You have that list
16 already, or is that one that --

17 MR. PERSENSKY: Pretty much. I think John
18 had put that together in the past for us.

19 MEMBER POWERS: I'd sure like to see that.
20 That's probably the level of detail that I'm looking
21 for right now.

22 MR. PERSENSKY: Okay.

23 MEMBER POWERS: Okay. I just -- I mean,
24 as you know, I have to communicate why the program is
25 useful.

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1 MR. PERSENSKY: I understand. Thank you.
2 We'll get that to you.

3 MR. BONGARRA: To quickly summarize, SRP
4 Chapter 18 has been used by the NRR for over 20 years.
5 It was revised in 1996 as part of the NRR's effort to
6 address advanced reactor design reviews. It's a
7 principal high-level source document for human factors
8 guidance in the NRC.

9 It relies on several detailed source
10 documents for guidance to perform human factors
11 engineering reviews, and we've also upgraded the
12 chapter to include a risk-informed screening method to
13 better evaluate licensing amendments that credit human
14 actions.

15 Moving on to NUREG-0711, which is the
16 human factors engineering program review model, 0711
17 was originally characterized, or identified rather, as
18 the program review model. And it had its origins in
19 the early days of advanced reactor design reviews, the
20 early 1990s.

21 NUREG-0711 is the NRC's principal human
22 factors engineering source document. The program
23 review model was first published as NUREG-0711 in
24 1994, once again to support the advanced reactor
25 reviews that the staff was conducting. It was again

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1 revised in 2002.

2 It's designed to be applied to a variety
3 of human factors reviews, ranging from reviewing
4 conceptual human factors engineering designs, as in
5 the case of advanced reactor submittals, to discrete
6 control room modifications.

7 The PRM is applicable to the plant's life
8 cycle, and the elements of the PRM can be applied in
9 reviewing a process and product as well. For example,
10 with regard to, for instance, doing a task analysis,
11 the PRM has guidance in it to allow us to look at the
12 process that a licensee would use to conduct a task
13 analysis as well as the final product of the task
14 analysis.

15 Also, NUREG-0711's elements are used in
16 other related applications. For example, our new
17 NUREG-1764 tailors the use of several of the elements
18 in NUREG-0711 using a graded approach to reviewing
19 changes for human actions.

20 This next slide is -- really illustrates
21 the overall structure of the program review model, the
22 12 elements, and the major design review areas that
23 each element is related to. The two newest elements
24 are highlighted under the implementation and operation
25 portion of this graphic.

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1 MR. PERSENSKY: And, Graham, to get to
2 your point, the -- particularly the two last columns
3 on that would address the performance issues more
4 thoroughly.

5 MR. BONGARRA: Changes from the prior
6 revision to NUREG-0711 are really shown on this slide
7 in some detail. The applicability of the guidance has
8 essentially been expanded to again address all types
9 of human factors design reviews.

10 The addition of the two elements that I
11 previously mentioned and the changes that have been
12 made were principally in the format and content of the
13 four elements that were shown. Essentially, the
14 technical nature of these elements did not change in
15 this revision.

16 Next?

17 NUREG-0700 -- that is, the human system
18 interface design review guideline -- this document
19 dates back to about 1981. It has been used
20 extensively by the NRC and the industry, certainly in
21 the wake of TMI, to complete the -- at that point in
22 time, again, the detailed control room design reviews
23 and SPDS reviews.

24 It's the agency's principal document for
25 reviewing human system interface design. And the

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1 major categories of the guidance are illustrated in
2 this slide, and I won't go into specific detail on
3 those.

4 Next?

5 Again, how did we change NUREG-0700 from
6 the previous revision? We upgraded the guidance
7 essentially to address digital technology. And, in
8 particular, there are guidelines now that are
9 incorporated in 0700 that relate to computer-based
10 information system interfaces, soft controls,
11 computer-based procedures, and issues related to
12 essentially -- we call it interface management and
13 navigation.

14 VICE CHAIRMAN WALLIS: What do you mean by
15 "information system interfaces?" Is that something
16 like a GUI? I mean, is that interface between people
17 and the computer, or is it within the computer itself?

18 MR. BONGARRA: It's really a combination
19 of the two, a combination of the two. We are -- we
20 have guidelines that identify, for example, techniques
21 to enhance the way information is presented to users,
22 guidelines that would envelope a broader spectrum in
23 terms of how information should be presented on a --
24 you know, on a screen as well as interacting with it.

25 Next?

1 VICE CHAIRMAN WALLIS: I just wonder how
2 -- again, are there measures for that? And in the
3 case of the performance of a mechanical device like a
4 pump, you have measures of performance. Do you have
5 ways of measuring the effectiveness of the
6 communication of information by computer to people?

7 MR. BONGARRA: Well, a good -- I think a
8 good part of the way that would be identified would be
9 through essentially the exercise of -- you know, of
10 the actual interfaces.

11 VICE CHAIRMAN WALLIS: Do you try them and
12 see which works best?

13 MR. BONGARRA: You try them. There is the
14 -- the element, of course, within the overall program
15 review model a verification and validation, although
16 that comes at the very -- typically comes at the very
17 end of the entire process.

18 There is also -- that is also an iterative
19 process. It takes place during the design, or it's
20 meant to take place during the design as well.

21 I see my colleague John also has -- John
22 O'Hara has further elaboration on this.

23 MR. O'HARA: I apologize, Jim.

24 MR. BONGARRA: That's okay.

25 MR. O'HARA: A lot of the guidance that's

1 in NUREG-0700 is based on performance. For instance,
2 we did a lot of research ourselves, to give one
3 example, on alarm systems and types of alarm
4 processing. That knowledge was gained through things
5 like doing simulation studies, varying the types of
6 processing, varying the types of displays, looking at
7 the impact of those changes on the operator's use of
8 the alarms and the alarm information.

9 And that cuts across the board for all of
10 these areas. And what we did as part of the technical
11 basis is developed this knowledge about how design
12 characteristics impact performance. Then we abstract
13 out of that principles that can be used to actually
14 just review the designs themselves. But those
15 principles reflect impact on performance.

16 CHAIRMAN BONACA: There was an extensive
17 amount of this kind of verification in design -- in
18 control room designs.

19 MR. O'HARA: Yes.

20 CHAIRMAN BONACA: Okay. So I imagine that
21 you also utilize a lot of those insights.

22 MR. O'HARA: Oh, absolutely. The research
23 that this work is based on is not just NRC research.
24 It's the tremendous wealth of research that is
25 available through conferences, papers, a lot of them

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1 done by vendors because doing performance-based
2 evaluations now is a common design practice, given
3 that engineering simulators are so sophisticated.

4 And we basically look at all of that
5 research, and we look for the common threads, and we
6 abstract out that which is justifiable based on the
7 research. We don't just make this -- you know, it's
8 not just made up. It's based on what the research is
9 telling us.

10 MEMBER POWERS: When I first got to the
11 point of interacting on this human factors area,
12 J Persensky gave me what I continue to grasp onto as
13 keen insight he has on this overall field. And that
14 is that it's a huge field, it's an enormous field, and
15 NRC can't possibly expect to do things to dramatically
16 impact the whole thing.

17 We have kind of a full-time job just
18 keeping track of everything that's going on,
19 collecting that, and then distilling out that fraction
20 that will aid the agency's processes, and whatnot.

21 It's very -- it's a very interesting kind
22 of research area for the NRC, and somewhat different
23 than many of the other research areas, like reactor
24 fuels. I mean, we could be the world's experts in
25 reactor fuels. It's more incumbent on these people to

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1 keep a breadth view than it is a specialized view, and
2 at the same time keep the finger on what -- the line
3 organizations that the NRC needs to get out of all of
4 that.

5 He told me he had a tough job, and by the
6 time he was done I actually believed him.

7 (Laughter.)

8 MR. BONGARRA: Next?

9 The next item is 1764, NUREG-1764, which
10 is guidance for the review of changes to human action.
11 This is the latest edition to the guidance supporting
12 our human factors engineering views, and I know that
13 the committee is interested in --

14 MEMBER ROSEN: I want to be sure you said
15 addition, not edition. This is an addition.

16 MR. BONGARRA: Sorry. NUREG-1764 is a
17 risk-informed, graded guidance document, and its
18 purpose is to help human factors engineering reviewers
19 to consistently determine the appropriate level of
20 review effort to put into evaluating license amendment
21 requests that essentially credit human action.

22 In the recent past, NRR has been reviewing
23 many of these types of requests. Licensees
24 essentially are examining their design and licensing
25 bases now, and they're coming up with modifications

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1 that many times involve manual operator actions to
2 sometimes supplement equipment modifications or as
3 compensatory manual actions.

4 Susan Cooper and Paul Lewis will explain
5 in more detail the specifics of NUREG-1764. I just
6 really want to kind of set the stage for it at this
7 point.

8 Next slide.

9 By the way of a quick overview of 1764,
10 the guidance consists of really three portions.
11 There's a risk screening portion, there's guidance for
12 human factors reviewers to use in actually evaluating
13 the submittals, and there is a portion or criteria
14 essentially that assists in making a final decision on
15 the -- determining the acceptance of that change
16 request.

17 MEMBER ROSEN: And, Jim, you didn't
18 mention -- it's on your slide, though -- that when
19 you're doing the risk screening it's different for a
20 risk-informed submittal from a non-risk-informed
21 submittal.

22 MR. BONGARRA: Indeed. That's true. I
23 was just going to mention that. NUREG-1764 is indeed
24 structured to address these two types of submittals --
25 either a risk-informed or a non-risk-informed

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1 submittal. And there is a -- the screening process is
2 somewhat different depending upon what type of
3 submittal is presented to us.

4 1764 is perhaps a first-of-a-kind
5 document, in the sense that -- I think anyway -- it's
6 an attempt that the staff has made to apply risk
7 methods to human performance issues that have been
8 traditionally -- that is, the methods have been
9 traditionally applied to systems and equipment
10 performance.

11 And, again, I will -- won't belabor the
12 overview here, but we're looking at this as -- and
13 this is one of the reasons we've come before the
14 committee -- is somewhat as a work in progress. It's
15 -- you know, it's an attempt here at this point to
16 really do something slightly different, and we're --
17 we have confidence in what we have, and the staff will
18 present the details to you in just a moment.

19 Next? I'm running out of time here.

20 Well, this last slide actually is really,
21 again, just a graphic -- it reiterates the
22 relationship of the various review areas within the
23 standard review plan and how they are treated and
24 addressed by the different supporting NUREG documents
25 that we've just reviewed with you.

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1 With that, I'll stop and turn this to --

2 MR. PERSENSKY: Unless there are any
3 questions, we'll turn it over to Susan.

4 Susan?

5 MS. COOPER: Susan Cooper, Office of
6 Research, Probabilistic Risk Assessment Branch. As
7 Jim mentioned, I'm going to be talking about one of
8 three elements in NUREG-1764 -- that being the risk
9 screening method. This is the method by which
10 decisions can be made about grading, how human factors
11 engineering reviews could be done, allowing the staff,
12 then, to focus their resources perhaps better on the
13 more appropriate actions.

14 Next slide. Oh, you're already there.
15 Okay.

16 There are four major steps to the risk
17 screening process, and they align with three inputs,
18 and then an integration of those three inputs. The
19 first step and first input is the determination of a
20 risk categorization as it's been -- as performed by
21 Reg. Guide 1.174.

22 The second input -- second --

23 VICE CHAIRMAN WALLIS: Excuse me.

24 MS. COOPER: Yes.

25 VICE CHAIRMAN WALLIS: Do you advise on

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1 acceptable methods for calculating this change in risk
2 due to human performance?

3 MS. COOPER: I'm sorry. I --

4 VICE CHAIRMAN WALLIS: Do you have
5 anything to say about what are acceptable methods for
6 calculating this change in risk due to human
7 performance? If you changed human performance in some
8 way, does it change in risk presumably? And the
9 question is: how do you put this into the 1.174
10 framework?

11 There has to be a method for going from
12 some change in the control room or people or
13 something --

14 MS. COOPER: Well --

15 VICE CHAIRMAN WALLIS: -- to calculating
16 the change in risk. And I'm not sure that we have
17 methods for doing that that are --

18 MS. COOPER: Well, this process is not
19 really designed to do that per se. What it's -- the
20 purpose of the process is to allow the staff to decide
21 which of the different human actions or different
22 license requests that involve human actions they ought
23 to look at to make such an assessment.

24 Now, as part of the process, there are --
25 I was just getting to step two where importance

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1 measures are calculated for the human actions. And we
2 do have a way to relate that to changes in core damage
3 frequency, and then, therefore, make some different
4 assignments based on that as to what level of review
5 then should occur.

6 VICE CHAIRMAN WALLIS: So this change in
7 risk is something that's submitted by a licensee
8 saying that, "We want to do this, and this is the
9 change which we calculate."

10 MS. COOPER: The license --

11 VICE CHAIRMAN WALLIS: Did you advise them
12 on what you would accept as methods for doing that
13 calculation?

14 MS. COOPER: Well, Reg. Guide 1.174
15 already is out there and is being used by the staff,
16 and the public knows about that. What is contained
17 now in 1764 is then some calculations of importance
18 measures, just getting to step two here and getting
19 ahead, and that's consistent also with what's in Reg.
20 Guide 1.174.

21 VICE CHAIRMAN WALLIS: That sort of
22 assumes that you can calculate the change in risk.

23 MS. COOPER: Yes. I mean, there's no
24 difference --

25 VICE CHAIRMAN WALLIS: That's the question

1 I have is that there is -- I don't know that we have
2 a good basis for calculating these changes in risk due
3 to human performance changes.

4 MS. COOPER: I don't see any reason why --
5 if something is calculated in the PRA, a human failure
6 event, basic event probability, why you can't -- and
7 you can -- make the same kind of calculation for that
8 event as you can for a piece of equipment.

9 Now, you can make some arguments about how
10 -- you know, uncertainties about it or the maturity of
11 the methods that go into making that calculation.
12 That's a different question, and we're not really
13 dealing with that here.

14 MEMBER APOSTOLAKIS: I think that's the
15 question, actually.

16 MS. COOPER: We're trying to work with the
17 state of the art as it is and use it to the best that
18 we can to try to make an informed decision about how
19 to make good choices about focusing resources on
20 reviewing licensee requests.

21 MEMBER APOSTOLAKIS: But there is huge
22 model uncertainty, Susan, in human reliability. So
23 even if you don't concern yourself with changes in
24 risk, you use importance measures, I mean, those will
25 have to use the probability that was calculated using

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1 some model for the human action.

2 MS. COOPER: Well, we are -- I mean, we
3 are using the inputs from Reg. Guide 1.174, which is
4 a change in risk.

5 MEMBER APOSTOLAKIS: 1.174 tells you what
6 to do after you calculate the change. The question
7 is, in calculating the change, what model do you use?
8 1.174 doesn't tell you that. 1.174 says use, you
9 know, a good PRA. So --

10 MS. COOPER: And this guidance does not
11 address that. That's not part of our job -- to try to
12 look into those particular issues.

13 Now, with respect --

14 VICE CHAIRMAN WALLIS: It seems to me a
15 scale of the whole thing, though. If you can't
16 calculate the model -- if you don't have a good way of
17 modeling this --

18 MEMBER APOSTOLAKIS: Right.

19 VICE CHAIRMAN WALLIS: -- then you're just
20 playing games with --

21 MS. COOPER: Well, I don't know that I
22 would -- I would agree with the fact that you -- we
23 don't have a good way of modeling human reliability.
24 There are some methods that may be better than others,
25 and when you compare it to other aspects of PRA it may

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1 not measure up.

2 But, I mean, you know, compare HRA to, you
3 know, seismic risk analysis or some of the other areas
4 where we have large uncertainties. And then, you
5 know, you can get a better basis. But I don't even --

6 MEMBER APOSTOLAKIS: But I think the
7 difference between seismic and HRA is that the seismic
8 fellows have recognized that the uncertainties are due
9 to models, and they are handling them explicitly. In
10 HRA, different groups develop their own model, and
11 they don't compare to what other people are doing.

12 MS. COOPER: Well, all I can --

13 MEMBER APOSTOLAKIS: One last point.
14 There is a paper by Andre Pousse in the PSA conference
15 of 1989 that shows a table of different people using
16 the same method, and the same people using different
17 methods, the results that they get for HRA. And they
18 are scattered all over the place.

19 Now, this committee has seen a variety of
20 models being used. In some of the power upgrades
21 people say -- some licensees say, "Well, and we use
22 the EPRI methodology." And then we find out that the
23 NRC never really reviewed the EPRI methodology.
24 Nobody knows, unless you are a member of the EPRI
25 alliance, what it is.

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1 So it's these, really, issues that concern
2 us. It's not -- I mean, the overall approach you are
3 describing is fine.

4 MS. COOPER: Well, all I can say is that
5 I think the approach does address the basic concerns
6 about, let's say, maturity in HRA on uncertainties in
7 the following ways. First of all, Reg. Guide 1.174
8 and SRP Chapter 19 already talk about quality of PRA
9 and quality of HRA and uncertainty. And that doesn't
10 change so far as how the input from Reg. Guide 1.174
11 in step one is done. So that's already there.

12 Then, we have this importance measure
13 calculation, which, you know, we can argue about its
14 robustness. But then we have a third step yet, and
15 that's where we bring -- can bring in qualitative
16 information to ingest further what we think is the
17 appropriate level.

18 And then, as we can see when we get to the
19 very end of the presentation, we have a table out of
20 Reg. Guide -- I'm sorry -- NUREG-1764 that shows how
21 we put all of these three inputs together and make
22 decisions. And you can see, again, from the table
23 that there are places where you can make adjustments.

24 And in the end, the worst thing that can
25 happen, the worst consequence is that perhaps at the

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1 end of this process you should have gone to a higher
2 level of review. And I guess I would argue that
3 that's probably still not the last line of defense,
4 because at the same time that the human factors people
5 may be looking at a human action, the SPSB folks over
6 in NRR are looking at the PRA side, and they still may
7 find a concern and come back to the human factors
8 people and say, "Look, we think that maybe you ought
9 to spend -- you know, look at this pretty closely
10 because of our concern."

11 So I still don't think this is the last
12 line of defense.

13 MEMBER APOSTOLAKIS: You will talk about
14 the --

15 MS. COOPER: And I think we have -- I
16 think there are a number of levels here that we've
17 built in.

18 MEMBER ROSEN: Yes. George, I think we
19 could stipulate that there is a lot of uncertainty
20 about the human reliability models and modeling, and
21 let them go on with that, and then come back to that
22 at the end and see how they use it.

23 MEMBER APOSTOLAKIS: Okay.

24 MS. COOPER: Okay. I think I'm still on
25 slide 18, talking about step number two where the

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1 input there is the evaluation of risk significance of
2 the human action not being performed correctly.

3 Step three, the third input then is
4 qualitative information, qualitative evaluation of
5 human action. And then step four is the integration
6 of those three inputs. And I'll go through each of
7 the steps with a little more detail.

8 Next slide.

9 In step one, as I said, the input here is
10 from calculations done with Reg. Guide 1.174 where the
11 delta CDF is calculated, and then an assignment is
12 made into one of three regions.

13 For the purpose of this particular
14 screening process, if -- okay, we're on the next
15 slide. If the license change request involves --

16 MEMBER ROSEN: The "HA" means human
17 action.

18 MS. COOPER: Human action. Only involves
19 a human action, and the assignment from Reg. Guide
20 1.174 is in Region I, we recommend that the most
21 detailed level of human factors engineering review be
22 done. If that's not the case, then we go -- proceed
23 to step two, develop additional inputs to the overall
24 screening process.

25 MEMBER APOSTOLAKIS: So let me understand

1 this. The first one says --

2 MEMBER ROSEN: Go back a slide.

3 MEMBER APOSTOLAKIS: -- what?

4 MS. COOPER: I'm sorry?

5 MEMBER APOSTOLAKIS: That you will do a
6 detailed analysis?

7 MS. COOPER: Yes.

8 MEMBER APOSTOLAKIS: Region I is which
9 one? Remind me.

10 MEMBER ROSEN: It's the high one.

11 MS. COOPER: Okay. Region I is the
12 highest one in Reg. Guide 1.174. It is -- when Paul
13 gets into his discussion, you'll find that there are
14 also three levels of human factors engineering review
15 where the Level 1 is the most detailed --

16 MEMBER ROSEN: This one basically says if
17 it's a human action, and it's clearly risk
18 significant --

19 MS. COOPER: Right.

20 MEMBER ROSEN: -- we're going to do a full
21 review.

22 MS. COOPER: That's correct.

23 MEMBER APOSTOLAKIS: And delta CDF is in
24 Region I.

25 MEMBER ROSEN: Right.

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1 MS. COOPER: Right.

2 MEMBER APOSTOLAKIS: All right. Now,
3 Region I is the rejection region?

4 MS. COOPER: That's not exactly the way
5 Reg. Guide 1.174 states it. It's implied that there
6 aren't going to be very many of those, but it does not
7 say that it's an absolute rejection. So we -- this --
8 for that reason, this NUREG must address the fact that
9 that's a possibility.

10 MEMBER APOSTOLAKIS: But the human factors
11 evaluation -- let's say, you know, you're doing it and
12 you say it, "Well, we're happy with the way they did
13 it," you are still in Region I. So who is going to
14 decide now whether --

15 MS. COOPER: Well, I -- that sort of
16 speaks to a process that's over in NRR, and I don't
17 know that I could speak to that. But all I'm saying
18 is that because Reg. Guide 1.174 allows for the fact
19 that there can be a Region I assignment that's not
20 rejected out of hand, we must also consider that.
21 Otherwise, we've got a gap.

22 MEMBER ROSEN: I mean, a licensee can come
23 in and propose a change. That has a very significant
24 human action delta CDF. I mean, they can do it. It's
25 not likely, but they --

1 MEMBER APOSTOLAKIS: They can do it. The
2 question is: what do we do?

3 MEMBER ROSEN: Well, you're about to hear
4 that.

5 MR. PARRY: Can I add -- this is Gareth
6 Parry, NRR.

7 MEMBER ROSEN: If you'll listen long
8 enough, you'll hear that.

9 MR. PARRY: I think, really, the way to
10 look at it is that if -- remember, the setting it in
11 regions according to Reg. Guide 1.174 is really the
12 use of a calculation using PRAs. I think the only
13 reason that you would have for not rejecting it is to
14 say that there was something about that calculation
15 that was extremely conservative.

16 So I think that's the direction it would
17 go, but it would be conservative enough to -- to make
18 you realize that that's probably not the right reason.

19 MEMBER APOSTOLAKIS: So we have here a
20 reversal of roles. The licensee comes with an
21 extremely conservative analysis, and the staff says,
22 "No, you are too conservative. You really deserve the
23 change."

24 MR. PARRY: No. I think they'd have to
25 make that -- they'd have to make that argument.

1 MEMBER APOSTOLAKIS: That's kind of
2 unusual, though.

3 MR. PARRY: They'd have to make that
4 argument.

5 MEMBER ROSEN: It will be very unusual.

6 MEMBER APOSTOLAKIS: Very unusual.

7 MEMBER ROSEN: No, no. Let's get through
8 this and get to the more usual cases of --

9 MR. PARRY: The Reg. Guide is for the
10 licensee, remember, not for the staff. So that they
11 would have to make the argument that the analysis --

12 MEMBER APOSTOLAKIS: I think Susan put it
13 in the right way, that the guide doesn't say that you
14 are rejected outright, but there is a hell of a strong
15 implication --

16 MEMBER ROSEN: There's a burden -- there's
17 a burden to be --

18 MEMBER APOSTOLAKIS: -- you'd better not
19 come.

20 MS. COOPER: Right. Why don't we go on to
21 the next slide and go to step number two, the second
22 input in the process. Here the risk significance of
23 the human action not being performed correctly is
24 evaluated. The way this is evaluated is using two
25 different types of importance measures -- the RAW and

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1 Fussell-Vesely importance measures.

2 And the results of this process in
3 determining the importance measures then makes a
4 preliminary determination of the level of review which
5 is going to be combined with the other inputs.

6 VICE CHAIRMAN WALLIS: This seems to be
7 easy when nothing is -- it's a yes/no. I mean, either
8 she has flipped the switch or she didn't. I mean,
9 that's, yes, they did, yes, they didn't -- but when
10 not correctly means something much more complicated,
11 like they misunderstood the whole situation, they did
12 something completely incorrect that no one
13 anticipated, or, you know, there are all kinds of ways
14 of being incorrect.

15 MEMBER APOSTOLAKIS: As has been found out
16 many times, correct is --

17 VICE CHAIRMAN WALLIS: Yes. So I'm not
18 quite sure how you do this. But maybe --

19 MS. COOPER: Well, it has to be based on
20 whatever event is modeled in the PRA, and that will be
21 defined --

22 VICE CHAIRMAN WALLIS: It's a yes/no
23 thing. You go this way or you go that way.

24 MS. COOPER: The failure modes and the
25 failure states are defined. You know, that -- so

1 that's more or less a good --

2 VICE CHAIRMAN WALLIS: It doesn't take
3 into account the human -- completely misunderstand the
4 situation and doing something very inappropriate.

5 MS. COOPER: That rather depends on what
6 they've modeled. I mean, it's possible that they
7 could have modeled that.

8 VICE CHAIRMAN WALLIS: Sure.

9 MS. COOPER: I mean, it doesn't say that.

10 MEMBER ROSEN: It's the classic cognitive
11 area you're talking about, where the human does the
12 right thing for the wrong accident.

13 VICE CHAIRMAN WALLIS: When I get into
14 trouble driving a car is not when I turn left instead
15 of right; it's when I completely misunderstand the
16 situation about what is going to do with his sports
17 car. And, therefore, I do completely the wrong thing.
18 And it's -- you know, anyway --

19 MS. COOPER: That's true. But this stuff
20 does not get into any of the underlying layers of how
21 the modeling was done. It's simply a mechanical test
22 here at this point in time. The event, the basic
23 event, is what it is in the PRA model, and this is a
24 mathematical exercise to try to see how important this
25 particular event is. The qualitative evaluation done

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1 in the next step could possibly, you know, get into
2 that.

3 VICE CHAIRMAN WALLIS: Okay.

4 MS. COOPER: All right? The next slide
5 then goes into a little more detail about how the RAW
6 importance measure is calculated. And the equation is
7 shown here. I don't know that we need to go into --
8 unless someone has a question, I don't know if we need
9 to go into any more detail there.

10 MEMBER APOSTOLAKIS: You select the ratio
11 method.

12 MS. COOPER: I'm sorry?

13 MEMBER APOSTOLAKIS: You say, "We select
14 the ratio method." That's what the second bullet
15 says.

16 MEMBER ROSEN: Right.

17 MS. COOPER: Yes.

18 MEMBER APOSTOLAKIS: What other method is
19 there?

20 MS. COOPER: There is more than one way to
21 express some of these importance measures.

22 MEMBER APOSTOLAKIS: I thought that was a
23 definition of RAW.

24 MS. COOPER: Jim Higgins, please, will
25 you --

1 MR. HIGGINS: Jim Higgins, Brookhaven Lab.
2 There is also the interval method, where you do
3 calculate the delta expressed that way. And if you go
4 back to the original 1983 Bill Vesely NUREG/CR, he
5 articles both an interval method and the ratio method
6 of RAW calculation.

7 And I guess when we first started
8 developing the methodology here, we were using the
9 ratios because we were trying to correlate the delta
10 CDF to the Commission's safety goal of delta CDF. And
11 so we were using the interval method.

12 But because of just what you raised, there
13 was a number -- a bit of confusion among people
14 because it hasn't been used recently, and so we just
15 shifted back to this.

16 MEMBER APOSTOLAKIS: Yes. This is the
17 standard of --

18 MR. HIGGINS: Which is the standard, and
19 so that's --

20 MEMBER ROSEN: That's why we use it, you
21 know, when you're doing --

22 MEMBER APOSTOLAKIS: Yes. The goal is to
23 use this, you know.

24 MEMBER ROSEN: It's the new CDF over the
25 old CDF.

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1 MR. HIGGINS: That's correct. Yes. And
2 we actually expressed it in this format a little bit
3 differently, because we're -- as Susan will get to,
4 we're calculating the differences in the regions based
5 on the change in delta -- on the delta CDF.

6 VICE CHAIRMAN WALLIS: So the best thing
7 you can do is have a big baseline CDF. Then your RAW
8 is smaller?

9 MEMBER ROSEN: Unfortunately, that's true.

10 MR. HIGGINS: Well, that's -- in fact,
11 you'll see here that's why the curves are -- look like
12 they do. We reduce it to account for that.

13 Go ahead, Susan.

14 MS. COOPER: Okay. We're here at the next
15 slide. This is showing the -- how the different level
16 assignments then can be made using the RAW importance
17 level. This slide does not show -- actually print out
18 the levels, but everything above is Level 1, between
19 the two lines is Level 2, and Level 3 is then below
20 the second line.

21 MEMBER APOSTOLAKIS: I don't understand
22 this. For what delta CDF is this calculated? It's a
23 function --

24 MS. COOPER: I'm sorry?

25 MEMBER APOSTOLAKIS: It's a function of

1 the baseline CDF.

2 MS. COOPER: It's a function of the
3 baseline --

4 MEMBER APOSTOLAKIS: For a given delta
5 CDF?

6 MS. COOPER: No.

7 MEMBER ROSEN: I didn't see this chart
8 before. This is --

9 MEMBER APOSTOLAKIS: It has to be for a
10 given delta CDF.

11 MEMBER ROSEN: This is Duane Arnold,
12 Perry, Nine Mile Point, Salem, and what else? Some
13 other -- Point Beach or what?

14 MS. COOPER: The data points I'm going to
15 have to let Brookhaven speak to. But the purpose --
16 the reason why this slide is here is to address a
17 question that came out of the subcommittee meeting
18 asking, you know, where did the level assignments come
19 from from the importance measure calculations?

20 And actually, the next slide discusses the
21 relationship, how this --

22 MEMBER ROSEN: Point of order. I don't
23 get it.

24 MS. COOPER: -- was developed.

25 MEMBER ROSEN: Go back to that previous

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1 slide. Why are you showing us data from these five
2 plants?

3 MR. PERSENSKY: Ignore that. At this
4 point, ignore the data. This was a convenient slide
5 in order to respond to your comments.

6 VICE CHAIRMAN WALLIS: This is the only
7 place where you present us data. Now, come on.
8 Don't --

9 (Laughter.)

10 MR. PERSENSKY: And the data was part of
11 the development of this in the first place. We were
12 trying to just demonstrate that this is where the
13 lines are and how we got -- and how the different
14 levels would be affected.

15 The data was part of the testing that we
16 had done at various times during the development of
17 this process. It came from IPE data that --

18 MEMBER ROSEN: IPE data.

19 MR. PERSENSKY: Yes.

20 MEMBER APOSTOLAKIS: The question is:
21 what does the curve, for example, that starts at 100
22 on the left and goes down --

23 MS. COOPER: Actually, let's go back a
24 slide.

25 MR. PARRY: I think that's delta CDF of

1 10⁻⁴ is the top one.

2 MS. COOPER: If we could go back to --

3 MEMBER APOSTOLAKIS: So for a fixed delta
4 CDF --

5 MR. PARRY: For a fixed delta CDF, it's
6 the RAW -- it's the variation of RAW as you --

7 MEMBER APOSTOLAKIS: Which confirms what
8 Graham said, that you are luckier if you have a higher
9 CDF. right? Or a fixed delta CDF.

10 MS. COOPER: Right.

11 MEMBER APOSTOLAKIS: You increase the --

12 VICE CHAIRMAN WALLIS: That doesn't make
13 sense. That doesn't make sense.

14 MR. PERSENSKY: No, because the absolute
15 change is the same. The delta CDF is always 10⁻⁴ on
16 that line.

17 MEMBER APOSTOLAKIS: Yes. So if you take
18 the --

19 MR. PARRY: Yes. But all that's telling
20 you is that the higher you have, the smaller your RAW
21 is to get the delta CDF --

22 VICE CHAIRMAN WALLIS: Right.

23 MR. PARRY: -- which doesn't actually make
24 you better. In fact, if you -- I think it puts you on
25 a level playing field.

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1 MEMBER APOSTOLAKIS: I don't think that
2 curve really is very informative. Plotting it as a
3 function of CDF doesn't really mean much.

4 MEMBER ROSEN: I don't know what that
5 curve means either.

6 MEMBER APOSTOLAKIS: It's not a crime,
7 but --

8 MEMBER KRESS: It means if you calculate
9 a RAW for a given change in your human error action,
10 or whatever, and your baseline CDF happens to be one
11 times 10^{-4} , then if that RAW you calculate is like --
12 on this thing it looks like two or three, then it's --
13 it's two, then it's not permitted, or you would
14 question it.

15 MS. COOPER: Well, it --

16 MEMBER KRESS: Because it's too big of a
17 change.

18 MS. COOPER: But it's supposed to function
19 the same way the curves or the tables that are in Reg.
20 Guide 1.174, except to use the information of
21 importance measures. As a matter of fact, it's based
22 on some on that material.

23 I think Jim Higgins has a burning question
24 here or a comment.

25 MR. HIGGINS: Yes. Maybe just to -- it

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1 gets back a little bit to I think the confusion here
2 is the reason we initially set up the acceptance
3 criteria to be based on a delta CDF. It was incurred
4 by failing the human action, and it was set up such
5 that if you failed the human action that delta CDF
6 would increase by no more than 10^{-4} . And that was our
7 cut between Region I and Region II for this. And
8 then, 10^{-5} was the cut between Region II and
9 Region III.

10 But then there was a desire to convert it
11 over to a RAW that people were more familiar with,
12 namely the ratio method. So what we did is we used
13 the same criteria -- namely, when you fail the human
14 action, you don't want the calculated increase in risk
15 to be more than 10^{-4} for Region I.

16 So in order to compute what the RAW would
17 then be, it has to vary depending on delta CDF to
18 address the comment that was made over here. And so
19 the curve -- what we did was we just used the equation
20 and we presumed a delta CDF of 10^{-4} . And then, for
21 each of the CDF -- the baseline CDF values, we
22 computed what the acceptance criteria were and
23 generated that line.

24 MEMBER KRESS: What bothers me about it
25 is, why does the curve convex instead of concave?

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1 MR. HIGGINS: Because it's a log scale.

2 MEMBER KRESS: I know. But I would have
3 thought that if you stick to the 10^{-4} , it would be a
4 straight line and not curve or turn up. This says
5 you're still allowing a change in RAW if the CDF is
6 10^{-3} .

7 MS. COOPER: Actually, it's not saying
8 that yet. It's just simply saying that --

9 MEMBER APOSTOLAKIS: This is just
10 mathematics.

11 MS. COOPER: -- this is just mathematics
12 to try to determine which -- which actions deserve the
13 most attention. And we still haven't even gotten to
14 that answer yet. That's simply the recommendation
15 based on this particular calculation, and there's yet
16 another one to be done here in step two. So --

17 MEMBER APOSTOLAKIS: So this is really the
18 figure in 1.174 converted to a RAW.

19 MR. PARRY: No, not really. This is a
20 "how bad could it get" if the human action fails on --

21 MEMBER APOSTOLAKIS: Yes. It's the
22 boundary of 10^{-4} in a --

23 MS. COOPER: Roughly, yes.

24 MR. PARRY: At 10^{-4} , if you look at Reg.
25 Guide 1.174, that top boundary is 10^{-5} .

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1 MS. COOPER: This sort of takes --

2 MEMBER APOSTOLAKIS: For CDF is 10^{-5} ,
3 you're right.

4 MR. PARRY: The delta CDF. So this
5 actually more -- corresponds more to the bands of the
6 reactor oversight process.

7 MEMBER ROSEN: That's what it says on that
8 slide.

9 MEMBER APOSTOLAKIS: Maybe the green line
10 is a 10^{-5} ?

11 MS. COOPER: Yes.

12 MR. PARRY: It is.

13 MEMBER APOSTOLAKIS: The green line is
14 that figure in 1.174 converted to RAW.

15 MS. COOPER: Right.

16 MEMBER APOSTOLAKIS: As a function of CDF.

17 MR. PARRY: That's correct.

18 MS. COOPER: That's correct.

19 MEMBER APOSTOLAKIS: Instead of delta CDF,
20 it's now RAW.

21 MEMBER ROSEN: And the dark line is where
22 -- if you're above that dark line, you've got a red
23 finding in the RLP.

24 MS. COOPER: That's right. And that's
25 actually all stated on slide number 24, which is the

1 next slide.

2 VICE CHAIRMAN WALLIS: But this slide
3 doesn't help and makes it worse. When you've got a
4 basic thing, which is 10^{-4} delta CDF, that's
5 understandable. When you put it into RAW and draw
6 these curves, you're obfuscating something very
7 simple.

8 MS. COOPER: Well, so far as understanding
9 perhaps, maybe so. But the purpose is to have a tool
10 for someone -- you know, in other words, NRR gets a
11 submittal and there is PRA information that's
12 provided, including maybe importance measures.

13 And NRR staff can take that information,
14 plot that on this curve, and get their input
15 reasonably quickly, because, really, all we're doing
16 right now is we're not -- we're not even yet to the
17 review yet. We're just trying to decide how much time
18 am I going to put in the review. So --

19 MEMBER APOSTOLAKIS: These points are
20 actually submitted?

21 MS. COOPER: No. I believe the comment
22 earlier was made that these are IPE --

23 MR. PERSENSKY: No, this is part of a test
24 of developing the -- where these things would fall.
25 We took some information from existing IPEs. These

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1 were not submittals in terms of submittals for
2 changes. This is just stuff that we took in a
3 hypothetical situation to apply, so we could see how
4 it would fit within these ranges, so that we could see
5 would it really discriminate.

6 MEMBER POWERS: Does it matter in your
7 kind of qualitative description of that that the IPEs
8 maybe aren't very reliable in this area?

9 MR. PERSENSKY: Again, this was -- these
10 were probably generated almost two years ago when we
11 were doing some -- this is not IPE. I'm sorry. Maybe
12 I've got the wrong data.

13 MR. HIGGINS: Right, yes. Jim Higgins
14 again. As part of the verification of the
15 acceptability of the method and the usability of the
16 method, we conducted a number of incremental tests
17 along the process, some of which we did where we
18 evaluated past submittals for changes to human
19 actions.

20 Secondly, we evaluated some IPE data. And
21 then, when we got up to this point, the most recent
22 point, we actually used the current PRA data, current
23 as of about a year or two ago, from plant PRAs that we
24 actually gathered as part of the ROP SDP notebook
25 development process when we went on the benchmarking

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1 trips to the sites.

2 And for most of the plants we had
3 available to us RAW and Fussell-Vesely information for
4 all of the components in the PRA, particularly the
5 human action. So we collected that, and for those --
6 we selected five plants, and that gave us -- that data
7 is actually 127 human actions that were plotted, so we
8 could see the distributions for the human actions that
9 were modeled in those PRAs, how they would fall out on
10 the curves to help us evaluate if those acceptance
11 criteria for the splits were reasonable.

12 MEMBER POWERS: I'm enthusiastic about
13 this, because this is a step toward quantifying the
14 question that we've asked -- maybe I've asked on this
15 committee several times is, how good is human
16 performance? And how good do you want it? I mean, I
17 can see you moving in that direction here with this
18 sort of approach.

19 MEMBER KRESS: It seems to me like also a
20 benefit of using RAW and Fussell-Vesely versus actual
21 CDF is that you to some extent incorporate the
22 uncertainty in the model, because they tend to be a
23 little more bounding than the actual calculated delta.

24 MR. HIGGINS: Right. In fact, that was --
25 when we first did it, we were just using RAW, and one

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1 of the reasons was because you don't -- a little bit
2 of -- if you're concerned about what the HEP value is,
3 this gets rid of that.

4 Now, you still have the modeling issues.

5 MEMBER KRESS: It doesn't get it out
6 altogether.

7 MR. HIGGINS: Right. You still have some
8 modeling issues, but it does -- and then, Gareth was
9 one of the people that had suggested that we go a
10 little bit further and also look at Fussell-Vesely,
11 which is just --

12 MEMBER KRESS: Which is more bounding than
13 RAW.

14 MR. HIGGINS: -- a different aspect of the
15 risk. And we actually, when we got into developing
16 the acceptance criteria, we initially tried -- it was
17 suggested that we look at the NRC SERs that had been
18 done for the risk submittals for South Texas and
19 Comanche Peak.

20 And we utilized their -- tried to utilize
21 the similar RAW and Fussell-Vesely combinations to
22 incorporate into here, and then there were a number of
23 issues that came up which we could get into if we want
24 to, but we found that the -- empirically, by looking
25 at a number of IPEs, then, that the raw Fussell-Vesely

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1 were not correlated, and you really were getting
2 different information from the two of those.

3 So we ended up to -- we ended up making
4 them two separate criteria -- RAW and Fussell-Vesely
5 -- and the way we evaluate it is we take the more
6 conservative of the two. It's an or.

7 MEMBER APOSTOLAKIS: So what is the result
8 of this?

9 MS. COOPER: I was going to say let's move
10 on forward and --

11 MEMBER APOSTOLAKIS: No, I'm mean --

12 MEMBER ROSEN: You'll get a fine graph
13 of --

14 MEMBER APOSTOLAKIS: No, no, no. But, I
15 mean, these are criteria for deciding what?

16 MS. COOPER: Deciding the level of human
17 factors engineering review. Okay?

18 MR. PERSENSKY: This is how much review
19 we're going to do from a human factors standpoint.

20 MEMBER POWERS: George, this is right on
21 what we've been asking for.

22 MEMBER APOSTOLAKIS: Yes, I know.

23 MEMBER POWERS: We're saying, how bad is
24 human performance? How good do you want it? Except
25 they're casting it in terms of review.

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1 MEMBER APOSTOLAKIS: Yes.

2 MEMBER POWERS: And I think that's what
3 they should be doing. I mean, I think this is great.

4 MR. PERSENSKY: And we're trying to make
5 use of existing agency's documents and existing
6 procedures. We weren't trying to develop brand-new
7 procedures here, and that's why we were --

8 MS. COOPER: We haven't gotten to the
9 review until --

10 MEMBER POWERS: But, J, this is new to you
11 guys. I mean, this is new to you guys.

12 MR. PERSENSKY: This is the way we apply
13 our work.

14 MEMBER POWERS: I mean, it's -- and it's
15 giving you a -- I mean, if you're looking for three-
16 decimal precision, you're in the wrong field. Okay?
17 But it's giving you a qualitative feel for, should I
18 do a lot or should I do a little bit? I mean, I think
19 it's great.

20 MEMBER APOSTOLAKIS: I'm trying to
21 understand slide 24. Let's go back.

22 VICE CHAIRMAN WALLIS: We should move on
23 I think. Really, the --

24 MEMBER APOSTOLAKIS: The Commission -- the
25 goal of 10^{-4} is for -- from all contributors. But now

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1 you seem to be applying it to human error only. Is
2 that the correct perception here what's happening? I
3 mean, shouldn't there be some reduction in this,
4 because you are dealing with a specific item?

5 The Commission goal of 10^{-4} is for all
6 contributors -- seismic, fire, human error.

7 MS. COOPER: This is a delta CDF.

8 MEMBER APOSTOLAKIS: Well, that's even
9 worse, because now you are adding it to the existing
10 CDF. So if the existing CDF is --

11 MS. COOPER: Okay. I'm going to let
12 Gareth field these questions. He thinks he's got this
13 one.

14 MR. PARRY: I think all we're trying to do
15 with this measure is to see how significant is that
16 action to maintaining a safe level of risk. Okay?
17 And if that were -- actually were to fail completely,
18 then what we're saying is that there is a high risk
19 significance.

20 And I take slight exception to what Dana
21 said. I don't think this is a measure of human
22 performance as such. It's more of a measure of where
23 you want to put your effort to make damn sure that
24 this thing doesn't fail.

25 MEMBER POWERS: But that's --

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1 MR. PARRY: In the sense of RAW.

2 MEMBER POWERS: That is exactly what we've
3 been asking for is some sort of an idea of where to
4 put the -- how much and where to put the effort.

5 MR. PARRY: Right.

6 MEMBER POWERS: And, I mean, I -- to my
7 mind, this is a breakthrough. I mean, it may not --
8 like I say, if you're looking for three decimal point
9 precision, it's not going to ever be here. But if you
10 want something that says, do I work a lot, or do I
11 work a little bit, do I worry a lot, do I worry a
12 little bit, I mean, what more --

13 MEMBER APOSTOLAKIS: But I would worry --

14 MEMBER POWERS: -- can you ask for here?

15 MEMBER APOSTOLAKIS: I disagree with
16 Gareth. I agree with the intent, but the "criterion"
17 are -- in quotes -- of when I should worry should be
18 lower than delta CDF 10^{-4} .

19 MR. PARRY: I think the criteria to some
20 extent are arbitrary, but I think maybe when they --

21 MEMBER APOSTOLAKIS: No, it's not
22 arbitrary. Why is it arbitrary?

23 MR. PARRY: Let me finish. When they get
24 to talking about the level of review, maybe that's
25 when it makes sense to worry whether these are the

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1 right levels, because I think when you're talking
2 about the highest level of review that's a very
3 detailed review.

4 The 10^{-5} is somewhat less, but it's sort
5 of equivalent to what you do now is what I understand.
6 And the third one is less than that.

7 MEMBER ROSEN: Yes. I've been pleading
8 with you, George, to let her get through the whole
9 story, and then I think you'll have an answer to your
10 question, which is what it's being used for is
11 really --

12 MEMBER APOSTOLAKIS: Okay.

13 MEMBER ROSEN: -- what makes it okay to do
14 what it seems like it's not okay to do up front.

15 MS. COOPER: What I'd like to do is skip
16 over the next few slides. I will simply say that the
17 same calculations -- type of calculation is also
18 performed with the Fussell-Vesely importance measure.
19 A similar curve or a curve with levels is also
20 generated.

21 And then, as Jim Higgins mentioned a few
22 minutes back, and as noted on page -- slide 28, the
23 most conservative of the two calculations, then, is
24 supposed to be the output of this particular step, and
25 then is the input to the overall process.

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1 So now we're on slide 29, which is the
2 third step in the process. And in this particular
3 step we're -- the intent is to do a qualitative
4 evaluation of the human action, which allows, then,
5 the reviewer to reduce or elevate the level of review
6 or the recommendation for the review.

7 There are three different basic areas in
8 which the evaluation is made -- personnel functions
9 and task, design support for task performance, and
10 performance shaping factors.

11 Then, the next slide --

12 MEMBER APOSTOLAKIS: Go back, back, back.

13 MS. COOPER: I'm sorry?

14 MEMBER APOSTOLAKIS: Now, this is where
15 there should be a good discussion of model
16 uncertainty.

17 MS. COOPER: No.

18 MEMBER APOSTOLAKIS: No. Why not?

19 MS. COOPER: Because it's not -- what
20 we're looking for is human factors input and general
21 performance information. The PRA is already going to
22 be looking at that. That's their job.

23 This is for the purposes of the human
24 factors folks to try to decide whether or not there
25 are important issues that they need to look at that

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1 increases their need to look at this particular
2 action. Now, they may get input from the PRA people,
3 saying, hey, we're looking at this from the HRA side.
4 We ought to be looking a little harder at this.

5 MEMBER APOSTOLAKIS: No, because you say
6 the screener reduces or elevates. So if the screener
7 is not familiar with the fact that --

8 MS. COOPER: Well, not overall.

9 MEMBER APOSTOLAKIS: Well, let me --

10 MS. COOPER: There is an integration of --

11 MEMBER APOSTOLAKIS: -- tell you what
12 bothers me. We talk about -- you are not involved in
13 that. Power upgrades -- I raise the issue of model
14 uncertainty and human reliability, but somehow we all
15 recognize it but we do nothing.

16 Then, in other regulatory matters, the
17 same thing. And I'm afraid we're going to do the same
18 thing here. Yes, we all agree there is -- there are
19 large uncertainties, but --

20 MS. COOPER: You could say --

21 MEMBER APOSTOLAKIS: -- somebody else
22 would worry about it.

23 MS. COOPER: -- to a certain extent that
24 this qualitative evaluation is to address that. It's
25 trying to address things that are not explicitly

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1 modeled.

2 MEMBER APOSTOLAKIS: But that's my point,
3 that -- does anybody understand why EDF, for example,
4 has chosen to follow one route, and we are choosing to
5 follow another one? And whether what they consider
6 important should play a role here? Because that's
7 human factors. They are not doing it as PRA analysts.
8 They are saying, no, no, no, we think that the
9 operator will develop a strategy what to do, right?

10 MS. COOPER: I think the answer is yes,
11 but I don't think that's the point of this project.
12 I don't think that's --

13 MEMBER ROSEN: Let me recognize Gareth.

14 MS. COOPER: Yes, Gareth has a comment.

15 MR. PARRY: It's Gareth Parry again. I
16 think there is somewhat of a disconnect between human
17 factors and human reliability analysis, as you know.
18 The human reliability analysis models are one thing.
19 They don't -- there's no direct relationship between
20 the human factors.

21 The way I think that we should look at
22 this is that what this -- what we're talking about
23 here is what level of human factors review do you need
24 to support a risk-informed application. Now, one of
25 the inputs is the PRA, and one of the inputs to that

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1 is the HRA. And you're right, the uncertainties in
2 that have to be addressed in the evaluation of which
3 region you're in.

4 But what we're looking at here, the human
5 factors review, I think is part of the supplementary
6 information that goes into the integrated decision-
7 making. It doesn't -- I mean, it could have an
8 influence on the HRA, but it may not have. It may be
9 additional information.

10 MEMBER APOSTOLAKIS: So there is
11 another --

12 MR. PARRY: It's another input.

13 MEMBER APOSTOLAKIS: Is there another
14 review of the HRA model? By whom?

15 MR. PARRY: That would be done by the HRA
16 -- by the people reviewing the PRA --

17 MEMBER APOSTOLAKIS: Right. But I'm not
18 talking about the quantification itself. I mean, the
19 reason why there are different HRA models is because
20 the human factors inputs are different. Different
21 groups consider different things as being important.

22 MS. COOPER: In a broad sense, perhaps
23 that's so.

24 MEMBER APOSTOLAKIS: Yes.

25 MR. PERSENSKY: I think if we go back,

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1 again, to the purpose of why we even have this
2 screening process, right now we are getting in fairly
3 routinely changes to licensing basis because of
4 changes in operator action. Without this screening
5 process, the decision is made on the amount of review
6 that we do on a very subjective human -- or
7 engineering judgment basis.

8 What we've tried to do by adding this
9 screening process in here and using existing NRC
10 documents and approaches was to give our reviewers a
11 little bit of help from a risk standpoint, a risk-
12 informed standpoint, as to whether we -- you know,
13 what level of review.

14 As part of this, we, I think, are -- we're
15 interacting more with the risk people. This gives us
16 an opportunity to get back into that integrated review
17 as the part of Reg. Guide 1.174 with some more
18 specific information. But, you know, to date, without
19 this system, it's purely a subjective way of deciding
20 what level to do.

21 A lot of the questions you're asking have
22 to do with, how do we improve Reg. Guide 1.174, and
23 that's not the purpose of this document. And how do
24 we approve HRA? Those are things that we agree need
25 to be done, but for this purpose right now all we're

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1 trying to do is say, can we use this as a way of
2 reducing resource towards the amount of review that
3 has to be done, or the amount of whatever is in the
4 submittal? I think we're getting way off board on
5 what the purpose of this document is.

6 MEMBER ROSEN: You're using it to try to
7 be more effective in your --

8 MR. PERSENSKY: We're just trying to be
9 more effective in how we do our work.

10 MEMBER ROSEN: That doesn't do away with
11 your concerns about human reliability. It doesn't do
12 away with our concerns about CDF and where you enter
13 it and whether you have full -- modeling that's full,
14 and whether you --

15 CHAIRMAN BONACA: Just one way --

16 MEMBER ROSEN: -- whether the PRA that
17 defines the CDF has got all modes and seismic and fire
18 in it.

19 This is something we argued yesterday --
20 Gareth and I -- about. He thinks 1.174 is fine. I
21 have a problem with 1.174. It may lead to non-
22 conservative answers, if you're not dealing with full
23 scope PRAs as we enter this process. So --

24 MEMBER APOSTOLAKIS: If I take a concrete
25 example that came before this committee, in one power

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1 upgrade request they concluded that the time available
2 to the operators would be reduced for action from 42
3 minutes to 39 minutes. And they used a non-reviewed
4 human reliability model, and they calculated the
5 change as being negligible.

6 Who in this process would catch -- not
7 catch -- raise the issue of model uncertainty here?
8 Your guys will not --

9 MS. COOPER: No.

10 MEMBER APOSTOLAKIS: -- because they will
11 follow this.

12 MS. COOPER: The PRA folks would -- NRR.
13 That's their responsibility.

14 MR. PERSENSKY: But what we would do is we
15 would ask them, gee, if you're reducing the amount of
16 time, what is the time necessary -- what is -- you
17 know, what would be a reasonable time to accomplish
18 that action based on the system's response?

19 And if it's well below 39 minutes, then we
20 probably -- we wouldn't be so concerned about the
21 risk, because if the operators in some simulator
22 experiments, which we may have asked them to do, can
23 do it all in -- in fact --

24 MEMBER APOSTOLAKIS: I agree. But the
25 problem is that --

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1 MR. PERSENSKY: -- what's the point of
2 going that next step?

3 MEMBER POWERS: In fact, J, for the
4 specific example, when asked they indicated they had
5 run 50 tests over the years, and the operator
6 experience was all less than 30 seconds.

7 MR. PERSENSKY: Right. So the difference
8 42 minutes and 39 minutes is not a meaningful
9 difference in that situation.

10 MEMBER APOSTOLAKIS: There was another
11 case where it was seven minutes, went down to four.
12 And that was not so obvious.

13 But, again, based on factors such as --
14 how would you know? How would you know what they took
15 into account unless you dug into the HRA model?

16 MS. COOPER: This is not to dig into how
17 the HRA was modeled. This is simply to understand the
18 action, the changes that the requests introduced, for
19 the human factors --

20 MEMBER ROSEN: I need to take control of
21 this session. We've got 15 minutes left, and I really
22 do want to get done on time.

23 MS. COOPER: Okay.

24 MEMBER ROSEN: So let's -- we can't solve
25 it here. We can express the concerns.

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1 MS. COOPER: Let's move on to step four,
2 slide number 30, and this is the integration of the
3 three inputs in the risk screening process.

4 It takes the results from steps one, two,
5 and three, and on the next slide it shows the table
6 from the Reg. Guide -- the NUREG that illustrates how
7 the decision-making process goes. From the --
8 probably you can't read from your slides. I can't
9 either, so I'm going to read from --

10 (Laughter.)

11 I'll try.

12 (Laughter.)

13 MEMBER POWERS: This is an example of a
14 human factors --

15 MS. COOPER: It is a --

16 MEMBER ROSEN: Let's go on, please.

17 MS. COOPER: -- human factors problem
18 here, yes. In any case, it shows you the inputs from
19 step one, step two, and step three, and then shows --
20 gives a recommendation on the far right column, then,
21 as to what the level of review would be.

22 MEMBER ROSEN: Of human factors staff
23 review of --

24 MS. COOPER: Of human factors staff review
25 of that particular human action, taking those three

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1 sets of inputs.

2 MEMBER ROSEN: Next slide. Now, we're
3 finally to it.

4 MR. LEWIS: Now, after the risk screening
5 process, the product of the risk screening process, is
6 advice to the human factors people. What level of
7 review do you do? A Level 1 is a detailed review,
8 Level 2 is a moderately detailed review, and Level 3
9 is a brief review. And what these -- how these are
10 defined is expressed in the NUREG-1764.

11 The criteria from --

12 MEMBER ROSEN: Don't leave it at that.
13 Just say, for example, what a Level 1 review contains.

14 MR. LEWIS: Well, it's basically all of
15 the -- well, it's tailored from NUREG -- it's right
16 down here, tailored from NUREG-0711. The 12 elements
17 are selected from those.

18 MEMBER ROSEN: Yes. Throw them out. What
19 are they? You are about to do a detailed review.
20 What are the 12 element? Give me six.

21 MR. PERSENSKY: Procedures, staffing, HMI
22 -- these are all the things -- and the question here
23 is they're all the things that were back on the slide
24 when we were talking about 0711. But each of them,
25 depending on whether or not that element is affected

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1 in some way -- if there was no change in the HMI, you
2 wouldn't do an HMI review.

3 If there's a change in staffing or a
4 change in procedures, then you would review their
5 procedures in staffing at the levels indicated by
6 the --

7 MEMBER ROSEN: Okay. So Level 1 you're
8 going to look at most of the performance shaping
9 factors.

10 MR. PERSENSKY: Most of the information,
11 yes.

12 MEMBER ROSEN: Okay. That's what I was
13 trying to get -- he's not listening, but I was --

14 MR. PERSENSKY: Whereas in Level 2 you
15 would pick up fewer of them, and you would not
16 necessarily go into as much depth in that review. And
17 then, the Level 3 we talked about as being something
18 that you make sure that everything is in place, and
19 you do it -- it's not that there's no review, but
20 there is a limited review because it is, in fact, the
21 lowest risk category from both region -- the 1.174
22 and --

23 MEMBER ROSEN: It's important that my
24 colleague Dr. Apostolakis understands what these
25 levels are, because that's what you're really

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1 complaining about.

2 The Level 1 review is they're going to
3 look at all of the performance shaping factors, you
4 know, basically for that thing. Level 2, only some of
5 them. And Level 3, hardly at all. And now when you
6 get to saying that and you say, "Well, you've got all
7 of the different modeling," I mean, surely the
8 different models use the same performance shaping
9 factors but ascribe different levels -- importance to
10 each of the performance shaping factors.

11 But the point is that knowledgeable human
12 factors professionals are going to look at all of them
13 in trying -- in a Level 1 case in trying to decide
14 whether this human action is likely to succeed.

15 MEMBER APOSTOLAKIS: But the point of
16 model uncertainties are there are other people who
17 don't even use performance shaping factors. We are
18 doing this within THERP. See, that's my point. That
19 other questions that other people have raised will
20 never come up. People don't even want to touch the
21 words.

22 So I want the reviewer to be sensitized to
23 that. I don't want them to become experts on HRA.
24 But why are other groups, reputable groups, doing it
25 in a different way? What are the human factor

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1 settlements that are different? And sensitize the
2 reviewer. That's all I'm saying. I'm not asking you
3 to develop an HRA model. That's somebody else's job.

4 MR. PERSENSKY: That's actually a response
5 to one of your -- the questions that came up in the
6 ACRS September 24th letter also.

7 MEMBER ROSEN: We're going to through that
8 if we have enough time, but we're running out of a
9 chance to do that.

10 MR. PERSENSKY: We'll get to that in a
11 minute.

12 MEMBER APOSTOLAKIS: September 24th?

13 MR. PERSENSKY: Last year's letter.

14 MEMBER APOSTOLAKIS: Oh, last year.

15 MEMBER ROSEN: We're going to go back to
16 last year's letter and try and see what's -- what
17 their response is.

18 MEMBER APOSTOLAKIS: For a moment I
19 thought we were having a meeting on --

20 MEMBER ROSEN: No. No, no, no. I would
21 have let you know. I would have invited you, and you
22 would have told me you couldn't come.

23 MR. LEWIS: Okay. Just to remind you,
24 this --

25 MEMBER APOSTOLAKIS: I was waiting for

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1 that kind of comment.

2 MR. LEWIS: This slide is --

3 MEMBER ROSEN: Go ahead.

4 MR. LEWIS: This review is performed by
5 human factors people, not HRA people. And so it's a
6 standard human factors review as opposed to an HRA
7 type of review. And the whole list of --

8 MEMBER APOSTOLAKIS: Until when are we
9 going to make that distinction?

10 MEMBER ROSEN: Which distinction?

11 MEMBER APOSTOLAKIS: Between the HRA
12 people and the human factors people. Shouldn't there
13 be -- the cowman and the farmer should be friends?

14 MR. LEWIS: Yes. But at the present time,
15 the human factors people can look at a lot more things
16 than human reliability people can quantify. And so
17 the issues that we're looking at, just to answer your
18 question, Mr. Rosen, in more detail, is back on
19 slide 10. Those are the -- the entire list is there.

20 MEMBER APOSTOLAKIS: Let's not go back.

21 MR. LEWIS: Okay. No, let's go forward.

22 MR. PERSENSKY: But they are considered --
23 in many cases are considered performance shaping
24 factors, but not all of it.

25 MR. LEWIS: Yes, it's a laundry list.

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1 Okay. So if we can go to slide 33, which
2 we are at. So after the human factors review, then
3 the human factors people make their decision, and that
4 decision is submitted to the integrated decision-
5 making process. This is the same sort of integrated
6 decision process that's described in Reg. Guide 1.174,
7 since this is a -- for a risk-informed submittal and
8 to the human factors safety evaluation report.

9 Now I'll turn it over to J.

10 MR. PERSENSKY: One of the other things
11 the subcommittee asked us to look at was the letter
12 from September 24, 2002. That particular meeting
13 actually was a meeting on the human factors and the
14 human reliability program plan. If you recall,
15 Erasmia and Bruce Hallbert came and talked a lot about
16 some of the work that had been done at Halden, and how
17 he used the staffing data to do some HRA.

18 MEMBER APOSTOLAKIS: That was one of our
19 better meetings, wasn't it?

20 MR. PERSENSKY: Right. Next to this one,
21 of course.

22 (Laughter.)

23 That letter had -- and what I've done is
24 I've just put all of the remarks -- those things that
25 are starred here were the things that came out as

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1 formal recommendations. The others were really more
2 remarks that were in the back.

3 Basically, at the time that these
4 documents -- the question was: how have we used the
5 input from the ACRS in the development of these
6 documents? The first answer is: well, most of these
7 documents -- these documents were pretty well done a
8 year ago. They've just been going through the review
9 process, so we couldn't have used a whole lot of it.

10 MEMBER APOSTOLAKIS: How long did it take
11 to do them?

12 MR. PERSENSKY: To do what?

13 MEMBER APOSTOLAKIS: To produce the
14 documents.

15 MR. PERSENSKY: Well, the total production
16 time in terms of all of the technical basis and stuff
17 was probably seven years, seven or eight years. But,
18 you know, again, a lot of research went into it, a lot
19 of other things, as far as putting it together in a
20 final document. I mean, the review process takes over
21 a year.

22 MEMBER APOSTOLAKIS: Yes, that's why I
23 asked.

24 MR. PERSENSKY: And the review process
25 internally, as well as we went to public comment with

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1 it, things like that. So, but the answer is most of
2 this was done before we got this letter.

3 However, and the other thing is we were
4 talking about where we were going in the future as
5 opposed to what we had. At that point, a lot of where
6 we were going in the future aimed at more the
7 monitoring aspect of what the NRC does as opposed to
8 the licensing aspect.

9 The licensing aspect guidelines
10 development is what we're addressing here today, not
11 that monitoring, like looking at latent errors. And
12 these are projects, some of which we have in fact
13 ongoing or will be starting based on whenever Congress
14 decides to give us a budget. But this was, again,
15 long term.

16 Now, the first remark, though, was talking
17 about generating guidance for use in inspection and
18 review, and that's exactly what this is. The issue of
19 team and individual performance was brought up. What
20 we have used in this, for instance, is the fact that
21 when we talked about -- one of the guidelines has to
22 do with -- sets of guidelines has to do with review of
23 displays.

24 But we did use research from team
25 performance versus individual performance to look at

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1 the whole concept of how people work together when
2 they have a single display to work from.

3 MEMBER APOSTOLAKIS: But the probabilities
4 you will get from the PRA most likely did not consider
5 these things.

6 MR. PERSENSKY: Most likely they did not.
7 And if you get down to the last couple of bullets on
8 this slide, I sort of separated those things that I
9 consider to be human factors from human reliability.
10 And where there's an overlap, they're in the middle.
11 But I think your -- that last issue you were bringing
12 up is the last bullet is to perform a critical review
13 of HRA models. That was one of the things that you --

14 MEMBER APOSTOLAKIS: Has anybody done
15 that?

16 MR. PERSENSKY: That has not been done.
17 It is something that, again, it was -- it's been put
18 into the budget process. As far as how far along it
19 is, I can't really tell you.

20 MEMBER APOSTOLAKIS: About seven years, J?

21 MR. PERSENSKY: Well, I think there's a
22 difference between doing that and coming up with a
23 consolidated guidelines document. But basically, we
24 haven't addressed a lot of these, but we are beginning
25 to address them as part of our program.

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1 MEMBER ROSEN: So what does the asterisk
2 mean again?

3 MR. PERSENSKY: The asterisk was -- those
4 were the formal recommendations. For instance, the
5 one on simulators. We are, in fact, as part of one of
6 our projects in the advanced reactor area looking at
7 various simulators that are out there including the
8 Halden simulator.

9 And tomorrow, as a matter of fact, Mr.
10 Thadani will be visiting EDF to look at what's called
11 a fitness simulator, which was a new simulator that
12 they've developed and that our staff has already
13 looked at and suggested that it was worth him going
14 down to visit to see what it's like.

15 So, and we know --

16 MEMBER APOSTOLAKIS: And what is it?

17 MR. PERSENSKY: It's FITNESS -- pardon?

18 MEMBER APOSTOLAKIS: Where is it?

19 MR. PERSENSKY: It's Lyon.

20 MEMBER APOSTOLAKIS: Lyon.

21 MR. PERSENSKY: And we have -- in fact,
22 Halden has used it in some of their work as well. So
23 in any event, we have --

24 MEMBER APOSTOLAKIS: So the other
25 statements there were in a discussion of the letter,

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1 is that what you mean?

2 MR. PERSENSKY: These were all in the
3 discussion of the letter, yes.

4 MEMBER APOSTOLAKIS: So the starred --

5 MR. PERSENSKY: The starred ones were
6 formal recommendations, and we did send back a formal
7 letter responding to that dated December 9th. But as
8 far as -- the subcommittee asked us to address how we
9 used it in this document and --

10 MEMBER ROSEN: And the answer is --

11 MR. PERSENSKY: The answer is not much.

12 MEMBER ROSEN: Okay. It's a question and
13 answer. Thank you very much.

14 MR. PERSENSKY: But we are doing some of
15 these things or beginning to do some of these things.

16 MEMBER ROSEN: Well, what about the other
17 letter? We didn't talk about that one.

18 MEMBER APOSTOLAKIS: What letter is that?

19 MR. PERSENSKY: Oh, the '95 letter?

20 MEMBER ROSEN: Yes.

21 MR. PERSENSKY: Paul is going to be
22 addressing that in the --

23 MEMBER ROSEN: Well, I'd rather skip to
24 that, and come back to Robert Fuld in a minute.

25 MR. PERSENSKY: To what?

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1 MEMBER ROSEN: To the '95 -- our own
2 letter first, and then we'll talk about the public
3 comment.

4 MR. LEWIS: Okay. This is --

5 MEMBER ROSEN: I have a priority. First,
6 I'll --

7 (Laughter.)

8 MEMBER ROSEN: -- we've got you here on
9 slide 40.

10 MR. LEWIS: Okay. This is a comment in a
11 letter by ACRS on its review of NUREG-0700. This is
12 not 0711.

13 MEMBER ROSEN: From 1995, right.

14 MR. LEWIS: 1995, yes. And the comment in
15 the letter was that NUREG-0700 might be overly
16 prescriptive and may discourage the approval of
17 equally qualified, acceptable alternatives. And kind
18 of as a corollary to that, it might result in de facto
19 regulation.

20 And so our response to that was that
21 NUREG-0700 is used as a part of the NUREG-0711
22 process, and NUREG-0711 encourages the use of vendor
23 and licensee-specific style guide used in 0700. And
24 the 0700 -- or 0711 process is flexible. They are
25 guidelines, and so there is a certain amount of --

1 there is flexibility in it, and licensees can come
2 with alternative proposals with a justification.

3 And the guidelines in 0700 do reflect the
4 best practices, and the human error discrepancy
5 evaluation process uses guideline discrepancies only
6 as a flag and -- for looking in more detail. And at
7 the end of an evaluation, they'll look at the whole
8 picture. Some of them will have human evaluation --
9 human error discrepancies, and some won't. And some
10 will pass.

11 So it is recognized that I&C and human
12 factors engineering technology are rapidly changing,
13 more so than other aspects of the plant. And so
14 there's a need to address new technologies, and that's
15 built into 0711, again.

16 Then, the items in 0700 are used to
17 evaluate what technology is employed by the vendor.
18 And the document does not suggest that the guidance
19 areas included are expected to be included in the
20 design. So this -- the document is a review document
21 as opposed to a design document.

22 So, for example, the guidance for the
23 review of computerized procedures is provided and used
24 -- used only if a system is provided. So that's --
25 the guidelines in 0700 are used only if applicable to

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1 this particular case.

2 MEMBER ROSEN: Okay. Well, we were
3 concerned about -- that that weighty tone, which has
4 gotten even weightier since 1995, being a de facto
5 standard and you keep saying -- shaking your head no,
6 no, no, and I know what it says on the front of the
7 Reg. Guide, and that was what the discussion was about
8 is when you put a book like 0700 -- do you happen to
9 have a copy there --

10 MR. LEWIS: Yes.

11 MEMBER ROSEN: -- you could just show the
12 committee? The rest of the committee who may not have
13 seen it? You hit somebody over the head with that,
14 they stay hit. So it's -- it's hard to argue with
15 Mother Nature, so that was what the comment is about.

16 MR. PERSENSKY: One of the things about
17 the weightiness of that particular document is,
18 remember, we're -- this document includes the entire
19 set of -- can be used for all of the plants that are
20 out there. So it includes both analog information,
21 digital information, things that would affect hybrid
22 control rooms.

23 So 0700 was a fairly weighty document back
24 in 1981 when it first came out. But what we've done
25 is we've actually added to it as opposed to

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1 necessarily replacing it, because the plants haven't
2 all changed yet. So we can't take out the stuff --

3 MEMBER ROSEN: Right. So it can be used
4 to anchor even a larger boat than --

5 MR. PERSENSKY: -- later on, or we could
6 separate it into 14 different volumes. But we tried
7 to put it into one.

8 MEMBER KRESS: Somehow, a panel --

9 MEMBER ROSEN: All right. Now let's talk
10 about Fuld. Dr. Robert Fuld came to talk to the
11 subcommittee. He's a human factors professional from
12 the public, and he had some comments that you -- I
13 thought you --

14 MEMBER APOSTOLAKIS: Does he represent
15 anybody?

16 MEMBER ROSEN: He represents himself.

17 MEMBER SIEBER: He's a public citizen.

18 MR. PERSENSKY: He doesn't represent the
19 group Public Citizen. He is --

20 MEMBER APOSTOLAKIS: I understand that.

21 MEMBER ROSEN: He is a member of the
22 public who has credentials in this area, and he had
23 some views that I thought the committee might like to
24 understand what they were.

25 MR. LEWIS: So the human factors

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1 subcommittee asked us to address the comments by
2 Robert Fuld, and that's what we've done beginning on
3 slide 36.

4 So his first comment is that NUREG-0711 --
5 his comments now are on 0711. The committee's
6 comments were on 0700.

7 VICE CHAIRMAN WALLIS: This looks like
8 some of our comments earlier. You're just describing
9 qualitatively a process. You're not saying what
10 method is acceptable.

11 MR. LEWIS: I didn't hear the comment.

12 VICE CHAIRMAN WALLIS: It sounds like what
13 we said earlier on. I mean, just -- his comments look
14 like some of ours. You have a process --

15 MR. LEWIS: Oh, yes.

16 VICE CHAIRMAN WALLIS: -- but then
17 everybody has a different way of doing it, and they're
18 all different. So how do you evaluate them?

19 MEMBER ROSEN: There's quite a bit of
20 commonality between what he said and what this
21 committee said in 1995. I don't know what --

22 MR. PERSENSKY: In 1995, you only reviewed
23 0700. You did not review 0711.

24 MEMBER ROSEN: I see.

25 MR. PERSENSKY: And his comments are only

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1 on 0711, not on 0700.

2 MEMBER APOSTOLAKIS: Do you remember when
3 in 1995 the letter was issued?

4 MR. PERSENSKY: We have a copy of it.

5 MR. LEWIS: November 13.

6 MEMBER APOSTOLAKIS: Oh, so I was a
7 member.

8 MR. PERSENSKY: Yes, you were there.

9 MR. LEWIS: November 13, 1995.

10 MEMBER ROSEN: Go ahead.

11 MR. LEWIS: Okay. So, yes, his comments
12 were similar to your comments. His first comment is
13 that NUREG-0711 is overly prescriptive, and our
14 response is, again, we have to make very clear when we
15 are making comments on 0711 that 0711 describes --
16 does not describe a design process. It provides
17 guidelines for the review of a design process.

18 So it's prescriptive in that sense. These
19 are review guidelines, not guidelines for designing a
20 nuclear powerplant.

21 MEMBER KRESS: The word "prescriptive"
22 usually applies to rules instead of review documents
23 or guides.

24 MR. LEWIS: I didn't -- I'm sorry?

25 MEMBER KRESS: When I think of the word

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1 "prescriptive," I'm thinking it usually applies to a
2 rule.

3 MR. LEWIS: A rule, oh, yes.

4 MEMBER KRESS: And not guidance or review
5 documents or standards or --

6 MR. LEWIS: Yes, that's a good segue into
7 my next slide. I'll get to that.

8 MEMBER APOSTOLAKIS: You're already there.

9 MR. LEWIS: Okay. Okay. We're there.

10 There's a hierarchy of NRC documents, and
11 the Code of Federal Regulations is the most
12 prescriptive. And by design, the standard review plan
13 is less prescriptive, and the NUREGs are even less
14 prescriptive, although the level of detail goes in the
15 other direction.

16 So the NUREGs are very detailed, but
17 they're not prescriptive. They are simply guidelines.

18 MEMBER ROSEN: Right. In the sense that
19 you -- 10 CFR 50, you go to jail -- directly to jail,
20 do not pass go, if you don't comply. Whereas NUREGs,
21 you could just say, "I want to do it differently" and
22 argue about it.

23 MEMBER APOSTOLAKIS: You go to exile.

24 MEMBER SIEBER: Well, the perfect example
25 in 700 is it tells you --

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1 MEMBER ROSEN: It's a figure of speech,
2 George.

3 MEMBER SIEBER: -- you can paint it green,
4 paint it red, paint it white. And if you paint it
5 red, people will look at it. It doesn't tell you to
6 paint it red.

7 MR. PERSENSKY: Exactly. Exactly. But it
8 does tell you to be consistent in the way you're --

9 MEMBER SIEBER: You can either be the Navy
10 or the coal fire guys, because they're backwards.

11 MR. LEWIS: Okay. There is a point on the
12 previous slide, slide 36, that I think is very
13 telling. And that is NUREG-0711 has already been used
14 for the review of three advanced reactor designs, and
15 those three advanced reactors are very different. The
16 hardware is different, the control room is different,
17 and what's more -- what's more, the process that they
18 used in developing it is very different.

19 And NUREG 0711 was used for all of those
20 and --

21 MEMBER APOSTOLAKIS: Which design were
22 these?

23 MR. PERSENSKY: There were the
24 evolutionary designs -- AP600, APWR.

25 MR. LEWIS: So given the fact that we are

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1 close to out of time, let's go to slide 38.

2 MR. PERSENSKY: I did want to just go back
3 on the one slide 37. I think the first bullet there
4 is also -- I mean, we've been talking about it from
5 the standpoint of human performance, but this concept
6 of prescriptiveness is an agency-wide problem. As an
7 implementation, it's not what the document says, but
8 it's the way it's implemented.

9 MEMBER APOSTOLAKIS: So you agree, then,
10 that the detail, you wouldn't call it prescriptive.

11 MR. PERSENSKY: Right.

12 MEMBER APOSTOLAKIS: You disagree with his
13 comments, and you say his comment is an agency-wide
14 problem.

15 MR. PERSENSKY: I agree that the problem
16 of interpreting things as being prescriptive when they
17 are not is an agency-wide problem.

18 MEMBER ROSEN: People interpreting it as
19 prescriptive.

20 MR. PERSENSKY: It's the way it's
21 interpreted as opposed to the way it's actually
22 written. I mean, we can only deal with how it's
23 written at this point.

24 MR. LEWIS: Yes. So there is an important
25 distinction between detail and prescriptiveness. 0700

1 is very detailed, is not prescriptive. You can -- if
2 you have a good reason for doing it, otherwise you
3 can --

4 MEMBER SIEBER: Then you don't have to.

5 MR. LEWIS: Okay. Now, are we ready for
6 38?

7 MEMBER ROSEN: Yes.

8 MEMBER APOSTOLAKIS: You're going to
9 define systems engineering, Paul?

10 MR. LEWIS: No.

11 MEMBER APOSTOLAKIS: Are you that brave?

12 MR. LEWIS: No. I wanted to avoid the
13 definition of -- the purpose of the slide was to avoid
14 getting entangled in a definition of systems
15 engineering. We're saying how it is -- how we are
16 using that in this particular document, so that we can
17 ignore the particular term.

18 So what the commenter is referring to is
19 our use of -- how we use 0711. And when I describe
20 how we use 0711, I think you will agree that it's a
21 reasonable approach.

22 How we are using 0711 is we consider those
23 12 elements that are on slide 10, we decide which of
24 those elements is applicable to the current
25 application at hand, which is a reasonable thing to

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1 do, and then we use those elements to review.

2 So we think that that's a justifiable way
3 of approaching it. And one of the reasons is the
4 approach is quite general, as indicated by the fact
5 that we've reviewed three types of advanced plant.

6 And, furthermore, this is the most widely
7 used approach in the industry. This is the one that's
8 taught in all of the schools. If we were to use
9 something else, we'd really have to justify that.
10 This is the standard approach.

11 MEMBER APOSTOLAKIS: Doesn't he have to
12 justify his statement, though? What does it mean the
13 use of systems engineering is not justifiable?

14 MR. LEWIS: That is a critique that Robert
15 Fuld made at the --

16 MEMBER APOSTOLAKIS: Right, to justify his
17 statement.

18 MR. LEWIS: No, that's my last point
19 there. Not only did he not justify it, he did not
20 really specify it. So it's kind of hard to respond to
21 the comment.

22 MEMBER ROSEN: And he doesn't suggest an
23 alternative is what --

24 MR. LEWIS: That's correct. Yes.

25 MEMBER ROSEN: All right. I think we've

1 given enough here on --

2 MR. LEWIS: Okay.

3 MEMBER ROSEN: If anybody wants to study
4 this, the committee has the slides. We did have a
5 responsible member of the public who feels strongly
6 about his point of view. He was given a chance to
7 address the subcommittee, and we would -- we made --
8 I made the decision that the full committee should at
9 least be made aware of his point of view.

10 With that, Mr. Chairman, I will thank the
11 members of the staff who have done a great job getting
12 us up to speed in this area. I think you, as Dana has
13 suggested, have made some important strides forward.
14 And we look forward to further discussion with you.

15 Mr. Chairman.

16 CHAIRMAN BONACA: Are there any further
17 questions? If not --

18 MEMBER APOSTOLAKIS: Will there be a
19 letter on this? Are we writing a letter on --

20 MR. PERSENSKY: Yes. One point in one of
21 the slides we didn't finish up is that, in fact, we
22 are asking for a letter, since we are asking for
23 endorsement of these documents.

24 MEMBER ROSEN: This is a draft --

25 MEMBER POWERS: I guess I'm looking for a

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1 little qualitative feel. You're moving into a more
2 quantitative approach on how to apportion your
3 efforts, or helping other people apportion their
4 efforts is what you're really doing.

5 How do you feel about that? It's a good
6 idea? Bad idea? Going to work? Not going to work?
7 Do you want to optimize it? Work on it?

8 MR. PERSENSKY: From the standpoint of how
9 do we feel about it, I think it has some value to us.
10 It will help us to prioritize our resources. However,
11 as we saw from today's meeting, the uncertainty
12 associated with some aspects of using those techniques
13 sometimes takes up more time than actually doing the
14 prescriptive approach.

15 But, in fact, if we use the existing
16 tools, I think it is more valuable for us. I mean,
17 it's going to help us out, and that's -- what we said
18 in the September 2002 meeting is that there is an
19 interaction between HRA and human factors. And part
20 of that is them helping us to prioritize, but us
21 helping to provide them data to do that.

22 So it's an iterative process, and we have
23 been working more and more towards that over the last
24 few years. And, in fact, I believe there is probably
25 some suggestion that the two groups be merged.

1 MR. LEWIS: I believe, Hussein, did you
2 want to be recognized? No? Okay.

3 MR. BONGARRA: I'd like to voice my
4 opinion if I may for just a second, as a user. I feel
5 very comfortable about the idea of trying to work
6 within a more risk-informed framework here.

7 I think that what we've collectively
8 attempted to develop here, as I mentioned earlier, is
9 really kind of a first-of-a-kind effort. And I think
10 I said it earlier in the subcommittee meeting, and I
11 won't -- well, the bottom line is I see this really as
12 a challenge not only to us to follow through with
13 implementing it, but I also see it as a challenge to
14 the industry to take a look -- and they have -- public
15 comment has been made on it, and we did see the fact
16 that there weren't a tremendous number of public
17 comments that were critical of the process.

18 So that gives me, as a reviewer, further
19 encouragement that this is something we should follow
20 through on. So bottom line is I look at this in a
21 positive light.

22 MEMBER POWERS: Let me ask you -- I mean,
23 it seems to me my perception is -- and maybe I'm wrong
24 about this -- that you go through and you say, what
25 level should I be doing the review at? And what

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1 you're doing in the past is all kind of Level 2, and
2 now you allow yourself to go more detailed or less
3 detailed or be the same thing. Is that a correct
4 perception here?

5 MR. BONGARRA: I think that is indeed
6 correct. What we're --

7 MEMBER POWERS: I think that's fantastic.
8 I mean, I think that's what the Commission was looking
9 for when they said, "Let's go with risk information"
10 is they didn't know whether what they were doing right
11 now was too much or not enough. And what you --
12 you're allowing yourself is to go either direction.
13 I think that's a great --

14 MEMBER ROSEN: And the answer is that it
15 was both. It was --

16 MEMBER POWERS: Yes. I mean, I --

17 MEMBER ROSEN: In some cases it was too
18 much, and in some cases it was not enough.

19 MEMBER POWERS: And I think they knew
20 that, and a lot of people said, well, the risk-
21 informed reduction is -- risk-informed regulation is
22 for burden reduction. But, no, it wasn't. It was for
23 burden focus, and I think you've done that here. I
24 think that's terrific.

25 MR. BONGARRA: I'd just like to make one

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1 quick mention as well because of the types of comments
2 that were made earlier in questions with regard to the
3 technical process itself. We do have a companion
4 document that we're in the process of completing.
5 Essentially, it's a technical basis document.

6 So some of the very detailed questions
7 that were asked with regard to how the curves were
8 generated, that information will be forthcoming in a
9 technical basis document.

10 MEMBER ROSEN: I think the committee, and
11 the subcommittee for sure, would be interested in
12 looking at that.

13 MEMBER POWERS: Well, Dr. Rosen, I think
14 this is one of the success stories we've got to
15 highlight. I mean, I think this is something that
16 comes across as a fallout in the move toward risk-
17 informed regulation that a lot of people don't
18 appreciate as -- wouldn't even imagine it could occur.

19 MEMBER ROSEN: All right. We'll take that
20 -- we'll have some more discussions of that when we
21 get to the research requirements. I think that's an
22 interesting suggestion.

23 MEMBER POWERS: Yes.

24 CHAIRMAN BONACA: Okay. Any further
25 questions for anybody? If not, thank you very much

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1 for a very informative presentation.

2 We will recess until 20 after 1:00 for
3 lunch.

4 (Whereupon, at 12:25 p.m., the
5 proceedings in the foregoing matter went
6 off the record for a lunch break.)

7 CHAIRMAN BONACA: The next item on the
8 agenda is final revision to 10 CFR 50.48 to endorse
9 NFPA 805 fire protection standard. And again, Mr.
10 Rosen is leading us in the presentation.

11 MR. ROSEN: Well, I'm not going to do much
12 leading. I'm just going to turn it right over to the
13 fire protection guys from the staff.

14 DR. POWERS: Aren't you supposed to
15 provide us prospective and context?

16 MR. ROSEN: You already have it.

17 DR. KRESS: Tell us what to listen for.

18 MR. ROSEN: Oh, I will if you insist.

19 (Laughter.)

20 You all understand that the fire
21 protection rules of this Agency are deterministic and
22 as such they place undue burden in some areas on
23 licensees and the staff. Do more work than may be
24 required.

25 To resolve this issue, the National Fire

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1 Protection Association and the staff have worked
2 together to develop a new standard called NFPA 805.
3 And the staff has proposed and the Commission appears
4 willing to undertake a study of rewriting 10 CFR 50.48
5 to allow NFPA 805 to be used as a voluntary
6 alternative to the prescriptive rules in 10 CFR 50.

7 With that context, the gentlemen from the
8 staff will brief us on where they stand on moving this
9 issue forward to rulemaking.

10 MR. BIRMINGHAM: Thank you. I'm Joe
11 Birmingham in the Office of NRR. I'm the project
12 manager to help in the rulemaking. We believe we are
13 now ready to move forward into the final rulemaking
14 stage for NFPA 805.

15 Also presenting today will be Paul Lain
16 from the Plant Systems Branch of the Fire Protection
17 Group. Paul will be handling some of the technical
18 structure of the rule and I'll be handling more of the
19 programmatic.

20 First, I'd just like to note that we did
21 meet with the Fire Protection Subcommittee in
22 September. We had a chance to make a similar
23 presentation at that time and we answered their
24 questions that they had for us. Not very much has
25 changed since then. We had a little bit of wording

1 differences that we worked out with OGC as far as the
2 technical bases, but the substance of the rule hasn't
3 changed.

4 The areas that we're going to cover today
5 will be the background of the rule, how it originated,
6 what the Commission direction was, some of the
7 advantages of NFPA 805 over existing Appendix R and
8 licensing conditions. As Mr. Rosen has said, our
9 deterministic structure of NFPA 805, how we expect it
10 to be implemented, some very basics on the rule
11 structures and then we'll get into the status of the
12 rulemaking and the schedule.

13 Paul, do you want to take over?

14 MR. LAIN: I'm Paul Lain from the Plant
15 Systems Branch. I see you're familiar with this time
16 line. I think Browns Ferry in 1975 woke a lot of
17 people up. The staff developed Appendix R after that
18 and put it into effect using 10 CFR 1048. There was
19 a lot of lower tier documents that followed to try to
20 soothe * (1:22:13) the implementation such as Generic
21 Letter 86-10 which instructed sites to sort of change
22 their license condition to allow changes to the fire
23 protection program as virtually affects a shutdown.
24 But also it was considered very deterministic and
25 quite a burden.

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1 So in the 1990s, the development of PRAs,
2 PSAs and advancements in fire modeling gave us
3 confidence that we could quantify the fire risk and
4 reduce the deterministic departments. It was in 1998
5 the Commission gave the go ahead to go ahead and
6 develop NFPA 805, the national consensus standard with
7 industry.

8 And sort of the later documents kind of
9 show what Dr. Rosen kind of put in the subcommittee
10 meeting that the glacial speed of this rulemaking --

11 MR. ROSEN: We knew which way it was
12 going.

13 MR. LAIN: Yes. Okay.

14 MR. ROSEN: But you had to watch it for a
15 while to see it move.

16 MR. LAIN: Yes, okay. The advantages of
17 going with 805. During this whole process, the staff,
18 industry and other interested parties worked together
19 to develop the NFPA standard which has an agreed upon
20 set of fire protection performance goals and criteria.
21 I think that's one of the major parts of the 805.
22 Therefore, I think the rule has a greater chance of
23 acceptance instead of the staff just sort of
24 developing it in isolation. And it's sort of goes
25 along with the Agency's policies of working along with

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1 industry.

2 So some of these other advantages, some of
3 it's voluntary. It's an alternative to Appendix R.
4 Facilities are happy with their fire protection
5 program right now. They don't necessarily have to
6 change to 805 which is -- uses performance-based
7 methods. If licensees find that it's advantageous,
8 then it's another way of handling issues.

9 That's sort of let's the licensees focus
10 on or allocate resources for the more significant
11 issues while fine tuning their fire protection
12 programs away from spending a lot of time on the lower
13 risk issues.

14 That's more of the meat of the new requirement.

15 There's a core program of minimum design
16 requirements and fundamental design elements or
17 program elements and we'll go more into that on the
18 next slide. It's Chapter 3 of the standard. I'm not
19 sure how many -- I think it was handed out previously
20 in some of the pre-materials.

21 MR. ROSEN: I think when you're talking
22 about the advantages of 805, I think you left out a
23 key one. You get to it later on, but it's the
24 analysis that goes to cold shutdown, right? Whereas
25 current analyses only go to hot shutdown.

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1 MR. LAIN: Yes.

2 MR. ROSEN: So in that sense the scope is
3 broader. It establishes requirements more broadly.

4 MS. BLACK: And it covers shutdown as
5 well.

6 MR. ROSEN: Shutdown.

7 MR. LAIN: Shutdown and low power also.

8 MR. ROSEN: Right. So it takes you all
9 the way out in the modes whereas the current
10 requirements are for power. So in that sense it's
11 more regulatory comprehensive.

12 MR. LAIN: More comprehensive. So for
13 transition purposes, 805 was developed sort of in a
14 parallel structure. One side of it, 805, has a lot of
15 the Appendix R deterministic requirements within it
16 and the other side is sort of the performance-based
17 requirements, so a facility may be able to transition
18 using the deterministic side and then as they want to
19 change their program or as issues arise, they'll be
20 able to use performance-based methods to resolve those
21 issues.

22 So it doesn't necessarily require a
23 facility to go in and re-analyze from a performance-
24 base their whole system. It does have a lot of the
25 deterministic type requirements in it.

1 So that is I think another -- a good part
2 of how it's structured is it's structured for existing
3 plants to be able to transition without having to
4 really start from ground zero and build a program up
5 from that.

6 I'll talk a little bit about the core
7 program fundamental elements and minimum design
8 requirements. Ed Connell who was part of the staff
9 worked hard as the NRC member on the Committee and he
10 wanted to make sure that there was sort of a core fire
11 protection program minimum program that the facilities
12 will maintain.

13 As you can see, some of these items like
14 fire suppression systems like a sprinkler system or a
15 fire alarm system, Chapter 3 doesn't necessarily tell
16 you where it has the system, it just kind of tells you
17 sort of the design and installation requirements,
18 whereas Chapter 4 where you go through your nuclear
19 safety analysis, that kind of decides where you're
20 going to need to protect these areas where you don't
21 need to protect and that's the performance-based side
22 --

23 MR. ROSEN: From a nuclear safety
24 perspective.

25 MR. LAIN: Yes.

1 MR. ROSEN: Now you may choose and most
2 licensees did choose to have much broader coverage
3 than just the nuclear safety because they want to
4 protect the asset as well for property damage reasons.

5 MR. LAIN: Yes. There are deterministic
6 requirements within Chapter 3. Five-person brigade
7 member is one of them that comes to mind. And it's
8 something that the NRC sort of has had since the 1970s
9 that is a minimum requirement of fire brigade members.
10 But it also does put sort of a quality stamp on that
11 that follows a different NFPA type standard.

12 Joe will talk a little bit later about how
13 the rulemaking handles deviations or changes to
14 Chapter 3 and how they'll be able to handle those.

15 Any questions?

16 Differences from Appendix R. Dr. Rosen
17 talked a little bit about the cold shutdown. Appendix
18 R sort of requires facilities to sort of design all
19 the way to cold shutdown within 72 hours with recovery
20 actions. NFPA 805 talks about bringing the fuel that
21 needs to be brought to a safe and stable condition
22 which is sort of hot standby. That's sort of makes
23 the evaluation a little bit shorter, shorter within
24 the first 24 hours, but also it sort of looks at all
25 modes of operation also. So it's sort of -- it's not

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1 a requirement to go all the way to cold shutdown, it's
2 the more -- the performance criteria is to keep the
3 fuel into a safe and stable condition.

4 Other ones are emergency lighting is now
5 sort of in the guidance section of NFPA and basically
6 you have to within your analysis you have to prove
7 that sufficient lighting is available to perform the
8 intended function and it's not necessarily a set
9 requirement.

10 Alternate --

11 DR. APOSTOLAKIS: How is that determined,
12 sufficient lighting?

13 MR. LAIN: I think when you go through
14 your nuclear safety analysis and you have certain
15 things you have to do for shutdown, you're going to
16 have to prove that you have sufficient lighting. You
17 mean what is sufficient?

18 DR. APOSTOLAKIS: So if it is small, for
19 example, you will have to evaluate how much that --

20 MR. LAIN: That whole topic is also --
21 it's being handled by a new rulemaking that's coming
22 down the pike on the manual actions. It's sort of
23 defining how are they going to be able to go about
24 doing manual actions. I think that's going to give
25 more of the guidance on where we're at. But within

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1 805, I think it's still kind of left at a level of
2 subjectivity and it's not necessarily a quantitative
3 requirement. But it is though -- it's not necessarily
4 they will have to have 8 hours of emergency lighting.
5 If they have something that they need to do within the
6 first hour, they need to prove that they have
7 emergency lighting for that first hour and so they're
8 not necessarily going to require to have 8-hour
9 lighting throughout the plant.

10 MR. BIRMINGHAM: As Paul said, the Agency
11 is looking at what are the feasibility criteria for
12 things like recovery actions and emergency lighting
13 under recovery actions, what's the effect of smoke and
14 heat and so on on the people performing those
15 emergency actions. But 805 does have criteria in it
16 that talks about that you have to be able to
17 demonstrate that the recovery action can be performed
18 and in the environment that it's going to be performed
19 in. It does have that criteria built into it,
20 although it is built into an appendices which is not
21 part of this rule per se, but it's a good point.

22 MR. LAIN: Alternate and dedicated
23 shutdown are not necessarily defined as they are in
24 Appendix R. The analysis document basically says that
25 you need to have a safe shutdown path or method.

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1 Recovery actions outside the control room
2 are allowed within 805 within the performance based
3 method where in Appendix R it was one success path had
4 to be free of fire damage. So the analysis allows
5 using the recovery actions.

6 805 does have some additional sort of
7 radiation release criterias for fires like in maybe
8 the rad waste areas which is a little bit more
9 complete standpoint and also 805 covers the fire
10 protection plan, sort of covers all modes of operation
11 such as low power and refueling which Appendix R
12 doesn't.

13 DR. APOSTOLAKIS: What happened to the 20-
14 foot separation criteria in Appendix R?

15 MR. LAIN: That is within the
16 deterministic requirement within 805. But if a
17 facility does not necessarily meet that, they can use
18 their performance-based method and determine whether
19 it's --

20 DR. APOSTOLAKIS: Why do you call it
21 performance-based? Is it risk-informed?

22 MR. LAIN: Yes, it has -- it uses risk-
23 informed information along with fire modeling to be
24 able to calculate the consequences of certain fires
25 along with the risk information.

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1 DR. APOSTOLAKIS: So is it possible then
2 for a licensee who has complied with Appendix R 90
3 percent, to use that and say now here we really don't
4 have the 20-foot separation, but we will use 805 to
5 prove to you that it's not necessary. So 90 percent
6 of the time they use Appendix R and in other words are
7 they allowed to pick and choose?

8 MR. LAIN: No. They're not necessarily
9 allowed to pick and choose on their own. I think
10 what's going to happen is they'll be able to use this
11 methodology to send in for exemptions or license
12 amendments.

13 MR. BIRMINGHAM: I was going to say it's
14 probably helpful to look at the 805 approach.
15 Licensees will need to do a self-assessment of the
16 plan, determine what are the nuclear safety systems
17 that have to be protected, how far -- if you have a
18 redundant system and they're both in a fire area, and
19 if for some reason they're not foot separated, first
20 you look at can I meet it by a deterministic -- do I
21 have the 20 feet?

22 If you can't meet the deterministic, you
23 do have the option of looking at it from a performance
24 based. Is there a reason to believe that in this room
25 is it credible to believe that there's a possibility

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1 of a fire that can affect both systems? And from a
2 performance-based standard, you can apply the risk
3 insights as well as the performance-based approach and
4 if it turns out that you can -- to know if there's a
5 credible fire you can have in that room that's going
6 to last for 15 or 20 minutes, you don't need a 3-hour
7 barrier, for example. You could get a lesser barrier.

8 MR. LAIN: And that's if they can do that
9 on their own, if they're an 805 plant. If they find
10 that they're becoming an 805 plant, then basically
11 they can keep that evaluation on record and the
12 inspectors will come through and question them on that
13 and they'll be able to show them the evaluation there
14 versus if they're an Appendix R plant, they would need
15 to come in for an exemption.

16 DR. APOSTOLAKIS: But when they come for
17 an exemption, can use 805?

18 MR. LAIN: Yes. We would expect to see
19 some performance-based type exemptions coming through.

20 MR. BIRMINGHAM: Well, we currently have
21 had some licensees come in and presented information,
22 showed us that while they may not meet the Appendix R
23 criteria at their plant for some reason or another,
24 that something less than 20 foot is acceptable at
25 their plant. And there are exemptions on the record.

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1 MR. LAIN: On the record, plenty. A lot
2 of those did not use as much risk information as they
3 used more fire modeling and other types of approach
4 there.

5 DR. APOSTOLAKIS: I thought that was one
6 of reasons that the Agency supported the development
7 of NFPA 805. There were too many exemptions to
8 Appendix R using deterministic --

9 MR. LAIN: That there are 800 or over 800
10 exemptions on the books now and they saw that the
11 Appendix R deterministic criteria, if we have another
12 issue like thermal lag or something of that sort, you
13 end up with a lot of exemptions coming in. So this is
14 one way a facility can figure out those exemptions on
15 their own.

16 DR. APOSTOLAKIS: So if I take two plants
17 that meet Appendix R criteria, and I do a risk
18 assessment, will I find roughly the same contribution
19 to CDF from fires?

20 MR. LAIN: I would think that's --

21 DR. APOSTOLAKIS: I'm not so sure.

22 MR. LAIN: You would think there's going
23 to be a --

24 DR. APOSTOLAKIS: There would be a --

25 DR. POWERS: I would be sponged, George.

1 MR. LAIN: It would take an hour.

2 DR. APOSTOLAKIS: Does it bother anybody
3 in the Agency that the risks are different, even
4 though the appendix is met?

5 MR. LAIN: I'll have to talk with my
6 manager.

7 MS. BLACK: I didn't quite understand the
8 question. What were the two plants you were
9 comparing?

10 DR. APOSTOLAKIS: Well, two plants that
11 meet Appendix R and then I do a risk assessment and I
12 calculate the contribution to CDF from fires. Now
13 most likely these will differ.

14 MS. BLACK: Right.

15 DR. APOSTOLAKIS: Is that a cause for
16 concern?

17 MS. BLACK: No.

18 DR. APOSTOLAKIS: Why not?

19 MR. SIEBER: I don't think it is because
20 you can have two entirely different plants, a PWR and
21 BWR, that are going to have different risk profiles
22 and the contribution to the risk from fire will be
23 different because of plant layout, plant
24 vulnerabilities are different.

25 So it wouldn't bother me.

1 CHAIRMAN BONACA: Plus, I mean if they're
2 both low --

3 DR. SHACK: If they are both acceptably
4 low.

5 MR. LAIN: Right.

6 DR. SHACK: They can be different but --

7 DR. APOSTOLAKIS: But will they be
8 acceptably low?

9 CHAIRMAN BONACA: Some of the earlier
10 design, I don't know how you define acceptably low.

11 MR. ROSEN: Right.

12 CHAIRMAN BONACA: That's a big
13 contribution for a fire, so on the latest designs fire
14 is much less because they were designed with fire in
15 mind.

16 MR. ROSEN: Right. But the Agency doesn't
17 go in and set individual criteria for what portions of
18 risk -- you can only have 10 percent to human actions.
19 You only have 20 percent for fire.

20 DR. KRESS: Wait until you see the Option
21 3 Framework.

22 MR. ROSEN: Well, maybe that's being
23 considered in the future, but as of today, we do have
24 requirements that plants meet the regulations and then
25 there's an implied understanding that that means

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1 typically a low enough CDF over all. But we don't go
2 in and try to parse that CDF into pieces and then say
3 -- and each piece must be less than a certain amount.

4 DR. APOSTOLAKIS: I agree with that, but
5 first of all, J.S. wants to say something.

6 MR. HYSLOP: This is J.S. Hyslop from --

7 MR. ROSEN: You do have to introduce a lot
8 of facts here.

9 MR. HYSLOP: I was just sitting here, but
10 from my perspective it seems like you can fly with
11 Appendix R in a couple of ways. There are several
12 3(g)(2) criteria. You can -- some plants rely more
13 than other plants on manual actions, so you would
14 expect different risk contributions from plant to
15 plant, at least from my perspective.

16 MR. SIEBER: That's another reason.

17 DR. APOSTOLAKIS: Would you then lead to
18 CDF greater than 10^{-4} ?

19 MR. SIEBER: Who knows?

20 MR. ROSEN: I don't think so. If you find
21 one of those, then you go after that.

22 DR. APOSTOLAKIS: But you're not even
23 looking there because you have satisfied Appendix R,
24 so you don't --

25 MR. ROSEN: No, if someone suddenly has a

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1 revelation that they haven't properly assessed the
2 safety of their plant and find themselves in 2 times
3 10^{-4} , 3 times 10^{-4} , then they're obviously going to be
4 doing something about it, especially if it's --

5 DR. APOSTOLAKIS: Did Quad Cities satisfy
6 Appendix R?

7 MR. ROSEN: Yes. There was a Quad Cities
8 data transient, I'll call it, where for a while they
9 thought their fire risk was quite a bit higher than it
10 ultimately turned out to be when they did the
11 analysis.

12 DR. APOSTOLAKIS: It was not as high as
13 they originally thought, but it was not negligible
14 either.

15 MR. ROSEN: It wasn't negligible, when
16 they got done doing it right, but originally they
17 thought it was higher than that.

18 MR. BIRMINGHAM: One of the advantages of
19 NFPA 805 is that it does require this assessment where
20 the licensees do go through fire area by fire area and
21 do determination, what their risk in that area, and by
22 doing this additional look they will be better
23 protected in some areas than they would have been
24 otherwise. And by protecting themselves in
25 relationship to the risk, the concern to nuclear

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1 safety, their contribution to CDF could drop as
2 opposed to what -- there's no reason for it to go up
3 that I see, but it could drop.

4 DR. POWERS: Do we still --

5 MR. BIRMINGHAM: Fire area plants aren't
6 required to even take that look.

7 DR. POWERS: Do we assume that each fire
8 area is isolated from other fire area?

9 MR. BIRMINGHAM: Yes.

10 DR. POWERS: There is no probability that
11 any of the barriers between fire areas would be
12 breached by the fire itself?

13 MR. ROSEN: From a deterministic point of
14 view, is that what you're asking?

15 DR. POWERS: Well, I'm really asking a
16 probabilistic question, I'll have to admit.

17 MR. LAIN: I think in the Appendix R
18 world, yes.

19 DR. POWERS: In an Appendix R world, yes,
20 I agree. Do we still do that in a non-Appendix R
21 world?

22 MR. LAIN: I think, yes. The evaluation
23 is going from a fire area to a fire area.

24 DR. POWERS: We've got absolutely 100
25 percent perfectly reliable fire barriers?

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1 MR. LAIN: No, no. I think they're going
2 to be evaluating fire barriers also.

3 MR. BIRMINGHAM: But we apply it
4 consistently against the Appendix R plants and against
5 the NFPA 805 plants that we assume that a single fire
6 starts and the language in there is from a single
7 fire. You're correct.

8 But that seems reasonable. A fire
9 initiates and it can propagate unless it's taken care
10 of quickly.

11 MR. ROSEN: Well, I think we have some
12 operating experience that says that one fire can cause
13 another fire in a remote area. I think that's what
14 probably Dana is thinking about, but I hesitate to
15 guess, but I think -- I know for sure that has been
16 seen in the field but it's highly unlikely. Most
17 fires that have occurred have not had that constant.
18 It can happen, but it's like everything else. It's
19 got a probability with it.

20 DR. POWERS: Let's see now, the Browns
21 Ferry fire didn't propagate from fire area to another?

22 MR. ROSEN: No, I'm not talking about
23 propagation. I'm not talking about propagation. I'm
24 talking about a fire which has an effect which causes
25 something else remotely to malfunction and that thing

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1 can catch on fire. That has happened, but it's not
2 typical of fires.

3 Now propagation is another matter. If you
4 have a huge fire someplace, it can overwhelm a fire
5 barrier, sure.

6 MR. LAIN: Implementation. NEI has been
7 working hard. We've been working with NEI on
8 implementation guide. I think Rev. D was handed out.
9 They've had two pilots. One at Farley, Farley Station
10 which reviewed the change control process and the
11 other was at McGuire which covered the transition
12 process. The staff has participation in both of those
13 pilots and our detailed staff comments on those, on
14 the Rev. D are presently in concurrence.

15 MR. ROSEN: Do you have a plan to endorse
16 the implementation guide by Reg. Guide?

17 MR. LAIN: Yes. I missed that first
18 sentence.

19 MR. ROSEN: It's not going to stand out
20 there alone, the implementation guide?

21 MR. LAIN: No, our plan is to have a
22 performance-based fire protection Reg. Guide and the
23 first thing we're looking at putting in that is this
24 implementation guide from NEI and we would like to
25 endorse the implementation guide, so we are trying to

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1 work with NEI in getting a quality product that we can
2 endorse.

3 MR. ROSEN: How close are you to that?
4 You said you were in Rev. D. Is that right? Did you
5 say that?

6 MR. LAIN: Right. And hopefully --

7 MR. ROSEN: There four revisions already,
8 to me, right?

9 MR. LAIN: Right.

10 MR. HANNON: Let me try to respond to
11 that. We anticipate -- I'm John Hannon, Plant Systems
12 Branch Chief.

13 We anticipate that our comments will be in
14 the latest revision, will be available to NEI by the
15 end of the year and we anticipate that they should be
16 able to wrap everything up in one additional revision
17 after this.

18 So we're looking at one more revision to
19 reach final.

20 MR. ROSEN: Will that guide be available,
21 assuming the Commission acts, I think the Commission
22 is going to be acting in the early part of 2004,
23 assuming the Committee recommends this going up?
24 We're going to need to have both the guide and the
25 rule at the same time, right, in order to move

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1 forward?

2 MS. BLACK: I'm Suzanne Black, Director of
3 DSSA. Back several years ago, before I was even in
4 DSSA, I think the decision was made to go ahead with
5 this rule ahead of the guidance, although we've been
6 slow writing the rule and we've been pushing the
7 guidance, so they're probably going to come together,
8 but we didn't want to hold the rule up or the
9 guidance. And I think the paper -- what the proposed
10 rule is due in March, I believe, to the Commission
11 now? Is that the new schedule?

12 MR. LAIN: I think we'll go over that
13 later. Right now, I think we've got a new date.

14 MR. ROSEN: But the rule is not much use
15 without the guide and the guide is not much use
16 without the rule.

17 MS. BLACK: Right.

18 MR. ROSEN: Fred Emerson?

19 MR. EMERSON: This is Fred Emerson with
20 NEI. Let me add a little clarification.

21 We anticipate at least two more revisions.
22 One to address the comments that we are going to be
23 getting and the other is because we're not going to be
24 seeing the final rule language until the March time
25 frame, despite our requests otherwise, we're going to

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1 have to issue another revision after the rule is
2 final, just to make sure that we pick up all the
3 language of any changes that are being made to the
4 rule language between the last time we saw it and the
5 next time we see it.

6 So the final one will be issued at some
7 point after the rule is final and that will be, I'm
8 guessing, May-June next year.

9 MR. BIRMINGHAM: Fred, isn't it somewhat
10 true that licensees, I mean -- they will have the rule
11 available to them. We expect early sometime shortly
12 after March when the Commission does approve it, but
13 they will have the rule, the standard will be
14 available to them and they will be able to begin to
15 also have the draft of the implementing guidance and
16 they'll be able to begin to look at their plants as
17 far as that economic decision that they need to make
18 to decide whether it benefits them to become an 805
19 plant or to stay as they are as an Appendix R plant.

20 MR. EMERSON: Yes, what you say is true.
21 They will have substantial information available to
22 allow them to begin the decision making process, but
23 because this is a pretty significant change in their
24 licensing basis that they're contemplating, they're
25 not going to make a final decision until after they

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1 see the final rule and the final implementing
2 guidance.

3 DR. POWERS: So we have the potential of
4 having Appendix R plants, 805 plants, Branch Technical
5 Position plants and Licensing Condition plants. Is
6 this right?

7 MR. LAIN: Yes sir.

8 DR. POWERS: And we're going to have
9 inspectors trained to do all four types, right?

10 MR. LAIN: Yes sir.

11 DR. POWERS: Challenging. This is burden
12 reduction on the inspection force.

13 CHAIRMAN BONACA: Or permutations thereof.

14 DR. POWERS: Plus 803 exceptions. This
15 sounds pretty easy to me.

16 MR. BIRMINGHAM: Well, we have the
17 advantage of the rather experienced inspection force
18 as far as looking at the Appendix R plan.

19 DR. POWERS: And they'll never retire, so
20 you'll have --

21 (Laughter.)

22 MR. BIRMINGHAM: Yes, they will. You're
23 right.

24 MR. LAIN: Something we've agreed to with
25 NEI is to do comprehensive reviews of the initial

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1 setups. I think our long term plan is to sort of have
2 an administrative license amendment transitioned with
3 the review of the transition with the efficiency and
4 inspection staff, but initially the headquarters staff
5 will be reviewing the first couple of transitions and
6 we are hoping to sort of provide a template for others
7 to follow and so that's something we've agreed to do
8 with NEI.

9 The staff, with enforcement discretion,
10 the staff wants to encourage the licensees to conduct
11 these self-evaluations in transition to 805 so we're
12 working with OE, the Office of Enforcement to develop
13 an enforcement policy and also with ROP, the Reactor
14 Oversight Process, to develop some incentives, I
15 think, that NEI's been looking forward to.

16 We don't necessarily punish the licensees
17 for finding old design issues. That's been an NRC
18 policy, I think, in the past with OE. And so in the
19 future the regions are going to continue to conduct
20 regular inspections during the transition period, but
21 they may focus their inspection, sort of concentrate
22 on the transition and the progress of the self-
23 evaluations.

24 DR. POWERS: Now the regions' fire
25 inspection capabilities --

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1 MR. LAIN: I didn't catch that first
2 couple of words.

3 DR. POWERS: There wasn't a couple, first
4 couple of words. I began with a prepositional phrase.
5 What I'm interested in is your last bullet here. It
6 says the Reactor Oversight Process will monitor future
7 changes and what not.

8 And what I'm interested in is this -- the
9 capability of the regions to inspect the diversity of
10 plants that we'll now have under this fire protection
11 scheme.

12 MR. LAIN: I think the plan now is to sort
13 of in next summer time period is to develop the
14 inspection criteria. Right now we're looking at audit
15 guidance on how to audit the first couple of initial
16 submittals. I think there's going to be a few years
17 before they've actually -- a few of them have actually
18 transitioned. So I think during that time period
19 we're going to be looking at ways to come out with the
20 inspection criteria.

21 MR. BIRMINGHAM: Were there plans to have
22 a temporary -- not a temporary, but a GI * (1:54:37)

23 MR. LAIN: No, that's still to be
24 determined.

25 DR. POWERS: Well, you've discussed the

1 mechanics and I'm more concerned about the manpower
2 right now.

3 In at least a few of our visits to the
4 regions, they've complained to us about their being
5 relatively at sea in the area of inspecting for fire
6 protection, lacking the trained manpower, having to
7 rely heavily on headquarters to provide that in
8 specialized inspections. Is it your intention that
9 these will be specialized inspections coming out on
10 fire protection or are you just going to rely on the
11 regions to do it in their normal inspection procedure?

12 MR. LAIN: My indication is we're going to
13 rely on their normal inspection, inspection schedule
14 and inspection process.

15 MR. HANNON: Dr. Powers, this is John
16 Hannon. It's been some -- at least a year or more
17 since we've had any requests from the regions to
18 support their fire protection inspections from
19 headquarters.

20 It's my current understanding is that all
21 of our regions are staffed up and are capable of self-
22 assessing --

23 DR. POWERS: I know you've been working in
24 that direction and I just basically am asking is it
25 successful and now you're going to rattle the drum

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1 again with another change.

2 MR. LAIN: From there I'm going to let Joe
3 talk about the rule.

4 MR. BIRMINGHAM: Okay, I'd like to talk
5 about the rule's structure itself a little bit. What
6 we intend to do is to add a paragraph 50.48(c) that
7 will incorporate NFPA 805 directly into 10 CFR 50.
8 That way NFPA 805 actually becomes part of 10 CFR 50
9 if it is the rule. 10 CFR 50.48(a) will continue to
10 apply.

11 DR. POWERS: Let me ask you a question
12 about this strategy. You're going to incorporate this
13 specific guidance by addition into the rule which
14 means every time it gets updated you're going to have
15 to go through a rule changing. Is that correct?

16 MR. BIRMINGHAM: Our intention is not to
17 generally not to go through an update to the rule. If
18 licensees see a specific advantage to a later edition,
19 we would prefer or expect or plan for them to actually
20 have to come in and request, take advantage of it,
21 rather than actually pursue rulemaking.

22 MR. ROSEN: So this is not going to be
23 like the ASME code 50.55(a)?

24 MR. BIRMINGHAM: No, it will not.

25 MR. ROSEN: That's not going to -- that's

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1 not the model to be thinking about here.

2 MR. BIRMINGHAM: Correct. it is not. It
3 will not automatically update as new versions of NFPA
4 805 come out in the future.

5 MR. LAIN: It's sort of my understanding
6 with OGC is that basically that would be allowing NPFA
7 to do rulemaking and the NFPA Committee could --

8 MR. ROSEN: But that's not the way it
9 works for the ASME code either. The ASME Code
10 Committee Committees can change the code, but then the
11 NRC staff adopts approves the new provision. So it's
12 a three-step process, with exceptions it's necessary.

13 When you're saying we don't intend, you
14 don't intend to do that with 5048(c)?

15 MR. BIRMINGHAM: That's correct.

16 MS. BLACK: This is Suzanne Black again
17 and I think if the Code Committee changed it to the
18 point where it looked like it was worthwhile going
19 through rulemaking, yes, we would, but once again,
20 this decision to adopt this into the rule versus use
21 something simpler in the rule was made years ago, but
22 in hindsight, it might have been an incorrect
23 decision, but it was made back when -- I don't know.
24 I don't know if I even want to get into the history of
25 why we decided to go this way versus that way, but it

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1 was modeled on the ASME code --

2 DR. POWERS: Process.

3 MS. BLACK: -- process back then and I
4 think with hindsight now we probably -- I would have
5 recommended another path, but I think it's too late to
6 change courses.

7 DR. POWERS: Well, I would think about
8 this horse a little bit. You've gotten a brand new
9 rule, a brand new fire protection process here.
10 You've run it through three plants, didn't exactly go
11 the smoothest of any pilots that I've ever seen in my
12 life. Those three plants are represented -- or two
13 plants are representative of two plants. And now
14 you're going to try it on some others. You might find
15 a kink or two here and you're going to ossify
16 yourself.

17 MS. BLACK: Well, I don't think the kinks
18 are with the standards so much as like interpreting
19 how to implement it and with a simpler rule you'd even
20 have more of that.

21 We run into the struggle of how much
22 detail to put into the rule with our legal staff
23 because you need to have detail and criteria that
24 anyone can look at and judge whether or not a licensee
25 is meeting the rules or any informed person is what

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1 OGC's standard is. And I think trying to come up with
2 some general criteria to put in the rule would be very
3 difficult and so at this point I think this is the
4 best way to go.

5 MR. ROSEN: I think Dana's point is well
6 taken. I think it's a big difference between the ASME
7 PP&V code and NFPA 805 in terms of experience and
8 broad scale implementation and use.

9 MS. BLACK: I think the code cases --
10 those are constantly making changes, required changes
11 that different code cases can be picked up.

12 MR. ROSEN: In the boiler and pressure --

13 MS. BLACK: Right, but in this, I don't
14 envision that many changes because even though it's
15 very long and detailed, it's pretty general. I think
16 most of the changes we'd want to make, you could make
17 through the guidance document at this point.

18 MR. ROSEN: Those are good arguments,
19 we'll see what it turns out to happen actually.

20 MS. BLACK: Twenty-twenty hindsight in the
21 future, right?

22 MR. ROSEN: We'll find out, if we're still
23 around.

24 DR. POWERS: There's a saving Grace. It
25 costs a fortune to change over to this so how many

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1 people are actually going to do it?

2 MR. ROSEN: Well, that's a whole other
3 question. I did read and I think it was the
4 regulatory analysis that now the staff thinks that
5 maybe 20 or 25 plants, I think it said, and I don't
6 know whether that means units or plants, will
7 ultimately adopt 805.

8 We had a representative from Duke here who
9 said they had already made the decision at the
10 subcommittee meeting. They had already made the
11 decision for McGuire and I think he said Catawba, but
12 they would make the transition. And he thought, as I
13 recall what he said then, there are probably another
14 dozen plants that their little working group had
15 decided would likely benefit a great deal from moving.
16 So one of the concerns of ACRS all along has been is
17 that we'll give this party and nobody will come. And
18 we would caution the staff to not make the barriers to
19 entry so high that the benefits of this move couldn't
20 accrue to the public's health and safety and to the
21 industry and the Agency's resources, all of which we
22 anticipate.

23 So now I'm still worried that as Dana
24 suggested that they'll give this party and nobody will
25 come, except the Duke guys who say they will.

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1 Can you say anything about that? What do
2 you know? What's recently being heard?

3 MR. HANNON: This is John Hannon. In the
4 last NEI fire protection forum we asked that question
5 and there was one hand in the audience. I turned out
6 it was a plant in Region 1 who said they had already
7 budgeted to make the transition to 805. They plan to
8 do it in FY 05. That was the only response we got at
9 that time.

10 MS. BLACK: But back in 2001 when we
11 almost didn't go forward with this rulemaking, we had
12 a letter from NEI that said that they supported going
13 forward with this because they thought it would be
14 beneficial use of our resources and that people would
15 adopt this rule.

16 MR. ROSEN: Maybe the NEI representative,
17 if he's still here, would be willing to give us a late
18 update on that.

19 MR. EMERSON: This is Fred Emerson with
20 NEI. I think most plants are still adopting a wait
21 and see attitude because we still haven't seen the
22 final rule and we haven't seen the final guidance.

23 I think over the last couple of years
24 there has been a major shift from total skepticism to
25 cautious optimism that this might actually be

1 beneficial. But even if you completely optimize its
2 benefits, there will still be some plants who don't
3 see a cost benefit and moving forward with it and
4 that's going to be a plant specific decision.

5 What we've been doing is working with the
6 staff to try to remove as many unnecessary barriers to
7 implementation as possible to improve the likelihood
8 that plants who can benefit from it will see the
9 benefits of going ahead and make that decision. And
10 we're going to be putting out guidance that -- and
11 have put out guidance that allows a plant to make some
12 early decisions as to whether this is going to be
13 beneficial or not when they do see the final paperwork
14 coming out of the staff and out of the NEI.

15 DR. POWERS: Fred, so do you remember when
16 were doing the fire protection functional inspection
17 and people had to get their fire protection licensing
18 basis in order? They were complaining vigorously
19 because that was costing like a million dollars. How
20 do they avoid that million dollars a plant?

21 MR. EMERSON: Well, the estimates that
22 we've seen coming out for making a transition like
23 this is on the order of one to two man-years,
24 depending on how well the current licensing basis is
25 documented and how good their PRAs.

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1 DR. POWERS: See, it's the codicil,
2 depending on how well the current licensing basis is
3 documented and we know from the fire protection
4 functional inspections that a lot of them have it
5 scattered, shall we say?

6 MR. EMERSON: True, but I don't think it's
7 in the area of a million dollars. I think it's more
8 in the area of half a million or less.

9 DR. POWERS: I'm quoting the numbers that
10 came out of the fire protection --

11 MR. EMERSON: I understand and I'm quoting
12 numbers that came out of our pilots.

13 MR. ROSEN: Well, I don't know if we're
14 going to get very much further with this line of
15 questioning, but what we have is a lot of unknowns, I
16 can see that and not a lot more clarify of the issue
17 of just how many plants are going to actually make the
18 transition. The only way to find out unfortunately is
19 to go ahead.

20 If we don't go ahead, then we'll never
21 know. If we go ahead, we might know.

22 MR. BIRMINGHAM: Sort of just following on
23 to that, an observation is that those plants that are
24 likely to be in operation for a longer period of time
25 are more likely to benefit from the NFPA 805 --

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1 MR. ROSEN: That's getting to be almost
2 all of the plants now in terms of license renewal.

3 MR. BIRMINGHAM: License renewal. Yes, I
4 think that's a good point.

5 The other thing is that NFPA 805, we are
6 amending paragraph (f) of 50.48 to state that a plant
7 that complies with NFPA 805 will be complying with the
8 requirements of paragraph (f) for decommissioning.

9 Within the rule itself we're identifying
10 seven exceptions. They were exceptions that we felt
11 that the standard had written into it statements that
12 the staff either wanted to clarify or that we just
13 felt we weren't going to quite go along with as
14 written. An example might be that the standard, for
15 example, required flame-retardant coating on cables.
16 I'm sorry, it required flame-retardant cables per se
17 and our practice has been that you have flame-
18 retardant cables or that you have applied flame-
19 retardant coating or that you have a suppression
20 system in place. We took an exception to that, for
21 example.

22 I could relate some of the other
23 exceptions --

24 MR. ROSEN: Well, I think you should make
25 it clear that some of the exceptions were because

1 they're beyond the scope of NRC regulation, for
2 example, the life safety goal.

3 MR. BIRMINGHAM: That's a good point. The
4 two that we felt were the life safety goal, in
5 general, and the plant damage goal were also -- those
6 are the two that -- they're not within the scope of
7 NRC regulatory structure, therefore we took exception
8 to them, not because they're not good goals, not
9 because we aren't glad to see them in NFPA 805, but we
10 felt they're outside our regulatory structure.

11 We expect licensees to document their --
12 there's a bullet missing.

13 (Pause.)

14 The last slide, the last bullet, the rule
15 structure requires licensees to complete a plant-wide
16 evaluation before changing any of their fire
17 protection program.

18 Once they complete that, the licensees
19 document that evaluation and will retain those records
20 on site. They will be maintained, available for our
21 inspectors to use as a basis for conducting their
22 inspections.

23 We are going to require in the rule
24 structure that alternatives to NFPA 805 and also any
25 changes, deviations to the Chapter 3 elements and

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1 minimum design requirements will require license
2 amendment. The NRC considers the Chapter 3 elements
3 and design requirements to be of sufficient importance
4 that we thought that was necessary and of course, we
5 require that alternatives to NFPA 805 which we don't
6 know what those alternatives are would be adopted by
7 a license amendment.

8 In working with the rule and the
9 rulemaking process, we determined that it's not
10 necessary for NRC to pre-approve the use of methods
11 such as fire modeling and fire PSAs. Licensees have,
12 in the past, been allowed to use models somewhat at
13 risk and that we believe licensees can do this.
14 Because NFPA 805 contains within it a regulatory
15 structure for the use of fire models, fire PSAs.

16 We provided for a decommissioning plants
17 to comply with NFPA 805. There's -- although
18 paragraph (f) describes the general qualities of a
19 fire protection program, it doesn't have specifics
20 built into it. Appendix R would be less applicable to
21 a decommissioning plant because the nuclear safety
22 aspects tend to diminish and you fall into the
23 radiation release aspects concerns and we felt that
24 well, NFPA 805 has an entire chapter devoted to how to
25 move your plant towards a decommissioning mode.

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1 The reactor oversight process monitoring
2 future changes, as we said, before you can make
3 changes to your plant, you need to complete the plant-
4 wide evaluation. Once you complete that, then you can
5 begin to make these changes. Those are the types of
6 changes that as they're made we expect the reactor
7 oversight process will be able to, over time, be able
8 to monitor. We don't expect 25 plants to come in all
9 at once. This will be maybe four plants a year to
10 come in and over time we will see up to maybe 20, 25
11 plants. And it will give a chance for the triennial
12 inspections to come in and look at the different
13 plants and gain that inspection experience.

14 Also, the NRC may approve such things as
15 risk-informed performance-based methods in the future
16 which maybe used under NFPA 805 structure.

17 MR. ROSEN: But because you have to
18 approve the transfer to 805 status, correct?

19 MR. BIRMINGHAM: Yes.

20 MR. ROSEN: You can control the rate at
21 which licensees are allowed to make that transition.
22 In other words, let's just assume for some reason
23 everybody wanted to do it all at once. Well, you just
24 say no. You'd set up a priority scale and do it
25 consistent with your resources, right?

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1 MR. BIRMINGHAM: Yes, not unlike what
2 we're doing in license renewal. We're having to limit
3 how many plants can come in for license renewal at one
4 time. Which plants are a priority, which plants can
5 identify the greatest need.

6 Plants are in their compliance for
7 Appendix R. They don't need to make a change, so
8 where it's not a penalty to them, it's going to delay
9 --

10 MR. ROSEN: In a sense, it's less
11 necessary than license renewal because at least in
12 license renewal plants may be rerunning up against a
13 hard stop in terms of the license * (2:12:30). But
14 here, that's not true at all. I mean they can
15 continue in Appendix R forever, or for as long as
16 their plant is licensed.

17 MR. BIRMINGHAM: Correct. Thank you.
18 Current status of the rulemaking, the proposed rule
19 was issued in November of 2002. The comment period
20 ended in January of 2003. We've been working with OGC
21 and with the Plant Systems Branch to resolve those
22 comments, to work on reducing the need for license
23 amendment requests for methods. We made some good
24 progress in those areas and we think we're ready to go
25 forward with the final rule now.

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1 The Federal Register notice for the final
2 review has been reviewed by OGC and they told us that
3 they had no legal objection to the Federal Register
4 notice. The Rev. E of the implementing guidance is
5 expected the first quarter of 2004.

6 Our current schedule is to brief the ACRS
7 in December. We're here. This is on the final rule
8 and we don't expect to see significant changes. OGC
9 has given us their no legal objection. Staff doesn't
10 plan any changes.

11 And the Commission is quite familiar with
12 it. And in the January-February time frame, we will
13 go through the office concurrence process. We'll see
14 CRGR. CRGR will be an information brief. This is a
15 voluntary alternative. It's not a requirement, so
16 they should not have any problem with the -- there
17 are no generic requirements.

18 MR. ROSEN: No backfit requirements. This
19 is typically what they focus on.

20 MR. BIRMINGHAM: Correct. In March, the
21 final rule will go to the EDO and then up to the
22 Commission.

23 We expect the final rule to be published
24 one month after the Staff Requirements Memorandum
25 comes out and we don't know how long the Commission

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1 will deliberate, but we really don't expect a lengthy
2 deliberation. It hasn't changed that significantly
3 from the proposed rules stage.

4 MR. ROSEN: Okay.

5 MS. BLACK: Steve, I'd like to clarify one
6 thing and this is Suzanne Black again. I wanted to
7 clarify the thing about the license amendment review
8 because remember, this was supposed to be more or less
9 self-implementing and the first few were going to
10 audit to make sure that the implementation guidance is
11 clear enough that everybody understands how licensees
12 are going to transition into this new regulatory
13 scheme. But we weren't going to review and approve
14 these new fire protection programs. We were going to
15 allow licensees to do it and then through the
16 inspection program, eventually, we would review its
17 implementation through the triennials.

18 MR. ROSEN: Okay, that's very helpful. I
19 forgot that. So actually what will really happen once
20 the rule is published is licensees that make a
21 decision to do this will just send you a letter
22 telling you they're doing it.

23 MS. BLACK: Right.

24 MR. ROSEN: And then you schedule your
25 review activities in the field as you choose to.

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1 MS. BLACK: Correct.

2 MR. ROSEN: Okay, I don't think this will
3 happen, but in principle, you could get 50 letters one
4 day. It's highly unlikely.

5 MR. BIRMINGHAM: Questions from the rest
6 of the Committee? Comments?

7 MR. ROSEN: Well, if there are no other
8 comments from any of the members, or members of the
9 public, I want to thank you all very much and turn it
10 back to you, Mr. Chairman.

11 CHAIRMAN BONACA: Thank you for the
12 presentation. It was informative.

13 MR. ROSEN: I notice we're on schedule.

14 CHAIRMAN BONACA: You are absolutely
15 right, so you are commended for that.

16 MR. ROSEN: I was fishing for that
17 compliment.

18 CHAIRMAN BONACA: We're now moving and
19 having a presentation from one of our members
20 regarding recent operating events. That's a quite
21 interesting presentation.

22 We can stay off the record at this point.

23 (Whereupon, at 2:16 p.m., the meeting was
24 concluded.)

25

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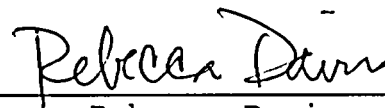
Name of Proceeding: Advisory Committee on
Reactor Safeguards

508th Meeting

Docket Number: n/a

Location: Rockville, MD

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Rebecca Davis
Official Reporter
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Construction Inspection Program

Mary Ann M. Ashley
CIP Team Leader



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- Joseph Sebrosky, NRR
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- Carl Konzman, NRR

Steering Committee

- Charles Casto
- Stuart Richards
- James Lyons



Development of the CIP

- Uses a team approach
 - Regional representatives
 - Steering committee

- Builds on work from 1996
 - Lessons learned



Program Overview

- Framework Document
- Inspection Manual Chapters
- Inspection Procedures



CIP Framework Document

Reflects that inspection program is focused on reaching conclusions

- IMC-2501 for Early Site Permits
- IMC-2502 Combined License
- IMC-2503 ITAAC
- IMC-2504 Preparation for Operation



Challenge: IMC-2503, ITAAC

- Majority of the inspection work
- Modular Construction Techniques
 - Aggressive construction schedules
 - Location of construction activities
 - Timing of inspections to support ITAAC conclusion



People

Inspection skills

Strategic Workforce Planning

On-going construction

- MOX fuel fabrication facility
- Enrichment facility construction
- Browns Ferry Unit 1 restart

Formal training



Programs and Processes

Construction Inspection Program Information Management System (CIPMS)

Collect, organize, manage and generate reports
Tie information to NRC ITAAC verifications

- Detailed construction schedules as early in the process as possible regardless of location
- Coding scheme



Procedures

Detailed Inspection Procedures

- Design-specific inspection procedures
- Estimate in SECY-01-188, "Future Licensing and Inspection Readiness Assessment (FLIRA)"
- Lead time for development varies by design



Public Comments

- Applicability of Part 21 to applicants
- More specifics:
 - public communications
 - engineering design verification
- Clarify expectations regarding Appendix B
- Clarify role of SAYGO



What's next for CIP?

- Finalize the framework document
- Test CIPIMS
- Observe construction in progress
(particularly modular construction)
- Complete Manual Chapters
- Complete change summaries for
Inspection Procedures



United States Nuclear Regulatory Commission

Standard Review Plan (SRP) Chapter 18, Human Factors Engineering and Associated Documents

**ACRS
December 4, 2003**

1

Agenda

- Introduction
- Overview of SRP and related documents
- NUREG - 1764
 - Risk-informed screening method
 - Human factors engineering review criteria
- ACRS Letter of Sept. 24, 2002
- Public comments and ACRS letter of Nov. 13, 1995
- Closing statements
- ACRS discussion

2

Meeting Purpose

- Request ACRS Endorsement of:
 - Revision to SRP Chapter 18, "Human Factors Engineering"
 - NUREG-0711, "Human Factors Engineering Program Review Model;"
 - NUREG-0700, "Human System-Interface Design Review Guidelines;"
 - NUREG-1764, "Guidance for the Review of Changes to Human Actions."

3

Presenters

- J. Persensky, RES/DSARE/REAHFB
- James Bongarra, NRR/DIPM/IROB
- Susan Cooper, RES/DRAA/PRAB
- Paul Lewis, RES/DSARE/REAHFB

4

SRP Chapter 18 and Related NUREGs Overview

- SRP Chapter 18 provides a high level framework for all HFE reviews

Applications:

Review aspects of →

- o New Plants
- o Control room modifications
- o Modifications affecting human actions

5

SRP Chapter 18 Revisions

- Modified review elements and acceptance criteria to agree with NURE-0711, Rev.2
- Added review of plant modifications and credited human actions
- Added a graded approach to HF review based on risk insights

6

SRP Chapter 18 Technical Basis for Revision

- Address feedback from applications
 - ALWR reviews
 - Plant modernization reviews performed in other countries
 - Feedback from staff and international users
- Incorporate NRC research on human factors engineering

7

SRP Chapter 18 Summary

- SRP Chapter 18:
 - Existence Since Early 1980's
 - Last Revised – 1996
 - Principal NRC HF Guidance
 - Refers to Several HF Related Guidance Documents
 - Latest Revision Upgraded, Partially Risk-informed

8

<p align="center">NUREG-0711 "Human Factors Engineering Program Review Model"</p>	
<ul style="list-style-type: none"> ■ Complete set of HF review elements. <ul style="list-style-type: none"> ● All HF reviews. ● Complete life cycle. ● Includes reviews of the design process and the design product. ■ Elements from NUREG-0711 are adapted in other documents for specific types of review. 	9

<p>NUREG-0711 Review Elements</p>				
<p>Planning and Analysis</p> <p>HFE Program Management</p> <p>Operating Experience Review</p> <p>Function Analysis & Allocation</p> <p>Task Analysis</p> <p>Staffing & Qualification</p> <p>Human Reliability Analysis</p>	<p>Design</p> <p>Human-System Interface Design</p> <p>Procedure Development</p> <p>Training Program Development</p>	<p>Verification and Validation</p> <p>Human Factors Verification and Validation</p>	<p>Implementation and Operation</p> <p>Design Implementation</p> <p>Performance Monitoring</p>	10

<p style="text-align: center;">NUREG-0711 Changes From Prior Revision</p>

- Applies to all HF reviews, not only advanced reactors.
- Two elements added :
 - Design Implementation.
 - Performance Monitoring.
- Changes made to the following elements
 - Function Analysis and Allocation.
 - Human Reliability Analysis.
 - Human-System Interface.
 - Verification and Validation.

11

<p style="text-align: center;">NUREG-0700 "Human System-Interface Design Review Guidelines"</p>

- HSI Elements
 - Information Display
 - Interaction and Interface Management
 - Basic Controls
- HSI Systems
 - Alarm Systems
 - Group-View Display System
 - Soft-Control System
 - Computer-Based Procedure Systems
 - Computerized Operator Support Systems
 - Communication Systems
- Workstations and Workplaces
- HSI Support
 - Maintainability of Digital Systems

12

NUREG-0700

Changes From Prior Revision

- Adds review guidance for digital systems
 - General computer-based information system interfaces
 - Soft controls
 - Computer-based procedures and alarm systems
 - Interface management and navigation
 - Maintainability of digital systems

13

NUREG-1764

"Guidance for the Review of Changes to Human Actions"

- Guidance addresses:
 - New actions (e.g., substitution of a human action for an automated action, when the automated equipment fails.)
 - Modified actions (e.g., due to new or modified system components.)
 - Modified task demands (e.g., change in amount of time available, or in environment.)
- Risk-informed review guidance
 - The risk screening method determines the level (detailed, medium, brief) of human factors review.

14

NUREG-1764 Review Approach

- + Risk-screening
 - Risk-informed submittal
 - Non-risk informed submittal
- + Human factors review criteria
- + Integrated Decision-Making (See RG1.174, Section 2.2.6) and Input to Safety Evaluation Report

15

SRP, Chapter 18, "Human Factors Engineering" Hierarchy

NUREG-0800, SRP, Chap. 18, "Human Factors Engineering"

New Plant

Modification to
Control Room

Modification to
Human Action

NUREG-1764

NUREG-0711: Complete HF review elements

NUREG-0700: Complete human-system interface review guidelines

16

**NUREG-1764
Phase 1
Risk Screening Method**

17

**NUREG-1764, Risk Screening Method
Four Steps**

- Step 1: Change in risk due to modification per RG 1.174.
- Step 2: Evaluation of risk-significance of human action not being performed correctly.
- Step 3: Qualitative evaluation.
- Step 4: Integrated assessment.

18

NUREG-1764, Risk Screening Method Step 1

- Step 1 - change in risk due to modification per RG 1.174
- $\Delta CDF_{\text{mod}} = [\text{new CDF (with modification in-place)} - \text{current baseline CDF}]$

19

NUREG-1764, Risk Screening, Step 1 (cont.)

- If HA only and Region I – Do a Level I HFE review.
- Otherwise - go to Step 2 to evaluate risk-significance of human-action not being performed correctly

20

NUREG-1764, Risk Screening Step 2

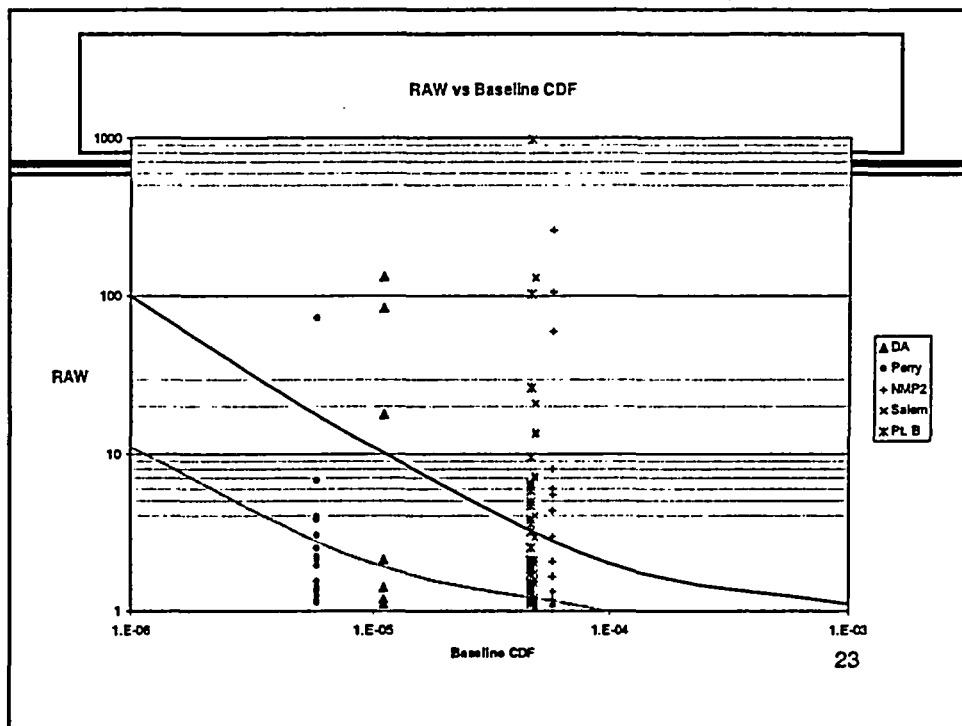
- Step 2 - evaluation of risk-significance of human action not being performed correctly
- Evaluates risk importance of HA based on both RAW and FV importance measures.
- Preliminary determination of Review level for HA as Level I, II, or III.

21

NUREG-1764, Risk Screening, Step 2 RAW versus CDF_{BL}

- RAW measures importance by computing the increase in CDF when the HA fails
- We select the ratio method of RAW since it is most commonly used and understood and PSA programs already calculate it
- $RAW_x = (CDF_{BL} + \Delta CDF_x) / CDF_{BL}$

22



NUREG-1764, Risk Screening, Step 2
RAW versus CDF_{BL}

■ Level I versus Level II split line:

- The line is based on a combination of CDF_{BL} and ΔCDF of $1 E^{-4}$
- Related to the Commission Safety Goal of not exceeding a CDF of $1E-4$ core damage events per reactor-year
- Relates to a red finding in the new NRC SDP program

24

NUREG-1764, Risk Screening, Step 2
RAW versus CDF_{BL}

■ **Level II versus Level III split line**

- Similar to RG 1.174, this is placed is one order of magnitude below the Level I line
- Equates the lower Level II curve to a Δ CDF of 1 E-5
- Thus Level II relates to a Yellow SDP finding and Level III to a White or Green finding

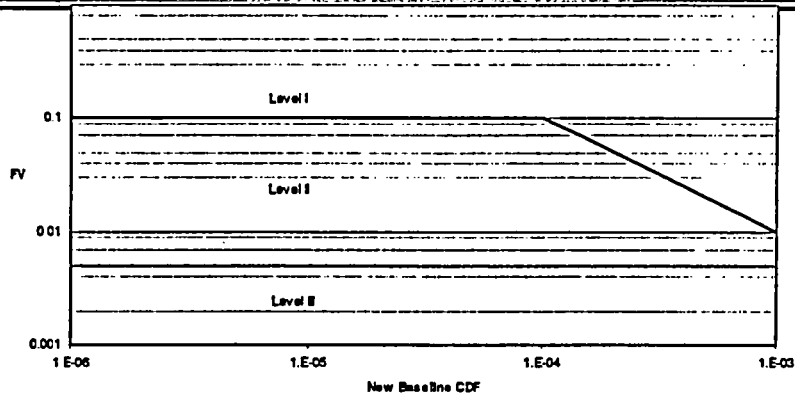
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NUREG-1764, Risk Screening, Step 2
FV versus CDF_{BL}

- FV represents a different aspect of risk than RAW
- FV is the fraction of total core damage cutsets (or sequences) that contain the action in question
- FV Split Criteria on next VG.

26

FV vs New Baseline CDF



27

NUREG-1764, Risk Screening, Step 2 Combining RAW and FV

- Take the most conservative Region as determined by RAW and FV

28

NUREG-1764, Risk Screening Step 3

- Step 3 - Qualitative Evaluation
 - Allows the screener to reduce or elevate the Level of HFE Review
 - Based on factors such as:
 - Personnel functions and tasks.
 - Design support for task performance.
 - Performance shaping factors.

29

NUREG-1764, Risk Screening Step 4

- Step 4 Integrated Assessment
 - Integrates the results generated in Steps 1 through 3
 - Provides a Table that gives the Level of HFE review based on screening.
 - Conclusion of Risk Screening: The level (I, II, or III) of human factors review.

30

NUREG-1764, TABLE 2.2 (p. 22), "Integrated Assessment with RI Screening"

Results of Step 1 RI Screening (see Note 1)	Results of Step 2 Performance Assessment	Results of Step 3 Qualitative Assessment	Results of Step 4 Recommended Level of HF Review
Region I (HA only)	-	-	Level I
Region I (Highway & HA)	Level I	No change or elevate	Level I
		Reduce	Level II
	Level II	Elevate	Level I
		No change	Level II
		Reduce	Level III
	Level III	Elevate	Level II (see Note 2)
Region II	Level I	No change or Elevate	Level I
		Reduce	Level II
	Level II	Elevate	Level I
		No change	Level II
		Reduce	Level III
	Level III	Elevate	Level II
Region III	Level I	No change or Elevate	Level I (see Note 3)
		Reduce	Level II
	Level II	Elevate	Level I (see Note 3)
		No change	Level II
		Reduce	Level III
	Level III	Elevate	Level II

31

NUREG-1764, HF Review Three Levels of HF Review

- Levels
 - Level I is the most detailed review
 - Level II is a moderately detailed review
 - Level III is a brief review
- Criteria are from NUREG-0711
 - Graded
 - Tailored

32

NUREG-1764, Phase 3 HF Review Decision

- Result of human factors review is submitted to Integrated Decision-Making (See RG1.174, Section 2.2.6) and to Safety Evaluation Report

33

ACRS Letter of Sept. 24, 2002 Remarks

- Generate guidance for the use of inspection and review tools
- Study team and individual performance in the context of plant organization*
- Consider need for simulator devoted to research*
- Study human performance during severe accidents
- Evaluate if the ROP detects human performance degradation
- Search for leading indicators of human performance degradation*
- Investigate latent errors and how to treat in PRA*
- Articulate HRA program vision*
- Use of simulators for quantifying HRA
- Perform critical review of HRA models.

34

Comments on NUREGs -0800,
Chapter 18,
-0711, and -0700

35

Comment by Robert Fuld (1):
NUREG-0711 is overly prescriptive.

■ Response

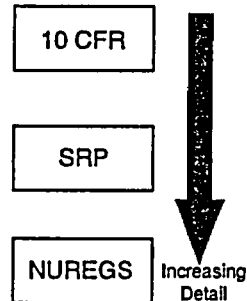
- NUREG-0711 does not prescribe a *process*; it provides *guidelines* for the *review of design process*.
- The review elements are used to review how important topics are addressed in the applicant's process.
- To illustrate
 - NUREG-0711 provides guidance on the review of task analysis, but does not specify that one task analysis method must be used.
 - Three advanced reactor reviews were conducted using NUREG-0711, yet *each* vendor had *its own design approach*, and *each design is very different*.
- NUREG-0711 is detailed, but the detail is needed
 - Increase the standardization across reviews
 - Reduce uncertainty in its application

36

Comment by Robert Fuld (2):
NUREG-0711 may be considered de facto regulation

■ Response

- This is an agency-wide issue
- HFE review information is provided in increasing detail to provide flexibility in application
- The HFE review guidance documents clearly state that the contents are guidance and that alternative approaches can be acceptable with justification
- NUREG-0711 explicitly provides guidance on how to evaluate the acceptability of alternative approaches



37

Critiques by Robert Fuld (3):
The use of a systems engineering approach is not justified.

■ Response

- What NUREG-0711 means by "systems engineering approach" is:
 - To consider the 12 elements,
 - To decide which of the 12 elements applies to this review,
 - To use those elements in the review.
- This approach is quite general.
- This approach is widely used and accepted
 - Systems engineering is a fundamental approach to human factors taught in most human factors courses
 - It is used by nearly all design organizations of large, complex systems
- *The critique does not suggest an alternative approach*

38

**Comment by Robert Fuld (4):
NUREG-0711 is too costly.**

■ **Response**

- The basis for this comments is unknown
 - Compared with what alternative?
- Industry currently recognizes the need for HFE and addresses it; NUREG-0711 is used to review what processes are used
- NRC guidance is forward looking and has smoothed the road for the introduction of new technologies for advanced control room technologies by providing clear guidance
- All NUREG-0711 elements are not used for all reviews.
 - A graded and tailored approach is used based on the type of review being performed.

39

**Comment by ACRS (1995): NUREG-0700
Overly prescriptive and may discourage the approval of
other equally acceptable alternatives (de facto regulation).**

■ **Response**

- **NUREG-0700 is used with the NUREG-0711 process**
 - NUREG-0711 encourages the use of a vendor/licensee specific style guide in place of 0700
- **Guidelines reflect best practices**
 - HED evaluation process uses guideline discrepancies only as flags for looking in more detail
 - It is recognized that I&C and HFE technology are rapidly changing (more so than other aspects of the plant) and the need to address new technology is built into 0711
- **The items are used to evaluate what technology is employed by the vendor**
 - The document does not suggest that the guidance areas included are expected to be included in the design, e.g., guidance for the review of computerized procedures is provided and used only if such a system is provided

40

Summary of Positive Feedback

- **NEI Public Comment Letter**
 - "It should be noted that there are few comments, indicating the draft sections provide adequate information to successfully develop and implement the targeted programs and plans."
- **ACRS Letter of January 14, 1994**
 - "We commend the staff for the development of this document (HFE Program Review Model). It provides much needed guidance to applicants on the staff expectations with regard to HFE for evolutionary reactors."
- **Results of extensive peer review by industry groups and its use by many organizations both within and outside of the nuclear industry reflect the positive light in which this guidance is viewed.**

41

SRP Chapter 18 and Related NUREGs Summary

- **SRP Chapter 18 now has three applications**
- **NUREG-0711**
 - Scope of application expanded
 - New and revised review guidance
- **NUREG-0700 added guidance for specific HSI topics**
 - Computer-based procedures
 - Soft controls
- **NUREG-1764**
 - New document.
 - It contains (1) a risk screening method and (2) graded HF review criteria.

42

**SRP Chapter 18
and Related NUREGs
Conclusion**

- **Supports NRC Performance Goals**
 - **Reduce unnecessary burden**
 - NUREG-1764 has a risk screening method
 - No new requirements
 - **Improve regulatory efficiency**
 - Clear, detailed review guidance
 - Standardized format
 - Users have expressed need for detail
 - **Maintain safety**
 - Risk screen provides detailed review for risk important human actions.
 - Reduces regulatory uncertainty, which can cause licensees to delay safety improvements
 - Contains review guidance for new technologies
- **Supports NRC policy on risk-informed regulation**
- **Asking for ACRS letter**

43

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NFPA 805 RULEMAKING

ACRS Full Committee
Briefing On Fire Protection
December 4, 2003

Paul Lain, Plant Systems, NRR
Joe Birmingham, Rulemaking, NRR

December 2003

NFPA 805 - Performance-Based Standard for Fire Protection for LWRs

- Background
- Advantages
- NFPA 805 Structure
- Implementation
- Rule Structure
- Status of Rulemaking
- Schedule

NFPA 805 - Background

- 1975 - Browns Ferry Fire
- 1980 - 50.48 and Appendix R
- 1998 - Reg. Guide 1.174, PRA
- 1998 - SECY 98-058, RI/PB FP Std
- 2000 - SECY 00-009, Rulemaking Plan
- 2001 - NFPA 805 Published
- 2002 - Proposed Rule Published

NFPA 805 - Advantages

- Uses stakeholder involvement
- Voluntary alternative
- Sets performance goals and criteria
- Focus on risk significant issues
- Endorses a National Consensus Standard
- Reduces unnecessary regulatory burden

NFPA 805 Structure

- Maintains a core FP program
- Requires an analysis to establish a fundamental fire protection program
- Allows transition of existing licensing basis including exemptions and GL 86-10 evaluations
- Guidance on performing nuclear safety analysis, fire modeling, and fire PSAs

NFPA 805 Structure (Continued)

- NFPA 805 Chapter 3 “Fundamental Fire Protection Elements”
 - ◆ Fire Protection Plan
 - ◆ Fire Prevention (e.g. control of combustibles)
 - ◆ Fire Brigade
 - ◆ Water Supply
 - ◆ Standpipes and Hose Stations
 - ◆ Fire Extinguishers
 - ◆ Fire Alarm and Detection Systems
 - ◆ Water-Based Fire Suppression Systems
 - ◆ Gaseous Fire Suppression Systems
 - ◆ Passive Fire Suppression (e.g. building separation, fire barriers, penetrations)

NFPA 805 Structure

- Differences From App. R
 - ◆ Cold shutdown
 - ◆ Emergency lighting
 - ◆ Alternate/dedicated shutdown
 - ◆ Analyzed shutdown method
 - ◆ Recovery actions
 - ◆ Adds radiation release criteria

Implementation

- NEI pilots held at Farley and McGuire
- NEI Implementation Guide
- Comprehensive review of initial submittals
- Enforcement discretion during transition
- ROP monitors future changes

Rule Structure

- Incorporates NFPA 805, 2001 Edition into 10 CFR 50.48(c)
- Identifies 7 exceptions to the standard
- Requires license amendment to adopt NFPA 805 including identifying any license revisions
- Requires licensee to complete a plant wide evaluation before changing fire protection program

Rule Structure

- Licensees document evaluation and retain records on site
- Alternatives to NFPA 805 and changes to Chapter 3 elements require license amendment
- NRC approval of methods not required licensee may use these at “risk”
- Decommissioning plants may comply with NFPA 805
- ROP monitors future changes
- NRC may approve new RI/PB methods in the future

Current Status

- Proposed rule issued November 2002
- Comment period ended January 2003,
- Federal Register Notice reviewed by OGC, November 2003
- Rev E of implementing guidance expected first Quarter of 2004

Schedule

- Dec – Brief ACRS on Final Rule
- Jan/Feb – Office Concurrences/CRGR
- Mar - Final Rule to EDO/Commission
- Final Rule published 1 month after Staff Requirements Memorandum