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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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649TH MEETING

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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OPEN SESSION

+ + + + +

THURSDAY

DECEMBER 7, 2017

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ROCKVILLE, MARYLAND

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The Advisory Committee met at the Nuclear
Regulatory Commission, Two White Flint North, Room
T2B1, 11545 Rockville Pike, at 8:30 a.m., Dennis Bley,
Chairman, presiding.

COMMITTEE MEMBERS:

DENNIS BLEY, Chairman

MICHAEL CORRADINI, Vice Chairman

PETER RICCARDELLA, Member-at-Large

RONALD G. BALLINGER, Member

CHARLES H. BROWN, JR., Member

1 MARGARET CHU, Member
2 VESNA B. DIMITRIJEVIC, Member
3 WALTER L. KIRCHNER, Member
4 JOSE MARCH-LEUBA, Member
5 DANA A. POWERS, Member
6 HAROLD B. RAY, Member
7 JOY REMPE, Member
8 PETER RICCARDELLA, Member
9 JOHN W. STETKAR, Member
10 MATTHEW W. SUNSERI, Member

11

12 DESIGNATED FEDERAL OFFICIAL:

13 DEREK WIDMAYER

14

15 ALSO PRESENT:

16 GREG BOWMAN, NRR

17 JIM ISOM, NRR

18 DAN MERZKE, NRR

19 ANDREA D. VEIL, Executive Director, ACRS

20

21 *Present via telephone

22

23

24

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P R O C E E D I N G S

8:30 a.m.

CHAIRMAN BLEY: The meeting will now come to order. It's my honor and privilege to welcome you to the first day of the 649th meeting of the Advisory Committee on Reactor Safeguards.

During today's meeting the committee will consider the following. Our annual review of operating experience. Our assessment of the quality of selected NRC research projects. The future ACRS activities and report on planning and procedures subcommittee, and reconciliation of ACRS comments and recommendations. And four, our biennial review of NRC research projects.

The ACRS was established by statute and is governed by the Federal Advisory Committee Act, FACA. As such the meeting is being conducted in accordance with the provisions of FACA.

That means that the committee can only speak through our published letter reports. We hold meetings to gather information to support our deliberations.

Interested parties who wish to provide comments can contact our offices requesting time after the Federal Register notice describing the meeting is

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1 published.

2 That said, we also set aside 10 minutes
3 for spur of the moment comments from members of the
4 public.

5 Written comments are also welcome. Mr.
6 Derek Widmayer is the designated federal official for
7 the initial portion of this meeting.

8 The ACRS section of the U.S. NRC public
9 website provides our charter, our bylaws, letter
10 reports and full transcripts of all full and
11 subcommittee meetings including the slides presented
12 at these meetings.

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

16 There is a telephone bridge line. To
17 preclude interruption of the meeting the phone will be
18 placed in a listen-in mode during presentations and
19 committee discussion.

20 To my surprise it appears we are also
21 being webcast again this morning. You can go to the
22 NRC website and follow the links to listen in. The
23 sound is usually better on that path than through the
24 bridge line although you can't talk to the committee
25 that way.

1 A transcript of portions of the meeting is
2 being kept and it is requested that speakers use one
3 of the microphones, identify themselves and speak with
4 sufficient clarity and volume that they may be readily
5 heard.

6 As an item of current interest I would
7 like to welcome our new member to the committee, Dr.
8 Vesna Dimitrijevic. I can't even say it this morning.

9 MEMBER BALLINGER: Dimitrijevic.

10 CHAIRMAN BLEY: She was the technical lead
11 for AREVA's U.S. EPR design certification. As a
12 technical expert Dr. Dimitrijevic has participated in
13 the development of diverse PRA methods including risk-
14 informed applications for Gen 3 plants, the EPRI risk-
15 informed in-service inspection program, and internal
16 flooding for fire and PRA guidance.

17 And even more impressive to me I think
18 she's the only present or past member of this
19 committee to be a chess grand master. I saw you on
20 the website.

21 Vesna, welcome to the committee.

22 (Applause)

23 CHAIRMAN BLEY: At this time I'm going to
24 turn the meeting over to Dick Skillman for our first
25 session. Dick?

1 MEMBER SKILLMAN: Mr. Chairman, sir, thank
2 you.

3 Colleagues, this is a meeting that we
4 rarely spend a lot of time on. Most of our time is
5 spent on looking at applications, at very high-tech
6 computer programs, things that are very, very
7 sophisticated.

8 For the next two hours, 120 minutes, we're
9 going to talk about the reactor oversight process.

10 And this is where our recon team, the
11 inspectors and the inspection agency within this
12 building confirm that the licensees are doing what
13 they are supposed to be doing.

14 This is just an extraordinary important
15 piece of our nuclear business.

16 What Derek and I have prepared is the data
17 for 2015 and 2016 of the plant data for the United
18 States for 101 nuclear power plants.

19 But as an introduction to that we've asked
20 Jim and Dan to talk about the changes to the reactor
21 oversight process.

22 Now we went through this if you will about
23 18 months ago. There were some changes on what causes
24 a plant to be in column 2 or column 3. What several
25 whites or a white plus a yellow mean in terms of risk.

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1 And those adjustments are now embedded
2 into the reactor oversight process. But those were
3 changes.

4 And so Dan and Jim are going to talk about
5 the changes to the reactor oversight process. And
6 when they're completed we'll proceed through the data.

7 And with that I'll turn it over to NRC
8 staff. Please proceed.

9 MR. MERZKE: Good morning. Thank you for
10 having us at your meeting today. We appreciate the
11 opportunity to come and talk to you about what the
12 folks at the Office of Nuclear Reactor Regulation have
13 been doing.

14 I'm Dan Merzke. I'm the assessment
15 program lead for the reactor oversight process in the
16 ROP assessment branch. With me today is Jim Isom
17 who's in the inspection programs branch.

18 I think between the two of us we've
19 implemented most of the recent changes that we're
20 going to talk about today, the reactor oversight
21 process.

22 And basically we're looking at the impact
23 of those changes up to date.

24 So as a little background in 2012 the
25 staff undertook an effort referred to as the ROP

1 Enhancement Project which was to take a fresh look at
2 the ROP, determine if the ROP was helping us achieve
3 what we wanted to achieve as a regulator.

4 Is it appropriate for the current
5 environment. What's working, what's not working and
6 what we can improve.

7 The staff reviewed all the baseline
8 inspections, communications initiatives and the
9 assessment program as part of this project.

10 Concurrently, the Commission directed the
11 staff to undertake an independent review of the ROP's
12 objectives and implementation including the relative
13 roles of headquarters and regional staff, our
14 interactions with industry over performance indicator
15 assessments and the effectiveness of NRC's assessment
16 of substantive crosscutting issues.

17 That report that was issued documented 8
18 recommendations and 10 suggestions to improve the ROP.
19 Staff dispositioned each of these recommendations and
20 suggestions and some of those are the subject of our
21 discussion this morning.

22 The key message that I want to leave you
23 with is that the ROP is constantly evolving to
24 recommendations made from the ROP feedback program,
25 annual self-assessments, independent assessments of

1 the program through entities such as the Office of
2 Inspector General and the Government Accountability
3 Office and feedback received from stakeholders during
4 our monthly ROP working group public meetings.

5 Today we'll be discussing several
6 noteworthy changes to the ROP as a result of those
7 efforts.

8 And in chronological order they are
9 changes to repetitive degraded cornerstone,
10 substantive crosscutting issue process, the action
11 matrix criteria, the inspection finding resolution
12 management project or process which has been recently
13 implemented, and the significance determination
14 process area, and changes to the engineering
15 inspections.

16 In 2015 the staff revised the definition
17 of the repetitive degraded cornerstone which was from
18 the beginning of the ROP in 2000 the definition of
19 degraded cornerstone was one yellow input in the
20 action matrix or two white inputs in the same
21 cornerstone.

22 An input is either an inspection finding
23 which is greater than green, i.e., white, yellow, or
24 red, or a performance indicator again that crosses a
25 threshold from green to white to yellow or red.

1 I'll quickly -- I wasn't going to talk
2 about it, but there may be some folks here who are not
3 familiar with the cornerstones, the safety
4 cornerstones of the ROP which make up the framework of
5 the ROP.

6 There are seven cornerstones, initiating
7 events, mitigating systems and barrier integrity, and
8 emergency preparedness make up the reactor safety
9 strategic performance area.

10 And then we have occupational radiation
11 safety and public radiation safety cornerstones as
12 part of the radiation safety strategic performance
13 area.

14 And the final cornerstone is security. So
15 those are our seven cornerstones.

16 CHAIRMAN BLEY: Dan?

17 MR. MERZKE: Yes.

18 CHAIRMAN BLEY: There's another thing not
19 everyone may be familiar with. Maybe you could say a
20 few words about it. And that's the action matrix in
21 this column 3 stuff.

22 MR. MERZKE: Sure. The action matrix as
23 defined in inspection manual chapter 03-05.

24 What it is is a matrix which prescribes
25 five columns in which we place reactors as far as

1 their performance.

2 The columns are numbered one through five.
3 Column one is the licensee response column. That
4 column is defined to be a licensee has all green
5 inputs in the action matrix, i.e., green inspection
6 findings and green performance indicators throughout
7 the assessment period. The assessment period is
8 basically a 12-month period, previous period.

9 To move to column two a licensee might
10 have one white input, i.e., either an inspection
11 finding or a performance indicator, or as many as two
12 whites now in the same cornerstone will put a licensee
13 into column two. Sure.

14 MEMBER SKILLMAN: Slide 43 on your package
15 is what Dan is going through now. This is good
16 information. Since you're presenting it we won't go
17 into detail later but for those colleagues who wish to
18 follow along what Dan is presenting is on slide 43.

19 MR. MERZKE: The action matrix actually
20 prescribes the regulatory actions that the NRC will
21 take in response to the licensee performance based on
22 the column they're in.

23 It prescribes the supplemental inspection
24 activities, communication activities, management
25 involvement based on again licensee performance.

1 And as you'll see in the action matrix the
2 further you go right, the licensee moves right in the
3 action matrix, that indicates declining performance.

4 And also you'll see that there will be
5 increased regulatory actions and increased management
6 attention to that licensee. Yes, sir.

7 MEMBER BROWN: This may be a dumb question
8 but findings are white, yellow, red and green is zero
9 I take it.

10 My question really has nothing to do with
11 those, but are there any category of findings that are
12 of such a level that they don't really fall -- they
13 don't get a white reading but their observations or
14 findings --

15 MR. MERZKE: Yes, sir, there are. A
16 finding is defined to be a performance deficiency
17 which is a licensee's failure to meet a requirement or
18 a standard, a self-imposed standard.

19 Now what the staff does, inspectors do
20 once they determine there's a performance deficiency
21 when they're under inspection they'll start processing
22 that for significance.

23 The first question they ask is is it minor
24 or more than minor. And IMC inspection manual chapter
25 06-12 appendix B right now has several questions that

1 the inspectors ask in order to determine if it's minor
2 or more than minor.

3 If it's minor it doesn't get documented in
4 an inspection report. If it's more than minor that
5 crosses the threshold and now it's defined to be an
6 inspection finding. And that will be documented in
7 the inspection report.

8 MEMBER BROWN: All right. So there's some
9 discretion allowed to the inspections to figure this
10 out based on the guidance in the inspection document.

11 MR. MERZKE: There's a major effort
12 ongoing right now to refine that criteria that
13 separates the minor from the more than minor criteria.

14 Because there is some subjectivity in
15 interpreting those questions and unfortunately that
16 results in some inconsistency in how the regions apply
17 that guidance.

18 MR. BOWMAN: This is Greg Bowman from DRS.
19 Maybe this goes without saying but even in cases where
20 we have a minor issue that doesn't get documented
21 licensees are required to correct the issue. It's not
22 documented but it still needs to be fixed.

23 MEMBER BROWN: Thank you very much.

24 MR. MERZKE: Does that answer your
25 question on the action matrix?

1 MEMBER BROWN: Yes, thank you.

2 MR. MERZKE: Okay. So, the repetitive
3 degraded cornerstone was -- it was actually the change
4 which we made to the repetitive degraded cornerstone
5 which originally was a cornerstone that was degraded
6 and that put a licensee in column three for the action
7 matrix.

8 If they were in a degraded cornerstone for
9 more than four consecutive quarters they would
10 automatically be transitioned to column four which is
11 the repetitive degraded cornerstone or multiple
12 degraded cornerstone, one or the other.

13 But column four is a significant increase
14 in regulatory activity where the NRC goes from
15 supplemental inspection of 200 hours to inspection of
16 3,000 hours or more. It's a very intrusive inspection
17 and licensees don't want to be in column four.

18 MEMBER POWERS: If a licensee had
19 identified or you had identified a degraded
20 cornerstone and they set upon an activity to correct
21 same and it extended over -- per plan over four
22 quarters do you move him?

23 MR. MERZKE: The process would have had
24 them moving automatically. Unless the supplemental
25 inspection, in this case a 95002 supplemental

1 inspection was completed, the exit meeting was
2 completed by the end of the fourth quarter in which
3 they were in the degraded condition then they would
4 automatically be transitioned.

5 Unless the staff submitted a deviation
6 request.

7 MEMBER POWERS: I would think that you'd
8 want to --

9 MR. MERZKE: There's a deviation process
10 where if the staff feels that the licensee doesn't
11 deserve to be placed into that column for some reason
12 then we would follow that process and not move them.
13 But that would be an approval process at the EDO
14 level.

15 MEMBER POWERS: And that's fine as long as
16 you have -- I mean if per plan the guy says you're
17 right, we've got a degraded cornerstone. It takes me
18 a year and a half to fix it. And here's my plan for
19 fixing it. I mean you're just belaboring him to move
20 him.

21 MR. MERZKE: This initiative actually was
22 not an initiative requested by industry which is
23 unusual. We would expect that maybe.

24 But this was actually requested by the
25 regions because they're having a very difficult time

1 getting that supplemental inspection completed within
2 that four quarter period.

3 MEMBER POWERS: That's true.

4 MR. MERZKE: So we thought it would be
5 helpful for the regions if they had an extra quarter
6 in which to schedule and complete that inspection.

7 Because it is a very -- licensees in that
8 position put a lot of effort into preparing for those
9 inspections and getting those corrective actions in
10 place.

11 So it takes some time for them to get that
12 done not counting the time that it takes for us to
13 actually make that final determination that puts them
14 in column three or the degraded cornerstone.

15 So we did add that additional quarter. It
16 was not without controversy. We did have a different
17 professional opinion when we made that revision.

18 But the independent DPO panel that was
19 stood up to review that vindicated our efforts and the
20 change to the repetitive degraded cornerstone stood.

21 So basically the change added an
22 additional quarter to that degraded cornerstone
23 condition before moving to column four, the repetitive
24 degraded cornerstone. Basically we added a quarter.

25 And the impact basically has been there

1 has been no impact. No licensee has met the criteria
2 for a repetitive degraded cornerstone since Pilgrim
3 moved in 2014. And that includes the original
4 criteria as well as the revised criteria.

5 CHAIRMAN BLEY: There was some years ago,
6 maybe eight, a commissioner who expressed concern that
7 maybe there was a way licensees could game this
8 process and not really be taking care of safety but
9 just meeting the rules of the process.

10 Did you folks talk about that and do you
11 have any feelings about that?

12 MR. MERZKE: I am not familiar with that
13 concern.

14 (Simultaneous speaking)

15 MR. MERZKE: There's always a concern that
16 licensees are gaming the system quote unquote. We
17 have also concerns that the regions are gaming the
18 system in other areas.

19 We look at that very carefully. We try to
20 adjust the program guidance to make sure that gaming
21 isn't taking place.

22 I'll throw out one example, significance
23 determination process timeliness. That timeliness
24 requirement is 90 days from the time that we document
25 a greater than green inspection finding, a potentially

1 greater than green inspection finding and an official
2 correspondence is publicly available to the time we
3 make that final significance determination.

4 Sometimes that finding isn't officially
5 determined until the choice letter is issued which is
6 already well into the significance determination
7 process. That's an example of gaming the system.

8 Now we'll talk about changes that we're
9 making to the significance determination process to
10 eliminate that potential gaming by creating a metric
11 and ensuring that identification of that performance,
12 that inspection finding is done in a more timely
13 fashion.

14 So we do make program adjustments to watch
15 out for things like that.

16 CHAIRMAN BLEY: Thanks.

17 MR. MERZKE: Sure. That's probably more
18 than I wanted to tell you.

19 (Laughter)

20 CHAIRMAN BLEY: It kind of happens here.

21 MR. MERZKE: It happens. So let's just
22 acknowledge it.

23 The next area that we put some effort into
24 was the substantive crosscutting issue process. The
25 substantive crosscutting issue process was implemented

1 in the ERP in 2006 as part of the Davis-Besse lessons
2 learned effort.

3 Weak safety culture was identified as a
4 root cause of the reactor vessel head degradation,
5 Davis-Besse, and the task force report recommended the
6 staff review inspections and plant assessment
7 processes to determine whether sufficient processes
8 were in place to identify and appropriately
9 disposition the types of problems experienced in
10 Davis-Besse.

11 In an SRM SECY-04011 that the Commission
12 issued the Commission directed the staff to enhance
13 the ROP treatment of crosscutting issues to more fully
14 address safety culture.

15 So, the substantive crosscutting issue
16 process was born. The purpose of the substantive
17 crosscutting issue is to inform the licensee that the
18 NRC has a concern with the licensee's performance in
19 that crosscutting area and to encourage licensees to
20 take appropriate actions before more significant
21 performance issues emerge.

22 Those crosscutting areas in the ROP
23 framework are human performance, problem
24 identification resolution and safety conscious work
25 environment.

1 Safety conscious work environment is
2 defined to be an environment in which workers feel
3 free to raise nuclear safety concerns without fear of
4 harassment, intimidation, retaliation, or
5 discrimination.

6 Staff conducted an effectiveness review of
7 the SCCI process in 2014. There were several
8 conclusions that came out of that effectiveness
9 review.

10 Of those it's difficult to prove that
11 licensee corrective actions that result from
12 identification of SCCI prevented more significant
13 performance issues from occurring. You can't prove a
14 negative didn't occur.

15 But we did also determine that SCCIs are
16 not a leading indicator for declining licensee
17 performance. At the time there were 86 licensees that
18 had moved right in the action matrix indicating
19 declining performance without exhibiting a substantive
20 crosscutting issue.

21 So consequently a working group was stood
22 up to make some changes to the SCCI process. Those
23 changes are -- the most significant changes are listed
24 here.

25 The original threshold for crosscutting

1 theme was four inspection findings for the same
2 crosscutting aspect in a 12-month assessment period.

3 That was pretty low. That means they only
4 needed one inspection finding per quarter with the
5 same crosscutting aspect to what we consider to be a
6 theme.

7 And at the time a crosscutting issue
8 needed two elements. I have a theme and the NRC had
9 to have a concern with the licensee's ability to
10 actually correct that theme.

11 CHAIRMAN BLEY: I have a question.

12 MR. MERZKE: Sure.

13 CHAIRMAN BLEY: I believe the indicators
14 came out. You know, 30 or 40 years ago there was a
15 tremendous amount of effort trying to come up with
16 leading indicators and as far as I could tell to no
17 avail.

18 I've heard rumors that INPO has developed
19 something they think is truly a leading indicator. I
20 don't know if you know anything about it or if you can
21 talk about it if you do, but if you can I wonder if
22 you've heard anything about it.

23 Have you guys given any more thought to
24 leading indicators.

25 MR. MERZKE: Actually I had this

1 discussion yesterday with our staff. Not about the
2 INPO leading indicators. First I've heard of it,
3 although I did meet with a representative from INPO in
4 Vienna a couple of months ago. We had a discussion
5 about more what we could do to adjust the baseline
6 inspection program based on INPO evaluations.

7 So there's some work to be done with INPO
8 and what they're doing. And I think we look forward
9 to that.

10 But the leading indicator issue has not
11 gone away. We know that the Commission is always
12 looking for us to find those leading indicators.

13 I will say that I reviewed the ANO-95003
14 lessons learned report recently and that report
15 concluded that the licensee had declining performance
16 over a period of years that was not captured by the
17 ROP.

18 And there were several indicators from
19 which they made that conclusion. So I'm taking a look
20 at those indicators to see is there a performance
21 indicator that we can generate out of those that would
22 be a valid leading indicator of declining performance.

23 CHAIRMAN BLEY: Of course in retrospect
24 you can always come up with something.

25 MR. MERZKE: It's easy looking back.

1 Maybe there's something there that we can develop.
2 But we're definitely focused on that.

3 VICE CHAIRMAN CORRADINI: If I can go back
4 to conversations with INPO. So they have their own
5 set of evaluations based on operating staff reviews,
6 technician reviews, and they do that on plants on a
7 regular basis.

8 Is there an ongoing conversation with INPO
9 between the NRC and INPO in terms of how they evaluate
10 and how you're evaluating? Because there's a lot of
11 overlap in certain areas.

12 MR. MERZKE: There is overlap but I would
13 not say that there's a regularly scheduled dialogue
14 between the two organizations.

15 We do have different objectives. Ours is
16 to make sure that the licensees operate safely. INPO
17 focuses more on excellence. You know, above and
18 beyond.

19 We do review INPO reports thoroughly when
20 they issue their evaluations. Basically we do that as
21 part of our process and it's formalized in our process
22 in IMC-0305 to review those INPO reports.

23 And that allows us to validate our
24 inspection and oversight processes. Are we seeing the
25 same things that INPO is seeing. If not, why not.

1 VICE CHAIRMAN CORRADINI: So it's more a
2 review of their reports than some sort of ongoing
3 meeting with them to see are there issues that they
4 see that you see.

5 MR. MERZKE: That's correct.

6 MEMBER POWERS: The heart and soul of
7 INPO's operation is a confidentiality between them and
8 the licensee. And I think that's essential for INPO
9 and if they were conducting conversations with the NRC
10 about the licensee with any frankness that would
11 violate that confidentiality to the point of rendering
12 them useless.

13 VICE CHAIRMAN CORRADINI: Thank you. So
14 the reports are the vehicle.

15 MR. MERZKE: Right.

16 VICE CHAIRMAN CORRADINI: Okay.

17 MR. MERZKE: Okay, so back to the SCCI
18 process. Originally they needed to have a theme which
19 was four inspection findings with the same
20 crosscutting aspect in 12 months.

21 And we had to have a concern that the
22 licensee was not going to be able to correct that
23 concern.

24 In order to help us facilitate that
25 determination whether we were confident that the

1 licensee could or could not address the concern there
2 were several questions that were in IMC-0305.

3 For instance, the licensee had not
4 identified or recognized a crosscutting theme affected
5 other areas and had not taken actions to address the
6 theme.

7 Or the licensee recognized the
8 crosscutting theme affected other areas but failed to
9 schedule or take appropriate corrective actions.
10 There were several questions to that effect.

11 Unfortunately the staff found that those
12 were very subjective questions and again were not
13 implemented or interpreted consistently between the
14 regions.

15 So we had some licensees in one region who
16 were getting SCCIs who in another region would not
17 have gotten the SCCI.

18 So in order to fix this the revision that
19 we made to the SCCI process, the first thing we did
20 was we adjusted the crosscutting theme threshold from
21 four findings to six with the same aspect in the 12-
22 month assessment period.

23 We did a lot of data analysis. The
24 licensees that we found had demonstrated performance
25 problems, significant performance issues and the

1 number of crosscutting aspects that they were getting
2 in areas.

3 We found that that threshold of six would
4 have eliminated the false positives we were getting
5 from licensees that really did not have a problem or
6 a performance issue from those that did. So that's
7 why we set the threshold to six.

8 In addition we created a new crosscutting
9 theme level at the area level, the crosscutting area
10 level. And it was created as a backstop.

11 There are 14 crosscutting aspects in human
12 performance area. If a licensee had 5 hits in each
13 one of those aspects they could potentially have 70
14 crosscutting hits in human performance over a 12-month
15 period without ever tripping the theme.

16 So we were like wow, that just would not
17 be right. There's a problem with a licensee that has
18 that many human performance issues.

19 So we set backstop levels, human
20 performance level at 20 hits and problem
21 identification resolution with 12 findings during a
22 12-month assessment period.

23 CHAIRMAN BLEY: Dan let me ask your
24 earlier statement in the other way. You did not find
25 that you needed a high number of crosscutting issues

1 to end up in trouble.

2 But did most of the plants that had high
3 numbers of crosscutting issues actually end up in
4 trouble eventually? It doesn't predict for everybody,
5 but for those who are in trouble, that area, does it
6 lead to other problems. Or have you been able to
7 determine that.

8 MR. MERZKE: It's a challenge because
9 licensees that have significant performance problems
10 issues end up getting increased regulatory oversight
11 in the form of supplemental inspections.

12 And when you put more inspectors and more
13 inspection resources into a licensee you're going to
14 find more findings. And those increase the number of
15 aspects you see.

16 So it's very difficult to say the chicken
17 or the egg which came first.

18 CHAIRMAN BLEY: Fair enough.

19 MR. MERZKE: I hope that answered your
20 question.

21 MEMBER SKILLMAN: Dan, I'm going to ask
22 you if you can to complete within 30 minutes please.

23 MR. MERZKE: Sure. I'll give it a shot.
24 In addition we eliminated the term substantive because
25 we determined that that really put a higher hat on an

1 issue that may not really have been significant.

2 We eliminated the subjective questions to
3 determine a crosscutting issue existed. And now we
4 basically put the criteria out there. The first time
5 they cross a theme or exceed a threshold for a theme
6 we'll document in an assessment letter.

7 The second consecutive time again we'll
8 document it.

9 The third consecutive time they have the
10 same crosscutting theme then we'll issue a
11 crosscutting issue which formalizes the process and
12 require an inspection to close that issue.

13 The impact of those changes. No licensee
14 has been issued a crosscutting issue to date since we
15 made those revisions.

16 For perspective from 2006 to 2013 269
17 substantive crosscutting issues were identified and
18 documented. It was a lot. A lot of effort was going
19 into this.

20 Two licensees have tripped the revised
21 criteria for a crosscutting theme with six findings in
22 the same crosscutting aspect. They were Fort Calhoun
23 and Pilgrim. Again those two licensees with
24 significant performance issues.

25 Four licensees have actually tripped the

1 crosscutting theme at the crosscutting area level.
2 They've hit the backstop either at the human
3 performance or PINR. Again I list those because
4 you'll notice that some of those again have
5 significant performance issues. In the case of Fort
6 Calhoun it's been closed down.

7 And the last bullet, licensees with
8 crosscutting themes are generally plants with
9 performance issues now. We're not seeing the false
10 positives we had before.

11 And also for perspective I looked at all
12 licensees that have had four CCAs based on the old
13 criteria. It's been consistent throughout since the
14 revision six to seven licensees have hit that old
15 criteria, but none of them are getting repeats in
16 subsequent periods.

17 So that indicates that the licensees are
18 fixing their problems, finding them and correcting
19 them, or they didn't have a problem in the first
20 place.

21 The next issue we revised was the
22 definition of degraded cornerstone. The staff
23 submitted a SECY paper 150108 in 2015 recommending to
24 the Commission that we change the definition of
25 degraded cornerstone from yellow input in the action

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1 matrix and two white inputs in the same cornerstone to
2 three white inputs in the same cornerstone.

3 We did this for a number of reasons that
4 were delineated or described in the SECY paper.
5 Basically there was no technical basis for two white
6 inputs resulting in a licensee being in a degraded
7 cornerstone, or that two white inputs was equivalent
8 to one yellow input.

9 We did a probabilistic risk assessment and
10 that concluded that three white inputs was more
11 equivalent to a yellow input.

12 The Commission agreed with us and
13 subsequently approved our recommendation. And in 2016
14 we made that change to the process.

15 And to date no licensee has met the
16 revised definition of degraded cornerstone nor has any
17 licensee met the original definition of degraded
18 cornerstone.

19 We had not had a licensee in column three
20 of the action matrix since Pilgrim in 2014 which is a
21 long period of time for no licensees in column three.

22 But again, no licensee met the original
23 criteria of two whites in a cornerstone. So it might
24 indicate that the licensee's performance is actually
25 improving. I mean that's just a thumbnail

1 observation.

2 MEMBER REMPE: So I am slow but I've been
3 puzzling on it on slide 9. You did a PRA that
4 concluded three white inputs are needed to cross the
5 threshold.

6 What kind of PRA and what was the --

7 MR. MERZKE: We took average risk delta
8 CDFs, delta core damage frequencies. I pulled the
9 risk analysis.

10 MEMBER REMPE: For a particular plant?

11 MR. MERZKE: If you go back to the
12 original development of the ROP the recommendation was
13 as many as five whites would be equivalent to a yellow
14 at the time.

15 And a conservative decision was made by
16 management to make it two.

17 MEMBER REMPE: It was based on a
18 particular plant?

19 MR. MERZKE: Not on a specific plant, but
20 in a generic, in this case an average white finding
21 was change of core damage frequency of $5E-6$. If you
22 get two $5E-6$'s basically you've got the $1E-5$ but that
23 was still -- that didn't cross the threshold for
24 yellow.

25 So even with another -- you're just barely

1 crossing the threshold of yellow.

2 CHAIRMAN BLEY: We actually had a series
3 of meetings with you on this and wrote a letter on
4 this a couple of years ago.

5 MEMBER SKILLMAN: This is where the DPO
6 issue came up and we met with the author of the
7 differing opinion and we ended up writing a letter on
8 it.

9 MR. MERZKE: It was not a change that was
10 accepted by many of the regions. As a matter of fact
11 only one region actually agreed with the proposal.

12 So it was controversial but the Commission
13 basically agreed with the staff.

14 The last topic I have to share with you is
15 the timely resolution of inspection findings. This is
16 an ongoing initiative at this time to improve the
17 timeliness of significance determinations for
18 potentially greater than green findings.

19 Basically it's taking a long time for an
20 event to occur and for the staff to develop the final
21 significance determination that moves the licensee to
22 a different column of the action matrix.

23 I think some studies have been done where
24 as many as 30 percent of greater than green inspection
25 findings were taking over 365 days to resolve.

1 There's always a balance, it's a very
2 delicate balance between coming up with the right
3 significance determination, the correct one, and doing
4 it in a timely fashion.

5 So licensees don't always agree with our
6 assumptions and there's a lot of back and forth
7 discussion over those assumptions. It sometimes takes
8 a lot of time.

9 And sometimes licensees are asking us for
10 more time in order for them to do testing to
11 demonstrate that a degraded component could still
12 fulfill its safety function when we thought it could
13 not.

14 So some of these things just end up taking
15 a long time.

16 ANO brought this to a head with the stater
17 drop and it took well over a year for the staff to
18 finally conclude that the significance of the event
19 was a yellow and moving them to column three at the
20 time, and then the second yellow moved them to column
21 four.

22 So the staff has implemented this new
23 process. It's called inspection finding resolution
24 management. And it's been ongoing through this year
25 and we'll be -- I think the piloting will be completed

1 at the end of the year.

2 The staff will do an effectiveness review
3 in 2018.

4 Basically an inspection finding review
5 board is stood up for potentially greater than green
6 findings to get alignment with stakeholders early in
7 the process to determine what the exact performance
8 deficiency is and the path forward to get that
9 significance done in a timely fashion.

10 We also added a metric to the ROP self-
11 assessment process from the time an event occurs to
12 the time we make a determination or lock down the
13 performance deficiency is the start of the official
14 STP process of 120 days.

15 And to date we've had eight significance
16 determinations meet that 120-day metric. Five still
17 have not.

18 There's some very complicated issues out
19 there which take some time. So we don't expect 100
20 percent.

21 But it's ongoing and there will be an
22 effectiveness review in 2018 to determine if this
23 process is viable and working.

24 MEMBER BALLINGER: Who are the
25 stakeholders? Are there any external stakeholders?

1 MR. MERZKE: No external stakeholders on
2 the finding review board. But there's significant
3 interaction with the licensees, especially with their
4 PRA folks in the development of the performance
5 deficiency and the initial significance determination.

6 That's it for the assessment process. I'd
7 like to turn it over to Jim now and he can talk about
8 what's going on with the engineering inspections as
9 our final topic.

10 MEMBER SKILLMAN: Please do. Thank you.

11 MR. ISOM: Good morning, my name is Jim
12 Isom. I work with Dan in NRR DRS. And the inspection
13 program. And I am on slide 12.

14 So the purpose of me talking to you all
15 today is to bring you up to date since I guess we
16 briefed you last October 2015, our ROP enhancement
17 efforts Dan mentioned.

18 ROP enhancement efforts started in 2012.
19 The report was issued 2014. I came in towards the
20 tail end of that project and I was tasked with making
21 the changes per the ROP enhancement recommendations to
22 one particular procedure. It's called a component
23 design basis inspection. People usually call it CDBI
24 inspection procedure.

25 In the letter it mentions a couple of

1 other programs and I'm only discussing the CDBI aspect
2 just to let you know where this is headed.

3 One of the recommendations we had from the
4 enhancement effort and also from our lessons learned.
5 We do have a lessons learned for every 95003 or every
6 plant that gets a finding was that we as NRC should
7 look at licensees' implementation of some key
8 engineering programs.

9 MEMBER SKILLMAN: It would probably be
10 helpful if you just took a minute and explained what
11 a 95003 inspection is.

12 MR. ISOM: Okay. So if there is a risk
13 significant finding which is the red we do a very
14 comprehensive root cause evaluation inspection that's
15 typically just called a 95003 but it's basically a
16 root cause inspection by us to verify the licensee
17 actually has the organization and ability to identify
18 and correct significant conditions of adverse quality.

19 So like Dan said it's a very resource-
20 intensive inspection. It takes many, many months to
21 complete. So that's what a 95003 is.

22 MEMBER SKILLMAN: Let's go a little bit
23 further for the members. So a 95003 normally involves
24 I'm going to say 16 to 24 inspectors onsite for two
25 weeks. They disappear for a writing period and they

1 come back maybe four weeks later.

2 And so when a licensee finds himself in
3 95003 that licensee is one step away from having the
4 keys taken away.

5 So when we talk 95003 we are talking
6 millions of dollars and the licensees are commonly not
7 able to conduct this inspection or respond to the
8 inspection by themselves. They normally must bring in
9 many contractors.

10 So when Jim talks about 95003 this is not
11 an afternoon affair. This is an affair that will go
12 on for approximately six months and maybe longer.
13 There might be corrective action letters, CALs,
14 confirmatory action letters.

15 So when Jim and Dan talk about 95003 this
16 is basically getting slugged with a baseball bat in
17 the back of your head. This is the ultimate wake-up
18 call because the next step is to lose your keys.
19 Davis-Besse 0350. You're literally not able to
20 operate.

21 So 95003 is the consequence of a 95001 and
22 a 95002 and whammo there's 95003. It is extremely,
23 extremely serious.

24 I'm not sure that the members if they
25 hadn't been through it might not appreciate just how

1 impactful that is.

2 MR. ISOM: They're one column away from
3 being shut down.

4 MEMBER SKILLMAN: You're one column away
5 from being shut down. The next item if it's a
6 significant finding may put you in 0350.

7 MR. ISOM: So one of the results of
8 internal lessons learned from one of our 95003 had to
9 do with a stem and disc separation in the power
10 plants. That was a red finding. It was a fire
11 protection issue but had a major impact on reactor
12 safety.

13 And from that internal lessons learned we
14 were requested that we do a staff review where we
15 should inspect the licensees and key engineering
16 programs like MOV program, equipment qualification
17 program, commercial weight dedication program.

18 So in early 2015 we decided that's a good
19 recommendation. We're going to take that on and we're
20 going to put that in the CDBI inspection procedure.

21 And we convey our intentions with the
22 industry in early 2015 and they engaged and one of the
23 feedback we received was the CDBI is too resource
24 intensive. We've been doing this in one form or
25 another since 2000.

1 We have inspected all the risk significant
2 components at least once at most of the power plants.
3 So can we do a more efficient form but still be
4 effective.

5 And so what we did in calendar year 2015
6 and 2016 is we piloted a shorter version of CDBI. It
7 was a two-week version. Two weeks onsite version
8 versus three weeks onsite.

9 And we separated the program
10 implementation inspection. And the first program we
11 chose was equipment qualification which put that out
12 of the CDBI inspection and we called it a different
13 inspection activity.

14 And that was a one-week inspection
15 activity. And we piloted those inspection activities
16 two per region so in calendar year 2015 and 2016.

17 We took the lessons learned from those
18 pilot inspections, we made changes to our inspection
19 procedures and starting this year we have implemented
20 a shorter version of the CDBI. We have renamed it and
21 we named it design basis assurance inspection. And
22 that was to emphasize that what we want to do is --
23 and those are the two IEPs that I'm talking about.
24 21M is design basis assurance inspection. It's
25 basically a successor to the old CDBI inspection

1 program in two-week format.

2 We renamed it to emphasize to the
3 inspectors that we want to make sure that the design
4 basis is maintained. We don't want the inspector to
5 challenge the original design basis, but make sure
6 that the changes are being made adequately.

7 And then 21N is the program implementation
8 inspection. The first program we are looking at this
9 year is equipment qualification or EQ program or 5049
10 rule.

11 And so the plan with the program
12 inspections, we're going to do it once at all the
13 power plants in the U.S. during the tri-annual cycle.

14 So ROP has tri-annual, bi-annual and
15 annual cycle. We're in one of the tri-annual cycles
16 now so 2017, '18, '19, those three years we'll look at
17 how licensees are implementing their EQ program at all
18 the sites in the U.S.

19 In order to make those changes to the
20 original CDBI procedure one of the feedback we got
21 from the piloting inspection was the inspectors told
22 us they could not perform the EQ inspection in one
23 week. Just the breadth was too much.

24 So we said okay, let's make it two weeks.
25 But in order to make it two weeks we had to take a

1 resource away from another inspection activity because
2 we were trying to make it a resource neutral activity.

3 So we reduced the scope of one of the
4 other engineering inspections called IEP 71117-T. It
5 was basically, it's a two-week inspection which we
6 look at mods and 5059 evaluations.

7 So we made that a one-week inspection and
8 made the EQ inspection to a two weeks inspection.

9 And we got some feedback from the region
10 saying we made the 17T procedure ineffective because
11 really when you look at modifications the mods in the
12 5059 evaluation, that should go together. It just
13 makes sense to do it together and we acknowledged that
14 was a shortfall of the change.

15 But in order to implement the EQ
16 inspection we had to take the resources somewhere. So
17 that conversation, the engineering effectiveness
18 efficiency review which we are currently in, sometimes
19 people call it the holistic engineering review.

20 We said okay, why don't we look at all the
21 engineering inspections that the regions perform, the
22 region-based inspectors. Let's see if we can identify
23 redundancies, inefficiencies built in, or IPs that
24 were really not effective. Let's do it better. And
25 we told them we'd be doing that.

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1 And on this website is our charter as well
2 as all the correspondence and comments we have
3 received from the industry.

4 So these are the procedures that we are
5 looking at and the scope of the review. So they're
6 pretty comprehensive.

7 Now we know some of these are not
8 effective inspection activities like the ultimate heat
9 sink performance inspection which is 07. That's the
10 inspection where we send one inspector out there to
11 the site to look at, make sure the licensees are
12 making the ultimate heat sink performance in
13 accordance with the design.

14 That's a worthwhile inspection to perform
15 but in the current format it's not really producing a
16 whole lot of issues or findings maybe because the
17 licensee is also maintaining the ultimate heat sink in
18 a good manner.

19 So that's one of the procedures we want to
20 modify or make it part of the example of the 21M
21 procedure design basis assurance team inspection.

22 And then the other thoughts are -- other
23 aspects we're considering is can we change the
24 inspection frequency of some of the activities, for
25 example, fire protection and the DBA inspection down

1 to every three years. Is there any reason we can't do
2 a four or perhaps even five to ensure more
3 flexibility.

4 And some of the other areas we're having
5 internal deliberations on, discussions on is fire
6 protection. For most plants that have adopted NFPA-
7 805 we understand that makes the plant much safer by
8 going through that process.

9 So our current thinking is maybe once we
10 inspect the implementation of that license amendment
11 we would stop inspecting NFPA-805 plants. And that
12 would encourage those facilities that have not
13 transitioned to 805 to make that transition. So those
14 are the kind of discussions we're having.

15 And we have actually developed like eight
16 or nine options that deals with all these six
17 inspection procedures. We developed them in June of
18 this year. We discussed them and shared them with our
19 management.

20 Currently we have whittled that down to
21 four recommendations. It hasn't been made public yet
22 but it will be made public next month when we meet
23 with industry.

24 So our view is that once we get comments
25 from industry -- we're also having a meeting next week

1 with industry on the same topic, on this topic to get
2 their additional comments and the members of the
3 public additional comments.

4 And then based on the feedback that we
5 have we're going to finalize our recommendations, make
6 recommendations internally to our senior management
7 within NRC to get their buy-in.

8 Once we get their buy-in we plan to write
9 a Commission paper in the summer of 2018 making
10 recommended changes to the engineering inspection
11 procedures and activities and ask for their approval
12 for the change.

13 So here are some of the meetings that we
14 have. Next one coming up is next week. It's December
15 12 and industry.

16 One of the things industry wants us to do
17 is they want us to give themselves credit for licensee
18 self-assessments.

19 They do them anyway to prepare for
20 inspections so their view is is it possible for us to
21 -- if they do a good enough self-assessment can they
22 give us credit for one of our inspection activities or
23 maybe more. It's not clear exactly what they want.
24 But that's the concept anyway.

25 This is the conceptual stage. We agree

1 with them conceptually but we need to go through all
2 the details like to what standards will you do the
3 licensee self-assessment.

4 Who does them to make sure they're
5 independent and they're quality like NRC inspectors
6 would do. And so we're evaluating that.

7 And that's probably a little bit more
8 long-term project rather than this effectiveness and
9 efficiency review which we're planning to complete, to
10 wrap up sometime next year.

11 So most of the comments received from the
12 public on the licensee self-assessments have not been
13 positive. They don't think we should cut back on our
14 inspection effort and give them credit for licensee
15 self-assessment.

16 So a lot of the comments are coming from
17 areas in the Northeast around Pilgrim. So just to let
18 you know.

19 And we're posting the comments on the
20 public webpage on the proceeding page.

21 MEMBER SUNSERI: I suppose one of the ways
22 you could address that is have an inspection like the
23 resident inspector or augmented inspector come down
24 and observe that self-assessment.

25 MR. ISOM: Yes. Right. If we approved

1 the licensee assessment inspection procedure we would
2 do exactly what you said. And that would validate
3 that it was done in a quality manner.

4 MEMBER BALLINGER: You mentioned Pilgrim.
5 Is that an aberration? Well, Pilgrim --

6 MEMBER STETKAR: Is it unique perhaps.

7 MEMBER BALLINGER: Unique and an
8 aberration.

9 Because Pilgrim has been in -- I could use
10 different words, deep yogurt for some time now.

11 MR. ISOM: I think they're unique I would
12 say.

13 MEMBER BALLINGER: Okay. Because there's
14 a cadre of people or whatever you want to call it at
15 Pilgrim that as soon as Pilgrim disappears as a
16 problem they find another place.

17 MR. ISOM: Yes, there is an anti-nuclear
18 element out there. We acknowledge that.

19 MEMBER RICCARDELLA: I want to ask a big
20 picture question. If one of these engineering
21 inspections were performed at the Fukushima plant
22 before that 211 incident do you think it would have
23 come up with any findings?

24 MR. ISOM: Oh yes. I have confidence in
25 our inspections and our contractor staff. We would

1 have questioned some of the issues like why are some
2 of your breakers below flood level. Issues like that.

3 MEMBER RICCARDELLA: Yes, I guess it had
4 to do with really I think the design basis external
5 events.

6 MR. ISOM: Right.

7 MEMBER RICCARDELLA: And were they
8 sufficient or not.

9 MR. ISOM: Yes. We looked at that. We
10 challenged the design basis even though we may have
11 approved them if they don't think we're incorrect we
12 will challenge that. And if we have to go through
13 backfit we will go through that process.

14 MEMBER RICCARDELLA: Thank you.

15 MEMBER STETKAR: How do you handle things
16 like manmade hazards that evolve over time?

17 MR. ISOM: Like -- and things like that?

18 MEMBER STETKAR: Like somebody built a
19 munitions plant next to my nuclear facility that
20 wasn't there when I was originally licensed. For
21 example.

22 MR. ISOM: That's not within the scope of
23 the design basis assurance inspection. But those are
24 the kind of issues that we expect the resident
25 inspector to raise when we come to the site like are

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1 there any issues that you have that we need to look
2 at.

3 MEMBER STETKAR: Well then how would you
4 -- in answer to Pete's question how would you then
5 raise a concern about flooding at Fukushima where the
6 plant was licensed and it was well within its design
7 basis?

8 MR. ISOM: Because we -- as part of our
9 review if for example flood protection was chosen as
10 an inspection sample.

11 MEMBER STETKAR: They had all the flood
12 protection in the world for their design basis.

13 MR. ISOM: Yes, but we would say okay,
14 what's the basis for the flood height of the wall.
15 Where is that coming from. So we would have questions
16 like that.

17 MEMBER STETKAR: But you don't look at the
18 munitions plant next door because that's not within
19 your scope. I don't get it, quite honestly, and it's
20 not clear to me you would raise the flag at Fukushima
21 for their design basis flooding.

22 You didn't raise flags at U.S. plants for
23 their design basis flooding when they had flood
24 problems until plants had flood problems or Fukushima
25 was flooded. Let's be honest.

1 MR. ISOM: Okay, so I'm not sure --

2 MR. BOWMAN: At Calhoun we did raise
3 inspection --

4 MEMBER STETKAR: After they had the flood.

5 MR. ISOM: For Calhoun we raised the issue
6 before the flood.

7 CHAIRMAN BLEY: You need to get your name
8 on the record.

9 MR. BOWMAN: Greg Bowman.

10 MR. ISOM: So I can send you information
11 on that. We raised it as part of the CDBI. One of
12 the contractors walking down our system says wait a
13 minute, this piping that's coming through this wall
14 that goes to the safety-related room, the flood
15 barrier had deteriorated or missing. And I know it's
16 below flood grade. And he knew that because he worked
17 under the --

18 MEMBER STETKAR: That was before the
19 flood.

20 MR. ISOM: Yes.

21 MEMBER STETKAR: Okay, thanks. I wasn't
22 aware of that.

23 MR. ISOM: That was an unresolved item
24 from that. And the region followed up on that and
25 they said wait a minute, there are other issues out

1 there.

2 And so based on the CDBI effort that
3 resolved, eventually it ended up in a yellow finding
4 before the flood.

5 CHAIRMAN BLEY: Jim, I'd like to pursue
6 John's -- I'll stay with the munitions factory because
7 why not. Let me go ahead with this. Because we've
8 been talking about this with people for a number of
9 years here.

10 I also don't get why this shouldn't be
11 part of the design basis inspection. And kind of all
12 we ever hear is well, either the resident or the
13 licensee will notice this and tell us.

14 It seems way too vague for something that
15 could potentially be a significant new problem at a
16 site.

17 Have you guys actually thought about this?
18 Where does this belong in the regulatory structure?

19 I don't think you can cite to me anything
20 that requires the licensee to tell you. I don't know
21 there's anything that guides the site inspector to
22 tell anybody.

23 Good sense would do that, but it seems a
24 real gap in the things we look at.

25 MEMBER STETKAR: And there are some other

1 subtle things. I use the munitions factory as
2 obviously something that people ought to recognize
3 being built.

4 But there are things, for example if you
5 have a regional airport that expands over the course
6 of years their traffic and the types of air traffic
7 that they have such that they're now handling a much
8 larger number of flights and a different mix of
9 aircraft that have different crash frequencies and
10 things like that.

11 They expand the local highways such that
12 they become a four-lane major thoroughfare that's
13 handling a heck of a lot more truck traffic with
14 hazardous materials, or our rail system isn't really
15 expanding these days but you can also use rails.

16 Those also would challenge the original
17 design basis of the plant which is based on estimates
18 of frequencies of numbers of aircraft takeoffs and
19 landings, numbers of traffic of specific types of
20 materials.

21 And from what we've heard those are never
22 challenged.

23 MR. ISOM: That's correct. That's not
24 within our baseline inspection program scope.

25 MR. BOWMAN: So I think John -- this is

1 Greg. We can take that back as something to look at
2 as part of this.

3 I think you're all aware we had all the
4 work on recommendation 2.2 where this came up
5 previously. So we did assess it at that time.

6 But we can certainly take back the concern
7 and see if -- personally I don't believe that the
8 design basis assurance inspection is the right place
9 for that kind of look because I think you're really
10 looking at whether new information would cause us to
11 backfit a license.

12 I think that's a bit beyond the scope of
13 their inspection. But I would tend to agree with you
14 that there ought to be some --

15 CHAIRMAN BLEY: There ought to be
16 somewhere.

17 Now we recommended when you were setting
18 up the center for excellence for external events that
19 you include human-induced events and we were told no,
20 we don't need to do that.

21 It ought to be somewhere. It really
22 should.

23 MR. ISOM: But just to kind of defend the
24 DBA inspection program a little bit it's focused on
25 ability of the mitigation system to function properly

1 once an event occurs.

2 So to your point we look at increased
3 frequency of external events, initiating events which
4 might drive you to that --

5 MEMBER RICCARDELLA: It just seems like if
6 you're going to review design basis adequacy and
7 demonstrate design basis adequacy you ought to do it
8 as if the plant were being licensed today. Shouldn't
9 you?

10 CHAIRMAN BLEY: Well, I'll take you back
11 to Fukushima. It wasn't when the plant was first
12 designed at least from my understanding that most
13 people over there understood quite the risk of
14 tsunami. But over the years it became clear that
15 there had been tsunamis this big and there's a long
16 history of identifying where they'd come.

17 And sometime over that period it would
18 have been reasonable to say we know more now and the
19 design basis ought to change.

20 But given what you just said I'm not sure
21 how that would have been picked up if it were here.

22 MEMBER REMPE: Didn't we hear from Dick's
23 research review that the staff is working with USGS
24 and EPRI to do some sort of partial review.

25 Although they're not taking over the

1 burden from the licensee to update their design basis
2 threat but they're going to be monitoring that.

3 I thought that was --

4 CHAIRMAN BLEY: For external events.
5 That's what the center of excellence is supposed to be
6 doing.

7 MEMBER REMPE: It won't cover munitions
8 factory but for some of the external events --

9 CHAIRMAN BLEY: It won't do anything
10 that's manmade.

11 MEMBER REMPE: Yes, right.

12 CHAIRMAN BLEY: On purpose. And we don't
13 know how well it's going to do the other but we will
14 certainly check up on it.

15 MEMBER SKILLMAN: To the exact point that
16 John and Dennis raised I recall when we were writing
17 our letter on 2.2 we identified this and got feedback
18 on our discussion of how the plants would be
19 interacting with the local community to stay abreast
20 of changes that might present an external threat.

21 CHAIRMAN BLEY: That seemed more of a hope
22 than a requirement to me.

23 MEMBER SKILLMAN: But I believe we made a
24 recommendation along those lines.

25 CHAIRMAN BLEY: Oh yes.

1 MEMBER SKILLMAN: So we've not been silent
2 on this. But I think the lens is becoming thicker and
3 our clarity is getting better asking that this be
4 acted on. And that's what we're hearing here.

5 MEMBER REMPE: Could I ask a different
6 question?

7 MEMBER SKILLMAN: Sure. I'd like to be
8 mindful of time because Derek and I have some good
9 stuff for you.

10 MEMBER REMPE: But one thing I haven't
11 heard you guys discuss today is what's happening with
12 the direction the commissioners gave you to take the
13 SAMGs and review them as part of the ROP.

14 And I know we've discussed that in the
15 past. It's been over a year since we've asked you
16 what's happening on that.

17 MR. BOWMAN: This is Greg Bowman of DRS.
18 I think this is -- it's not these guys who are doing
19 that. We can get back to you with more information.
20 I don't think we have the right people in the room
21 here to answer that.

22 MEMBER REMPE: I'm just curious on what's
23 happening.

24 MR. BOWMAN: We've been doing work to --
25 I risk giving you information that's not entirely

1 accurate. So we'll get back to you on that.

2 But we have been doing work to update
3 inspection procedures to first ensure that the SAMGs
4 are updated to the owner's group guidelines and then
5 establish on a periodic basis that as they're updated
6 in the future that those updates are reflected in
7 site-specific SAMGs.

8 So those are things that we're putting
9 into existing inspection procedures. I don't have a
10 status update on that. That's not something the three
11 of us are directly involved in. I'm just semi aware
12 from my time in JLD.

13 MEMBER REMPE: Because yes, my
14 understanding is that there's generic stuff coming out
15 of the owners groups but they really need to have
16 plant-specific implementation.

17 MR. BOWMAN: And the generic guidance for
18 the PWRs was a couple of years ahead of that for the
19 BWRs just because of the work the BWRs were doing on
20 the hardened vent that feeds into the SAMGs.

21 So there was sort of a staggered timeline
22 for the two different types of reactors. I'm just not
23 exactly sure where things are with that. I haven't
24 gotten a recent update.

25 MEMBER REMPE: Okay, thank you.

1 MEMBER SKILLMAN: Jim and Dan, thank you
2 very much. I would like to present one idea. I'm
3 going to ask my colleagues to do the same if they wish
4 to for the information you've presented.

5 When you mention that you're going to look
6 at the 95003 inspection for ANO in the lessons and the
7 discovery at some level that there had been lingering
8 issues for years that might lead to a discussion
9 regarding leading indicators.

10 I for one would like to hear about that.
11 But I would like to suggest that with the experience
12 that exists around this table perhaps a discussion
13 about what we think, members think individually about
14 leading indicators might be a very fruitful
15 discussion.

16 Between those of us around the table we've
17 got a lot of insights based on the journeys that we've
18 all had in our careers.

19 And there might be some value in an
20 information briefing with a couple of hours of
21 discussion. We've got individuals who've run plants,
22 been in executive positions for plants, been deep in
23 the bowels of the plants for years who went from the
24 SALP to the ROP and who know industry the lingo and
25 maybe where the skeletons are.

1 And that information might be very useful
2 in trying to put together some leading indicators.

3 MR. MERZKE: Yes, sir, I agree. I think
4 your experience and knowledge would be invaluable in
5 developing an indicator like that.

6 MR. BOWMAN: This is Greg Bowman of DRS.
7 We'll work with Derek to get on your calendar at some
8 point. I think we would get a lot from your insight.
9 Talk about what we're thinking, what you're thinking.

10 MEMBER SKILLMAN: And I'm going to suggest
11 first quarter of 2018 because we might be losing key
12 members and the insights from those members may be
13 particularly valuable.

14 MEMBER RAY: Dick, I apologize to
15 everyone. I had to go to the badging office at 9
16 o'clock and I missed the discussion that just
17 occurred.

18 But looking through the presentation and
19 piggybacking on what you just said I didn't see any
20 reference to a performance in accordance with appendix
21 B as being a leading indicator.

22 And yet it's one of the most --

23 MEMBER SKILLMAN: Critical.

24 MEMBER RAY: Well critical, or it's one of
25 the things that you can look at in advance of bad

1 things happening and see the requirements of that
2 regulation aren't being met.

3 And inevitably I think it leads then to
4 other problems that concern us in terms of
5 consequences.

6 So that would be my addition to what Dick
7 just said is in my experience and I've as he said had
8 a lot of it if somebody disregards the requirements of
9 appendix B where they apply they often are not looked
10 at. The owners groups don't like it to be looked at
11 because they feel it's not significant unless it has
12 consequences.

13 I think it's significant as a leading
14 indicator.

15 MR. ISOM: Thank you.

16 MEMBER SKILLMAN: I concur with Harold and
17 I add to that work management and material condition
18 of the plant, enforcement of maintenance rule. Put
19 those together I think you've got the indicators you
20 need.

21 With that --

22 CHAIRMAN BLEY: Since we're getting on the
23 record with our thoughts on this thing -- but they're
24 from individual members I move to say a lot of -- I've
25 seen over the last 40 years a lot of fairly smart

1 people and experienced people give this a whirl.

2 Every one of the ideas they came up with
3 sounded pretty reasonable. And not one that I've seen
4 has really proved out as a genuine leading indicator.
5 So some care is required before we move forward.

6 MEMBER SKILLMAN: Thank you, Dennis. Jim
7 and Dan, you're completed with your task. You're
8 welcome to stay for the information that Derek and I
9 will --

10 MR. MERZKE: Thank you for the invitation.

11 MEMBER SKILLMAN: With that I'm going to
12 transition to the slide package that you have in front
13 of you and Derek's going to operate the slides and
14 we're going to jump right into this because we've only
15 got about 50 minutes remaining.

16 CHAIRMAN BLEY: If Derek does a slide a
17 minute he might get close to done.

18 MEMBER SKILLMAN: Slide 2. Dan explained
19 this earlier. Notice at the bottom the crosscutting
20 areas, the three human performance, BNIR, and safety
21 conscious work environment. Those three were born out
22 of the Davis-Besse head event in 2002.

23 The cornerstones that we learned to live
24 with, this is the -- if you will the replacement of
25 SALP, the systematic assessment of licensee

1 performance. This is the new ROP from about the year
2 2000 and the cornerstones are initiating events,
3 mitigating systems, barrier integrity and emergency
4 preparedness.

5 Notice that the four greens feed reactor
6 safety. The two yellows or oranges, the public
7 radiation occupational radiation are the radiation
8 safety. That's really 10 CFR 20.

9 And then security, the blue on the right
10 is safeguards. An awful lot of that information is
11 SUNSI but that's the protection of the plant.

12 All of the information from those seven
13 cornerstones feed to the three key areas of reactor
14 safety, radiation safety and safeguards and ultimately
15 to the mission of the NRC which is to protect the
16 public.

17 So the reactor oversight process is
18 focused on these major themes. Next slide.

19 At a very basic level each of the
20 cornerstones has its own assessment. And those
21 assessments are conducted with the residents onsite
22 and they're in their supplemental inspections, the
23 event reports and so on.

24 Those feed up to the enforcement block,
25 the assessment process. I would just make this one

1 comment. When there is a finding very often the site
2 or the people at the site communicate with the region.

3 And the people at the sites are normally
4 in contact with their own PRA experts within the
5 utility. And those PRA experts will communicate with
6 the region PRA resource.

7 And between those two if there's an
8 emergent issue at the plant the site people and the
9 region PRA people will discuss what is the
10 significance of this.

11 And that really begins the process of what
12 have we found, what does it mean, and what do we do
13 with it. Next slide.

14 How many plants are in the target? It's
15 101. This is calendar year 2015 and 2016. We had a
16 couple of plants fall off. But basically it's 101 and
17 that includes Watts Bar 2. It's really 100 plus 1 so
18 it's 101.

19 So region 1, that's the northeast part of
20 the country and the center for that is King of
21 Prussia, Pennsylvania.

22 Region 2 is down in Atlanta. Region 3 is
23 out of Chicago. And region 4 is where we visited in
24 Dallas.

25 So for these colors, green. Charlie, you

1 asked about green. This is the risk assessment for
2 green.

3 They find a finding so say it's us at the
4 site. We say goodness gracious, it's a feedwater
5 item, it's a feedwater valve that's been isolated.
6 What's the CDF assigned to that particular event.

7 They do a review and you say golly, it's
8 less than 10^{-6} it's green. Or you might say it is a
9 closed suction valve for decay heat removal. That
10 might bump you up into white where for that time
11 period for that event you have a CDF that's between
12 greater than 10^{-6} and less than 10^{-5} . And so it goes.

13 If you find holy smoke all of your ECCS
14 disabled for nine months and you didn't realize it
15 you're probably up in red.

16 So it's a graded approach for the color of
17 the finding. But there's a surprise.

18 Green is a finding of very low
19 significance. Greater than green is a security event,
20 but its color is not described. The greater than
21 green security could be yellow, red, or white. But
22 for SUNSI reasons the security event color is not made
23 public. So there are really five categories. Green,
24 greater than green, white, yellow and red.

25 And in all cases the color is based on the

1 delta LERF and delta CDF that's on the prior slide.

2 VICE CHAIRMAN CORRADINI: Not for blue.

3 MEMBER SKILLMAN: There's no blue.

4 VICE CHAIRMAN CORRADINI: There's a blue
5 greater than green.

6 MEMBER SKILLMAN: That's called greater
7 than green.

8 VICE CHAIRMAN CORRADINI: It's blue on the
9 screen. What about that? That's not a risk
10 calculation.

11 MEMBER SKILLMAN: Yes, sir. It is.

12 VICE CHAIRMAN CORRADINI: It's not
13 calculable because if it is then -- I thought it
14 wasn't calculable. It wasn't being calculated.

15 MEMBER SKILLMAN: You are accurate, sir.
16 No argument. That will be an assessment for the
17 significance of that finding greater than green.

18 All right. 2015. We're reaching back
19 because the data is trailing data. Okay, how many
20 reds were there and in which of the seven
21 cornerstones.

22 And there are the data. You can see --
23 you just might kind of keep in mind about how many
24 findings there are because this is relatively
25 consistent from 2015 into 2016.

1 The industry seems to have a cadence and
2 it kind of follows that cadence.

3 Notice that the greater than green were 12
4 in 2015 and there are the data.

5 Notice in '16 greater than green was four,
6 significant decrease in the security greater than
7 greens.

8 And the other numbers are at approximately
9 the same order of magnitude.

10 MEMBER KIRCHNER: So Dick, I noticed just
11 looking quickly at the material you've given us most
12 of the findings appear to be in initiating events,
13 mitigating systems. So what is that telling you? In
14 terms of trends and such.

15 MEMBER SKILLMAN: It tells me that the way
16 the inspections are being conducted and --

17 MEMBER KIRCHNER: That's a leading
18 question.

19 MEMBER SKILLMAN: It tells me that the
20 inspectors are down in -- probably in mitigating
21 systems it's probably design issues relating to
22 hardware. Initiating events is probably perhaps
23 operating procedure type issues. You'd have to get
24 into the inspection details to really if you will give
25 the forensics for why the numbers are what they are.

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1 For calendar year '15 and '16 at Arkansas
2 1 and 2, the pair, there are two each for initiating
3 events and for mitigating systems and one event at
4 Oyster Creek in 2015, mitigating systems. There will
5 be some details to follow.

6 MEMBER STETKAR: But in a sense those
7 aren't -- the ANO things aren't four separate events
8 aren't they? It's one thing that gave them two yellow
9 findings at each unit.

10 MEMBER SKILLMAN: And they carried it two
11 years.

12 MEMBER STETKAR: Yes. But I mean it's
13 just been carried through. It's not as if four things
14 have cropped up separately in Arkansas. It's a
15 continuation of the yellow findings from that state.

16 MEMBER SKILLMAN: What it is is as Dan
17 said earlier once they got into the inspections they
18 found more issues related to those two events.

19 MEMBER STETKAR: They found flooding
20 issues. They found offsite power.

21 MEMBER SKILLMAN: That's correct.

22 MEMBER STETKAR: But it's all derived from
23 that single event.

24 MEMBER SKILLMAN: That's correct.

25 MEMBER STETKAR: At both units.

1 MEMBER SKILLMAN: At both units.

2 MEMBER STETKAR: What I'm trying to make
3 a point is at Oyster Creek it's one event.

4 MEMBER SKILLMAN: That's correct.

5 MEMBER STETKAR: This is not necessarily
6 four separate events.

7 MEMBER SKILLMAN: They are related to the
8 original event.

9 MEMBER STETKAR: This is bookkeeping in
10 terms of tracking stuff over two years.

11 MR. WIDMAYER: Well and not only that, but
12 if Dick had asked me okay, rather than make a chart of
13 the number of plants make a chart of the actual number
14 of findings I can't do it. I mean there's lots of
15 them.

16 MEMBER SKILLMAN: We'll get into
17 permutations and combinations and derivatives of one.

18 But in a way you're right, John. For the
19 two events at Arkansas 1 and 2 those were actually
20 four. And the ones in '16 are derivatives of the 2014
21 drop.

22 MEMBER STETKAR: Just because it's a
23 public meeting I'm trying to make the point that
24 counting up things, you can be misled if you say
25 Arkansas Nuclear 1 has had four events in two years.

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1 It's not that. It had one event that the regulatory
2 oversight process is now tracking as two findings at
3 each of two units and they've stretched out over time.

4 MR. WIDMAYER: Thus the follow-on slides.

5 MEMBER SKILLMAN: Let's proceed because we
6 tried to clarify that. This is historic. The
7 standard drop was early in '14 that resulted in the
8 flooding and the loss of offsite power. This placed
9 Arkansas into column four. And they planned to do a
10 95003. So this is historic.

11 MEMBER RICCARDELLA: It's kind of
12 interesting. Getting back to what Harold said about
13 QA. The standard drop was clearly a quality assurance
14 problem. They had a bad engineering calculation that
15 wasn't strong enough.

16 But if you hadn't had that the inspection
17 wouldn't -- the normal course of inspections wouldn't
18 have turned up these other things. It's somewhat
19 serendipity.

20 MEMBER SKILLMAN: That's why Dan said when
21 they did the 003 they discovered that there were
22 longstanding years before problems at that site.
23 Hence the question about leading indicators.

24 That's I think what was very important
25 about what Dan said and why Harold might have picked

1 up on that.

2 And you can know that. That's information
3 that you can discover if you can if you will smell the
4 culture at that plant.

5 And I say that unreservedly. Those who go
6 to these sites and who come to these sites a lot, you
7 can smell it. You detect it very quickly.

8 So into 2014 they've got an unplanned
9 scrams. Just a number of issues that are identified
10 here.

11 MEMBER KIRCHNER: So not to be defensive
12 on the part of the utility, but what does it say about
13 the inspection process? I'm going back to slide 10.

14 So as a consequence of having this
15 incident obviously it attracted a lot of attention,
16 more thorough inspection and such, and now all of a
17 sudden you have 100 flood barriers that are
18 inadequate.

19 How long had they been inadequate?

20 MEMBER SKILLMAN: Great question.

21 MEMBER KIRCHNER: Right. But why didn't
22 the inspections pick this up sooner?

23 MEMBER SKILLMAN: I suspect it's because
24 they didn't do design basis inspections or other types
25 of inspections.

1 MEMBER KIRCHNER: I'm just making an
2 observation. It's not just the applicant or the
3 utility but also raises questions about past
4 inspection practices.

5 MEMBER MARCH-LEUBA: One more question is
6 how many other plants have 100 flood barriers
7 inadequate.

8 MEMBER STETKAR: You raise that but again
9 we're talking about today post Fukushima. I suspect
10 that number is few because people have been looking at
11 flood barriers.

12 Now, the other thing that people aren't
13 looking at that we're going to catch the next time
14 something funny happens.

15 MEMBER MARCH-LEUBA: The munitions plant.

16 MEMBER STETKAR: Is we don't know the
17 answer to that because people haven't been looking for
18 that other thing.

19 MEMBER RICCARDELLA: Someone once said
20 prediction is difficult, especially of the future.
21 That sounds like Mark Twain.

22 MEMBER SKILLMAN: Slide 12. It was the
23 one item having to do with the EMRVs and solenoids
24 back in 2015.

25 Slide 13. Now we've gone from yellows to

1 whites. And for 2015 there were two plants with
2 initiative events, cornerstones, two different at
3 Pilgrim and so on from the slide there.

4 Six plants with mitigating systems. Four
5 with emergency preparedness and one plant with
6 occupational radiation safety concerns.

7 Just looking at several of these at
8 Pilgrim in 2013 there was a white PI and initiating
9 events. And in two quarters in '13.

10 In 2015 at Pilgrim it was a white finding
11 in mitigating systems and a green finding in
12 mitigating systems. Next slide.

13 It was a white at Palisades. It was the
14 effective dose equivalent external dosimetry during an
15 outage that they had. There was one at Duane Arnold
16 regarding coatings that had to do with processes.
17 Next slide.

18 And two whites at Fort Calhoun. You see
19 at the bottom there 56 uncorrected greens at Fort
20 Calhoun. We've got a backup slide for that.

21 But when one pulls the thread one sees
22 that there is an awful lot of work at Fort Calhoun
23 that has needed attention for a long time. So it's
24 not surprising that Calhoun's been in the regulatory
25 position that they have been in.

1 MEMBER RAY: Notice both of those cite
2 appendix B which is almost universal that when you
3 want to write a violation you cite appendix B but of
4 course you never inspect appendix B because that
5 annoys people.

6 But it's the standard citation basis is
7 appendix B, failure to comply with appendix B. But
8 the inspection that is the leading indicator kind of
9 thing you see very, very little or none inspections of
10 appendix B.

11 MR. WIDMAYER: I think it's also probably
12 accurate but Fort Calhoun was licensed prior to the
13 standard review plan becoming a standard for review of
14 the licensing of the plants.

15 So I think the standard review plan is
16 much more rigorous approach. Just cite that.

17 MEMBER SKILLMAN: And building on what
18 Harold said not just appendix B but criterion 3 design
19 control.

20 It is that combination that is so often
21 the debilitating event in the inspection.

22 MEMBER RAY: Well it's the easiest thing
23 to cite to, but actually I would say that organization
24 is problematic also although you rarely ever see a
25 citation to organization.

1 MEMBER SKILLMAN: And it's overlooked.
2 You're right.

3 MEMBER RAY: But the independent review
4 which is part of organization, not criterion 3, I
5 don't think any plants comply with that anymore.

6 MEMBER SKILLMAN: Next slide, please.
7 Okay we're getting into oversight process for calendar
8 year '16.

9 The whites have been reduced to six
10 plants, five plants with mitigating cornerstone
11 issues. You can see them listed there. And one with
12 emergency response. Next slide.

13 The security cornerstone. I thought it
14 was appropriate we talk a little bit about security
15 and a little bit about fitness for duty because they
16 really are part of this culture that we are part of.

17 So the inspectable areas of the security
18 cornerstone are shown in this slide. Hard to read.
19 Let's go on to 19.

20 For calendar years '15 and '16 a finding
21 of greater than green means that finding could be
22 white, yellow, or red.

23 There were 12 plants in that category in
24 2015, 4 plants in that category in 2016.

25 So greater than green is not new, it just

1 means that the finding isn't green, it's greater than
2 green. The details are SUNSI. They are reported to
3 Congress.

4 And we see that the greens have reduced
5 from 54 in calendar year '15 to zero in calendar year
6 '16.

7 VICE CHAIRMAN CORRADINI: I guess I don't
8 understand that last bullet. I don't understand the
9 last bullet at all.

10 MR. WIDMAYER: We're talking about green
11 findings now, not greater than green findings. Green
12 findings.

13 And they've been reduced from 54 in '15 to
14 zero in calendar year '16.

15 MEMBER SKILLMAN: You'll see it on the
16 slides. We've got the data for that.

17 MEMBER KIRCHNER: What's the takeaway.
18 What does that mean?

19 MEMBER SKILLMAN: The takeaway for me is
20 that the plants have really tightened up in their
21 security area. That tells me that the plants have
22 probably in the post 9/11 era have finally developed
23 a discipline that is --

24 MEMBER KIRCHNER: So if we went back and
25 looked at prior year data when the security

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1 inspections were first implemented we would see just
2 a rapid decline to zero.

3 MEMBER SKILLMAN: If you look at slides 7
4 and 8 you will see that data.

5 CHAIRMAN BLEY: I've got to toss in my own
6 personal view on this.

7 MEMBER SKILLMAN: Sure.

8 CHAIRMAN BLEY: At the level we're going
9 through I don't really trust anything I learn. Where
10 I learn is going into individual events and
11 understanding exactly what happened and exactly what
12 the problem was and exactly what the proposed solution
13 is.

14 At this level I just don't have a hint of
15 that kind of information.

16 MR. WIDMAYER: And part of the challenge
17 is that we can have a secure meeting, we can have a
18 non-public meeting and discuss the security issues and
19 get a better answer.

20 CHAIRMAN BLEY: Not just security. All of
21 --

22 MEMBER SKILLMAN: -- vast majority of the
23 other events.

24 MR. WIDMAYER: Well, we picked the most
25 significant ones to discuss in some detail. Like I

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1 said if we got into trying to figure out what was
2 going on in green. I mean we could use the whole day
3 if you want.

4 MEMBER SKILLMAN: Maybe more than that.
5 Maybe Dennis's question begs an answer around how
6 often we discuss this as a committee. Because this is
7 the real data that is the heartbeat of the --

8 MEMBER STETKAR: Data is not the point is
9 what Dennis is trying to --

10 MEMBER SKILLMAN: Yes, I got that. The
11 details.

12 MEMBER STETKAR: Understanding why is ANO
13 in trouble and why have they continued to be in
14 trouble. What's really going on there. That's
15 important I think for this committee to understand.
16 Not numbers and spreadsheets.

17 MEMBER SKILLMAN: We can do that and the
18 way I would propose that we do that is to get into
19 that 95003 inspection that came out of the event and
20 discuss those details in a closed meeting.

21 CHAIRMAN BLEY: I think it would be useful
22 to have --

23 MEMBER POWERS: Dennis, I thought the
24 whole purpose of this was to identify those things
25 that we would like to plunge into the details. That

1 this was a grand overview by intent. That it was not
2 supposed to ferret out the details or explain the
3 details. It was simply to give us an overview to
4 identify things we want to know more about.

5 CHAIRMAN BLEY: That's a reasonable
6 interpretation. I don't think we discussed how it was
7 going to play out ahead of time.

8 For me it would be useful to find a few
9 and go into them.

10 MEMBER POWERS: But this is not the place
11 to do it.

12 MEMBER SKILLMAN: When we did this two
13 years ago or whatever it was we were at the 50,000
14 feet level which is where we are now. And if we want
15 something different we can do that.

16 CHAIRMAN BLEY: That's what I suggest.
17 We'll talk about that.

18 MEMBER SKILLMAN: But the template of this
19 meeting has been let's talk about the data and if we
20 want to dig more deeply into that data we can
21 certainly do that.

22 VICE CHAIRMAN CORRADINI: Not to belabor
23 the point, but at least in this area to the extent
24 that these things affect safety I care. If they don't
25 affect safety I don't think it's in our purview.

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1 MR. WIDMAYER: That's correct, yes. But
2 that's hard to say without digging into the details.

3 MEMBER MARCH-LEUBA: By definition the
4 effect of the quality frequency to be yellow and white
5 --

6 VICE CHAIRMAN CORRADINI: But that's why
7 I asked whether this was a qualitative or a
8 quantitative calculation. If it's a qualitative
9 calculation then I'm not so sure.

10 But my only point is I think we've had --
11 well I don't know, a handful of meetings over the last
12 12 years.

13 But the underlying theme is it has to
14 overlap and affect safety to the extent that we really
15 have -- that's where our expertise lies. At least
16 that's where my expertise I think lies.

17 MEMBER SKILLMAN: I'm the guy that said
18 hey Derek I think we ought to present security and
19 fitness for duty. And I believe from my 50 years the
20 next two topics are as safety intensive as any other
21 technical topic we deal with.

22 CHAIRMAN BLEY: Let's go ahead with them.

23 MEMBER SKILLMAN: So notice table 2 is
24 commercial nuclear power plants. Table 3 is fuel
25 plants.

1 Table 2 is what's going on where the
2 cooling towers are. Table 3 is going on where the MUF
3 is.

4 And in 2015 205 inspections. You can see
5 the data. None of the findings were greater than
6 security level 4 which means that they were all low
7 level.

8 Greater than security level 4 is if you
9 will safety security.

10 And same with the fuel cycles. These do
11 not include force on force. There was one in 2015
12 that was greater than security level 4. I don't know
13 what the data is. But just to point out the numbers.

14 MEMBER BROWN: Dick, what's MUF again?

15 MEMBER SKILLMAN: Material unaccounted
16 for. That's u-235 that's not accounted for. Slide
17 21.

18 This is force on force. Twenty-two
19 inspections in 2015. Every force on force is a double
20 and so there should be 44 total regarding exercises
21 and the findings.

22 Notice that on 2015 there was just one
23 ineffective exercise. There were 26 inspection
24 findings. None were greater than level 4 in 2015.

25 CHAIRMAN BLEY: Do we have any good hint

1 of what an ineffective or -- like the one above that,
2 uncertain exercises.

3 MEMBER SKILLMAN: What is an ineffective
4 exercise. And there's the definition. It's
5 ineffective implementation of its protective strategy.

6 MR. WIDMAYER: These are actually not
7 definitions. This is a description, a SUNSI
8 description of what the inspection finding actually
9 was that caused them to make this determination.

10 So there's a lot of different reasons
11 you'd have an ineffective -- no, this is the non-SUNSI
12 determination.

13 MEMBER SKILLMAN: This is from the NUREG
14 report that is released.

15 MR. WIDMAYER: Correct. So we're not
16 allowed to know where and when it happened but this is
17 what it is.

18 MEMBER BROWN: Does inability or
19 ineffective, does that mean the bad guys got in?

20 CHAIRMAN BLEY: I don't think we can talk
21 about that.

22 MEMBER BROWN: Well, like where it is or
23 who it is or whatever, but I mean I guess I'm just
24 trying to get an understanding what an ineffective
25 exercise is.

1 MEMBER SKILLMAN: Let's just leave it the
2 way it's written there. Again, I told Derek I think
3 it would be constructive for the members to know what
4 this information looks like. We can probably talk
5 about it offline sometime.

6 MEMBER DIMITRIJEVIC: I have a more basic
7 question. There is a table on page 7 also for 2015.
8 And I was wondering how this compares because here we
9 have 56 green findings and on page 20 says one of one
10 green findings in 2015. So why do we have --

11 MR. WIDMAYER: The chart is the number of
12 plants. The page 7 is the number of plants.

13 MEMBER DIMITRIJEVIC: Oh number of the
14 plants with the green findings. I see.

15 MR. WIDMAYER: And the details are the
16 actual, that's the number of findings. Doesn't tell
17 you which plant.

18 MEMBER DIMITRIJEVIC: I see. All right.

19 MEMBER SKILLMAN: Okay. Slide 23, please.

20 In 2016 there were 189 security
21 inspections that were conducted. These were on
22 commercial nuclear power plants, not force on force.
23 Fourteen on fuel plants.

24 There were six in 2016 that were greater
25 than security level 4. And the fuel plants none.

1 Slide 24. Force on force. You can see
2 that there were 21 total force on force in '16, two
3 per, that would be 42 exercises. And there are the
4 data for those 42 exercises.

5 MEMBER DIMITRIJEVIC: I thought we had no
6 green findings in 2016 because we had the zero plants.
7 It's tough to follow some of this.

8 We say that when we went to zero plants on
9 page 8 and now we said we had 117 green findings in
10 2016.

11 MR. WIDMAYER: I can't really say but this
12 is just the number for the force on force. I can't
13 really say why --

14 MEMBER DIMITRIJEVIC: This was the number
15 without force on force. I'm looking on 22. So for
16 the commercial nuclear plants 2016 117 total number of
17 green findings.

18 MR. WIDMAYER: Yes, I can't --

19 MEMBER DIMITRIJEVIC: And when I go to
20 page 8 says number of the plants with green findings
21 zero.

22 MR. WIDMAYER: I can't explain that to
23 you.

24 MEMBER DIMITRIJEVIC: Okay.

25 MEMBER SKILLMAN: We are not attempting to

1 reconcile all of the data. I was trying to make sure
2 that the committee understands what the heartbeat of
3 the oversight program is providing.

4 MEMBER DIMITRIJEVIC: Because we made the
5 statement that it was big improvement. That's only
6 why I'm sort of looking at this. We said there were
7 zero plants.

8 MEMBER POWERS: We will never get through
9 this if we continue to crosscheck. This is a
10 qualitative understanding of what has happened at the
11 plants.

12 MEMBER SKILLMAN: Let's keep on going.
13 Crosscutting issues. This is probably the most
14 important area for '15 and '16.

15 The crosscutting issues if you recall came
16 out of the Davis-Besse environment. And crosscutting
17 means that you have a number of if you will adverse
18 findings that give an indication if you will of site
19 culture.

20 At Duane Arnold it was consistent process.
21 This was initiated by the recognition of the failure
22 of the coatings in that containment. They failed to
23 control the application of the coating and the
24 coatings when failed could compromise the suction
25 strainers for emergency cooling which is why this

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1 became crosscutting for Duane Arnold.

2 Twenty-eight, Monticello. This had to do
3 with conservative bias. It had to do with the
4 calculations regarding flooding at the site.

5 MEMBER RICCARDELLA: Do you mean lack of
6 conservative bias?

7 MEMBER SKILLMAN: Correct.

8 MEMBER RICCARDELLA: Okay.

9 MEMBER SKILLMAN: Lack of conservative.
10 And if you read the documentation it wasn't just
11 there. Throughout the site there was this I don't
12 want to say cavalier, but there was not a conservative
13 bent toward decision-making.

14 Twenty-nine is Prairie Island
15 documentation. And this item was closed.

16 Thirty. And in 2016 there were no new
17 open issues identified for crosscutting.

18 Thirty-one. Okay, on the lefthand column
19 you see the safety cornerstones. There are seven that
20 Dan explained earlier.

21 And you can see the performance
22 indicators, the PIs that are related to the safety
23 cornerstones.

24 Slide 32. So for 2015 and '16 green is
25 all the performance and cornerstones objectives are

1 met. White means they're outside of expected nominal
2 but related cornerstones objectives are met. And
3 yellow and red are showing reductions in safety
4 margin.

5 Thirty-three. There are eight plants with
6 white cornerstones in calendar year '15. At
7 Fitzpatrick this had to do with unplanned power
8 changes in 7,000 critical hours. Seven thousand is a
9 nominal operating year.

10 And if you do the arithmetic you find that
11 there were probably down powers or other power
12 affecting transients prior to the first quarter of
13 2015. Hence late 2013 into 2014 that would cause that
14 performance indicator to be high in the first quarter
15 of '15.

16 And then as the second quarter of '15
17 emerged the prior data fell off, causing the product
18 to be reduced and so on into the fourth quarter.

19 And the white threshold is greater than
20 six. So this is Fitzpatrick.

21 Next slide is Riverbend. Same type of
22 metric but it's unplanned scrams with complications.

23 Thirty-five, Salem 1 and Dresden. Same
24 kind of data. Notice Dresden seemed to have a more
25 difficult time having this performance indicator

1 decrease, meaning they were probably dealing with
2 something in mid to late 2014, in early 2015 that kept
3 that number from continuing to decrease.

4 MEMBER BROWN: Do you have fractions of
5 unplanned scrams? So we're dividing by --

6 MEMBER SKILLMAN: It's x/y.

7 MEMBER BROWN: So it's per hour. I guess
8 I don't understand the metrics.

9 CHAIRMAN BLEY: It's actually per year.

10 MEMBER POWERS: And there's a three-year
11 integration period.

12 MR. WIDMAYER: It's per four quarters.
13 Per the previous four quarters.

14 MEMBER SKILLMAN: It's a rolling average.

15 MEMBER BROWN: Okay. Now you can come up
16 with fractions.

17 CHAIRMAN BLEY: Mike, you weren't around
18 and Charlie in this business but back in the seventies
19 3.7 a year wasn't far off. Some people did a fair
20 amount more than that.

21 MEMBER POWERS: But unplanned scrams with
22 complications is a flag.

23 CHAIRMAN BLEY: That's a leading
24 indicator.

25 MEMBER POWERS: Well, I don't know how

1 leading it is. I think it's probably the product of
2 a lot of things. But it's certainly unusual to see
3 any complications nowadays.

4 MEMBER SKILLMAN: You hope you don't see
5 them, that is a scram with complications, but when you
6 have scram with complications it normally means one of
7 two things. You didn't implement your procedures
8 correctly or you have underlying hardware issues that
9 drove the plant in a direction that you do not want it
10 to go.

11 And both of those -- TMI was an unplanned
12 scram with complications. It just happened to end up
13 with core melt.

14 MEMBER BALLINGER: Nowadays you can go
15 years without having an unplanned scram.

16 MEMBER SKILLMAN: Most plants do.

17 MEMBER BALLINGER: So is it likely that
18 we're going to see -- since nobody experiences these
19 unplanned scrams that when we do get a scram there
20 might be complications because of --

21 MEMBER POWERS: There's no question that
22 an unplanned scram now has become a rare evolution.
23 It's just no question about it.

24 CHAIRMAN BLEY: You don't get the spurious
25 ones you used to get. So many of them happened

1 because something went wrong.

2 MEMBER SKILLMAN: In my own view part of
3 the performance improvement that we're seeing is very
4 much a function of the maintenance and owners taking
5 care of their equipment to make sure that you don't
6 have these spurious failures that trip the plant.

7 Slide 36. Oyster Creek, decrease. Notice
8 Sequoyah increasing 2015.

9 Thirty-seven. Indian Point increasing.
10 Prairie Island increasing.

11 Thirty-eight. This is 2016. No plants
12 with red or yellow, unplanned scrams with
13 complications Davis-Besse. It's holding steady. So
14 the trailing four quarters is not causing that number
15 to decrease. That number is staying the same so they
16 are still having problems.

17 MEMBER BALLINGER: I have another
18 question. Can you break it down between merchant
19 plants and non-merchant plants?

20 MEMBER SKILLMAN: Not at this level you
21 can't. I mean we could dig into the data and probably
22 separate them.

23 MEMBER BALLINGER: I haven't seen anybody
24 do that but you could.

25 MEMBER SKILLMAN: You could.

1 MEMBER REMPE: Get a grad student and give
2 them the report.

3 MEMBER BALLINGER: In general I think
4 merchant plants are up against it much more severely
5 with respect to financial issues and stuff like that.
6 So you don't know.

7 CHAIRMAN BLEY: There's been -- especially
8 through INPO there's been a really strong push to cut
9 down on scrams. So I think they're all feeling the
10 same.

11 MEMBER SKILLMAN: Thirty-nine. Indian
12 Point. One is Indian Point 3 is recovering. Prairie
13 Island 2 has recovered.

14 Forty. Sequoyah 1 has recovered. Salem
15 2 is still having difficulty in the trailing four
16 quarters for unplanned scrams.

17 Forty-one. Grand Gulf is struggling. And
18 Watts Bar 2 has been added to the database.

19 Forty-three. Now we kind of move over
20 into the plant assessment.

21 Forty-four. Dan presented this in his
22 opening comments and this is where maybe everybody
23 wants to take note.

24 Column one everything is dandy. Column
25 two a little bit of friction. Something is going on.

1 Column three, a degraded cornerstone. Column four,
2 you're moving into 95003, there are real problems but
3 you haven't lost your keys. And column five is 0350
4 you've lost your keys.

5 And there is if you will as you go from
6 the bottom of this slide or bottom of the image there
7 to the top you can see the escalation of NRC response
8 and the identification of what the column means.

9 And you want to be in column one and you
10 want normal oversight. Normal oversight is you have
11 your residents, you have your scheduled inspections
12 and by and large there is a cadence that is healthy.

13 As you increase from column one to column
14 five you can see the increase in the investment by the
15 agency of inspection resources.

16 MEMBER BROWN: Can column one be a blank?

17 MEMBER SKILLMAN: No.

18 MEMBER BROWN: So having findings in green
19 means they found no problems.

20 MEMBER SKILLMAN: Sure. Uncited
21 violations.

22 MEMBER BROWN: Pardon?

23 MEMBER SKILLMAN: Uncited, not cited
24 violations is very common.

25 MR. WIDMAYER: You can have no findings,

1 yes, but that probably means you just weren't
2 inspected in that quarter.

3 MEMBER BROWN: I'm just -- not being a
4 civilian plant operator I was --

5 MR. WIDMAYER: You can have a lot of no
6 findings.

7 MEMBER BROWN: I'm just looking at the
8 previous graphs where we had 56 greens or whatever it
9 was, all these numbers of greens. Those are green
10 findings. That means there's no findings? Does that
11 mean they had findings but they were not worth talking
12 about?

13 MEMBER POWERS: A green finding simply
14 means that it goes to the corrective action program.

15 MEMBER SKILLMAN: I'll give you an
16 example. They might come in and do a review of your
17 calculations and they might find that the calculation
18 is absolutely pristine but the page numbers are not
19 accurate.

20 MEMBER BROWN: Not what?

21 MEMBER SKILLMAN: Not accurate. Page 1,
22 2, 3, 7, 8, 9 but the calculation is good and the
23 pages are all there but the page numbers are wrong.
24 And they might cite you uncited for documentation.

25 MEMBER BROWN: You've got to be kidding

1 me.

2 MEMBER SKILLMAN: No, I'm not kidding.
3 That's the type of thing that you might find in column
4 one. It would say something is wrong but fix it.
5 You'd say I'll put it in my corrective action program
6 and I'll fix it.

7 But it doesn't materially affect the
8 safety of the plant. There is that category of if you
9 will not cited violations are green.

10 MEMBER BROWN: I've never understood this
11 process.

12 MEMBER POWERS: Well, you're just not
13 trying. You'd understand it perfectly well if you
14 just tried.

15 MEMBER SKILLMAN: The inspectors provide
16 an absolutely essential valuable service. They will
17 come in and find things that the licensee is blind to.

18 And the inspectors will say we found this
19 but it really isn't related to safety but you better
20 fix it. And it's well done, okay.

21 But that's part of the culture at the site
22 to allow that to occur. And it's well done.

23 But sometimes they say you know what,
24 you've got this in two areas and that count might be
25 inaccurate because of what you did here.

1 MEMBER BROWN: Okay. You're overwhelming
2 me with minutiae right now. I just roll my eyeballs.
3 And if I'd found the page numbers wrong I would have
4 taken a pen and marked them out and put a CB by them
5 and say I've corrected it and I'm done for this one.
6 Make sure the next one.

7 Now when they print it out it'll get the
8 right page numbers based on --

9 MEMBER SKILLMAN: And a resident inspector
10 might say you can simply do this but you better get it
11 fixed.

12 But the culture at the site will
13 communicate we'll put that in our corrective action
14 system. We'll take care of it. Uncited.

15 MEMBER BROWN: Okay.

16 MEMBER SKILLMAN: That's what level one
17 is, column one. Next slide.

18 Okay, 2015. How many plants are in which
19 column. And you might want to bounce from this slide
20 45 back to 44.

21 But in 2015 you can see who's in column
22 one, how many plants are in column one, two, three,
23 and four.

24 And I would observe that the takeaway here
25 is how many plants are in column four. That's

1 serious. That's a lot of plants. That's 3 percent of
2 the plants in the country.

3 MEMBER BALLINGER: Are they the same
4 plants?

5 MEMBER SKILLMAN: Yes. You'll see. Forty-
6 six, 2016, guess what. Three plants in column four.

7 CHAIRMAN BLEY: But nobody in column three.

8 MR. WIDMAYER: But did they go up or down.
9 That's what you want to know.

10 MEMBER POWERS: Well, what it does say is
11 the NRC is expending an awful lot of supplemental
12 inspection resources here.

13 MEMBER BROWN: So the threes are all
14 carryovers from the previous zero quarter, is that
15 right? Because there were no degraded cornerstones in
16 column three during quarter 1, 2, 3 and 4.

17 MEMBER SKILLMAN: Basically, yes.

18 MEMBER BROWN: I'm just making sure I
19 understand.

20 MEMBER SKILLMAN: You're right. And once
21 you get over into column four you've got some work to
22 do. It might take you a year to get out of that.

23 MR. WIDMAYER: Or more.

24 MEMBER SKILLMAN: Or more. It might take
25 you two years. That's why I said when you're in 95003

1 you've got to start printing money. It's expensive to
2 get out. I mean you've got to do a lot to regain the
3 NRC's trust.

4 MEMBER REMPE: When you say you spent a
5 lot of money it's not just the consultants you hire.
6 The agency charges them.

7 MEMBER SKILLMAN: Plus you have to do real
8 work at the site. When you get into that situation
9 for the people who are just not really putting in a
10 day's work now they are whether it's correcting
11 hardware, correcting documentation, correcting
12 calculations, modifying the plant.

13 When you get into column three you really
14 begin to see people getting work done.

15 CHAIRMAN BLEY: Dick, your time is about
16 up and you've got about eight more slides.

17 MEMBER SKILLMAN: Two minutes. Okay, 47.
18 There are your column four plants.

19 Forty-eight. One deviation. Dan
20 mentioned when you might be in multiple degraded
21 cornerstones there might be a deviation to allow you
22 to back out without going through extraordinary effort
23 and this is one case where that plant was removed from
24 four to column two.

25 They scheduled another IP95002 inspection

1 which is a very thorough inspection.

2 Very quickly, 49. Fitness for duty.
3 Going to go through these quickly. There are the --
4 those are the types of facilities that are being
5 inspected or that are if you will subject to 10 CFR 26
6 fitness for duty rule.

7 Fifty. Get an idea of the tests, pre-
8 access, random, for cause, post event, and follow-up.
9 We probably know those from our experience here or
10 other places.

11 Fifty-one, subversion is where people are
12 trying to smoke the system, get by with if you will
13 abuse without being detected.

14 The last bullet, the construction sites
15 have higher positive rates in pre-access. These are
16 people coming in to work and they get discovered.

17 MEMBER BALLINGER: The number of Harley-
18 Davidson riders.

19 MEMBER SKILLMAN: Not necessarily. And I
20 know that that is a commonly held point of view but
21 there are supervisors and folks like us who get caught
22 in pre-access. So it isn't just people with tattoos
23 and Harleys.

24 Fifty-two. The overall data for the
25 industry, the overall positive is about a little over

1 half a percent. It's low, but it's higher than it's
2 been in the last couple of years.

3 Total tests in calendar year '14 increased
4 because of the construction sites. About 64 percent
5 of the positives are at pre-access. Those are people
6 knocking on the door to come to work.

7 And the random testing identified about 20
8 percent of the substance abusers. That's people like
9 us getting called out to be checked.

10 MEMBER BALLINGER: So what that last one
11 means, are you saying that random testing identified
12 19.5 percent. Does that mean it only caught 19.5
13 percent and there are a lot more?

14 MEMBER POWERS: No, it's of those caught.

15 MEMBER SKILLMAN: One in five on random
16 was positive.

17 CHAIRMAN BLEY: But others were caught
18 because they were falling down and we took you out of
19 there.

20 MR. WIDMAYER: There are five types of
21 tests. The random test catches 20 percent of the
22 positives. The pre-access, the one before you get
23 your job catches most. That's 64 percent.

24 MEMBER BALLINGER: So this is a
25 significant winnowing down.

1 MR. WIDMAYER: Right. But nonetheless
2 these are the people that got the job and have an
3 issue after they're at work.

4 MEMBER SKILLMAN: Let's go on. We're
5 almost done. I want to give Dennis the floor back.

6 Fifty-four. For cause. The highest rate
7 of 12 percent. And notice that three substances are
8 about 80 percent, marijuana, alcohol and amphetamines
9 and cocaine is fourth.

10 MEMBER BALLINGER: So cocaine would also
11 include opioids in general?

12 MEMBER SKILLMAN: That's the next group.
13 Fifty-four, please. When there is a violation you've
14 got a 24-hour report. Ron, this is the bullet I
15 wanted to point to relative to the Harley riders.
16 Almost all the Harley riders are supervisors.

17 Forty-five of the 25-hour reports of those
18 over half were supervisors and nine are licensed
19 operators.

20 And maybe that's where we can stop here.
21 This is why I wanted to bring the fitness for duty
22 information into this meeting because we do have an
23 epidemic in the country and our industry is not immune
24 from that epidemic.

25 I just thought this was information that

1 we should know about.

2 CHAIRMAN BLEY: Just to note to everyone
3 out of that 60 percent that are caught pre job or
4 whatever you call that we contributed one, no names.
5 And it's because of a confusion.

6 One of our consultants got a note saying
7 report for drug testing and the consultant said no
8 because I'm not in town. But he's no. And within 24
9 hours you have to report a no. And we lost him. Very
10 unhappy.

11 So don't ever say no. Say let's arrange
12 for a time for me to come and get it. Because if you
13 say no you're in that group. You failed. Just don't
14 ever say no to a drug test here unless you want to
15 leave.

16 You're done?

17 MEMBER SKILLMAN: One more slide and we're
18 done.

19 Industry trends. No long-term industry
20 trends. And the IMC-0313 will now replace the
21 industry trends program with the ROP PIs. So it's a
22 change in how industry trends will be addressed by the
23 agency in the future.

24 MEMBER BALLINGER: I'm assuming that the
25 NRC has dealt with this but I don't know whether we

1 have the combination of a state where marijuana is
2 legal and a state in which there's a power plant. I
3 don't know the answer to that.

4 CHAIRMAN BLEY: It's illegal federally so
5 it's illegal for anybody under our program. That's
6 clear.

7 MEMBER BROWN: That doesn't mean you can't
8 get nailed. If you go to a concert, one of these big
9 concerts, just don't breathe because literally if you
10 get nailed the next day you're very likely to be
11 tested.

12 MEMBER SKILLMAN: Dennis, I'm done.

13 CHAIRMAN BLEY: Okay, thanks Dick.

14 MEMBER SKILLMAN: I want to thank the NRC
15 staff. Thank you.

16 CHAIRMAN BLEY: Thanks to the NRC staff.
17 Thanks to you and Derek. I think the subcommittee,
18 we're going to have a little executive session and
19 then we ought to do this more often and we ought to
20 talk about how we like to focus it.

21 We are recessed until 10 till. See you
22 then.

23 (Whereupon, the above-entitled matter went
24 off the record at 10:36 a.m.)

25



Recent Changes to the Reactor Oversight Process

Dan Merzke – NRR/DIRS/IRAB

Jim Isom – NRR/DIRS/IRIB

U.S. Nuclear Regulatory Commission

December 7, 2017

Scope

- Repetitive Degraded Cornerstone
- Substantive Cross-Cutting Issue (SCCI) Process
- Action Matrix criteria
- Inspection Finding Resolution Management (IFRM)
- Engineering Inspections

Repetitive Degraded Cornerstone

- Definition changed in 2015 from a cornerstone that is degraded (1 Yellow input into the Action Matrix or 2 White inputs in same cornerstone) for more than four consecutive quarters to one degraded for more than five consecutive quarters.
- Change requested by Regions because challenged in completing IP 95002 supplemental inspections within four quarters.
- No licensee has met the criteria (original or revised) since Pilgrim 2014.

Substantive Cross-Cutting Issues

- Implemented in 2006 as part of the Davis Besse Lessons Learned.
- Purpose of an SCCI is to inform the licensee that the NRC has a concern with the licensee's performance in the cross-cutting area and to encourage the licensee to take appropriate actions before more significant performance issues emerge.
- Cross-Cutting Areas:
 - Human Performance
 - Problem Identification and Resolution (PI&R)
 - Safety Conscious Work Environment (SCWE)

Substantive Cross-Cutting Issues

- Increased threshold for cross-cutting theme from 4 to 6 findings with same aspect in 12 month assessment period
- Created backstop at cross-cutting area level (HU=20; PI&R=12 during 12-month assessment period)
- Eliminated term “substantive”
- Eliminated questions for opening a Cross-Cutting Issue (CCI).
 - First time = theme documented in assessment letter
 - Second consecutive = theme documented in assessment letter
 - Third consecutive = Cross-Cutting Issue
- Develop standard closure criteria (inspection)

Impact of CCI Changes

- No licensee has been issued a CCI
- 2 licensees have tripped revised criterion for a cross-cutting theme with 6 findings with same CCA
(Ft Calhoun, Pilgrim)
- 6 licensees have received 5 findings with the same CCA
- 4 licensees have tripped the cross-cutting theme at the cross-cutting area level (Clinton, Ft Calhoun, Pilgrim, River Bend)
- Licensees with cross-cutting themes are generally plants with performance issues

Impact of CCI Changes

- Numbers of licensees meeting the old criterion for a cross-cutting theme with 4 CCAs is consistent with licensee performance prior to revision (6-7 per assessment period)
- Those licensees tripping the old criterion are not repeating in subsequent periods, indicating they either do not have a performance issue in the cross-cutting aspect, or the licensees are taking corrective actions to address issues before tripping the criterion for a theme.

Degraded Cornerstone

Original

- 1 Yellow input into the Action Matrix
- 2 White inputs in the same cornerstone

Revised (01/01/16)

- 1 Yellow input
- 3 White inputs in the same cornerstone

Basis

- No documented technical basis for criterion of two White inputs in the same cornerstone indicative of a degraded cornerstone (moderate degradation in safety performance), or two White inputs are equivalent to one Yellow input.
- Probabilistic Risk Assessment concluded at least 3 White inputs needed to cross the White/Yellow threshold.

Impact

- No licensee has met the original or revised definition of Degraded Cornerstone since implementation in 2016.

Timely Resolution of Inspection Findings

- Inspection Finding Resolution Management (IFRM)
 - Goal: Improve the efficiency, effectiveness, and timeliness of the inspection and SDP processes.
 - Inspection Finding Review Board (IFRB) aligns stakeholders early in the process on both the performance deficiency and the path forward for assessing the significance of the finding.
 - Includes enhanced metrics and performance monitoring.
 - A trial period for IFRM began November 2016 and is expected to extend through 2017.
- IFRM effectiveness review planned for early CY2018.

Engineering Inspections

- Introduction/Background
- How Did We Get Here?
- Pilot Component Design Bases
Inspections and Equipment Qualification
Inspections Conducted During CY 2015
and CY 2016

Design Bases Assurance (DBA) and EQ Inspections

- Revisions Made to CDBI and EQ Inspections Based on Pilot Inspection Results
- NRC Started Performing New Design Bases Assurance Inspection – IP 71111.21M and EQ Inspection – IP 71111.21N in CY 2017

Engineering Effectiveness and Efficiency Review

- Make recommendations on improving both the effectiveness and efficiency of the suite of engineering inspections within the ROP
- <https://www.nrc.gov/reactors/operating/oversight/rop-design-insp-review.html>

Engineering Effectiveness and Efficiency Review - Scope

- IP 71111.05T, “Fire Protection (Triennial)” or IP 71111.05XT, “Fire Protection-NFPA 805 (Triennial)”
- IP 71111.07, “Heat Sink Performance”
- IP 71111.08, “Inservice Inspection Activities”
- IP 71111.17T, “Evaluations of Changes, Tests, and Experiments”
- IP 71111.21M, “Design Bases Assurance Inspection (Team)”
- IP 71111.21N, “Design Bases Assurance Inspection (Program)”

Engineering Effectiveness and Efficiency Review

- Public Meetings Conducted/Planned (June 6th; Oct 11th; Dec 12th; Jan 17th and 18th)
- Comments Received from Industry and Members of the Public
- Use of Licensee Self-Assessments
- Engineering Program Inspections Options

Path Forward

- Discuss NRC Proposed Options with Public Stakeholders during Jan 17 – 18, 2018 Meeting
- Commission Paper – Summer of 2018
- Approved Changes to be Implemented in CY 2020 or sooner

Questions/Comments



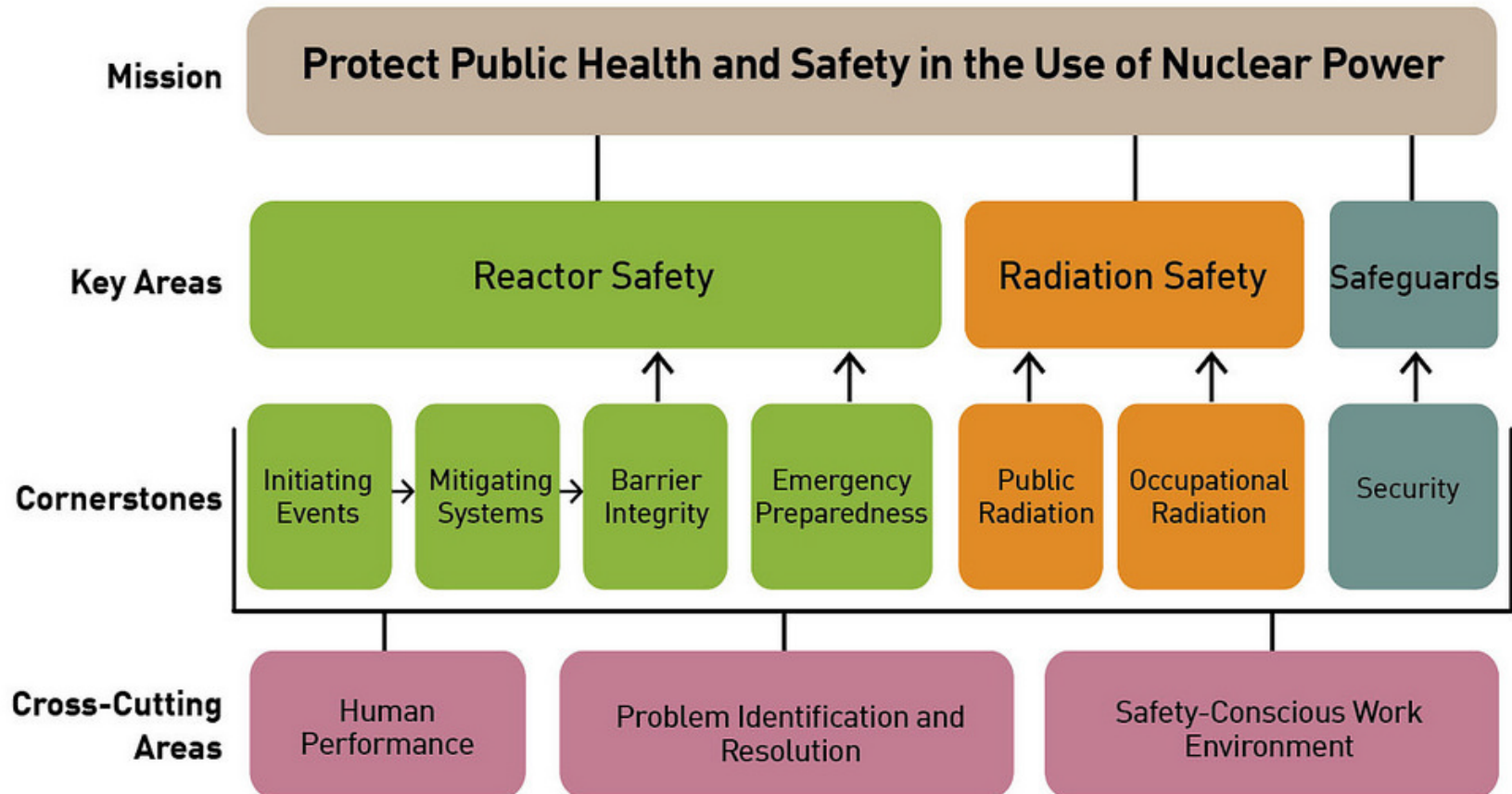
ACRS 647th Full Committee Meeting

**Summary of Operating Experience
for CY2015 and 2016**

**Gordon Skillman, ACRS
December 7, 2017**

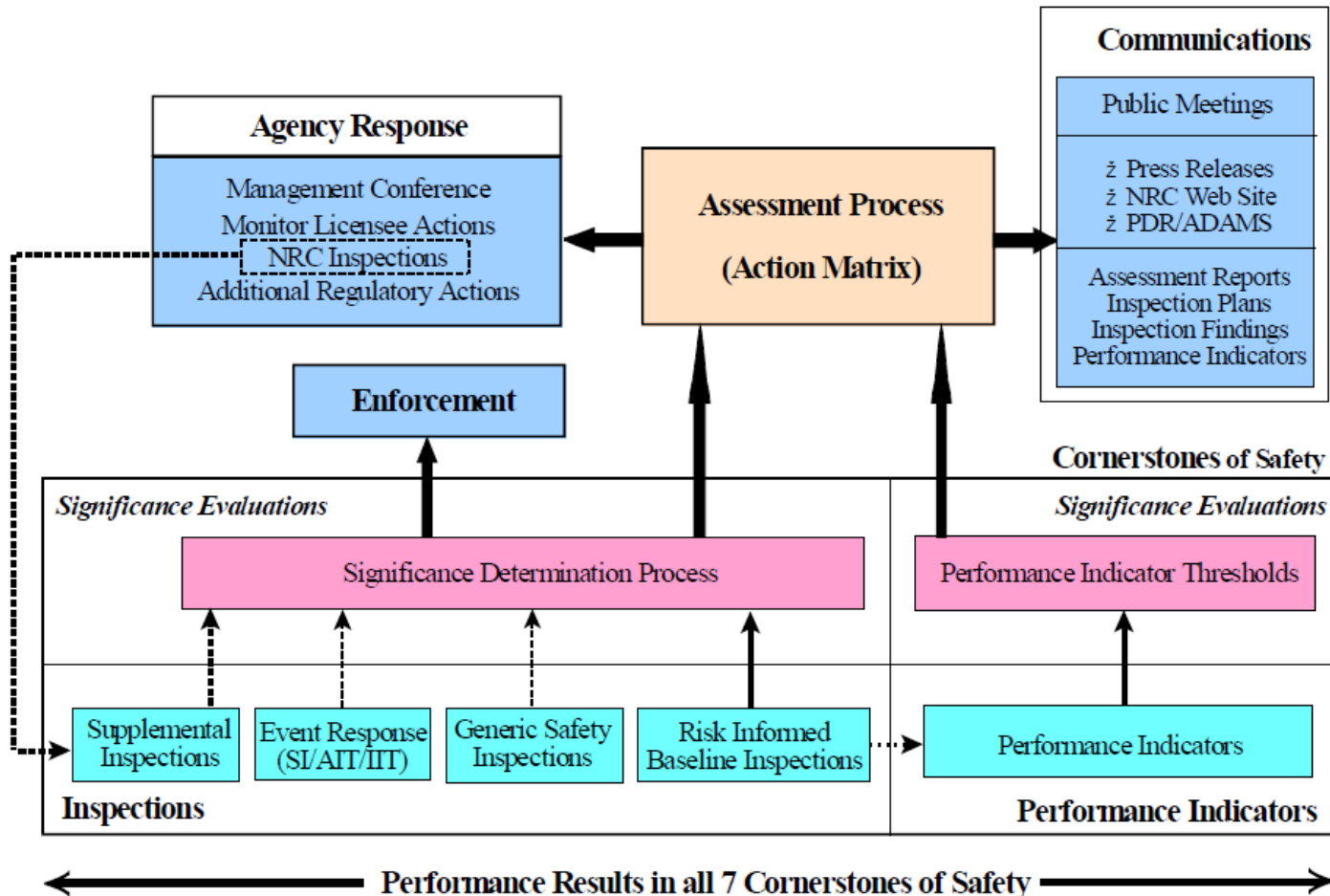
ROP Framework

Reactor Oversight Framework



ROP Process

REACTOR OVERSIGHT PROCESS



CY2015 and 16 ROP

Total Number of Plants in ROP Evaluation:

Region I = 25

Region II = 34

Region III = 23

Region IV = 19

TOTAL = 101

CY2015 and 16 ROP

Inspection Findings – Quantitative Thresholds

| Red | |
|------|---|
| CDF | greater than $10^{-4} \Delta \text{CDF}$ or |
| LERF | greater than $10^{-5} \Delta \text{LERF}$ |

| Yellow | |
|--------|---|
| CDF | greater than 10^{-5} and less than or equal to $10^{-4} \Delta \text{CDF}$ or |
| LERF | greater than 10^{-6} and less than or equal to $10^{-5} \Delta \text{LERF}$ |

| White | |
|-------|---|
| CDF | greater than 10^{-6} and less than or equal to $10^{-5} \Delta \text{CDF}$ or |
| LERF | greater than 10^{-7} and less than or equal to $10^{-6} \Delta \text{LERF}$ |

| Green | |
|-------|--|
| CDF | less than or equal to $10^{-6} \Delta \text{CDF}$ or |
| LERF | less than or equal to $10^{-7} \Delta \text{LERF}$ |

Inspection Findings

(Qualitative Definitions)

- **Green:** a finding of very low safety or security significance
- **Greater-Than-Green:** a finding of more than very low significance – security cornerstone only
- **White:** a finding of low to moderate safety or security significance
- **Yellow:** a finding of substantial safety or security significance
- **Red:** a finding of high safety or security significance

CY 2015 Inspection Findings

| | Number of Plants | | | | | | |
|----------------|----------------------|-----------------------|----------------------|-----------------|--------------------|---------------------|----------|
| Insp. Find. | Safety Cornerstone | | | | | | |
| | Initiating Events | Mitigating Systems | Barrier Integrity | Emerg. Prep. | Occ. Rad Safety | Pub. Rad. Safety | Security |
| Red | 0 | 0 | 0 | 0 | 0 | 0 | ? |
| Yellow | 2 | 3 | 0 | 0 | 0 | 0 | ? |
| White | 2 | 6 | 0 | 4 | 1 | 0 | ? |
| GTG | - | - | - | - | - | - | 12 |
| Green | 55 | 85 | 41 | 23 | 34 | 14 | 56 |

? = Red, Yellow, or White designation of GTG is SUNSI

CY 2016 Inspection Findings

| | Number of Plants | | | | | | |
|----------------|----------------------|-----------------------|----------------------|-----------------|--------------------|---------------------|----------|
| Insp. Find. | Safety Cornerstone | | | | | | |
| | Initiating Events | Mitigating Systems | Barrier Integrity | Emerg. Prep. | Occ. Rad Safety | Pub. Rad. Safety | Security |
| Red | 0 | 0 | 0 | 0 | 0 | 0 | ? |
| Yellow | 2 | 2 | 0 | 0 | 0 | 0 | ? |
| White | 0 | 3 | 0 | 1 | 0 | 0 | ? |
| GTG | - | - | - | - | - | - | 4 |
| Green | 54 | 91 | 42 | 16 | 31 | 10 | 0 |

? = Red, Yellow, or White designation of GTG is SUNSI

Inspection Findings

- **Five Yellows (Five in 2015, Four in 2016)**
 - **Two Each at Arkansas 1 and 2 (Both CY2015 and 2016):**
 - Initiating Events Cornerstone
 - Mitigating Systems Cornerstone
 - **One at Oyster Creek (CY2015):**
 - Mitigating Systems Cornerstone

Inspection Findings

— **Four Yellows - Arkansas Nuclear 1 and 2 – Historic:**

- **Initiating Events Cornerstone:**
 - Failure to Follow the Materials Handling Program during the Unit 1 Generator Stator Drop – Initially in 1st QTR 2014
 - LOOP of 6 days Unit 1; Partial LOOP Unit 2
- **Mitigating Systems Cornerstone:**
 - Inadequate Flood Protection for Auxiliary and Emergency Diesel Fuel Storage Buildings Concurrent with Stator Drop Event
 - Over 100 Flood Barriers Inadequate
- **Placed in Col 4 of Matrix Assessment**
- **Supplemental Inspection Procedure (IP) 95003 planned**

Inspection Findings

- **Four Yellows - Arkansas Nuclear 1 and 2 – Recent:**
 - 2nd & 3rd QTRs 2014 – Unplanned Scrams/7000 Hrs White PI
 - Subsequent decision to also conduct Supplemental Inspections 95001 and 95002
 - 3 Supplemental Inspections Conducted Jan & Feb 2016
 - Entergy submitted “ANO Comprehensive Recovery Plan Area Action Plans,” May 2016 to respond to recover from Col 4
 - NRC Issued Confirmatory Action Letter (CAL) June 2016
 - Most Recent Inspection July 2017 indicates only 2 Action Plans require further inspection (still several individual actions needing closure)

Inspection Findings

– One Yellow - Oyster Creek:

- **Mitigating Systems Cornerstone:**

- Inadequate measures for the suitability of applications of materials and processes (maintenance) for the EMRV solenoid-operated actuators.
- 10 CFR Part 50, Appendix B, Criterion III, “Design Control”
- Technical Specification 3.4.B, “Automatic Depressurization System,”
- CDF = Mid E-5
- Also met criteria for Old Design Issue – not aggregated into Matrix Assessment
 - » No change in Matrix Response Column
- Supplemental Inspection completed Nov 2015
- Corrective Actions Completed
 - » redesigned EMRV actuators installed

Inspection Findings

– Whites – 13 Plants

- **2 Plants in Initiating Events Cornerstone:**
 - 2 Different at Pilgrim
- **6 Plants in Mitigating Systems Cornerstone:**
 - Various Systems / Causes
- **4 Plants in Emergency Preparedness Cornerstone:**
 - 3 for inaccurate Emergency Action Levels (EALs)
- **1 Plant in Occupational Radiation Safety Cornerstone:**
 - Unusual - Palisades

Inspection Findings

— 2 Whites at Pilgrim

— Historic

- 3Q2013 – White PI in Initiation Events Cornerstone:
 - Unplanned scrams w complications > 1
- 4Q2013 – White PI in Initiation Events Cornerstone:
 - Unplanned scrams w complications > 1
 - Unplanned scrams per 7000 Hrs > 3
- Two Parallel White PIs equals White Inspection Finding

• CY2015

- 1Q2015 – White Finding in Mitigating Systems Cornerstone:
 - Failure to Identify, Evaluate & Correct “A” SRV Failure to Open in Manual Actuation.
 - For One Year – 2 of 4 SRVs in Degraded Condition
- 1Q2015 – Green Finding in Mitigating Systems Cornerstone:
 - Inadequate Operability Assessment of “C” SRV
- (“A” and “C” SRVs replaced at outage following Jan 16 LOOP)

Inspection Findings

— 1 White at Palisades

- **Unusual White Finding in Occupational Radiation Cornerstone:**
 - Failure to Monitor the Highest Exposed Part of the Compartment When Using Effective Dose Equivalent External (EDEX) during replacement of Control Rod Drive Housings
 - 10 CFR 20.1201, “Occupational Dose Limits for Adults”
 - Technical Specification 5.4 “Procedures”

— 1 White at Duane Arnold

- **Interesting White Finding in Mitigating Systems Cornerstone:**
 - Inadequate quality controls during the application of torus coating resulted in unqualified torus coating in excess of emergency core cooling system (ECCS) suction strainer design debris loading margin (BWR Precursor to GSI-191)
 - 10 CFR Part 50, Appendix B, Criterion IX, “Control of Special Processes”

Inspection Findings

- **2 Whites at Fort Calhoun**

- Historic

- **White Finding in Mitigating Systems Cornerstone – 4th QTR 2014**

- Failure to Correctly Translate Design Requirements into Installed Plant Configuration
- 10 CFR Part 50, Appendix B, Criterion III, “Design Control”

- CY2015

- **White Finding in Mitigating Systems Cornerstone – 1st QTR 2015**

- Failure to Ensure Tornado Missile Protection for Site Components
- 10 CFR Part 50, Appendix B, Criterion III, ‘Design Control’

- **56 Uncorrected Greens at Ft Calhoun in Mitigating Systems cornerstone during same 2 QTRs**

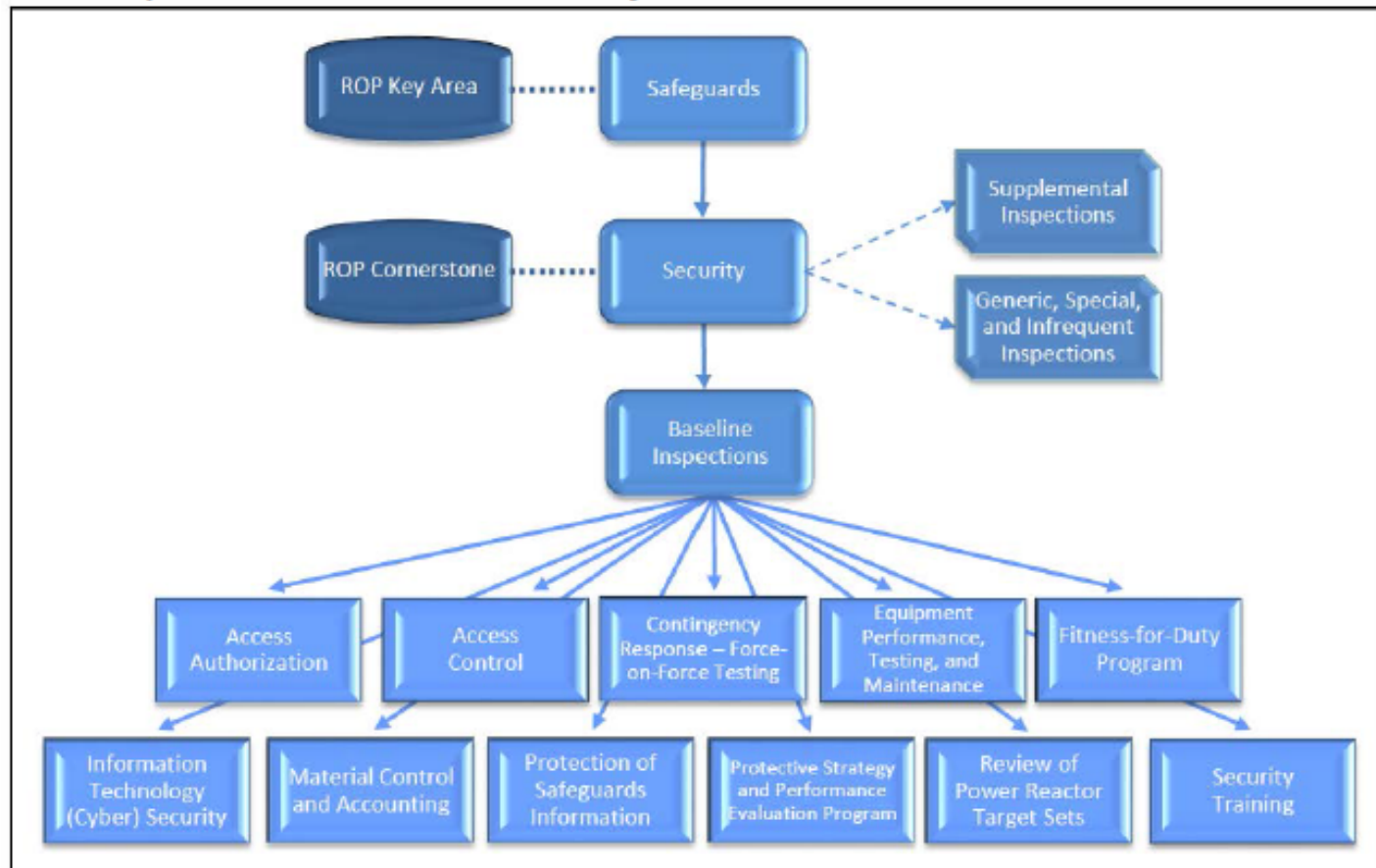
Inspection Findings

— Whites - Reduced to 6 Plants

- **5 Plants in Mitigating Systems Cornerstone:**
 - Dresden 2
 - Pilgrim
 - River Bend 1
 - Oyster Creek
 - Hope Creek 1
- **1 Plant in Emergency Response Cornerstone:**
 - Ginna

Security Cornerstone

Figure 2 Inspectable Areas of the Security Cornerstone



Inspection Findings – Security Cornerstone

- **Plants Greater-Than-Green; 12 in 15, 4 in 16**
- **GTG is not a “new” category, it means the finding was either white, yellow, or red**
- **Details are SUNSI and not publically available**
- **But NUREG-1885 - Annual non-SUNSI report provided to Congress**
- **Greens Reduced from 54 in CY 2015 to 0 in CY 2016**

Security Cornerstone Baseline Inspection Findings

Table 2: Calendar Year 2015 Security Inspection Summary for Commercial Nuclear Power Reactors (without Force-on-Force)

| | |
|-----|--|
| 205 | Total number of security inspections conducted |
| 108 | Total number of inspection findings |
| 101 | Total number of green findings |
| 1 | Total number of greater-than-green findings |
| 6 | Total number of SL IV violations |
| 0 | Total number of greater-than-SL IV violations |

Table 3: Calendar Year 2015 Security Inspection Summary for Category I Fuel Cycle Facilities (without Force-on-Force)

| | |
|----|--|
| 15 | Total number of security inspections conducted |
| 4 | Total number of inspection findings |
| 3 | Total number of SL IV violations |
| 1 | Total number of greater-than-SL IV violations |

Security Cornerstone - Inspection Findings Force – on – Force Exercises

Table 1: Calendar Year 2015 Force-on-Force Inspection Program Summary

| | |
|----|--|
| 22 | Total number of inspections conducted (two exercises per inspection) |
| 39 | Total number of effective exercises |
| 4 | Total number of indeterminate exercises |
| 0 | Total number of marginal exercises |
| 1 | Total number of ineffective exercises |
| 0 | Total number of canceled exercises |
| 26 | Total number of inspection findings |
| 26 | Total number of green findings |
| 0 | Total number of greater-than-green findings |
| 0 | Total number of SL IV violations |
| 0 | Total number of greater-than-SL IV violations |

Force-On-Force Exercises

- **1 Ineffective Exercise:**
 - licensees' inability to demonstrate an effective implementation of its protective strategy to defend designated target set components
- **4 Indeterminate Exercises:**
 - site responders neutralized adversaries using practices unanticipated by the design of the protective strategy
 - site responders' demonstration of use-of-force was inconsistent with the licensees' protective strategy
 - exercise controllers failed to control drill artificialities
 - anomalies with the control of the exercise and performance related to the sites' protective strategy implementation

Security Cornerstone Baseline Inspection Findings

Table 2 Calendar Year 2016 Security Inspection Summary for Commercial Nuclear Power Reactors (without Force-on-Force)

| | |
|-----|--|
| 189 | Total number of security inspections conducted |
| 128 | Total number of inspection findings |
| 117 | Total number of green findings |
| 2 | Total number of greater-than-green findings |
| 3 | Total number of SL IV violations |
| 6 | Total number of greater-than-SL IV violations |

Table 3 Calendar Year 2016 Security Inspection Summary for Category I Fuel Cycle Facilities (without Force-on-Force)

| | |
|----|--|
| 14 | Total number of security inspections conducted |
| 3 | Total number of inspection findings |
| 3 | Total number of SL IV violations |
| 0 | Total number of greater-than-SL IV violations |

Security Cornerstone - Inspection Findings Force – on – Force Exercises

Table 1 Calendar Year 2016 Force-on-Force Inspection Program Summary

| | |
|----|--|
| 21 | Total number of inspections conducted (two exercises per inspection) |
| 37 | Total number of effective exercises |
| 1 | Total number of indeterminate exercises |
| 1 | Total number of marginal exercises |
| 1 | Total number of ineffective exercises |
| 2 | Total number of canceled exercises |
| 20 | Total number of inspection findings |
| 20 | Total number of green findings |
| 0 | Total number of greater-than-green findings |
| 0 | Total number of SL IV violations |
| 0 | Total number of greater-than-SL IV violations |

Force-On-Force Exercises

- **1 Ineffective Exercise:**
 - licensee's inability to demonstrate an effective implementation of its protective strategy to defend designated target set components
- **1 Marginal Exercise:**
 - adversary(ies) was neutralized at a location, or making preparations to enter a location, that contained a single element target set
- **1 Indeterminate Exercises:**
 - licensee failed to properly control the exercise, which resulted in the NRC inspection team's inability to assess the licensee's capability to implement its protective strategy
- **2 Exercises Cancelled due to weather**

Cross-Cutting Issues - 2015

- **All Under “Human Performance”**
 - **Duane Arnold**
 - **SCCI H.13 – “Consistent Process”**
 - **Monticello**
 - **SCCI H.14 – “Conservative Bias”**
 - **Prairie Island 1 and 2**
 - **SCCI H.7 – “Documentation”**

Open Cross-Cutting Issue - 2015

- Duane Arnold – SCCI H.13 – “Consistent Process”**
 - Identified as a concern (not finding) in Mid-Year 2012 Assessment – CAs implemented**
 - 2013 observed progress, but NRC remained concerned**
 - Four 2014 inspection findings with this CCI**
 - Therefore Opened in 1st QTR 2015**
 - Root Cause completed and CAs implemented**
- Closed in Annual Assessment Report for 2015**
 - Two separate problem identification and resolution inspection samples completed with no new H.13 findings**

Cross-Cutting Issues Closed - 2015

- Monticello – SCCI H.14 – “Conservative Bias”**
 - Adverse trend in this CCI identified in Oct 2013**
 - Five inspection findings with this CCI in four straight quarters**
 - CCI identified at Mid-Year 2014**
 - Delays in responding with cause evaluation**
- Closed in Mid-Cycle Assessment Report for 2015**
 - Only one H.14 finding since 3rd QTR 2014 = Sustained Improvement**

Cross-Cutting Issues Closed - 2015

- Prairie Island – SCCI H.7 – “Documentation”**
 - Four inspection findings with this CCI in four straight quarters**
 - CCI identified at Mid-Year 2014**
 - Second year annual assessment has this SCCI concern**

- Closed in Mid-Cycle Assessment Report for 2015**
 - Corrective Actions completed and No H.7 findings for 4 consecutive QTRs**

Cross-Cutting Issues - 2016

- **No New Open Issues in 2016 !**

CY2015 and 16 ROP

| Safety Cornerstone | Performance Indicators |
|----------------------------------|---|
| #1 Initiating Events | <ul style="list-style-type: none"> • Unplanned reactor shutdowns, or “scrams” (automatic and manual) • Complicated unplanned shutdown • Unplanned events that result in significant changes in reactor power |
| #2 Mitigating Systems | <ul style="list-style-type: none"> • Safety system availability and reliability • Safety system failures |
| #3 Barrier Integrity | <ul style="list-style-type: none"> • Fuel cladding (measured by radioactivity in reactor cooling system) • Reactor cooling system leak rate |
| #4 Emergency Preparedness | <ul style="list-style-type: none"> • Emergency response organization drill performance • Readiness of emergency response organization • Availability of notification system for area residents |
| #5 Occupational Radiation Safety | <ul style="list-style-type: none"> • Unplanned radiation exposures to workers |
| #6 Public Radiation Safety | <ul style="list-style-type: none"> • Effluent releases requiring reporting under NRC regulations and license conditions |
| #7 Security | <ul style="list-style-type: none"> • Security system equipment availability |

CY2015 and 16 ROP

Performance Indicators

- **Green:** performance within an expected level where all cornerstone objectives are met
- **White:** performance outside an expected range of nominal utility performance but related cornerstone objectives are met
- **Yellow:** related cornerstone objectives are met, but with a minimal reduction in safety margin
- **Red:** significant reduction in safety margin in area measured by the PI

CY2015
ROP

Performance Indicators

NO Plants with **Red** or **Yellow**

Eight Plants with White

IE03 - Unplanned Power Changes / 7000 Critical Hrs

- Fitzpatrick**

(Multiple downpowers due to Main Condenser tube leakage for several quarters beginning 4Q12. Retubing completed during refuel outage: Oct 2014 - PI improved to **Green** by 3Q15.)

| White Threshold > 6.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 16.4 | 7.3 | 4.1 | 0.8 |

CY2015
ROP

Performance Indicators

***IE04* - Unplanned Scrams with Complications**

- **River Bend 1**

| White Threshold > 1.0 | | | |
|-----------------------|-----|-----|----|
| 1Q | 2Q | 3Q | 4Q |
| 2.0 | 2.0 | 2.0 | 0 |

CY2015 ROP

Performance Indicators

IE01 - Unplanned Scrams per 7000 Critical Hours

- Salem 1**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|----|
| 1Q | 2Q | 3Q | 4Q |
| 3.7 | 0.9 | 0.9 | 0 |

- Dresden 2**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 3.4 | 1.6 | 1.6 | 1.7 |

Performance Indicators

IE01 - Unplanned Scrams per 7000 Critical Hours

- Oyster Creek**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 2.7 | 3.6 | 2.5 | 1.6 |

- Sequoyah 1**

(3 scrams 3Q and 1 more in 4Q)

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 0.8 | 0.9 | 3.7 | 4.8 |

Performance Indicators

***IE01* - Unplanned Scrams per 7000 Critical Hours**

- Indian Point 3**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 0.9 | 2.7 | 2.8 | 3.7 |

- Prairie Island 2**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 0 | 1.7 | 1.7 | 3.2 |

Performance Indicators

NO Plants with **Red** or Yellow

Six Plants with White

IE04 - Unplanned Scrams with Complications

- **Davis-Besse**

| White Threshold > 1.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 2.0 | 1.0 | 2.0 | 2.0 |

CY2016 ROP

Performance Indicators

IE01 - Unplanned Scrams per 7000 Critical Hours

- Indian Point 3**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 3.7 | 3.5 | 1.7 | 0.8 |

- Prairie Island 2**

(3 scrams in CY2015: April, June, December)

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|----|
| 1Q | 2Q | 3Q | 4Q |
| 3.6 | 1.2 | 1.2 | 0 |

CY2016 ROP

Performance Indicators

IE01 - Unplanned Scrams per 7000 Critical Hours

- Seqouyah 1**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|----|
| 1Q | 2Q | 3Q | 4Q |
| 4.4 | 3.9 | 0.9 | 0 |

- Salem 2**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 2.7 | 3.6 | 3.7 | 3.3 |

CY2016 ROP

Performance Indicators

***IE01* - Unplanned Scrams per 7000 Critical Hours**

- **Grand Gulf 1**

| White Threshold > 3.0 | | | |
|-----------------------|-----|-----|-----|
| 1Q | 2Q | 3Q | 4Q |
| 0.9 | 2.7 | 3.1 | 4.6 |

-
- **Watts Bar 2 began tracking PIs in 3Q2015 with No Data**
 - In 1QCY2016 – 1 PI with Data - EP02 (ER Drill Participation) was Green
 - Starting 4QCY2016 – about ½ of PIs with Data - all Green

ROP Action Matrix

Inspection Findings

+

Performance Indicators

=

Plant Assessment

ROP Action Matrix Assessment

- **Column 5: Unacceptable Performance**
- **Column 4: Multiple/Repetitive Degraded Cornerstone**
- **Column 3 Degraded Cornerstone**
- **Column 2: Regulatory Response**
- **Column 1: Licensee Response**

CY2015 and 16 ROP

ROP Action Matrix Assessment of Plant Performance

Column 5. Unacceptable Performance

Column 4. Multiple/Repetitive Degraded Cornerstone
Repetitive degraded cornerstone, multiple degraded cornerstones, or multiple **YELLOW** inputs, or one **RED** input

Column 3. Degraded Performance
One degraded cornerstone (three **WHITE** inputs or one **YELLOW** input in a cornerstone) or three **WHITE** inputs in any strategic area

Column 2. Regulatory Response
No more than two **WHITE** inputs in a strategic area

Column 1. Licensee Response
All performance indicators and cornerstone inspection findings **GREEN**

NRC Response

Response at Agency Level

- Meeting with NRC Executive Director for Operations and senior plant management
- Order to modify, suspend, or revoke license

Response at Agency Level

- Meeting with NRC Executive Director for Operations and senior plant management
- Plant operator improvement plan with NRC oversight
- NRC team inspection focused on performance issues at the site
- Demand for Information, Confirmatory Action Letter, or Order

Response at Regional Level

- Meeting with NRC regional management and senior plant management
- Plant operator self-assessment with NRC oversight
- Additional NRC inspections focused on cause of degraded performance

Response at Regional Level

- Meeting with NRC and plant management
- Plant operator corrective actions to address **WHITE** inputs
- NRC inspection to follow up on **WHITE** inputs and corrective actions

Normal Regional Oversight

- Routine inspector and staff interaction
- Baseline inspection program
- Annual assessment public meeting

Increasing Safety Significance

Increasing Regulatory Oversight

ROP Action Matrix Assessment

| | Number of Plants in Each Column (per QTR) | | | | |
|-----|---|---------------------|----------------------|--|--------------|
| | Col 1 | Col 2 | Col 3 | Col 4 | Col 5 |
| QTR | Licensee Response | Regulatory Response | Degraded Cornerstone | Multiple/Repetitive Degraded Cornerstone | Unacceptable |
| 1 | 78 | 19 | 1 | 2 | 0 |
| 2 | 83 | 14 | 0 | 3 | 0 |
| 3 | 92 | 5 | 0 | 3 | 0 |
| 4 | 91 | 6 | 0 | 3 | 0 |

ROP Action Matrix Assessment

| | Number of Plants in Each Column (per QTR) | | | | |
|-----|---|---------------------|----------------------|--|--------------|
| | Col 1 | Col 2 | Col 3 | Col 4 | Col 5 |
| QTR | Licensee Response | Regulatory Response | Degraded Cornerstone | Multiple/Repetitive Degraded Cornerstone | Unacceptable |
| 1 | 89 | 8 | 0 | 3 | 0 |
| 2 | 87 | 10 | 0 | 3 | 0 |
| 3 | 91 | 6 | 0 | 3 | 0 |
| 4 | 91 | 6 | 0 | 3 | 0 |

Action Matrix Summary Lowlights

- Pilgrim 1 – 6 consecutive QTRs in Col. 3 followed by 7 consecutive QTRs in Col. 4 (starting 4th QTR 2013)
- Arkansas Nuclear 1 & 2 – 9 consecutive QTRs in Col. 4 (starting 4th QTR 2014)
- Davis-Besse – 5 consecutive QTRs in Col. 2 (starting 4th QTR 2015)
- River Bend 1 – 8 consecutive QTRs in Col. 2 (3rd QTR 2014 to 3rd QTR 2016)
- Millstone 3 – 5 consecutive QTRs in Col. 2 (3rd QTR 2014 to 4th QTR 2015)

Action Matrix - One Deviation

- **Monticello – Feb 2015**
 - Entered Col 3 (Degraded Cornerstone) 2nd QTR 2013
 - **Yellow** in Mitigating Systems Cornerstone
 - IP95002 Supplemental Inspection Completed Dec 2014 - Closed Yellow
 - **Greater-Than-Green** in Security Cornerstone 4th QTR 2014
 - Definition of Repetitive Degraded Cornerstone Met – Move to Col 4
 - Due to successful completion of IP95002 inspection and of biennial PI & R inspection;
 - EDO Approved ROP Action Matrix Deviation, assigned to Col 2
 - Another IP95002 Inspection Scheduled

Fitness for Duty

- **61 operating reactor sites**
- **2 reactor construction sites (Summer, Vogtle)**
- **4 formerly operating reactor sites (Crystal River, Kewaunee, San Onofre, Zion)**
- **5 corporate program offices**
- **2 fuel cycle facilities (B&W, NFS)**
- **1 contractor/vendor organization (INPO)**
- **Tests conducted on licensee and C/V employees**

Fitness for Duty

- **5 Types of Tests Conducted:**
 - **Pre-Access** (applicants for employment)
 - **Random** (unscheduled/unannounced for employees)
 - **For Cause** (behavior of , or information received about employee)
 - **Post-Event** (after an event involving human error)
 - **Follow-up** (after a positive test)

Fitness for Duty Data*

- **Three Multi-year Trends being Tracked:**
 - **Subversion attempts prevalent since CY2011 (18 to 21% of violations: 143 to 187 events per year) with 54 to 66% of sites reporting at least one.**
 - **Amphetamine positive results increasing since CY2008 (from 3.8% (in 2008) to 10.6% (in 2014) of drug & alcohol positives.**
 - **Reactor construction sites have higher positive rates, primarily in pre-access and random tests, and have higher incidence of subversion attempts than operating reactor sites.**

* 2014 Data; Newer Data not compiled.

Fitness for Duty Data (cont.)

- **Overall industry positive rate = 0.68%**
 - Low, but higher than CY12 and 13 (both were 0.62%)
- **Total tests in CY2014 increased by 3%**
 - Due mainly to increase in construction site tests
 - 7% of facilities use stricter cutoff levels than required
- **Approx 64% of positives and refusals occur at pre-access**
 - Prevents access, directly protecting public health and safety
- **Random testing identified 19.5% of substance users**
 - Identifies more employees using substances than pre-access

Fitness for Duty Data (cont.)

- **For cause testing had highest positive rate (12%)**
 - (11.88% in CY12; 13.40% in CY13)
- **Three substances accounted for 88% of positives**
 - Marijuana (53.2%), Alcohol (24.1%), Amphetamines (10.6%)
 - Cocaine knocked out of 3rd place: was 2nd most from 1990 to 2008 and 3rd most from 2009 to 2013. Cocaine is 4th with 10%
 - 12% (9) of facilities test for other substances: barbiturates, benzodiazepines, hydrocodone, hydromorphone, methadone, oxycodone, oxymorphone, propoxyphene, suboxone

Fitness for Duty Data (cont.)

- **Events concerning individual employee violations must be reported to NRC within 24-hours**
- **Forty-five 24-hour reportable events**
 - 28 involved Supervisors (increase in random positives poses potential problem)
 - 9 involved NRC-Licensed Operators
- **Events concerning lab performance/method, quality control, or specimen collection must be reported to NRC within 30-hours**
- **Five 30-day reports**
 - 67% decrease from previous year

Industry Trends Program

- **2015 Long Term Industry Trends**
 - No statistically significant adverse trends
- **2015 Short Term Industry Trends**
 - No statistically significant adverse trends
- **IMC 0313 was revised on January 26, 2016, to replace ITP indicators with ROP Pls.**

Questions ?