

Official Transcript of Proceedings
NUCLEAR REGULATORY COMMISSION

Title: Advisory Committee on Reactor Safeguards
Radiation Protection and Nuclear Materials

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Monday, June 20, 2011

Work Order No.: NRC-972

Pages 1-155

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

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RADIATION PROTECTION AND NUCLEAR MATERIALS

SUBCOMMITTEE

+ + + + +

MONDAY

JUNE 20, 2011

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ROCKVILLE, MARYLAND

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The Subcommittee met at the Nuclear
Regulatory Commission, Two White Flint North, Room
T2B1, 11545 Rockville Pike, at 1:00 p.m., Michael T.
Ryan, Chairman, presiding.

SUBCOMMITTEE MEMBERS PRESENT:

MICHAEL RYAN, Chairman

SAID ABDEL-KHALIK

DENNIS C. BLEY

CONSULTANTS TO THE SUBCOMMITTEE PRESENT:

JOHN FLACK

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NRC STAFF PRESENT:

DEREK WIDMAYER, Designated Federal Official

MARGIE KOTZALAS

DOUG COLLINS

DENNIS DAMON

JONATHAN DeJESUS

JAY HENSON

MARISSA BAILEY

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

12:59 p.m.

CHAIRMAN RYAN: It being the appointed hour, the meeting will now come to order.

This is a meeting of the Advisory Committee on Reactor Safeguards Subcommittee on Radiation Protection and Nuclear Materials.

I'm Michael Ryan, Chairman of the Subcommittee. ACRS members in attendance include Said Abdel-Khalik and Dennis Bley. ACRS Consultant John Flack is also in attendance.

The purpose of this meeting is to hold discussions with NRC on proposed enhancements to NRC's fuel cycle oversight process, FCOP. In a letter to the NRC staff dated April 19, 2011, the ACRS indicated they would like an opportunity to review the staff's findings, conclusions and recommendations prior to NRC staff response to the Commission on proposed enhancements to the fuel cycle oversight process. This meeting is in response to the Committee's request. So, thank you very much for it.

The Subcommittee will gather information, analyze relevant issues and facts and formulate proposed positions and actions as

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1 appropriate.

2 Derek Widmayer is the designated federal
3 official for this meeting.

4 A transcript of the meeting is being
5 kept and will be made available on the Web.

6 It is requested that speakers first
7 identify themselves and speak with sufficient
8 clarity and volume so that they can be readily
9 heard.

10 We have not received any requests from
11 members of the public to provide comments. The
12 phone line is not open at this time for that reason.

13 We will proceed with the meeting and
14 call up Margie Kotzalas, Acting Branch Chief,
15 Technical Support Branch, Special Projects and
16 Technical Support Division of Fuel Cycle Safety and
17 Safeguards, NMSS, to open the presentations.

18 That's a lot of hats there, Margie.
19 Must be very busy.

20 MS. KOTZALAS: Thank you, Dr. Ryan.

21 CHAIRMAN RYAN: Thank you.

22 MS. KOTZALAS: As Dr. Ryan stated, my
23 name is Margie Kotzalas, and this afternoon we are
24 going to be presenting the work that we are doing to
25 enhance the fuel cycle oversight process, or FCOP.

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1 While the existing process is effective
2 and provides reasonable assurance of safety and
3 security of fuel cycle facilities, we are
4 undertaking enhancement to improve the process to
5 make it more risk-informed, performance-based,
6 predictable and transparent.

7 We are currently focusing our efforts on
8 two enhancements: We're developing cornerstones
9 which will help us focus our inspections on the
10 items most important to safety and we are developing
11 a process to give licensees incentive for
12 maintaining effective corrective action programs
13 because we know that when licensees identify and
14 correct their problems, it benefits them, us and the
15 public.

16 The work that we're presenting to you
17 this afternoon is work in progress. We're
18 continuing to work on the elements of an enhanced
19 FCOP as we respond to the Commission's SRMs and
20 prepare a SECY paper. Our SECY paper, as I stated
21 earlier, is now due to the EDO on September the 30th
22 and we look forward to hearing your feedback and the
23 feedback of the full Committee as we work through
24 our process.

25 Now, to refresh your memory, I'll

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1 provide a summary of the Commission direction we
2 received on the FCOP.

3 Next slide. Okay. We have received at
4 least two SRMs. The first SRM was in response to
5 the ACRS Commission briefing on April the 29th of
6 2010. That SRM directed us to prepare a paper
7 comparing the Integrated Safety Analysis for fuel
8 cycle facilities and the Probabilistic Risk
9 Assessment for reactors and submit it for your
10 review. We submitted our ISA-PRA paper on December
11 the 15th and we met with you on January the 11th and
12 the full Committee on February the 10th. You had
13 issued your letter report on February the 17th and
14 in this report you recommended that we continue to
15 develop and test the use of focused PRA-like
16 analyses to help assess the risk significance of
17 inspection findings for fuel cycle facilities.

18 Next slide. In the second SRM the
19 Commission disapproved our plan for enhancing the
20 FCOP as we described in SECY-10-0031. Instead, the
21 Commission directed us to make modest adjustments to
22 the existing oversight process to enhance the
23 effectiveness and efficiency, including providing
24 incentives for licensees to maintain strong
25 corrective action programs, asked us to develop a

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1 set of cornerstones, and to provide an assessment of
2 the work we've accomplished and recommendations for
3 next steps.

4 Now, I would like to turn over the
5 presentation to my team mates who will go over the
6 elements of the enhanced FCOP.

7 Doug Collins, who's sitting next to me,
8 will present our approach for developing a set of
9 cornerstones.

10 Jay Henson will present our initiative
11 to provide licensees incentive to maintain strong
12 corrective action programs.

13 Dennis Damon will present the staff's
14 proposal to develop and test a fuel cycle
15 significance-determination process for assessing the
16 significance of inspection findings.

17 And finally, Jonathan DeJesus to my left
18 will conclude the presentation by summarizing the
19 staff's work and describing the next steps.

20 So with that, I would like to turn it
21 over to Doug.

22 MR. COLLINS: Good afternoon. I'm Doug
23 Collins. I'm a rehired annuitant working for NMSS
24 and I'm the former director of the Division of Fuel
25 Facility Inspection in Region II.

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1 I'll discuss what we've done thus far in
2 response to the Commission's direction to develop a
3 set of cornerstones that would be useful in fuel
4 cycle oversight.

5 Today I'll discuss how we used the
6 strategic plan elements, our bible here, to develop
7 the cornerstones, I'll outline the proposed
8 cornerstones and their elements, and use the
9 criticality safety systems draft cornerstone as an
10 example to show how the NRC staff can determine if a
11 licensee is meeting a cornerstone objective.

12 Next slide, please. We used the
13 strategic plan in a top-down approach to selecting
14 the cornerstones. We started with the mission and
15 strategic goals to ensure adequate protection of
16 public health and safety and the environment, and
17 the secure use and management of radioactive
18 materials. To meet these goals, the strategic plan
19 then gives the safety strategic outcomes of
20 preventing inadvertent criticalities, preventing
21 acute radiation exposures resulting in fatalities,
22 preventing releases of radioactive materials that
23 result in significant radiation exposures or
24 significant environmental impacts.

25 Note that today we're discussing safety

1 cornerstones. We're considering delaying the
2 development of security cornerstones because of
3 ongoing rulemaking in the security and material
4 control and accounting areas.

5 In addition to these radiation-related
6 strategic outcomes, we also included as an outcome
7 preventing certain chemical releases that could lead
8 to significant chemical exposures. We did this
9 because NRC regulations require licensees to control
10 potential impacts on workers and the public from
11 certain hazardous chemicals used at their
12 facilities. These chemicals would be those that are
13 associated with processes involving radioactive
14 materials. These requirements stem from a
15 Memorandum of Understanding with the Occupational
16 Safety and Health Administration, or OSHA, and so
17 we're implementing an outcome based on that.

18 In developing the fuel cycle
19 cornerstones, we also reviewed how the reactor
20 oversight process cornerstones had been developed by
21 reviewing the Commission papers associated with that
22 development and by reviewing the basis documents for
23 that program in the Inspection Manual chapters.

24 We started with a concept that the
25 cornerstone would be the fundamental building block

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1 for the regulatory oversight process. Acceptable
2 license performance in each cornerstone would
3 provide reasonable assurance that the NRC's overall
4 mission would be met.

5 Next slide. In developing each safety
6 cornerstone the staff identified the objective, the
7 desired results, the key attributes of licensee
8 performance necessary to achieve the results, the
9 scope of what the NRC needs to inspect to ensure the
10 objectives are met and the metrics used to evaluate
11 performance in the cornerstone.

12 The objective of each cornerstone was
13 derived from one or more of the strategic outcomes
14 or the chemical exposure outcome. For example, the
15 objective of the criticality safety systems
16 cornerstone was derived from the strategic outcomes
17 noted above in preventing criticalities, acute
18 radiation exposures that could lead to fatalities,
19 or releases of radioactive materials that could
20 result in significant exposures or significant
21 environmental impacts.

22 The desired results, the next item on
23 the slide, were related to the determining that
24 there is reasonable assurance that the cornerstone
25 objectives could be met. A key attribute is a

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1 characteristic of a cornerstone that needs to be
2 achieved or maintained to meet the objective. The
3 scope of inspection activities is what the NRC would
4 inspect to determine whether a key attribute is
5 being implemented effectively. Metrics, as used
6 here, are the acceptance criteria for the inspection
7 findings.

8 Next slide, please. We considered
9 several different sets of cornerstones, some of
10 which had been proposed in earlier efforts to
11 improve the fuel cycle oversight. These
12 considerations led us to this set of cornerstones
13 because they were considered the most important
14 elements in meeting the strategic outcomes,
15 acceptable performance in each of these cornerstones
16 provides reasonable assurance that the NRC's overall
17 mission is met, the proposed cornerstones are
18 consistent with how licensees developed and
19 implement their integrated safety analyses, or ISAs,
20 and they would result in effective communication
21 with stakeholders because they used terms commonly
22 used when discussing fuel cycle facilities.

23 CHAIRMAN RYAN: Doug, one thing that
24 would be helpful I think that may be explained; and
25 if this isn't the right fine, that's fine, but we've

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1 kind of in a way, at least on the slides,
2 compartmentalized radiological and chemical.

3 MR. COLLINS: Yes, sir.

4 CHAIRMAN RYAN: And they're not always
5 so in the plant. So, are you going to talk a little
6 bit about how you deal with when they show up in the
7 same piping system and may have combined risk that
8 could be greater than the sum of the two, or --

9 MR. COLLINS: Well, the way that's
10 handled is that when licensees did their ISAs their
11 analyses would have considered the total impact;
12 chemical, radiological, or both. And we anticipate
13 that the oversight for ISA-related cornerstones will
14 be based on the ISA results. So, the ISA would have
15 established a set of controls or items relied on for
16 safety depending upon the risk in any particular
17 accident sequence that was analyzed.

18 CHAIRMAN RYAN: So, the licensees really
19 would be the ones that would have to convince you
20 that they either put it all together, that the
21 things that are mixed correctly, or you'll have that
22 opportunity to challenge whether or not they've
23 addressed, you know, where materials are commingled
24 in the review process. Is that right?

25 MR. COLLINS: Yes. And the summaries of

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1 those ISAs have been sent to us and we've reviewed
2 them, and we've actually gone out and done some
3 vertical slices at the sites before we agreed that
4 the ISAs were appropriate.

5 CHAIRMAN RYAN: Right. Any specifics
6 that you can maybe share with us to talk us through
7 that would be helpful. Maybe not at this meeting,
8 but maybe later.

9 MR. COLLINS: Yes, and I have to think.
10 You know, generally if you have a criticality, that
11 will potentially in certain facilities result in
12 chemical releases. But again, the controls have to
13 be in place so that the consequences are mitigated
14 under and --

15 CHAIRMAN RYAN: Right. You know,
16 another one that comes to mind that's a little
17 simpler than a criticality perhaps is a fire that
18 involves both radioactive material and solvents.
19 You know, where does that end up? How is that
20 mitigated? That's one where you clearly have both
21 interacting in the same time so --

22 MR. COLLINS: Yes. Okay. We'll take
23 that.

24 CHAIRMAN RYAN: Okay.

25 MS. KOTZALAS: We'll take that. We'll

1 take that.

2 CHAIRMAN RYAN: Just as a general
3 question, I think it would help certainly the
4 Subcommittee, and perhaps the full Committee, to get
5 your insights and appreciate for where you're
6 dealing with that combination of the radiological
7 and the chemical risk to understand how you've dealt
8 with the range that it possibly can be.

9 MR. COLLINS: All right. And as I say,
10 that originally -- I think we'll have to look at
11 some ISAs and maybe get you some examples --

12 CHAIRMAN RYAN: That's fine.

13 MR. COLLINS: -- of where that -- but
14 you're right. Solvents and, you know, UF6 would be
15 areas that would --

16 CHAIRMAN RYAN: Yes.

17 MR. COLLINS: -- potentially have both
18 of those.

19 MEMBER ABDEL-KHALIK: You indicated
20 earlier that you will address security issues later
21 on.

22 MR. COLLINS: Yes, sir. We believe we
23 will. We haven't made a final decision on that, but
24 we're considering delaying the development of the
25 details of those cornerstones until after the

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1 rulemakings are over.

2 MEMBER ABDEL-KHALIK: But wouldn't it be
3 appropriate to at least include it on the list of
4 cornerstones and indicate that you'll address this
5 later

6 MR. COLLINS: Yes. And in fact, right
7 now what we've presented to members of the public
8 when we talked about security cornerstones were two
9 cornerstones: One that's security, which would be
10 physical protection and information security, and
11 then material control and accounting. Now, that may
12 change. Those two cornerstones may change as we
13 further develop things, but --

14 MEMBER ABDEL-KHALIK: Yes, but, you
15 know, by not including it at all, I think that
16 conveys the wrong message.

17 MR. COLLINS: Okay.

18 MEMBER ABDEL-KHALIK: And now, if I look
19 at this list of cornerstones, if you were to include
20 security, and I compare those against the
21 cornerstones in the reactor oversight process, the
22 only difference then becomes the first two.

23 MR. COLLINS: The first two are
24 different than the first three in the reactor
25 oversight process.

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1 MEMBER ABDEL-KHALIK: Well, correct. In
2 the reactor there is a third one that relates to
3 initiating events. Here you're focusing on systems.
4 I mean, it may be a good idea to try to mirror or
5 have a symmetry with the reactor oversight process.
6 And rather than just focusing on the systems, it may
7 be also appropriate to look at the initiating events
8 that would cause concern that one would have to keep
9 track of.

10 MR. COLLINS: Well, when we talk about
11 systems, we do it in a broad sense. When you look
12 at, for example; and we'll get to it in a minute,
13 the criticality safety cornerstones, we include
14 design, we include procedures, we include staff
15 performance, we include corrective action programs.
16 So, when we say systems, we mean it in the broad
17 sense, not just hardware systems.

18 MEMBER ABDEL-KHALIK: Right, but not
19 initiating events.

20 MR. COLLINS: Well, and let me back up
21 and talk about how we got to here, rather than
22 replicating the power reactor cornerstones.

23 We considered that process; initiating
24 events, mitigating systems, barrier integrity --

25 MEMBER ABDEL-KHALIK: Right.

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1 MR. COLLINS: -- and on. And in fact,
2 we proposed that in an earlier effort to improve
3 fuel cycle oversight.

4 And let me back up and talk a little bit
5 about how an ISA looks at those kinds of things,
6 those three boxes.

7 First of all, ISAs don't use those
8 terms. And ISA may look for process upsets. At one
9 of those facilities, as I'm sure you know, there are
10 a large number of processes and people have to
11 develop a large number of sequence of events that
12 could lead to accidents. So, some licensees might
13 talk about process upsets and which might be akin to
14 initiating events. Their ISAs will talk about items
15 relied on for safety, which in a sense could be
16 mitigating systems, but they also could be systems
17 or elements or controls that minimize the likelihood
18 of an initiating event. They kind of mix the two.
19 And when an ISA uses the term "barrier," they are
20 more talking about a kind of generic control rather
21 than the three fission product barriers in the ROP.
22 And so, it would be a control or an IROFS that they
23 might be talking about. So, there is some symmetry,
24 but the paradigms are different.

25 But initially, several years ago when we

1 -- as I say, doing this at an earlier time, we
2 proposed something like that and we got considerable
3 feedback from our stakeholders, strong feedback that
4 we ought not try to force-fit the power reactor
5 cornerstones on their processes, that there's
6 another way to look at the way they control safety;
7 and it's the way that's in the ISA. And they
8 suggested that we use the terminology in the ISA
9 rather than just using the cornerstones from power
10 reactors. And given that we believe that we can get
11 to the goals of cornerstones and their objectives by
12 using terminology that's familiar to those in the
13 fuel cycle oversight and fuel cycle business; both
14 stakeholders, members of the public, NRC staff. We
15 right now have chosen these cornerstones.

16 Did I answer your question?

17 MEMBER ABDEL-KHALIK: I understand where
18 you're coming from, but I still -- I mean, at this
19 very, very high level I just don't see the danger of
20 symmetry.

21 MR. COLLINS: And I wouldn't say there's
22 a danger. What I'm saying is since we can meet the
23 objectives and use the language that's in place,
24 we've thus far decided to use these cornerstones.

25 Now, if you look at the level below the

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1 cornerstones; and we'll get there in a minute, for
2 key attributes there -- I mean, safety is safety and
3 the key attributes of assuring a mitigating system
4 operates, those key attributes are quite similar at
5 the next level down to the key attributes you might
6 find at a power reactor. Now, they're talking about
7 different things. They're talking about items
8 relied on for safety rather than, you know, safety-
9 related equipment and so forth, but again --

10 DR. DAMON: Okay. Do you mind if I make
11 a comment.

12 MEMBER ABDEL-KHALIK: Yes. Yes, please.

13 DR. DAMON: Because I thought about
14 this. There are some systems in the fuel cycle
15 facilities that kind of analogous to reactors in the
16 sense that they've got a process and they'll talk
17 about a process upset as an initiating event and
18 then there will be some kind of hardware or software
19 to protect against whatever the upset is.

20 But like in the field that I used to be
21 in, criticality safety, they don't make that
22 distinction. Usually, where they share critically
23 safety is there are controlling parameters in the
24 system, like say mass and moderation. So, if you
25 got like a low enriched facility, you've got to have

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1 both critical mass and it has to be moderated to go
2 critical. And they don't draw the distinction as to
3 whether an upset in moderation or an upset in mass
4 are the initiating event.

5 Now, they could make that distinction by
6 saying, okay, whatever one happens first is the
7 initiating event. But they don't designate one as
8 being a process upset and the other one as the
9 control, you know? So, they don't identify it as
10 initiating.

11 And so, if you did it the way I suggest;
12 which is the one that happens first is the
13 initiating event, then there'd only be one
14 cornerstone, that everything that happened would be
15 an initiating event unless you actually had a
16 criticality. And so, the whole paradigm that's used
17 in the reactors thing would collapse down to
18 initiating events, because they don't have barriers.
19 They don't have shielding or containment usually
20 around these things. So, the whole paradigm for
21 reactors just collapses down to one thing,
22 initiating events. And so, it's not very useful.

23 MEMBER ABDEL-KHALIK: I don't agree with
24 that, but continue.

25 MEMBER BLEY: Let's see what comes and

1 then we'll talk about it. But before you leave this
2 one though --

3 MR. COLLINS: Yes, sir?

4 MEMBER BLEY: -- one little piece of it
5 worries me.

6 MR. COLLINS: Yes.

7 MEMBER BLEY: We have the last two which
8 deal with people and protecting people.

9 MR. COLLINS: Yes.

10 MEMBER BLEY: We have the second one
11 that sounds like it's protecting the system rather
12 than the people. I wonder why there isn't a
13 parallel between the worker and public chemical
14 safety.

15 MR. COLLINS: Well, we have integrated
16 into the chemical process safety systems those
17 elements in the ISA that protect people. But the
18 chemical process safety systems are there to make
19 high-consequence events under Part 70 highly
20 unlikely, and those are events that could have
21 significant chemical impact on a worker or a member
22 of the public. So, workers and members of the
23 public are integrated with the chemical process
24 safety systems.

25 And the same for an intermediate

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1 consequence event, which is a lower consequence
2 event from a chemical point of view. And again,
3 workers and members of the public, that has to be --
4 controls or IROFS have to be put in place so that an
5 intermediate consequence event is unlikely. So,
6 high-consequence --

7 MEMBER BLEY: I'm just curious why
8 they're different. So, why not have radiation
9 process safety in parallel with chemical process
10 safety? Historical reasons?

11 MR. COLLINS: You could, but --

12 MEMBER BLEY: It just seems odd that
13 there's no parallel there, but let's go ahead and
14 hear the rest of what --

15 MR. COLLINS: Again, we looked to the
16 objectives, you know, what do we want from these
17 cornerstones. Public radiation safety or public
18 safety is the terminology used in the ROP. And
19 again, we looked at those when we started, so --

20 MEMBER BLEY: Well, let's come back to
21 this one at the end and see --

22 MEMBER ABDEL-KHALIK: I guess my
23 concern --

24 MEMBER BLEY: -- how comfortable we are.

25 MEMBER ABDEL-KHALIK: -- really the same

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1 as yours, Dennis. I look for this same level of
2 abstraction in these cornerstones, and yet I don't
3 see that. It's sort of and mix and match between
4 things where you say public chemical safety and
5 worker chemical safety are integrated within the
6 first two. And why is that? Why not approach this
7 with the same level of abstraction in each one of
8 the cornerstones?

9 MR. COLLINS: Well, to start to answer
10 that question radiation safety is integrated into
11 criticality safety systems, because again items
12 relied on for safety that come from criticality
13 safety systems are there to prevent public and
14 worker exposures in the event of a criticality.

15 Now, we've had suggested cornerstones.
16 For example, someone suggested why don't we have a
17 public chemical safety and a worker chemical safety
18 cornerstone. And in a sense right now our
19 regulations only require limits for chemical
20 exposure under the accident conditions as defined in
21 an ISA. We don't have chemical limits for routine
22 operations at these plants. So, rather than have
23 another cornerstone, since they're integrated into
24 the chemical process safety systems, the limits are
25 integrated there as part of the ISA, we --

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1 CHAIRMAN RYAN: Just a question. If you
2 run a chemical facility, radiation or not, you do
3 have effluent controls.

4 MR. COLLINS: Yes.

5 CHAIRMAN RYAN: So, the public aspect of
6 dose from chemicals is addressed.

7 MR. COLLINS: Under accident conditions
8 as analyzed in the ISA.

9 CHAIRMAN RYAN: Right, but you also have
10 routine release requirements as well.

11 MR. COLLINS: And routine releases are
12 under EPA jurisdiction --

13 CHAIRMAN RYAN: Right.

14 MR. COLLINS: -- or state jurisdiction,
15 depending on --

16 CHAIRMAN RYAN: But at some point
17 they've got to come together, you know, with the
18 same analyses structured around that facility, that
19 location, those people and all the rest. So, there
20 is some common ground for thinking about routine and
21 accidental releases.

22 MR. COLLINS: Right. Well, you know, we
23 appreciate whatever you can do to help us --

24 CHAIRMAN RYAN: Yes.

25 MR. COLLINS: -- and approve these, but

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1 I'm trying to give you at least the logic that we've
2 gone through. We have considered --

3 CHAIRMAN RYAN: It's helpful to have the
4 logic of where you are, but it's good to have a
5 conversation about what might be, too.

6 MR. COLLINS: Right. Oh, yes. Yes.

7 CONSULTANT FLACK: Just out of
8 curiosity, if I may, why wasn't fire protection a
9 key cornerstone? Is it integrated into the other
10 cornerstones?

11 MR. COLLINS: It's integrated under
12 facilities and equipment in the other cornerstones
13 and in criticality system safety and chemical
14 process safety systems. Again, we considered that
15 potentially to be a cornerstone, but the logic was
16 the fire protection systems are there to protect so
17 that you don't exceed the criticality safety systems
18 objective, that you don't exceed the chemical
19 process safety systems objective. You know what I'm
20 saying? So, they're integrated as key attributes
21 elsewhere.

22 CONSULTANT FLACK: But again, the same
23 thing, fire protection, size and inequalities could
24 be like cornerstones. But getting back to the
25 earlier comments about having things generic in a

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1 sense, initiating event is a generic event. It can
2 apply to all types of events. And the same with
3 mitigation and the same with barriers. It could
4 apply to all of them. So you're not left vulnerable
5 to why isn't this a cornerstone? I mean, is the
6 program not important enough to be a cornerstone? I
7 think you may be susceptible to those kinds of
8 arguments.

9 This was sent to the Commission once
10 before, I believe, right, earlier with the same
11 cornerstones as was presented to the --

12 DR. DAMON: Did it have the cornerstones
13 in it, do you remember, in 31?

14 CONSULTANT FLACK: The first paper that
15 went up on discussions of the reactor oversight
16 process, that this is the same approach that was
17 presented?

18 DR. DAMON: It probably was in there.
19 Yes, in SECY-10-0031.

20 CONSULTANT FLACK: Yes, right. Right.
21 And the Commission rejected the approach? Or why
22 did they reject the approach that was being used at
23 that point in time.

24 DR. DAMON: It's hard to say, because
25 each Commissioner really had their own reasons. But

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1 I mean, some of the Commissioners I think felt that
2 we were being too ambitious maybe, you know, trying
3 to do the whole thing just like the Reactor
4 Oversight Program and they thought maybe --

5 CONSULTANT FLACK: Okay.

6 DR. DAMON: No, but different
7 Commissioners had different views. The Chairman had
8 one view and Commissioner Apostolakis had a view and
9 so on. And so, it's hard to generalize.

10 CONSULTANT FLACK: Okay.

11 MEMBER BLEY: So, going ahead, you've
12 got five cornerstones listed here.

13 MR. COLLINS: Yes, sir.

14 MEMBER BLEY: I expected to find slides
15 about all five of them. It looks like I only find
16 slides about criticality safety.

17 MR. COLLINS: Right. We were going to
18 use criticality safety as an example to show how we
19 developed the elements of a cornerstone. We do have
20 those four. We have drafts of all the other
21 cornerstones. And, I mean, we could provide those
22 to you if you'd like to look at them. But, for the
23 meeting today our goal was to show you how we
24 developed crit safety.

25 MEMBER BLEY: Okay. Yes, I think we'll

1 certainly want to see those, because I want to
2 understand how the whole structure works together
3 and if in fact these things that feel a little ad
4 hoc really integrate in a good way, not just for
5 facilities where criticality is the main problem,
6 but for other kinds of facilities that have lots of
7 other radiation hazards and the like, of which we
8 might see some in the future.

9 CHAIRMAN RYAN: And there may be some
10 where the chemical has -- it tends to be a driver
11 more than some other things as well. So, I mean, to
12 me the interesting thing about this category of
13 facilities is on the list of five, or if you had a
14 sixth, or whatever it is, you can always find a
15 facility where one of those is the key one and may
16 not be in any other, you know, or maybe just a few.
17 So, it's interesting to think about how you balance
18 the system so that you don't over emphasize one
19 cornerstone or under emphasize another over the
20 range of facilities you have to deal with. So,
21 there has to be some art in the clarity with which
22 you deliver the message on how you apply these to a
23 range of facilities, I think. Is that a fair
24 thought?

25 MR. COLLINS: Absolutely. And in fact,

1 the next thing I was going to talk about is the fact
2 that not all of these cornerstones may apply to all
3 the facilities. For example, if you've got a
4 uranium conversion facility, they process actual
5 uranium. They don't have enriched uranium.
6 Criticality is not possible. And therefore, the
7 criticality safety cornerstone would not be
8 applicable at a conversion facility.

9 Next slide, please. As I indicated
10 earlier, to give a better understanding of what's
11 been developed as a result of our efforts today,
12 I'll walk through the elements of the criticality
13 safety systems cornerstone, and this is the
14 objective. And the objective of this cornerstone is
15 to ensure that nuclear criticality safety controls
16 and items relied on for safety protect worker/public
17 health and safety by preventing criticalities. This
18 includes ensuring adequate nuclear criticality
19 safety analyses and ensuring the availability,
20 reliability and capability of NCS controls and
21 IROFS.

22 Next slide. From this objective an NRC
23 working group identified the key attributes and
24 scopes of inspection for all cornerstones. This
25 working group included staff from NMSS, Region II,

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1 NRR and NSIR. The drafts were reviewed within the
2 NRC and provided to external stakeholders for
3 discussion at public meetings. Comments from within
4 the NRC and from the external stakeholders are being
5 evaluated and incorporated. If further work on this
6 approved, we intend to use the inspection activities
7 that you will find outlined on what we call the
8 football diagrams that we'll talk about in just a
9 minute. We intend to use those to revise the
10 inspection procedures. Once the cornerstone
11 objective was defined, the working group developed
12 these key attributes or characteristics of a
13 cornerstone that need to be achieved to meet the
14 cornerstone objective.

15 For the criticality safety systems
16 cornerstone, the working group identified the
17 following key attributes; and here they are: Staff
18 performance, procedure quality, facility and
19 equipment performance, design, configuration
20 control, criticality analysis and corrective action
21 program. And so, you can see from these that when
22 we say "systems," we're using a broader, not just a
23 hardware definition of systems.

24 CHAIRMAN RYAN: Just a question.

25 MR. COLLINS: Yes.

1 CHAIRMAN RYAN: Help me understand a
2 little bit, Doug. If I think about criticality
3 control, I immediately think about sampling and
4 analysis samples for criticality content. Where
5 does that fit in?

6 MR. COLLINS: That would fit in either
7 under procedure quality or staff performance. The
8 sampling would be done in accordance with -- well,
9 the initial procedure for sampling would have a
10 basis based on the criticality analysis itself.
11 Specifications would be placed. And then there
12 would be a procedure developed for that sampling.
13 And so, that procedure is dependent upon the quality
14 of the procedure itself and the performance of the
15 staff in implementing that procedure.

16 CHAIRMAN RYAN: So, basically it sounds
17 like that you're putting what I would call a
18 traditional QA/QC into every one of the elements?

19 MR. COLLINS: Yes.

20 CHAIRMAN RYAN: So, how does QA/QC come
21 together as an overall assessment?

22 MR. COLLINS: The licensees are required
23 to have a level of QA and QC under something called
24 management measures which are applied to items
25 relied on for safety. And so, when someone

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1 implements an item relied on for safety, they have
2 to have QA and QC around that item relied on for
3 safety. So, it would be around the samples, the
4 sampling procedure, the training of the people who
5 do the sampling procedure, the equipment. And so,
6 it's integrated with the item relied on for safety.

7 CHAIRMAN RYAN: These look like an NQA-
8 1-type program, or not?

9 MR. COLLINS: I wouldn't want to say
10 that, no. Some of the newer applicants have
11 committed to a higher-level quality assurance
12 program, but some at the operating facilities. I
13 wouldn't want to say -- I'm not sure we've done an
14 NQA-1 inspection at operating plants, because
15 they're not really required to meet NQA-1 in an
16 operating plant for this kind of work.

17 CHAIRMAN RYAN: Yes, that's one of the
18 interesting challenges I think you all face is that
19 you're going to see this kind of range from NQA-1 to
20 some other versions of a lesser, you know, standard
21 program, not necessarily bad, but certainly not NQA-
22 1. So, that's a hard thing to wrestle with across a
23 whole industry component.

24 CONSULTANT FLACK: And how do the
25 findings relate to risk in the end.

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1 CHAIRMAN RYAN: Yes.

2 CONSULTANT FLACK: I mean, you know, how
3 important are they?

4 CHAIRMAN RYAN: So, I mean, to pick up
5 on Said's point, I think the idea that how do you
6 get to uniform application or uniform implementation
7 of some of the concepts across the range of
8 facilities is a tough challenge.

9 MR. COLLINS: Well, the licensees in
10 providing us their license application do describe
11 to us the management measures that they will apply
12 to their items relied on for safety. And we have a
13 Standard Review Plan that establishes the acceptance
14 criteria for that. So, there is some normalization
15 in the license review as far as risk is concerned.

16 CONSULTANT FLACK: That's true, but look
17 at the MOX facility with 12,000 IROFS.

18 MR. COLLINS: Yes.

19 CONSULTANT FLACK: And then you put this
20 on top of that, and then what does it all mean in
21 the end? I mean, it just overwhelms you, right?

22 MR. COLLINS: There's a lot of IROFS.
23 But the licensee has to establish management
24 measures for every one of those IROFS.

25 CONSULTANT FLACK: Twelve-thousand?

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1 MR. COLLINS: Yes, sir.

2 CONSULTANT FLACK: And if you find one
3 out of whack, you have to assess the significance of
4 that?

5 MR. COLLINS: Yes.

6 CONSULTANT FLACK: And how do you do
7 that then? I mean, it's just incredibly
8 complicated.

9 MR. COLLINS: Well, then we turn to Dr.
10 Damon.

11 DR. DAMON: I didn't review MOX. I
12 don't really --

13 MR. COLLINS: You know, we do have risk
14 analysts.

15 CONSULTANT FLACK: Okay.

16 MR. COLLINS: But, I mean, that's part
17 of what he's going to potentially talk about is how
18 do we assess the significance of findings?

19 MEMBER BLEY: You're going to get to
20 that on this one?

21 MR. COLLINS: No, sir.

22 MEMBER BLEY: I mean on criticality.

23 MR. COLLINS: I think -- I'm not sure
24 how much detail Dennis Damon is going to talk about.
25 He's going to talk about risk assessment of

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1 findings.

2 MEMBER BLEY: Okay. Well, after you go
3 through the flow chart I've got a few questions
4 about that.

5 MR. COLLINS: Yes, sir.

6 MEMBER BLEY: It looks like a model of
7 everything and --

8 MR. COLLINS: At this point it might be,
9 yes.

10 MEMBER BLEY: It's not quite processed
11 to a result, so you'll find a place to put anything
12 that happens, but how do you decide what you ought
13 to do about it?

14 MR. COLLINS: Well, let me explain how
15 that's done now. And then again, that's something
16 we're going to be developing. But for example, what
17 to look at at a plant when an inspector plans an
18 inspection. The inspector looks at the ISA summary
19 first, and the ISA summary provides a sense of what
20 the risk of certain operations are. And an
21 inspector pre-selects what IROFS they might want to
22 look at. Now, that may be modified when they show
23 up at the plant because something unique may be
24 going on at the plant which would change their
25 thought about the priority for work. And I would

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1 expect a similar situation might occur under this
2 new program. But again, that's to be developed. We
3 have not --

4 MEMBER BLEY: Okay. Because there's
5 nothing here that hints how you would do things
6 differently than you're doing it today, is there?

7 MR. COLLINS: And if the Commission
8 approves, I would think we would be considering how
9 we would put some process in place for that.

10 MEMBER ABDEL-KHALIK: If I look at two
11 of these, staff performance and the corrective
12 action program, they're sort of similar to two of
13 the three cross-cutting issues.

14 MR. COLLINS: Yes.

15 MEMBER ABDEL-KHALIK: So, will these
16 appear in each one of the cornerstones?

17 MR. COLLINS: They do now.

18 MEMBER ABDEL-KHALIK: So, why not again
19 follow the same sort of logical structure by
20 introducing cross-cutting issues?

21 MR. COLLINS: And we are considering
22 having cross-cutting issues or safety culture
23 traits, depending upon what decision is made, across
24 the cornerstones. And staff performance, which we
25 use here, if you look at the details under staff

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1 performance, it looks like human performance under
2 the ROP.

3 MEMBER ABDEL-KHALIK: Right.

4 MR. COLLINS: The ROP has a key
5 attribute pretty much in every one of their
6 cornerstones that's called human performance. We
7 use staff performance so that it would not
8 necessarily be confused with all of the elements of
9 human performance under the safety culture or cross-
10 cutting issues. When we say "staff performance"
11 here, we're talking about observation of the staff's
12 performance, whether they're trained and provided
13 adequate procedures to do the job right. Okay?
14 That's somewhat different than human performance
15 under cross-cutting issues.

16 CHAIRMAN RYAN: But then just to sharpen
17 the pencil on that one a little bit, I mean, if a
18 staff member isn't provided with the training and
19 the procedures to follow, I mean, that's so very
20 basic. It seems to me you'd have to have that as a
21 prerequisite to even apply for a license, let along
22 et one.

23 MR. COLLINS: Correct. And what the
24 inspector would be looking at is the implementation
25 of that. I mean, there clearly would be a training

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1 and qualification program that would have been
2 reviewed as part of the license application. There
3 clearly would be a procedure system established as
4 part of the license application. But what we're
5 talking about here is the inspection of the
6 implementation of those things.

7 CHAIRMAN RYAN: And I think, I mean,
8 just from being a receiver of many inspections over
9 many years, the rigor of the inspection is really
10 where you learn. So, there's got to be some element
11 of, you know, how rigorous is the inspection? Is it
12 a -- and I don't mean this to be critical, because
13 it does serve a useful purpose, but a checklist-kind
14 of approach as opposed to a diving down into the
15 details of, you know, time, motion, material and
16 personnel and how all that works as an integrated
17 whole rather than the parts and pieces.

18 MR. COLLINS: And again, those are the
19 kinds of things that I would expect would come out
20 of our development of inspection procedures once
21 we've decided on the cornerstones and key attributes
22 and what needs to be inspected to assure that the
23 cornerstone objective is being met.

24 CHAIRMAN RYAN: But somewhere along the
25 line, if I'm hearing you right, your plan is to tie

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1 the cornerstone objectives into a coherent,
2 synthesized, this is how the plant and its people
3 and its procedures and its design requirements and
4 design implementation should all work together to
5 prevent accidents.

6 MR. COLLINS: I would say that that
7 probably is now being done through the ISA and
8 implementation of the ISA. And this is intended to
9 inspect the implementation of the ISA. The ISA
10 assures chemical safety, radiation safety,
11 criticality safety, fire protection, general plant
12 safety. It's all integrated in the ISA. So, if the
13 inspections are based on the ISA, I would say we
14 will get to that point.

15 CHAIRMAN RYAN: And that kind of gets
16 back to Said's comment about, you know, where is the
17 cross-cutting aspect of the program or the plan as
18 you outlined it to say some of those things touch
19 all of them.

20 MR. COLLINS: And if you were to look at
21 -- and I don't know if we have a copy of the
22 framework slide.

23 CONSULTANT FLACK: No, not --

24 MR. COLLINS: We can get you a copy of
25 the framework slide, because it gives an integrated

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1 flow of how we get from a cornerstone to a
2 consequence from an NRC action point of view, and it
3 does include cross-cutting issues. It is our
4 intent; again, if approved by the Commission --

5 CHAIRMAN RYAN: Yes.

6 MR. COLLINS: -- that this process would
7 have cross-cutting issues or safety culture traits,
8 to use the current potential terminology, as part of
9 the oversight. All we're looking at here are
10 cornerstones sort of separated from the whole
11 framework.

12 CHAIRMAN RYAN: Maybe it would be
13 helpful to go through the criticality flow chart and
14 see that example, how that's laid out.

15 MR. COLLINS: Okay. Slide 10. As we
16 indicated, these are the elements of the current
17 draft of the criticality safety cornerstone. And we
18 recognize that these slides are busy, but they are
19 an attempt to show how the cornerstone objective
20 leads to the key attributes and eventually to what
21 the NRC would inspect to determine whether a
22 licensee meets the cornerstone objective.

23 And take for example on slide 10,
24 facility and equipment performance, in order to
25 assure that the facility and equipment perform to

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1 meet the objective of the criticality safety
2 cornerstone, there would have be effective
3 maintenance surveillance testing, post-maintenance
4 testing. Here we have fire protection, flood
5 protection and cold-weather protection. And then
6 below that, in the boxes below that are proposed
7 inspection activities that would be used to assure
8 that, for example, maintenance is effective.

9 MEMBER ABDEL-KHALIK: So, why isn't
10 procedure compliance a box under your staff
11 performance?

12 MR. COLLINS: Well, it is in a sense,
13 because if you look down at the bottom, we talk
14 about staff performance and staff walk-throughs.
15 The intent is to observe staff; and there's a verbal
16 description of this as a cornerstone. And it talks
17 about observing staff conducting activities to
18 determine whether they are using their procedures
19 effectively and doing the work in a safe way.

20 Did I answer that question? It's
21 imbedded, but not -- we call -- this is a football
22 diagram, and it's really an attempt to summarize
23 much more. And again, we can get you for
24 criticality safety and probably for the other
25 cornerstones the current write-ups that describe

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1 what this really means in detail.

2 CHAIRMAN RYAN: That would be helpful.

3 MR. COLLINS: Okay.

4 CHAIRMAN RYAN: This is kind of an odd
5 question perhaps, but you have cold-weather
6 protection features.

7 MR. COLLINS: Yes.

8 CHAIRMAN RYAN: Do you have hot weather?
9 I mean, I live in South Carolina, so hot weather's a
10 lot more important than cold weather.

11 MR. COLLINS: You know, I don't think
12 we've applied hot-weather protection procedures. I
13 guess there's -- we've not found anything at the
14 plants that --

15 CHAIRMAN RYAN: Well, some chemicals,
16 you know, might not be too good at real high
17 temperatures. You might boil them.

18 MR. COLLINS: Okay. Well --

19 CHAIRMAN RYAN: You know, you get to 90
20 or 100, 110 degrees in a process building, something
21 might go wrong.

22 MEMBER BLEY: Plus the environment for
23 the operator.

24 CHAIRMAN RYAN: Oh, yes. The
25 environment for the operator is also a problem,

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1 Sure.

2 MR. COLLINS: Yes.

3 CONSULTANT FLACK: But could I just --

4 MR. COLLINS: Okay. We'll think about
5 that.

6 CONSULTANT FLACK: -- a question on
7 this? Again, getting back to the question on fire
8 protection, I see it listed on the facility and
9 equipment performance, but say I raise that up to a
10 cornerstone. Wouldn't these other things apply as
11 well, like staff performance, procedure quality and
12 so on and so on? I mean, how does that all get
13 folded up into the fire protection program from
14 below? It looks like it's just focusing on things
15 related to facility, equipment and performance.
16 That's what I'm --

17 MR. COLLINS: Yes, that may be something
18 we need to consider as we move forward. Again, if
19 you look at phase 2, in-depth fire protection of NCS
20 controls, fire protection of NCS IROFS, when you see
21 the words, that talks about looking at those kinds
22 of elements when you get into the level of an
23 inspection procedure, but maybe that --

24 MEMBER BLEY: Well, I guess we need to
25 see the write-up, but when I'm looking at --

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1 MR. COLLINS: -- communicate
2 effectively.

3 CHAIRMAN RYAN: When I'm looking down
4 there, I thought what that was doing was picking up
5 what you talked about before on the NCS controls.
6 Make sure the fire protection is controlled in a way
7 that you're not putting water where it could cause a
8 criticality problem. And the same thing with the
9 IROFS that are aimed at fire protection. Same
10 thing, make sure the things that are in place rather
11 than, you know, including the kind of things John
12 was just raising about the general --

13 CONSULTANT FLACK: The general nature of
14 fire protection.

15 MEMBER BLEY: Well, general nature of
16 people interacting with that sort of --

17 CONSULTANT FLACK: Yes. Right. Yes.

18 CHAIRMAN RYAN: You know, one -- just to
19 look at that same box, control of combustible
20 materials is procedures and people.

21 MR. COLLINS: Yes, it is.

22 CHAIRMAN RYAN: So, that is, you know,
23 kind of at a higher level over the staff side than
24 the other one. So, I kind of second John's
25 observation that, you know, fire protection is kind

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1 of off in a box by itself, and you may intend for it
2 to be as connected, but it doesn't seem to have that
3 same structural connectivity across the programs.

4 MR. COLLINS: Well, we'll consider that,
5 because originally in one of the versions of the
6 cornerstones we had fire protection up at a higher
7 level. And again, in interactions with our
8 stakeholders we --

9 CHAIRMAN RYAN: When you say
10 "interactions with our stakeholders" on this point,
11 you mean licensees?

12 MR. COLLINS: Anybody who showed up at a
13 public meeting, but for the most part it's licensees
14 at public meetings who've said really think about
15 it. Is that where we ought to be considering? I
16 think the substance would change as to what we mean
17 by "fire protection." But the question was do we
18 give it the importance of making it something
19 separate when it fact it really is integrated with
20 all of the equipment cornerstones, and even
21 radiation safety cornerstones.

22 MEMBER BLEY: Let me ask you a question
23 about what goes on now --

24 MR. COLLINS: Yes.

25 MEMBER BLEY: -- and what you envision

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1 for the future. Because if we go back to reactors
2 for just a minute, before we had the ROP, we had the
3 meeting where people would sit around after some
4 event was observed or an inspection finding and say,
5 boy, this one's really important. We're going to
6 put this down in our guide list. And so it was very
7 subjective and that caused a lot of the things that
8 drove toward the ROP to have some more objective way
9 to find things.

10 I'm assuming now you work kind of the
11 same way. If an inspector finds something, somehow
12 you folks decide whether it's important enough to
13 somehow elevate the intensity of observing this
14 facility. Is that right? Is that what you do?

15 MR. COLLINS: Every inspection finding
16 is evaluated for significance.

17 MEMBER BLEY: In kind of a collegial
18 sense in NMSS?

19 MR. COLLINS: Yes. Well, if it appears
20 to be something that is of low safety significance,
21 something we would call a severity level IV -- we
22 have severity level I, II, III, IV and then minor
23 violations. If it's something that is a severity
24 level IV -- I'll talk about the way it was, because
25 as I said I'm a rehired annuitant. But as I

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1 understand the words and the process still, that
2 decision, if it's low safety significance, is
3 between the inspector and his or her branch chief.
4 If it looks like it's going to --

5 MEMBER BLEY: So, it's at that level?

6 MR. COLLINS: Correct. And we have
7 examples in the enforcement policy of what a
8 severity level IV is. If it looks like it could be
9 more than severity level IV, if it could be a
10 severity level III or a II or a I, then we have an
11 enforcement panel. An enforcement panel involves
12 the division director of the division, the branch
13 chief, the enforcement coordinator in the region,
14 somebody who knows the enforcement policy well --

15 MEMBER BLEY: Yes.

16 MR. COLLINS: -- the counsel for the
17 region, a representative of NMSS. And there's a
18 preparation for that which attempts to determine or
19 provide an explanation of what the safety
20 significance of security significance of the finding
21 is.

22 MEMBER BLEY: Okay.

23 MR. COLLINS: Now, occasionally when we
24 get --

25 MEMBER BLEY: And it's still a

1 descriptive finding of this group that then has
2 possibly some penalties associated with it?

3 MR. COLLINS: And the basis for the
4 decision that this could be an escalated enforcement
5 is sent to the licensee and they're offered or told
6 we need an enforcement conference. That's a public
7 meeting unless it's security issues. And they come
8 in and they tell us why we're right or wrong in our
9 determination of safety significance. Then we go
10 back and evaluate the results of that.

11 But as far as criteria used, right now
12 what's in the enforcement policy is a guide; not
13 controlling, but it's a guide.

14 MEMBER BLEY: Now, and I assume if
15 you're at the higher levels the group becomes more
16 elevated that over --

17 MR. COLLINS: Yes, if it's a higher
18 level -- under any circumstances more senior
19 management can come to the enforcement --

20 MEMBER BLEY: Yes. Where I was really
21 taking you though is, given that's how it's done;
22 and that's kind of the way it was done in reactors,
23 what's the vision for what's going to come out of
24 this? It looks like you're still going to have --
25 well, now you've got a place where this fits in the

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1 hierarchy, but you're still going to have to go back
2 to something about like it is now to make a judgment
3 about how severe this event is and how you are to
4 treat it. Is there something new associated with
5 this that you're trying to get to?

6 MR. COLLINS: There is the potential if
7 the Commission approves that we would have a fuel
8 cycle significance determination process which would
9 be more transparent, which would use for radiation
10 protection and emergency preparedness the flow
11 charts as they're used now in the ROP. So, a
12 licensee can pick the -- you know, if somebody comes
13 in and says you've got a violation of this, this and
14 this, then go to the flow chart and find out whether
15 it's going to be a severity level I, II, III or IV.

16 MEMBER BLEY: And in the ROP, those are
17 tied to the quantitative results of a PRA. And that
18 tells you that, yes, this thing's more severe than
19 this one. It's more likely to get us into trouble.
20 I haven't seen anything out of the ISAs or anything
21 on these charts you're showing us that show me how
22 you're going to have a map to that importance
23 function you're talking about.

24 MR. COLLINS: And we haven't been
25 authorized by the Commission to do that.

1 MEMBER BLEY: Isn't that what you're
2 looking for? I thought that's what this --

3 MR. COLLINS: Eventually --

4 MEMBER BLEY: -- whole process was
5 supposed to be looking for.

6 DR. DAMON: Yes, but they didn't direct
7 us to do it this year.

8 MEMBER BLEY: Okay.

9 DR. DAMON: We're proposing to do it
10 next year.

11 MEMBER BLEY: So, this year they're
12 building a structure, but the structure has no
13 hierarchical content in terms of risk significance
14 of these things?

15 MR. COLLINS: We could not begin to do
16 this without some concept of where we were going,
17 honestly. I mean --

18 MEMBER BLEY: Well, that's what I'm
19 hoping to hear. I'm not hearing where we're going.

20 MR. COLLINS: We have --

21 MEMBER BLEY: That's why I took you
22 through this, but --

23 MR. COLLINS: Okay. Well, we'll have to
24 get back to you on that because we have a framework
25 that includes the potential for that kind of risk

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1 assessment, particularly for the ISA-related
2 cornerstones. Where we have risk information and
3 where we don't have risk information Dr. Damon's
4 paper to you guys earlier showed how we could
5 potentially --

6 MEMBER BLEY: Showed some ways to
7 estimate risk in some of these cases?

8 MR. COLLINS: Correct.

9 MEMBER BLEY: You didn't bring that
10 framework to us today?

11 MR. COLLINS: I don't.

12 DR. DAMON: Well, I'm going to talk
13 about it.

14 MEMBER BLEY: Okay. Then I'll shut up.

15 CONSULTANT FLACK: But the key piece was
16 the ranking that wasn't really picked up; and that
17 is putting things in a certain way that you could
18 see what the highest one was on down. And I think
19 that was the piece that -- I think that when you
20 came back to the letter to the ACRS said that you
21 didn't have enough time to think about that.

22 DR. DAMON: Well, we've thought about
23 it. Back in 2009, we, Rudy Bernhard and I developed
24 risk thresholds that we thought might work.

25 CONSULTANT FLACK: Yes.

1 DR. DAMON: But you have to test them
2 out basically, is my view, because you have to do a
3 whole bunch of examples to see how things sort out
4 and then maybe you adjust those thresholds in some
5 way.

6 CHAIRMAN RYAN: This may not be a fair
7 question, but on the reactor side of the house
8 there's a couple of basic designs; PWR, BWR with I
9 know lots of variations among them, but maybe not as
10 many as we would think. Yet in the fuel cycle
11 facilities, I mean, my own experience is there's
12 quite a wide range of, in my estimation, relative
13 hazard points of chemical inventory. You know, I'm
14 a lot more interested in toluene and xylene than I
15 am kerosene, for example, you know, and other things
16 and differences like that among fuel cycle
17 facilities. Is this difference among fuel cycle
18 facilities, one to the next, part of the dilemma
19 that you're wrestling with trying to figure out how
20 to make a one-size-fits-all, or can be adapted to
21 all process?

22 DR. DAMON: Yes, I mean, my thoughts are
23 on the -- what risk metrics you would use is you tie
24 it to the actual health effects, you know? Fatality
25 is fatality and --

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1 CHAIRMAN RYAN: Yes.

2 DR. DAMON: -- has the same significance
3 no matter how it happened. And so, there's a
4 hierarchy of consequences, and actually it's built
5 into the rule.

6 CHAIRMAN RYAN: Sure.

7 DR. DAMON: There are consequence
8 thresholds in the rule. You could use those or you
9 could have a slight modification of it. But I mean,
10 you tie things to -- you know, most accidents in
11 fuel cycle facilities are -- they don't affect all
12 -- it's not a question of like having a lot of
13 accidents where you would affect a lot of people.
14 Usually the accidents affect a small number.

15 CHAIRMAN RYAN: Just like reactors. And
16 that's why we get back to the sequences
17 probabilities where we begin to make the judgment
18 rather than the number of accidents.

19 MEMBER BLEY: Just where you began,
20 although in general these two kinds of reactors look
21 the same, there are two areas whereby they're
22 absolutely unique.

23 CHAIRMAN RYAN: Oh, absolutely.

24 MEMBER BLEY: And that's their electric
25 power systems and their cooling systems.

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1 DR. DAMON: Right.

2 MEMBER BLEY: And their risks are
3 unique. So, there isn't a general location there.

4 CHAIRMAN RYAN: So, when we get down to
5 the --

6 MEMBER BLEY: You got to look at the
7 plant-specific configuration.

8 CHAIRMAN RYAN: Okay. And I accept
9 that, but I mean, in a way it's the same thing among
10 fuel cycle facilities. They all have --

11 MEMBER BLEY: They're even more -- they
12 start more different.

13 CHAIRMAN RYAN: They're different, yes.

14 MEMBER BLEY: Yes.

15 CHAIRMAN RYAN: Well, I guess that was
16 my point.

17 MEMBER BLEY: Yes.

18 CHAIRMAN RYAN: They start a lot more
19 different, even though the reactors have different
20 settings, you know, and we state that. But it seems
21 to me that you quickly get to -- the currency of all
22 this is the probability of something happening
23 rather than accident rates.

24 DR. DAMON: Well, what I was going to
25 say is like on a reactor they use LERF, right, large

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1 early release frequency, as a surrogate metric that
2 works good enough for their purposes of sorting out
3 things by importance. And in the fuel cycle
4 facilities we have -- different processes have
5 different ways of doing bad things to people. But
6 by tying it to actual health effects, then you're
7 liberated from how the heck it happened and you can
8 just use the -- so, the metrics that we were
9 envisioning our, you know, probability of death by
10 criticality essentially. I mean, we wouldn't
11 necessarily put it that way, but and the same for --

12 MEMBER BLEY: I could understand that
13 one, if you got there.

14 CHAIRMAN RYAN: No, but the part that
15 doesn't get captured in that is death by inhalation
16 of nitric acid fuels.

17 DR. DAMON: Well, that would be in the
18 chemical cornerstone.

19 CHAIRMAN RYAN: Yes, so you're saying
20 that you use criticality as an example, that the
21 others -- for all the other --

22 DR. DAMON: Yes, there are all the
23 different ways that you could do the health effects.

24 CHAIRMAN RYAN: Okay.

25 MR. COLLINS: Next slide?

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1 CHAIRMAN RYAN: Yes, please.

2 MR. COLLINS: The next slide is more of
3 the criticality safety cornerstone.

4 Next slide, quickly, please.

5 MEMBER ABDEL-KHALIK: Well, let me ask
6 you about No. 4 then.

7 MR. COLLINS: Yes, sir.

8 MEMBER ABDEL-KHALIK: I mean, presumably
9 we're doing all this with the ultimate goal of
10 coming up with a coherent oversight process.

11 MR. COLLINS: Yes, sir.

12 MEMBER ABDEL-KHALIK: Review of the
13 design happens early during the licensing of the
14 facility. And it would seem to me that for an
15 oversight process, which you ought to be focusing
16 on, is item 5, configuration control. What are the
17 temporary modifications or what are the permanent
18 modifications, rather than the design per se? So,
19 can you explain to me why this item is sort of
20 explicitly included in an oversight process?

21 MR. COLLINS: Licensees under Part 70
22 have the authorization to do significant changes to
23 the facility without coming back to the NRC for a
24 license amendment. And so, for -- and you'll notice
25 we have ISA summary, ISA safety analysis. The

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1 thought is here when these significant changes are
2 made some of those changes might be inspected from a
3 design point of view to look at how the decisions
4 were made and what went into the design.

5 MEMBER ABDEL-KHALIK: So, it's design
6 change?

7 MR. COLLINS: It's more intended to be
8 design change; yes, sir.

9 DR. DAMON: I might mention something in
10 that context. Unlike reactors and some other
11 systems that the NRC regulates, the staff of the
12 Fuel Cycle Division does not review and approve the
13 design of the plant. They look at the ISA in a
14 selective way. I mean, there is what they call a
15 horizontal slice. So you look to see if they've
16 covered the whole plant, but you don't really review
17 that detail.

18 You pick what they call a vertical
19 slice, which is a small subset of the many hundreds
20 of things in the plant and look to go to the
21 facility and look at the full ISA that they've got,
22 because they don't send us the full ISA. They send
23 us what they call an ISA summary. When you go to
24 the plant, then they got big stacks of documentation
25 on what they actually did when they analyzed a

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1 particular process. So, the purpose of doing that
2 vertical slice is to see if the staff feels that the
3 licensee's process for doing ISAs is adequate, but
4 they don't review and approve the whole design of
5 the plant.

6 So, when inspectors go out, they do in
7 fact look at -- you know, they'll pick a particular
8 piece of equipment and they will look at the design
9 and they may be the first person from the NRC that's
10 ever looked at that.

11 CHAIRMAN RYAN: That's interesting.

12 CONSULTANT FLACK: So, you're actually
13 evaluating the performance of those that we have
14 originally submitted, I guess the original design
15 and the IROFS that were not identified at that time,
16 which now maybe an inspector would say why isn't
17 that an IROFS? And then you go back and you find
18 out the licensee never identified it as one and now
19 it becomes a performance issue in the context of
20 this process, right?

21 DR. DAMON: Yes, I mean, I could give
22 you an example of a case where something happened at
23 the plant and they went there and found out that
24 there were no IROFS. They had screened out the
25 entire process as identifying that, well, nothing

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1 could really go wrong with this thing, and then
2 something did and they didn't have any controls in
3 place. There was no safety design for that process.

4 MEMBER BLEY: We don't review the IROFS,
5 right? I mean, the ISAs.

6 DR. DAMON: We review the ISA summary.
7 And like I say, they do a horizontal slice, which
8 means that they look to see if they think they've
9 covered the plant, the whole plant.

10 MEMBER BLEY: Okay.

11 DR. DAMON: But they don't --

12 MEMBER BLEY: That's our inspectors do
13 that?

14 DR. DAMON: No, no, no. The license
15 reviewers when they approve the ISAs.

16 MEMBER BLEY: Okay.

17 DR. DAMON: Okay. They look at the ISA
18 summary and they look to see if they think they
19 covered the plant. Then they'll pick a subset, a
20 small subset of the processes which -- on a risk-
21 informed basis, you know, something that sort of
22 covers a variety of things, but are high-risk
23 significance. Then they'll go to the plant and
24 they'll look at the detail documentation for those
25 things that they've selected. Now, they may change

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1 what they look at when they get to the plant and
2 they may find something more interesting, but that's
3 the process they go through. But they don't look in
4 detail at the entire design of the plant and approve
5 it, you know? They're not in the business of
6 approving. Now, implicitly you are when you review
7 something. You know, you're implicitly approving
8 it. But that's not the nature of the process.

9 MEMBER BLEY: It's not like a design
10 certification for a --

11 CHAIRMAN RYAN: Well, it's a design
12 certification of one plant.

13 MEMBER BLEY: But it's not. It's not an
14 approved design.

15 DR. DAMON: Yes, it's quite --

16 MEMBER BLEY: It's they've looked at it
17 and haven't found anything wrong.

18 MEMBER ABDEL-KHALIK: So, in the context
19 of this process one may find himself reviewing a
20 design change that had not been evaluated in the
21 first place, that where the unrevised original
22 design may not have been evaluated in the first
23 place. So, how would you do that?

24 MR. COLLINS: In doing that, we have
25 certain criteria established in the regulation for

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1 how an analysis must be done. Now, if it's an
2 accident sequence that they screened out, I'm not
3 sure how this would be done. I mean, there is the
4 potential for an inspector in observing activities
5 at a plant to say wait a minute, I don't remember
6 any IROFS related to this operation and it looks to
7 me like -- okay? And it can go from there.

8 But with regard to having a design
9 change, I'm not sure whether this is going to expect
10 the inspector to go back to the original design and
11 verify the original design and then the change.
12 Again, I'm not sure how this is going to be done.
13 It's to be determined.

14 Jay, right now when somebody goes and
15 looks at a design or a design change out of an ISA
16 summary, I guess they do go back and look at the
17 entire design, because you --

18 MR. HENSON: Yes, there's -- of course
19 there's --

20 MR. COLLINS: -- can't do this.

21 MR. HENSON: From the time they get
22 their license and before they go into operation we
23 do operational readiness readings. And so we have
24 inspectors that go out and look out all the IROFS
25 that are listed in the ISA. We confirm that those

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1 IROFS have been installed and are capable and able
2 to do their design function. But we don't do an
3 evaluation of the overall ISA. We're just looking
4 to make sure what they said they would implement has
5 indeed been implemented as they described.

6 When an inspectors goes out and does
7 that inspection of operations, he again looks at the
8 ISA, picks out some of the IROFS to look at and they
9 go out with a questioning attitude and an open mind.
10 And if they identify any concerns, then they address
11 it first with the licensee to see, okay, why isn't
12 there an IROFS or why isn't this control that you
13 say is important, you don't call it an IROFS, you
14 just call it a safety control? And so they engage
15 in that conversation to locate why did you decide
16 that? And then they call back to NMSS and talk to
17 these ISA engineers to say, okay, here's what we
18 found. Now, where are we in ISA space and do we
19 need to go further?

20 Unfortunately, a lot of the issues we've
21 discovered with the problems with ISA have been a
22 result of events or related to events that the
23 licensee discovers. And I think in the case that
24 Dennis is discussing that, oops, we missed one.
25 We've had an event, we've looked at it, we've done

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1 an investigation. We now realize we didn't
2 characterize the safety controls that are here as
3 IROFS, so we don't have management measures. So, we
4 didn't do the right thing and so we've got
5 enforcement cases around that.

6 MR. COLLINS: But back to your first
7 question: I'm not sure how you can look at a design
8 change well without looking at the original design,
9 as I think about it. So, I would anticipate; can't
10 say for sure, because, you know, these would -- how
11 this is going to be done will be reviewed or
12 determined when we revise the inspection procedures.
13 But I would expect design changes will have to at
14 least look at part of the original design.

15 MEMBER ABDEL-KHALIK: Which may or may
16 not have been reviewed early on in the licensing
17 process.

18 MR. COLLINS: Yes, that's true.
19 Anything else on slide 11?

20 MEMBER BLEY: Not exactly, but, Dennis,
21 back when you were telling us how some of all this
22 stuff works you talked about the riskiness factor,
23 whatever it is, really coming from the enforcement
24 policy. And is that a particular document?

25 DR. DAMON: Yes, there's an enforcement

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1 policy document.

2 MEMBER BLEY: For fuel cycle facilities
3 in particular, or just the --

4 DR. DAMON: Right. The things in the
5 enforcement policy is called supplements. So,
6 there's a fuel cycle supplement. And in that
7 supplement it has guidance as to how to assign
8 severity levels to inspection findings.

9 MEMBER BLEY: Okay. When we're done if
10 somebody could point me to that. I haven't read
11 that and I want to get a look at that.

12 So, Derek, if you could track that down
13 for us.

14 Or one of you guys can give it to Derek,
15 or at least the reference so we can pull it up. I'd
16 like to understand that. I think to go further, I
17 really need to know what's in there.

18 DR. DAMON: Yes, of course that strictly
19 is in in fact enforcement, so those are, you know,
20 used in an enforcement process whereas --

21 MEMBER BLEY: Understand.

22 DR. DAMON: -- you know, I think the
23 idea here is to get a lot of this stuff out of
24 enforcement space.

25 MEMBER BLEY: But you're trying to draw

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1 on that substance to set up what you're doing, I
2 think.

3 DR. DAMON: Well, the way I would put it
4 is they were trying in fuel cycle supplements to do
5 something similar to what's an ROP in terms of risk
6 significance, but they couldn't count on having risk
7 information available, you know, because the ISAs
8 don't necessarily have --

9 MEMBER BLEY: Right.

10 DR. DAMON: -- good risk information.
11 But they're trying to use it. They're trying to use
12 the ISAs. Like I say, there's a revised enforcement
13 policy. It has different supplements. It used to
14 have much more purely qualitative criteria. For
15 example, severity level I for criticality was an
16 actual criticality.

17 MEMBER BLEY: Okay.

18 DR. DAMON: Okay? And severity level II
19 was you've lost all your criticality controls. You
20 had none left, but fortuitously you did not have a
21 criticality. And then the next one was you have one
22 control still left, and so on.

23 Well, they've revised that to be more
24 directly a risk metric, I would say, based on
25 concepts that are in the ISAs. But my proposal

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1 here, which is supposed to come at the end, is I'm
2 saying I would like to do better than that, because
3 the ISAs weren't done for the purpose of risk
4 significance and many of them they leave out safety
5 controls that actually exist. And they're formal
6 controls and they're managed and everything. And
7 so, I'm proposing that you consider that when you do
8 the risk significance, otherwise you get the wrong
9 answer, you know? Yes, they lost the controls that
10 were designated IROFS, but they still had something
11 else that they didn't tell you about.

12 And the other one, the other big
13 conservatism is in assessing consequences to the
14 public off site, especially from large chemical
15 releases. They do worst-case weather and then they
16 don't take credit for the fact the wind might not be
17 blowing at the public. And so, there's a gross
18 conservatism in there, and I think you have to take
19 that out.

20 MEMBER ABDEL-KHALIK: I'm guess I'm
21 still having difficulty with the level of
22 abstraction and the consistency in what is being
23 attempted here as part of an oversight process and
24 what was originally done as a part of licensing. If
25 the safety case is made during licensing on the

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1 basis of sampling, and yet you're trying to
2 essentially do the oversight on a more comprehensive
3 basis than what the original safety case was made
4 on, I find that troubling and inconsistent.

5 MR. COLLINS: I would like to be sure
6 that we don't give the impression that this is more
7 than sampling. This is sampling. This is intended.
8 We would not, for example, look at every permanent
9 plant modification, I would not think. Again,
10 that's to be decided later. But right now we don't
11 look at every permanent plant modification. We make
12 a judgment as to which affect the risk based on
13 looking at the ISA summary and choose what we
14 believe to be the higher-risk modifications to look
15 at, not all of them. And I would anticipate this
16 would operate the same way. We would not look at
17 all permanent plant modifications. We wouldn't look
18 at all temporary modifications. We would only do a
19 sampling of walk downs of equipment alignment, again
20 all of it based on being informed by the ISA.

21 So, if I left you with the impression we
22 were going to do more here than in licensing --

23 MEMBER ABDEL-KHALIK: Well, I guess, you
24 know, to me I think your presentation has too much
25 detail and not enough detail. It would seem to me

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1 that a big-picture overview of the process would be
2 very helpful versus sort of jumping into the details
3 which leave me quite confused as to -- my initial
4 reaction is that you're trying your best to not
5 duplicate anything out of the reactor oversight
6 process, trying your best to be different than the
7 reactor oversight process and I don't see the logic.

8 MR. COLLINS: Well, just like we
9 couldn't develop cornerstones without looking at
10 where we think we might end up going, even though
11 the Commission didn't tell us we could go there, I
12 think we need to get you a copy of that framework.
13 I think once we do that, if we need to we can sit
14 down again and talk about it to see how this fits
15 over the whole framework.

16 With regard to not using the same
17 terminology, there is some of that, because what
18 we're talking about may look like the same thing,
19 but really isn't. And let me give an example: The
20 alert notification system, which everybody knows in
21 reactors what that is. That's the sirens, that's
22 the off-site organizations. Well, some licensees,
23 fuel cycle licensees have sirens. It's not an alert
24 notification system. It doesn't meet all the
25 criteria of an alert notification system. It's not

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1 expected to meet those requirements. And so, there
2 is a different term used for that because it is
3 different. And I think that's somewhat the approach
4 we've attempted to use.

5 I mean, in the ROP "configuration
6 control" is the same term as we use. "Design" is
7 the same term. The -- well, they call it "equipment
8 performance." We call it "facility and equipment
9 performance." "Procedure quality." I mean, we
10 weren't trying -- where there's a difference, we did
11 try to make a distinction. But we need to be
12 sensitive that this is not exactly one-for-one.

13 MEMBER BLEY: I think the problem we're
14 having, if you look at the one for the reactor, you
15 can make and they've made arguments why at each
16 level it's a complete system and why anything that
17 creates a significant hazard comes up through one of
18 those paths that reflects a cornerstone. I don't
19 see here at the top level, even at this level an
20 argument for completeness or an argument that
21 anything coming up from the bottom of this, up in
22 one of these paths is likely to defeat the
23 criticality safety system. If that's there, it
24 isn't coming out real strongly.

25 MEMBER ABDEL-KHALIK: Right.

1 MEMBER BLEY: So, as Said says, the
2 logic, the abstraction doesn't -- at least hasn't
3 been explained in a way that I get it, that I see,
4 well, this is a complete set and all the pieces of
5 this are not only complete, but are important. And
6 how I would use this to do anything more than say,
7 oh, they found that some sprinklers weren't working
8 properly, or we see that fits in -- I see a place in
9 here to put it, but I don't know what I'd do with
10 that other than say I got a place to put it.

11 MR. COLLINS: And what we would do with
12 that depends on something to be developed later.
13 The intent of this is to identify at the top what
14 the Commission said our strategic outcomes are. How
15 do we take a fuel cycle facility and ensure that
16 those strategic outcomes, that we have reasonable
17 assurance as a regulator that those strategic
18 outcomes will be met? And so, this was a top-down.
19 We didn't start at the bottom and say what are all
20 the things that you need to do to have a safe plant?

21 We started at the top. Right or wrong,
22 we started at the top and said, okay, how do we meet
23 the outcome for not having significant environmental
24 impact off site, or not have significant radiation
25 exposures? We said, okay, we'll establish those

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1 objectives for the five cornerstones, or however
2 many. The objectives will probably be pretty much
3 the same not matter how many cornerstones you have.

4 And then we said, okay, what things make
5 sure you don't have a criticality? What do you do
6 to make sure you don't have a criticality? And
7 those are the key attributes. And then we said,
8 okay, how do I have reasonable assurance as a
9 regulator that those key attributes are going to be
10 met? And those are the things that we look at.

11 MEMBER BLEY: I guess --

12 MR. COLLINS: Okay. So, it's --

13 MEMBER BLEY: -- that first step, how do
14 I know these are the key attributes? I haven't seen
15 an argument for that yet. I'm sure you've come up
16 with these and you think they are the key
17 attributes, but --

18 MR. COLLINS: And we used the experts on
19 our working group and we said, okay, how do you make
20 sure you don't have a criticality? Well, we go to
21 the ISA. The ISA lists lots of things that say
22 we're going to do not to have a criticality. And
23 we've come to the conclusion that that provides
24 reasonable assurance if they're effectively
25 implemented.

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1 CONSULTANT FLACK: But doesn't all this
2 lead to is a performance indicator for the
3 cornerstone and then that performance indicator's
4 got to be fed into an action matrix where you're
5 going to take some action? I understand all the
6 words you're saying; at the very top this is what
7 we're trying to achieve, but down here somehow what
8 Dennis is saying has to be converted into a
9 performance indicator on critical safety systems.
10 And whatever that performance indicator, what color
11 it is in the ROP, gets fed into an action matrix
12 which then determines whether you have to increase
13 your inspections or not. But I don't see that
14 connection at all at this point.

15 DR. DAMON: No, it's not here.

16 CONSULTANT FLACK: Is it there?

17 DR. DAMON: It's something that remains
18 to be developed. We've had discussions about it,
19 but we weren't directed by the Commission to work on
20 that this year.

21 CONSULTANT FLACK: But that is a key
22 piece, isn't it?

23 DR. DAMON: Oh, yes, absolutely.

24 CHAIRMAN RYAN: Well, and then coming
25 after that then it comes to, you know, procedures

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1 and all that aspect, and then it comes to the
2 training and capability of the work force aspect,
3 because it is a system that has to operate together.

4 MEMBER ABDEL-KHALIK: I mean, I
5 understand that the Commission has not directed you
6 to do this, but is there a potential then if and
7 when the time comes for you to work on this you'll
8 look at this and say this is not going to work?

9 DR. DAMON: Well, I mean, the action
10 matrix is quite a different thing. And the same
11 with like I think Dennis Bley was referring to; you
12 don't see the direct connection to the safety of the
13 design. Well, yes, it's not like a fault tree of
14 all-the-things-that-can-go-wrong-kind of thing. For
15 example, the 1Y seed in fact does use fault trees
16 for all the criticality safety analyses they do.
17 And you could make a generic fault tree for all
18 criticality safety because there's a defined set of
19 parameters that determines the criticality of the
20 system. You know, mass, enrichment, some moderator,
21 reflection, heterogeneity and so on.

22 There's a list of parameters in the crit
23 safety discipline that control those parameters and
24 the most common strategy is to pick two parameters
25 that you're going to control. Then in the safety

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1 analysis, in the criticality analysis you assume
2 that all the other parameters are at their most-
3 reactive, worst-case condition. And so, by doing
4 the analysis that way, controlling two of the
5 parameters to some limiting value, you achieve a
6 double contingency, which means that two different
7 things have to happen to get you in trouble. So,
8 any one parameter will not cause a criticality, you
9 know, no matter how bad it goes. And so, that's the
10 normal strategy.

11 Now, sometimes, I mean, they'll only
12 control one parameter. There's facilities called
13 dry conversion facilities and they just control
14 moderation, and they just keep moderator out of that
15 facility basically. And they just don't have pipes
16 full of water running around and stuff like that.
17 But traditionally in the low-enriched facilities
18 they like to control two parameters because then it
19 gives you that independence. You're really working
20 with two physically separate things.

21 Now, in the high-enriched facilities of
22 course they can't exactly do that, but you know,
23 because in principle at least you could go critical
24 without moderation. But they just have to be very
25 careful with their single parameter that they

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1 control. But like I say, even if you don't use a
2 fault tree, there's an implicit fault tree for
3 criticality safety, you know, that covers everything
4 because they --

5 MEMBER BLEY: If-and-only-if logic?

6 DR. DAMON: Yes, they're looking at all
7 the parameters that would influence criticality.
8 And now chemical is different, but like I say, some
9 of the licensees do use fault trees, some use event
10 trees. Most of them though they don't. Most of
11 them use -- they use HAZOP, which is a structured
12 logic that looks at the parameters of the system;
13 flow, temperature, so on. They make a list of --

14 MEMBER BLEY: Against the guide
15 questions?

16 DR. DAMON: Yes, right. So, they use a
17 structured method, but it's not oriented towards
18 quantification, which again is another problem with
19 using ISA results. I found that often when you do a
20 HAZOP you're not defining your quantities quite as
21 crisply as you would if you did a fault tree.

22 MR. COLLINS: So, the intent is, under
23 here for inspection activities there would be a
24 metric and that metric would be based on a
25 regulatory requirement that would be a pass/fail and

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1 that once -- if there's an inspection finding, that
2 an inspection activity has identified a finding, we
3 would then have a significance determination process
4 that would for certain risk-informed ISA-related
5 findings use the ISA to determine the significance.
6 And then for others a flow chart; for example,
7 transportation safety, a flow chart not unlike in
8 the ROP to come to a safety significance.

9 MEMBER BLEY: But your purpose in
10 building this tree structure then is to identify the
11 points which might be selected for inspection?

12 MR. COLLINS: Correct. Yes. How do we
13 come to a reasonable assurance that a licensee is
14 not going to have a criticality, licensee is not
15 going to have a release that has significant off-
16 site impacts? What do we need to look at to come to
17 that decision? And if we find something that
18 doesn't meet our acceptance criteria down here in
19 the inspection activities, we then would go to a
20 significance determination process, which would lead
21 to a hopefully predictable NRC and licensee action.

22 MEMBER BLEY: And it's not there yet?

23 MR. COLLINS: And we're not --

24 MEMBER BLEY: How often does a facility
25 get an inspection, if they're okay? You know, if

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1 they're not on some special list?

2 MR. COLLINS: It depends. For example,
3 a low-enriched facility gets a criticality
4 inspection once a year. They get an HP inspection
5 once a year. They get a waste inspection once a
6 year.

7 CHAIRMAN RYAN: Not all together at the
8 same time?

9 MR. COLLINS: No.

10 CHAIRMAN RYAN: Yes.

11 MR. COLLINS: Well, it could be, but
12 they might get a fire protection inspection every
13 two years.

14 MS. KOTZALAS: Two to three years.

15 CONSULTANT FLACK: There's a triennial
16 one, that complete thing, and then there's an
17 annual.

18 MR. COLLINS: Okay. But, so right now
19 there's a structured process based on a year.

20 MEMBER BLEY: If you keep going the way
21 you're going, you'll have a set of these logic
22 structures, one for each of the five cornerstones?
23 And then somehow you'll have to pick off of that
24 very large list at the bottom a handful of these
25 things to inspect on when you go visit a plant?

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1 MR. COLLINS: Correct. And right now,
2 all these things at the bottom, all of these
3 inspection activities; I should make it clear, our
4 stakeholders haven't focused on those. And we've
5 got potentially a meeting with all of the inspectors
6 in the near future to encourage them to focus on
7 those things, because we may have missed some
8 things, like licensees have done, and there may be
9 some things in here that really are not significant
10 from a risk --

11 MEMBER BLEY: Do you expect any effort
12 to pick at least one from each of the columns?

13 MR. COLLINS: It seems to me we're going
14 to have to do something. I would expect we'd have
15 to do something to determine that, for example,
16 staff performance is adequate.

17 MEMBER BLEY: Yes.

18 MR. COLLINS: We'd have to do something
19 to make sure that the facility and equipment is
20 adequate and assures that the IROFS --

21 MEMBER BLEY: So, for 1 through 7 at the
22 top you'd have to do something on each of them, or
23 maybe not.

24 MR. COLLINS: I would think so, but I
25 don't want to --

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1 MEMBER BLEY: Because we got another
2 four of these charts.

3 MR. COLLINS: We do not have performance
4 indicators. If we had performance indicators, I
5 might be able to say maybe not, but we don't. Now,
6 we may not have to do it every year. I mean, like
7 fire protection, we do a detailed look every three
8 years and that's based on experience. But that's to
9 be determined.

10 MEMBER BLEY: Okay.

11 CONSULTANT FLACK: And then there is the
12 connection with the cross-cutting issues as well.
13 So, in addition to all that, you'd have to look
14 across your cornerstones to see if you're getting
15 cross-cutting issues, right?

16 MR. COLLINS: And there we anticipate;
17 and this flow chart will show it, the framework,
18 which we didn't give you, would show that there is
19 conceptually an approach, you know, as a starting
20 point not unlike the ROP to identify if there are
21 cross-cutting issues coming from numerous folks at
22 the licensee.

23 So, I talked about metrics. And then
24 finally in summary, we're developing it --

25 MEMBER ABDEL-KHALIK: Let's speak about

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1 that slide on metrics.

2 MR. COLLINS: Yes, sir.

3 MEMBER ABDEL-KHALIK: When one thinks of
4 metrics, you think of measurable and objective
5 measures.

6 MR. COLLINS: Yes.

7 MEMBER ABDEL-KHALIK: How are these
8 measurable, the list of four that you have on the
9 slide?

10 MR. COLLINS: Well, Part 70, Subpart H
11 gives specific performance or limits that a licensee
12 must meet. The license does the same thing. You
13 must do this. You must have a procedure for this.
14 It must be adequate.

15 Now, this does include a decision on
16 adequacy, but the decision on adequacy I would
17 expect will be based on performance. You know, this
18 says you have to have procedures as they are in the
19 license. Okay? There are certain procedures that a
20 facility has that the license requires them to have
21 and to implement. And whether they're implemented
22 adequately would depend on a view of the
23 performance. That's the way it is now.

24 MEMBER ABDEL-KHALIK: So, these are all
25 pass/fail metrics?

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1 MR. COLLINS: For this, these are
2 pass/fail. In a simple sense they're pass/fail.
3 And that would lead you into a significance
4 determination process, if you fail. If you fail to
5 do a safety analysis that's required, how
6 significant is that? If you fail to follow
7 procedure and take a sample adequately, that's a
8 violation.

9 Got a procedure that says take a sample.
10 Do it this way. Use this scoop. Take the scoop,
11 put it in here. Write down on the form, etcetera,
12 etcetera, and send it over and do a moisture
13 evaluation on it before you do anything else.

14 MEMBER ABDEL-KHALIK: And report it back
15 to the --

16 MR. COLLINS: And report it back. Okay?
17 Somebody uses the wrong scoop. Okay? That's a
18 violation. Okay? It could be a minor violation, or
19 it could be significant. Because again, this is for
20 moisture content and that's the significance
21 determination that comes from the quasi-pass/fail
22 here. And that's to be developed.

23 Did I answer your question? No?

24 MEMBER ABDEL-KHALIK: That's okay.

25 MR. COLLINS: So in summary, we're

1 developing cornerstones from top down.

2 MEMBER BLEY: Can --

3 MR. COLLINS: No, please; go ahead.

4 MEMBER BLEY: Back to your previous
5 slide --

6 MR. COLLINS: Yes, sir?

7 MEMBER BLEY: -- you know, I get where
8 if they're missing something on Part 70, it's a
9 violation.

10 MR. COLLINS: Yes.

11 MEMBER BLEY: What would be the kind of
12 things in the ISA that would be a finding from an
13 inspection?

14 MR. COLLINS: Well, the example that
15 Dennis brought up. You've got an accident sequence
16 that's not evaluated in the ISA.

17 MEMBER BLEY: And it happened?

18 MR. COLLINS: And it happened.

19 MEMBER BLEY: Okay.

20 MR. COLLINS: And the regulations say
21 your ISA has to encompass all potential accident
22 sequences. That's a violation.

23 MEMBER BLEY: Okay. Now, that you find
24 because you have an event. You go to inspect the
25 plant. If you just went to the plant and inspected

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1 things --

2 PARTICIPANT: You wouldn't find it.

3 MEMBER BLEY: -- you probably wouldn't
4 have found that one.

5 DR. DAMON: Now, I'll tell you a funny
6 story: Actually it wasn't done by an inspector; it
7 was done during the review of the ISA itself. One
8 of our reviewers went to a plant and she walked into
9 a room and she says this room's got HF piping
10 running through it. How come there isn't a sensor
11 in here for HF? And, you know, they said, well,
12 maybe we overlooked, you know, this. A couple
13 months later they had an HF leak in that exact spot.
14 Okay? So, she not only identified it; she predicted
15 it.

16 MEMBER BLEY: Okay.

17 MR. COLLINS: Does that answer your
18 question?

19 MEMBER BLEY: I'm must thinking about
20 it. Yes, I'm a little biased by having looked most
21 recently at that enormous ISA. In a more normal ISA
22 I expect you could review the summary in short order
23 before you went to the plant and be pretty familiar
24 with it. Nobody could be familiar with the one for
25 the MOX branch in any level of detail.

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1 MR. COLLINS: Even the ISA summary? Is
2 that right?

3 MEMBER BLEY: The ISA summary was over
4 400 pages thick, maybe 600.

5 PARTICIPANT: Yes, more like 600.

6 MEMBER BLEY: No, nobody could be
7 familiar with that. I tried studying it. It was
8 really a beast to work your way through.

9 MR. COLLINS: And in fact, NMSS has done
10 a risk ranking, haven't you, on the IROFS because of
11 that?

12 DR. DAMON: We did it on the centrifuge
13 plants, okay, because the centrifuge plants only had
14 like 60 IROFS, whereas, you know, like you say, MOX,
15 if we tried to do a ranking of, you know, all that
16 stuff in there, it would take you forever, you know?

17 MEMBER BLEY: At least from their
18 documentation, going through it every page looks
19 almost the same.

20 DR. DAMON: You know, the centrifuge
21 plants applied a risk-indexing method like there's
22 in the standard review plan and they only have like
23 60 IROFS. So, we had a guy come from Region II and
24 came up for a couple months. He put it on all on a
25 spreadsheet and we did a risk ranking of --

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1 MEMBER BLEY: Oh, that's interesting. I
2 hadn't heard about that.

3 MS. KOTZALAS: Yes, and we are working
4 on one, a risk ranking for the IROFS for MOX so that
5 it will help focus our inspection activities.

6 MEMBER BLEY: It's going to take you
7 awhile.

8 MS. KOTZALAS: Yes, well, we've been
9 working on it for awhile. Yes, a couple years
10 already.

11 MEMBER BLEY: Yes, okay.

12 MR. COLLINS: So, next slide. I think
13 we've talked about the summary. We've talked about
14 that.

15 Next slide. I invite more questions.

16 MEMBER BLEY: You don't really mean that
17 do you?

18 MR. COLLINS: I do. I do, because you
19 haven't been seeing me writing, but Margie's been
20 over writing all the things you've said down. So,
21 we'll take them back and work on them.

22 MEMBER ABDEL-KHALIK: I guess I must
23 confess, I'm comparing what you're doing against
24 sort of an established reactor oversight process.
25 And when one studies the reactor oversight process,

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1 there is a certain logic, elegance and consistency
2 in the process, which I don't see here.

3 MR. COLLINS: Yes, the reactor oversight
4 process has a lot of --

5 MEMBER ABDEL-KHALIK: I understand that
6 there are differences. I understand, you know, that
7 your constituencies might want to shy away from
8 using the same terminology, but I'm just looking for
9 a big-picture structure and logic which I don't see.

10 MR. COLLINS: And the framework might
11 help, but after the reactor oversight process was
12 put together, a lot of these basis documents were
13 published, and we have not done a lot of those basis
14 documents yet.

15 MEMBER ABDEL-KHALIK: We have a lot to
16 learn from. I mean, you know, there's a lot of
17 history there.

18 MR. COLLINS: And I don't think it's the
19 intent of doing the same degree. I mean, you know,
20 the Inspection Manual chapter 308 is this thick,
21 speaking of 400 pages.

22 MEMBER ABDEL-KHALIK: Yes.

23 MR. COLLINS: Is it 308? I think it's
24 308. Which is a lot of the basis for the ROP. And
25 I would not anticipate that degree of elegant

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1 explanation, but it depends; we may.

2 MEMBER ABDEL-KHALIK: Just a general
3 comment.

4 MR. COLLINS: Understand.

5 MEMBER ABDEL-KHALIK: And hope you take
6 it in the spirit in which it was offered.

7 MR. COLLINS: We know what the ROD did
8 and we're trying to get to a good oversight process.

9 MEMBER BLEY: And it didn't happen in a
10 day, and it didn't happen in one pass.

11 MR. COLLINS: True.

12 MS. BAILEY: Can I just sort of add to
13 that a little bit? We are looking at the reactor
14 oversight process, and to the extent that we can, we
15 are looking at its elements and if we can do it, put
16 it into fuel cycle oversight process.

17 I mean, for example, the concept of
18 cornerstones. We're taking cornerstones. The
19 cornerstones will help us decide where we focus our
20 baseline inspection program. A significance
21 determination process like the reactor oversight
22 process has. We're looking at a significance
23 determination process to help us determine the
24 significance of inspection findings or violations.
25 We are not at a point yet in figuring out what a

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1 significance determination process is going to look
2 like or how an ISA might fit into it, but we know
3 that the fuel cycle oversight process that we
4 develop will have some sort of a significance
5 determination process. It's going to have an action
6 matrix similar to the reactor oversight process and
7 we're going to look at also cross-cutting activity.

8 So, we are trying to take what's in the
9 ROP and apply it to the FCOP, but we don't want to
10 force-fit it. We want to make sure that, you know,
11 it makes sense for fuel cycle facilities.

12 CHAIRMAN RYAN: Thank you.

13 MS. BAILEY: And I think we probably
14 should have put the framework there, because the
15 framework would illustrate to you maybe a vision of
16 where we're trying to go. I think we started with
17 cornerstones because right now we're trying to
18 answer the mail. You know, the Commission told us
19 to develop cornerstones and then to propose to them
20 a path forward. So, that's kind of why we focused
21 on the cornerstones now.

22 CHAIRMAN RYAN: Thank you.

23 MR. COLLINS: And with that --

24 CHAIRMAN RYAN: Thank you, Doug.

25 MR. COLLINS: Okay. Thank you.

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1 CHAIRMAN RYAN: Mr. Henson?

2 MR. HENSON: Good afternoon.

3 CHAIRMAN RYAN: Good afternoon.

4 MR. HENSON: Name's Jay Henson. I also
5 am a re-hired annuitant. I was a branch chief in
6 Region II in the fuel facility inspection area for
7 about seven years before I retired. I'm assisting
8 NMSS with the Commission-directed actions associated
9 with fuel cycle facility licensee corrective action
10 problems, and I'm going to discuss what actions
11 staff has taken in regard to the Commission's
12 direction to consider how to best reflect fuel
13 facility licensees' corrective action programs and
14 the NRC enforcement policy.

15 What I'll do today is describe the
16 Commission's direction to the staff regarding
17 corrective action programs, discuss the staff's
18 approach, status and path forward for the effort to
19 provide incentives to licensees to maintain strong
20 corrective actions, and discuss the approach for the
21 effort to revise the baseline inspection program for
22 creating licensees' effective problem identification
23 and resolution programs.

24 Next slide. In the August 4 Staff
25 Requirements Memorandum the Commission informed the

1 staff that they should consider how to best reflect
2 the fuel facility licensees' corrective action
3 programs and the NRC enforcement policy. Commission
4 stated that the staff's approach should provide
5 incentives for licensees to maintain strong
6 corrective action programs and should implement
7 revisions to the baseline inspection program to
8 credit licensees' effective problem identification
9 and resolution programs.

10 MEMBER BLEY: Can I ask a question about
11 the corrective action programs in these facilities?
12 It turns out if one studies some of the more
13 interesting abnormal events in reactors over the
14 last two or three years; probably further back than
15 that, we find some of the more severe ones at the
16 heart of them have an ineffective corrective action
17 program. Either things didn't get into the program
18 or things sat in there and weren't handled the way
19 they're supposed to have. Is that same situation
20 prevalent among the fuel cycle facilities?

21 MR. HENSON: I think you'd find similar
22 conditions.

23 MEMBER BLEY: Okay. So, it really is a
24 crucial piece to making this work right?

25 MR. HENSON: Yes, and as you'll hear

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1 later, I mean, both the industry and the NRC agree
2 the strong corrective action programs are absolutely
3 essential for these facilities.

4 MEMBER BLEY: Okay. Good.

5 MR. HENSON: So, next slide. So, the
6 staff determined that the incentive for fuel
7 facility licensees to maintain strong corrective
8 action programs should be similar to that applied to
9 reactor licensees. So, the NRC would non-cite NRC-
10 identified violations of low significance, basically
11 what are now severity level IV violations at fuel
12 facilities, and enter these violations into a
13 corrective action program that the NRC has
14 determined to be strong and effective.

15 Now, an effective corrective action
16 program is one that identifies, reports, evaluates,
17 corrects, tracks and trends safety and security
18 issues and routinely assesses its own effectiveness
19 with this so that the safety and security issues do
20 not recur and similar issues with similar causes are
21 prevented. So, you want to prevent recurrence and
22 you don't want to have similar issues that are a
23 little bit different occur as well.

24 Next slide. Now to implement this
25 incentive for strong corrective action programs the

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1 NRC would revise the enforcement policy to include a
2 provision that would allow NRC inspectors to not-
3 cite NRC-identified severity level IV violations
4 when specific conditions are met. The draft
5 enforcement policy revision will be published for
6 public comment this summer.

7 MEMBER BLEY: I have to admit some
8 ignorance here. What's a non-cited violation?

9 MR. HENSON: Non-cited violation is if
10 it's -- right now for fuel facilities, if it's
11 licensee-identified and it's a low safety
12 significance, severity level IV, and they have
13 developed corrective actions that the NRC considers
14 should be effective; whether or not they have had
15 time to implement them, but at least they're
16 effective. It's non-willful.

17 MEMBER BLEY: So, they found it and
18 they're fixing it?

19 MR. HENSON: Right, we could non-cite it
20 as an NRC inspector. So, what this would change
21 then is if it's an NRC-identified violation -- which
22 it can be the same violation as that 1Y-seed
23 identified.

24 MEMBER BLEY: Right.

25 MR. HENSON: But in this case we

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1 identify it. As long as they have a corrective
2 action program we've determined to be effective,
3 they put in that corrective action program. Again,
4 it's non-recurring, it's non-willful, we think the
5 corrective actions they've described to us should be
6 effective, then we can non-cite it.

7 MEMBER BLEY: Oh, either way?

8 MR. HENSON: Right.

9 MEMBER BLEY: Okay.

10 MR. HENSON: That's what we're working
11 towards. Now, non-cited basically means that we
12 don't -- in our report we identify it as a non-cited
13 violation. So, we don't cite them for the
14 violation. They don't have to come back to us with
15 a written response to that.

16 MEMBER BLEY: But there is a record?

17 MR. HENSON: But there is a record. And
18 in some cases that is something that they would like
19 to see go away, as well as the record completely
20 disappear, that it not be mentioned at all in a
21 report; and we've had discussions on that. But
22 basically right now it would just be -- it would be
23 what you call it. It's not a cited violation. It's
24 non-cited, so you don't have to -- we're not going
25 to issue the violation to you and you don't have to

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1 respond to us. We trust that you're going to take
2 care of it, but we're going to verify in a later
3 inspection that you've done it right.

4 MEMBER BLEY: I'd hope you don't leave
5 the policy of recording it, because if you begin to
6 get a lot of these, I would suspect that's a symptom
7 of something.

8 MR. HENSON: Yes, a non-cited violation
9 would tell you -- I mean, it's still a violation.
10 It's not that it's not a violation. It's not that
11 it can't be symptomatic of an increasing trend or
12 problem, and that's why trending is so important.

13 MEMBER BLEY: But you think it's on the
14 right track?

15 MR. HENSON: Yes.

16 CHAIRMAN RYAN: And I imagine, to get to
17 Dennis' point, when you do have a non-cited
18 violation you go back and look is that part of a
19 pattern of other non-cited violations, or is it
20 unique and succinct all of that.

21 MR. HENSON: Certainly.

22 CHAIRMAN RYAN: So, I think that --

23 MEMBER BLEY: And he did say it's not
24 repeated.

25 MR. HENSON: Right, it's not repetitive.

1 And that again is one of the features of a strong
2 corrective action program, is you put all these
3 issues; non-cited as well as cited violations, in
4 that corrective action program.

5 CHAIRMAN RYAN: I may be putting too
6 much in your thought, but to me it would also mean
7 not necessarily a repetitive thing, but something
8 that was related to or should have been like the
9 previous non-cited violation. Maybe not exactly the
10 same, but in the same general area of fire
11 protection or something else.

12 MR. HENSON: Yes, and we look at that,
13 because again one of the things we expect to see is
14 an extended condition, extended cause evaluation so
15 that you do identify, you know, generic issues
16 potential for this particular issue to reflect
17 itself somewhere else in the plan.

18 CONSULTANT FLACK: And, Jay, how do you
19 determine if it's low-safety significance?

20 MR. HENSON: Well, they again right now
21 in their traditional enforcement, they have the
22 supplements in the enforcement policy to tell us for
23 a specific type of violation some guides as to
24 whether or not this is a severity level IV.
25 Inspector looks at that guidance, makes that

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1 determination based upon his experience and
2 understanding of the policy. But then he also comes
3 back and discusses it with his branch chief and they
4 reach consensus that, yes, this particular violation
5 is of low safety significance and it makes -- it
6 falls in that severity level IV description or
7 guidance in the enforcement policy, so therefore
8 they agree it's a severity level IV.

9 CONSULTANT FLACK: So, there's no
10 quantitative criteria? It's really expertise here
11 that --

12 MR. HENSON: Right, it's expertise. And
13 we're again referring to that policy where it gives
14 you examples of what's a severity level IV
15 violation. Sometimes you find the exact thing that
16 the example represents. Sometimes it's not exact,
17 but you can kind of discern it from a significance
18 standpoint. It's in that same ballpark.

19 CONSULTANT FLACK: Okay.

20 MR. HENSON: Next slide? Now, of course
21 the benefit of a strong corrective action program
22 goes well beyond just the fact that you get NRC to
23 non-cite a violation, or the fact that there may be
24 some reduction in the baseline inspection program.
25 And in our discussions with the industry, you know,

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1 we both recognize and agree that the true benefit of
2 a strong effective corrective action program is the
3 safety benefit to workers and the public that result
4 from the identification and correction of safety and
5 security issues before they result in serious safety
6 and health consequences. So, there's great
7 alignment there.

8 Now, all fuel facilities currently have
9 corrective action programs. And as I will discuss
10 later, the nature and scope of these programs varies
11 from licensee to licensee. And with the current
12 corrective action programs in place at each fuel
13 facility, the NRC, as a part of the licensee
14 performance review process, routinely concludes that
15 the safety at the fuel facility is adequate. So
16 again, they've got corrective action programs and we
17 have not come to any conclusions their safety is not
18 adequate. However, the staff uses Commission
19 direction regarding corrective action programs as an
20 opportunity to support continuous improvement of
21 safety performance at fuel facilities by the
22 creation of more comprehensive and consistent
23 corrective action programs that are based on the
24 most current knowledge and lessons learned from the
25 implementation of the current program.

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1 MEMBER ABDEL-KHALIK: Now, the
2 corrective action program at these facilities is
3 pretty much inward-looking. They don't look at
4 operating experience at other facilities?

5 MR. HENSON: Oh, they do.

6 MEMBER ABDEL-KHALIK: Do they?

7 MR. HENSON: They do. Again --

8 MEMBER ABDEL-KHALIK: So, how much
9 detail are actually shared amongst different
10 licensees?

11 MR. HENSON: Well, there won't -- there
12 is -- no, we don't find a lot with reactors, because
13 these are competitors. So, there's been improved
14 discussion among the group, certainly through NEI
15 and stuff to have some discussions on what are our
16 common issues and problems. And sometimes if
17 they're non-competitors, like a uranium conversion
18 facility, they're probably more open to have
19 discussions with a fuel fabricator than they would
20 be another uranium conversion facility, if there was
21 another one. And they certainly learn from -- they
22 look at inspection reports that the NRC does at
23 other similar-type facilities. They look at the
24 enforcement cases that are taken. So, they do apply
25 operating experience.

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1 And depending on the licensee, some of
2 them actually have an operating experience person,
3 who that's all he does is he looks and finds
4 operating experience. Because again, they're
5 looking not on the cross-fuel facilities, but the
6 chemical industry. Because again, these are
7 chemical plants basically. They have nuclear
8 material. And so, there is operating experience
9 considered --

10 MEMBER BLEY: Jay --

11 MR. HENSON: -- and the corrective
12 action --

13 MEMBER BLEY: Internationally WANO has
14 at least one now process plant member. Does INPO
15 accept or have any process plant members?

16 MR. HENSON: They have service plants,
17 and a lot of these plants are a member of that
18 organization from that perspective --

19 MEMBER BLEY: Is it under --

20 MR. HENSON: -- support, so --

21 MEMBER BLEY: -- INPO, or is it
22 something separate?

23 MR. HENSON: It's an INPO organization.
24 And I don't know, Doug --

25 MEMBER BLEY: So, those same kind of

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1 things? And this is one of the issues INPO likes to
2 push, I know.

3 MR. HENSON: Right, and in some cases
4 they've invited INPO to come out and look at their
5 facility and do an inspection and give them some
6 insight on where they might --

7 MEMBER BLEY: Is it common to be
8 involved in that, or is that a rare case?

9 MR. HENSON: It's perhaps not as common
10 as one would like to see it, but they're -- and
11 again, we're counting that change. We're not moving
12 towards that. And so, as they've seen what the
13 reactors have done, as they've seen what there is to
14 gain from being a little more cooperative and having
15 that kind of relationship with that organization,
16 you see more and more movement. And I'm not really
17 sure on exact numbers.

18 MEMBER BLEY: Okay. Now, I've seen one
19 place who kind of didn't think it was a good idea,
20 even though they joined, because it's all reactor
21 people, but after a couple of years and going out on
22 inspection visits and the like began to say we're
23 learning a lot.

24 MR. HENSON: A lot of times what you
25 find is this especially becomes critical when

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1 they've gotten themselves in so much regulatory
2 trouble --

3 MEMBER BLEY: Yes.

4 MR. HENSON: -- that they're looking for
5 help. And so, they understand that INPO, although
6 they are a reactor organization -- safety is safety
7 and there's a lot of insight they can gain from
8 them. And so, they have been moving towards that.

9 MEMBER BLEY: Okay.

10 CONSULTANT FLACK: Yes, just to follow
11 up a little bit on that, I know they give you safety
12 culture assessments every other year, I believe,
13 INPO, nuclear facilities. Has anyone actually done
14 a safety culture assessment at a fuel cycle
15 facility?

16 MR. HENSON: Yes.

17 CONSULTANT FLACK: They have been done?

18 MR. HENSON: Yes.

19 CONSULTANT FLACK: But not INPO? I
20 mean, a separate --

21 MR. HENSON: Not necessarily INPO, no.
22 They may hire some separate organization, an
23 independent organization to do a safety conscious
24 work environment assessment as part of a safety
25 culture assessment. Or at some facilities they've

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1 come and actually done a safety culture assessment
2 and where they've hired an independent contractor to
3 come in and do that for them, or they've established
4 a team of independent individuals to come in and
5 look at their safety culture.

6 CONSULTANT FLACK: Okay.

7 MR. HENSON: Okay. So, that takes us to
8 slide 20. So, the first step in the staff effort to
9 develop a process to determine if a licensee's
10 corrective action program is effective was to
11 develop what basically what we call a list of
12 criterion associated elements that describe a
13 comprehensive corrective action program. If they've
14 appropriately implemented these criterion elements
15 it should result in an effective corrective action
16 program.

17 The basic attributes of a corrective
18 action program included in these criteria were you
19 describe your corrective action program and
20 policies, programs and procedures. The staff are
21 trained and encouraged to follow and implement the
22 corrective action program, policies, programs and
23 procedures. Staff identifies and reports safety and
24 security issues as required without fear of
25 retaliation or discrimination. Safety and security

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1 issues are assessed for significance using a graded
2 approach to determine the method used to evaluate
3 and identify contributing and root causes and to
4 determine the necessity to conduct extended
5 condition and extended cause evaluations.

6 Corrective actions are developed that
7 address the identified contributing and root causes
8 with an intent to prevent the issue of occurrence
9 and are implemented in a timely manner. The
10 completion of corrective actions is verified and
11 their effectiveness is assessed before closure.
12 Corrective actions are tracked to monitor corrective
13 action program status and performance and corrective
14 action program data is trended to identify the
15 recurrence of issues, to identify conditions that
16 may result in additional or more serious issues and
17 to assess the effectiveness of causal factor
18 analyses and corrective actions. And lastly, the
19 overall effectiveness of the corrective action
20 program is periodically assessed by an independent
21 entity.

22 Now, we reviewed these basic concepts
23 of an effective corrective action program in the
24 first meeting that we had with the Nuclear Energy
25 Institute industry representatives in March of 2011,

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1 and there was general agreement with these criteria
2 as described. So, these basic criteria, everybody
3 agreed that that's the skeleton upon which you would
4 build an effective application.

5 The NRC provided a more detailed
6 description of the corrective action program
7 criteria and elements to NEI and industry
8 representatives in preparation for a meeting in
9 April of 2011. And the NEI and industry
10 representatives expressed divergent views on some of
11 these elements described in a more-detailed
12 corrective action program criteria. And some
13 representatives stated that the added detail
14 resulted in creating elements that were either too
15 prescriptive or were not performance-based. So, as
16 you start hanging meat on the bone, then you start
17 having some discussions on when is the right amount
18 of meat and is it the right meat to hang there?

19 In the most recent meeting, based on
20 what we've concluded with NEI and industry
21 representatives, which was in June, that the
22 description of the attributes of an effective
23 corrective action program which will serve as the
24 standard by which a licensee's corrective action
25 program will be assessed for effectiveness should be

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1 completed to support the development of the
2 effectiveness determination process. So, we
3 basically need to come to a conclusion then on what
4 is going to be the final description of a corrective
5 action program that we consider to be effective in
6 order to start using that as a tool to assess
7 licensee programs.

8 MEMBER BLEY; The one thing that has
9 cropped up a few times, and I wonder how you're
10 dealing with that, is even though the program might
11 look effective for things that are in it, this
12 process by which things that happen in the facility
13 end up being added to that list is sometimes flawed
14 in the sense that items don't get on there because
15 the person at the lowest level who finds them makes
16 a decision that others wouldn't have agreed with.
17 Is there something about --

18 MR. HENSON: There will be an inspection
19 program process. We have one now --

20 MEMBER BLEY: Okay.

21 MR. HENSON: -- where in a current
22 inspection procedure there is an element where you
23 look at the corrective action program, but to a very
24 small degree. It's an inspection procedure that
25 covers six different areas and the inspector is

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1 given on average about 16 hours to complete that, so
2 you're not spending a whole lot of quality time.
3 So, you basically look at the corrective actions
4 associated with a particular event or something as
5 opposed to a comprehensive assessment. However, we
6 have had one facility where we've gone out and we've
7 done two inspections where we've used the inspection
8 procedure 71.152, which is a problem identification
9 resolution program that's used for reactors, and
10 molded that around this facility because it had a
11 lot of issues and problems.

12 MEMBER BLEY: Okay.

13 MR. HENSON: And we have looked at those
14 kinds of things. We've looked at the willingness of
15 people. Do they understand what they should report?
16 Is it at a low enough level? Are you avoiding that
17 process where now that's not important, you know?
18 What you look for is -- if you have any concern
19 about an issue, let's put it in the system. We've
20 got a process to evaluate it and we'll determine
21 with that process what we need to do about it. But
22 the idea is to encourage everybody to report things
23 at a very low level. So, and we have found some
24 issues where people are either reluctant to report
25 or they may make that assessment of, well, I don't

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1 want to be looked on as someone who's, you know, a
2 whiner, so I'm not going to -- this is so minor,
3 it's just not that important. I'll let it go.

4 And so, and we look at this particular
5 licensee and the improvements they've made; and they
6 are making improvements, and certainly the safety
7 conscious work environment and the safety culture is
8 much improved over what it was years ago. But
9 again, it is a continuous improvement process. You
10 never reach the destination; you're always on the
11 trip.

12 So, and that's the kind of things we --
13 we're applying at this particular plant because
14 they've had a lot of issues for the last few years,
15 but we're learning how to apply that. That's one of
16 the lessons learned we hope to incorporate in
17 this --

18 MEMBER BLEY: One of the things I was
19 getting at and wondering if any of the facilities
20 have built it into their plans, you know, the fault
21 that occurred a year-and-a-half ago at one place was
22 an on electrical system. A light on the panel went
23 out and they tried to replace it and it stayed out.
24 So, the guy who was, you know, replacing light bulbs
25 said that's not a big deal; and the light bulb

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1 wouldn't been. Trouble is the light bulb gets its
2 current from the protection circuit. He didn't know
3 that.

4 MR. HENSON: Right.

5 MEMBER BLEY: So, somebody at a higher
6 level needs to take a look to who would understand
7 how the systems interact to decide that a thing
8 really had no importance.

9 MR. HENSON: And --

10 MEMBER BLEY: And they've adjusted their
11 program, too.

12 MR. HENSON: Right, and they try to do
13 that, trying to -- and in that particular case, if
14 it's the one I'm thinking of, yes, that is something
15 they addressed with their staff through training to
16 inform everybody it's not just a light.

17 MEMBER BLEY: Yes.

18 MR. HENSON: There's more too it than
19 that. But how do you identify every one of those
20 potential cases and address them? Unfortunately,
21 those are things you find more often through
22 occurrence as opposed to before the fact. And so,
23 but, yes, people, you know, they are recognizing
24 those are things you need to consider.

25 MEMBER BLEY: Okay.

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1 DR. DAMON: I know one of the licensees
2 puts a blue tag on everything that has a safety
3 significance.

4 MEMBER BLEY: Ah, so then whoever comes
5 to it knows that they ought to pay attention to it?

6 MR. HENSON: Right, they put notes in
7 their procedures to say, note: This is an item
8 relied on for safety. You don't do anything to
9 this, you know, without contacting this person. And
10 as Dennis said, some facilities actually label every
11 significant safety control or IROFS to make sure
12 that's recognized.

13 So, that gets us to the next slide, 21.
14 Now, the staff has determined that in order to apply
15 the revised non-cited violation policy at a fuel
16 facility the NRC must have reasonable assurance that
17 the licensee has established and implemented a
18 corrective action program that will effectively
19 identify; again, report, document, evaluate, track
20 and trend safety and security issues. And as a
21 result will identify and implement corrective
22 actions that prevent their recurrence.

23 Now, the current operating fuel
24 facilities have described elements of their
25 corrective action program in their license

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1 application and related documents. Now, the nature
2 and scope and level of detail of each licensee's
3 description of its corrective action program vary.

4 Now, the regular basis for a licensee's
5 corrective action program is the description of the
6 corrective action program provided in its license
7 application it submitted in accordance with the
8 guidance in NUREG 1520, which is the standard review
9 plan for the review of a license application for a
10 fuel cycle facility. In this guidance document the
11 licensee is requested to describe its program for
12 the development and implementation of corrective
13 actions for issues identified in audits and
14 assessments of incident investigation as described
15 in its quality assurance program and as a result of
16 failed items relied on for safety. The plan does
17 not require the licensee to describe a comprehensive
18 corrective action program.

19 So as a result, a licensee's description
20 of its corrective action program in it's current
21 licensing basis documents may not include enough
22 detail and all the standard cap criteria we've
23 developed and the elements to support a conclusion
24 that a licensee has established at least an
25 effective corrective action program.

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1 Now, during the meetings held with NEI
2 and industry representatives on the corrective
3 action program initiative, they've stated that the
4 procedures they have implemented at their respective
5 fuel facilities provide much more detail and insight
6 into their corrective action programs and are more
7 closely aligned with the NRC's proposed corrective
8 action program criteria.

9 As I've previously stated, the NRC's
10 current fuel facility core inspection program
11 includes a limited review of the licensees' problem
12 identification resolution and incident investigation
13 programs, but does not require a comprehensive
14 assessment of a licensees' implementation of its
15 corrective action program. So, we can't right now,
16 based on the results of the current level inspection
17 effort conclude with reasonable assurance that a
18 licensee has indeed implemented an effective
19 corrective action program. We just don't have that
20 data.

21 So basically, there is no currently
22 established means to assess a licensee's commitment
23 to an effective corrective action program in its
24 existing licensing basis documents or by NRC
25 inspection. So, licensees who want the NRC to apply

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1 the revised NCV enforcement policy at their
2 facility, will voluntarily agree to implement an
3 effective corrective action program as described in
4 the corrective action program criteria to be
5 developed. And the challenge is for the staff to
6 develop a process that will enable the NRC again to
7 conclude with reasonable assurance that a licensee
8 has implemented an effective corrective action
9 program. Now, we may base this again on a
10 description of a licensee's corrective action
11 program in its licensing basis documents.

12 We could say, okay, we want you to amend
13 your license to commit to all these things so we
14 have a basis now to inspect and cite you, but could
15 just say, okay, now we're just going to rely upon a
16 revised inspection program that does a more
17 effective look at your corrective action program
18 implementation to come to some conclusion that, yes,
19 you are effectively correcting issues, or there may
20 be some combination of the two. So, that's one of
21 the things we're having to work out. However, there
22 may be some alternative process that we haven't
23 thought of yet.

24 Next slide. So, basically to complete
25 the effort to provide incentives to licensees to

1 maintain strong corrective action programs, what
2 we're in the process of doing is; one, completing
3 and publishing the standard corrective action
4 program criteria; we need to establish a process to
5 conclude a licensee's corrective action program is
6 effective; and to apply the revised policy of how
7 we're going to roll that out. And then, once we've
8 rolled it out and we've given that credit, we've got
9 to establish an inspection program for the continued
10 assessment of a licensee's corrective action program
11 so that we continue to assess it's effective. And
12 if it's not effective, do we make a decision to no
13 longer apply that NCV policy?

14 So, these actions will be completed
15 before the March 2012 publication of the revised NCV
16 policy. So, we should be ready so that when that
17 policy becomes effective we can roll this out and
18 apply those credits.

19 CHAIRMAN RYAN: Jay, before the roll-out
20 step do you have any work shops or other kinds of
21 activities with licensees as a group to get
22 together? I mean, not that you're going to pick on
23 any one licensee in front of the room, but it's
24 sometimes helpful to have them all there at once so
25 you can get a range of views without having to try

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1 and synthesize that yourself.

2 MR. HENSON: Right, and we've had three
3 meetings where we've discussed this whole process --

4 CHAIRMAN RYAN: Yes.

5 MR. HENSON: -- about the development of
6 criteria. And I'm assuming we will continue to have
7 these meetings and exchanges with them as we further
8 define and refine this process.

9 CHAIRMAN RYAN: And once you kind of get
10 to where you're comfortable you'll maybe have sort
11 of a roll-out-kind of test drive with them and say
12 here's where we are and we think we're going to be
13 and --

14 MR. HENSON: And we'll do the same thing
15 with Region II.

16 CHAIRMAN RYAN: Yes.

17 MR. HENSON: Make sure the inspectors --

18 CHAIRMAN RYAN: Oh, yes.

19 MR. HENSON: There may some insights
20 inspectors have about this.

21 CHAIRMAN RYAN: Absolutely. Okay.

22 MR. HENSON: So, yes, we want to include
23 all the stakeholders as we get closer and closer and
24 develop this.

25 CHAIRMAN RYAN: One thing I think that

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1 would help, as I'm thinking ahead to the full
2 committee, is if you have a schedule of events and
3 activities like that --

4 MR. HENSON: Okay.

5 CHAIRMAN RYAN: -- or you could maybe
6 even tell us in as part of -- you know, two or three
7 sentences or half a paragraph on what your
8 objectives are for those major interactions with the
9 various stakeholder groups, that would really help
10 us understand kind of the whole picture.

11 MR. HENSON: All right then.

12 MEMBER ABDEL-KHALIK: Do you have at
13 least the raw data as far as the number of condition
14 reports that are written at each facility? I know
15 it's kind of hard to compare because they're unique,
16 but --

17 MR. HENSON: There again, it depends on
18 the facilities. It will be in the thousands at some
19 facilities.

20 MEMBER ABDEL-KHALIK: Yes.

21 MR. HENSON: At some facilities it will
22 be less. Some facilities have -- they haven't
23 integrated all their corrective action program --
24 you know, you may have this organization or this
25 process that has their own corrective action

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1 program. And it doesn't get integrated, you know,
2 rolled up into an overall database, so to speak. So
3 like I said, there's a lot of variability. Others,
4 they have a very descriptive program. They have a
5 single tracking and trending process. They have
6 meetings every day to discuss what's going on the
7 corrective action program as a part of their daily
8 operations meetings. So, the level of
9 sophistication varies as lot.

10 Generally, you find that those fuel
11 facilities that have a lot of reactor people on the
12 staff, you know, were used to understanding what a
13 corrective action program was. And those that have
14 a very descriptive quality assurance program
15 document, they have more detail and more process in
16 the corrective action programs. Those that have
17 been in existence for awhile that didn't come up
18 through that, they have a less-detailed program and
19 a little more disjointed perhaps as far as a single
20 comprehensive program.

21 CONSULTANT FLACK: Jay, do they have
22 techniques on how to prioritize corrective actions?
23 I mean, what --

24 MR. HENSON: Yes, most of them will do
25 that. They have a way, because they want to limit

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1 the effort in doing say a causal factors analysis.
2 If you've got a very simple low-significance issue,
3 you're not going to put together a whole
4 investigation team looking at that.

5 CONSULTANT FLACK: Right, right, right.

6 MR. HENSON: You're going to assign it
7 to one individual --

8 CONSULTANT FLACK: Yes.

9 MR. HENSON: -- because you're going to
10 look at it and come to a conclusion as to what the
11 root cause and contributing factors were. And so,
12 they do that. They've got to determine
13 reportability. So, they got to look at it from a
14 significance standpoint there. Is it reportable?
15 And there again, when they start developing the
16 corrective actions, the effort going into that, it's
17 also predicated on how severe or the significance
18 was.

19 CONSULTANT FLACK: Okay.

20 MR. HENSON: I guess slide 23, the last
21 slide there, again, well, the other direction of the
22 Commission to the staff was that they implement
23 revisions to the baseline inspection program to
24 credit licensees' effective problem identification
25 and resolution programs. Now, the staff expects the

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1 fuel facility's baseline or core inspection program
2 to undergo significant revision as a result of the
3 implementation of the fuel cycle oversight process
4 enhancements associated with the cornerstones.

5 The staff believes that this is the most
6 appropriate time to make changes to the fuel
7 facility's inspection program to credit licensees'
8 effective problem identification and resolution
9 programs. And by that time the staff should also
10 have some corrective action program inspection
11 experience to inform the revision of the inspection
12 procedures.

13 However, that does not preclude some benefits to the
14 baseline or core inspection program as a result of
15 the implementation of an effective corrective action
16 program.

17 The staff also expects that the
18 implementation of effective corrective action
19 program supports a more effective an efficient
20 conduct of various NRC core facility inspections and
21 therefore may result in a slight reduction of the
22 level of effort required for an NRC inspector to
23 complete the related inspection procedures. Staff
24 have also found that facilities that have a very
25 good corrective action program, that's a great

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1 benefit to the effective and efficient conduct of an
2 event-related inspection. If they've already got an
3 organization that's looked into this and you see
4 what they've got that helps inform us in what we're
5 doing is part of our effort in that type of inspect.
6 So, that concludes my part of the brief.

7 CHAIRMAN RYAN: Thank you, Jay.

8 I'm going to suggest that -- we didn't
9 have a formal break, but maybe we ought to take a
10 five-minutes bio break for everybody to just pause
11 for a couple minutes. And we'll come back in about
12 five minutes, at 20 after. Okay?

13 (Whereupon, at 3:12 p.m. off the record
14 until 3:21 p.m.)

15 CHAIRMAN RYAN: Okay. Well, I guess all
16 the participants are in place, so we'll go ahead and
17 we'll reconvene and reopen the record, please.

18 Dennis Damon, I think you're up.

19 DR. DAMON: Okay. My name is Dennis
20 Damon. My job is Senior Advisor for Risk Assessment
21 and I actually cover all of NMSS. Actually, I've
22 been assigned to all the divisions in NMSS at one
23 time or another, but mostly I've spent most of my
24 time in fuel cycle, and that's currently where I'm
25 doing most of the work.

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1 First slide, yes. I'm going to talk
2 about the fuel cycle significance determination
3 process; but I have to apologize, we did work on
4 this as an un-budgeted activity back in 2009. But
5 like I say, it wasn't budgeted and we weren't
6 budgeted to work on it this past year, although, I
7 mean, I can't help thinking about the thing once in
8 awhile and talking to John Flack on the phone about
9 it. But there's really not been any further
10 development work that's been budgeted on this
11 activity. And so, anything I say here is strictly
12 my own views, my own thoughts, and we don't have any
13 formal documentation of this stuff that's been
14 reviewed by anybody other than me and Rudy Bernhard.

15 But I thought I'd remind everybody of a
16 few things, is that of course in the reactor
17 oversight program all the reactors have PRAs, and
18 the staff has done these standardized plant models
19 to standardize across the different designs. But
20 fuel facilities don't have PRAs. They have these
21 things called ISAs. And they do have quantitative
22 information in most of them of some kind, but ISAs
23 were not done to generate a risk estimate, and they
24 don't even add up accident sequences to sum the risk
25 to individuals or anything like that. And many of

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1 them leave controls out that they have and they just
2 simply don't mention them. they don't invoke them
3 and identify them as items relied on for safety,
4 which is a concept that belongs to the ISA rule.
5 And so, you have to be careful about using what's in
6 an ISA to evaluate the significance of things.

7 And so, my view on this is we will have
8 to -- also, the other aspect of that is consistency.
9 I mean, one of the primary things that was started
10 up front as to why we're doing this fuel cycle
11 revision thing is to have a consistent way of
12 judging what things are more risk significant out
13 there. And what I realize that means is that you
14 have to do things just as they did for reactors with
15 standardized models. You have to use the same --
16 you're going to have to have a standardized way of
17 doing these evaluations, because if you don't, if
18 you rely on the licensees' evaluations and their
19 inconsistent with one another, they you get the
20 wrong answers.

21 But, as I see in the second-to-last
22 bullet there, what we're proposing here as a result
23 of this year's work is to propose to the Commission
24 as a path forward that we pursue development of a
25 significance determination process, and of course we

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1 don't know exactly how it will turn out. And so,
2 like I say, anything I say here can't be held
3 against me, because we may change it as we go
4 through the development process.

5 So, the next slide, I'm going to just
6 walk through what I envision as being the
7 development process and that this would be done if
8 the Commission approves our proposal to move forward
9 in this area and of course provides budget.

10 The first thing you've got to do is
11 develop criterion and guidance for a qualitative
12 screening of inspection findings. So, there's a
13 two-stage process here; a qualitative screening and
14 then a quantitative evaluation if it's found to be
15 necessary. And we did back in 2009 develop a set of
16 qualitative criteria, and we applied them to all the
17 inspection findings and criticality safety and
18 chemical safety for the preceding five years to see
19 if we thought we could do this. And I think they
20 need a little bit of work, but we were able to march
21 through and do a qualitative screening. So, we need
22 to tune that up and try it again.

23 Then the next thing you need is metrics
24 that you're going to evaluate and guidance as to how
25 you're going to do a quantitative evaluation of risk

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1 significance.

2 And the third bullet there is to remind
3 us of what was in the ISA-PRA comparison paper. In
4 Section 5 there was an example of a significance
5 determination for a criticality sequence. And what
6 we're initially proposing here; or at least I am, is
7 to use a metric that's essentially the same kind of
8 a metric as is used in the reactor oversight
9 program; and that is, the inspection finding is some
10 kind of deficiency that results in an increased
11 frequency of accidents for some period of time.

12 And so, you calculate that delta
13 frequency, that increased frequency and you multiply
14 it times the duration that existed. And that's a
15 probability of whatever the outcome was that was
16 incurred because of the inspection finding. And so,
17 it's an exact analogue of what's done in the reactor
18 oversight program, the difference being that we have
19 multiple of these metrics. We have frequencies of
20 criticality, frequencies of chemical accidents, and
21 you got multiple receptors. You actually have
22 multiple workers and then you have the off-site
23 public. And so, you've got a lot of different ones
24 to evaluate.

25 Now, it turns out in any given

1 deficiency typically it's quite clear which one of
2 those metrics is going to be the significant one,
3 and so you don't actually have to evaluate all these
4 different metrics every time you get a deficiency.
5 It's usually quite clear what you need to evaluate.

6 MEMBER ABDEL-KHALIK: But looking at the
7 fourth bullet, presumably not all sequences are
8 equally consequential.

9 DR. DAMON: Right, absolutely.

10 MEMBER ABDEL-KHALIK: So, how are you
11 just multiplying frequency times and adding them
12 up --

13 DR. DAMON: Well --

14 MEMBER ABDEL-KHALIK: -- to give you any
15 indication of a meaningful assessment of risk?

16 DR. DAMON: Well, typically, I mean, the
17 rule itself defines consequence categories. So,
18 like I said, there are going to be multiple metrics.
19 There will be one for fatality, you know, of a
20 chemical fatality, a criticality fatality. And in
21 principle you could have the next level down, which
22 is irreversible serious or other serious long-
23 lasting health effects. That's the phraseology of
24 ADGL-2, which is a chemical consequence criterion,
25 and it's actually imbedded in the rule that way.

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1 MEMBER BLEY: I think the key is though
2 you're applying this to a finding, right?

3 DR. DAMON: Yes.

4 MEMBER BLEY: You're not applying it to
5 the whole plant?

6 DR. DAMON: Right, it's not a risk
7 assessment. That's why I did that little example in
8 the ISA-PRA comparison paper, because it is very
9 typical; and that is, a deficiency typically affects
10 one control and one process in a very small subset
11 of accident sequences that are affected by that
12 finding. So, in the example in the ISA-PRA
13 comparison paper there was a system that criticality
14 controls. The first one, it's a solution system and
15 it's to keep the solution in the safe geometry that
16 it's in and not let it leak out. And the next one
17 is if it does leak out, there's a protective dike
18 around the process and the leaking fluid would then
19 assume a subcritical slab-type geometry. And so,
20 that was the example. So, it was obvious, you know,
21 it's oriented towards criticality safety. And it's
22 very simple and there were just a couple sequences.

23 Now, sometimes it's not true. Sometimes
24 there's lots of sequences, you know? But I'm saying
25 in general you end up with very few. And you

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1 notice, I mean, there could have been all kind of
2 other things that could have gone wrong with that
3 process, like chemical releases and stuff that were
4 -- might have had toxic chemicals in it. This is
5 irrelevant if it's not affected by the finding. So,
6 it's only those sequences that are affected by the
7 finding.

8 MEMBER BLEY: You can't compare it to a
9 base risk because you don't have one.

10 DR. DAMON: Yes, right.

11 MEMBER BLEY: But at least you have a
12 delta, an add-on to whatever it was.

13 CONSULTANT FLACK: Yes, what is it
14 though, whatever it was? That's the question. I
15 know with the reactor it's CDF. You don't know what
16 it is actually.

17 DR. DAMON: Well, in the case of the
18 example, it was probability of a criticality
19 which --

20 CONSULTANT FLACK: Okay. So, it's
21 likely at a criticality. That's just one example
22 though. I mean, you could have --

23 DR. DAMON: Yes.

24 CONSULTANT FLACK: -- chemical releases.
25 What would it be? Likelihood of a chemical release,

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1 increase in frequency?

2 DR. DAMON: Right.

3 CONSULTANT FLACK: But then you'd have
4 the consequences as well of that, right? So, you'd
5 have to figure that in.

6 DR. DAMON: Yes.

7 CONSULTANT FLACK: And how you would
8 measure that.

9 DR. DAMON: Yes, you would. The way I
10 would envision it is you'd have a significance
11 criterion for -- well, you could do it different
12 ways, but let's do a simple one. The rule defines
13 high consequences and intermediate consequences.
14 And then presumably in some sense these things are
15 coordinated. They really weren't in the following
16 senses; and it actually says this in the Statements
17 of Consideration, is biased towards a radiation
18 safety.

19 CONSULTANT FLACK: Yes, right.

20 DR. DAMON: Okay?

21 CONSULTANT FLACK: Right, yes.

22 DR. DAMON: So, they're not exactly
23 equivalent, but you could do it and make them
24 equivalent. In other words, death is death, right?
25 So, you could say chemical fatality, criticality

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1 fatality.

2 CONSULTANT FLACK: The environmental
3 impact may be different though.

4 DR. DAMON: Right.

5 CONSULTANT FLACK: Correct?

6 DR. DAMON: Oh, yes.

7 CONSULTANT FLACK: I mean, very
8 different.

9 DR. DAMON: Yes.

10 CONSULTANT FLACK: So, you have to go
11 beyond then fatalities. You'd have to involve the
12 environment as well.

13 DR. DAMON: You could. You could do
14 that. We thought about it. We thought about should
15 we have a collect risk criterion in addition? The
16 rules is oriented to the individuals, you know, that
17 are affected, right?

18 CONSULTANT FLACK: Right, right. I know
19 that.

20 DR. DAMON: And see, that is the
21 difference between fuel cycle facilities and
22 reactor accidents. When you get a large early
23 release, you get a large release and it contaminates
24 the environment. But in a fuel facility you might
25 get a large chemical release and it could be fatal

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1 to someone off site, yet it's not a permanent
2 contamination. You know, it could be something that
3 dissipates and goes away.

4 CONSULTANT FLACK: Or vice versa. You
5 get a large release and contaminate the environment
6 but not kill anybody.

7 DR. DAMON: Yes.

8 CONSULTANT FLACK: So, I mean, how do
9 you measure that?

10 DR. DAMON: Yes, fuel cycle facilities,
11 there's a variety accident scenarios and they're
12 very different. Fatality and contaminations are
13 usually disconnected. For one thing, most of the
14 facilities except for MOX don't have highly
15 radioactive material. They're uranium, right? So,
16 in terms of radiation contamination like we
17 traditionally would worry about, like with cesium
18 and iodine in the environment like they're having in
19 Japan, we don't have that for most of these
20 facilities. Now, MOX is different, although it's
21 located on a DOE reservation. And a reprocessing
22 plant would be different. But the current licensees
23 that are operating, they're all uranium and you just
24 really don't have the radiological contamination
25 issue that we worry about with reactors.

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1 CONSULTANT FLACK: Yes.

2 DR. DAMON: So anyway, that's what I'm
3 thinking, is you would have multiple of these
4 quantities. When I say "delta frequencies,"
5 frequency of different things; frequency of a
6 chemical fatality, frequency of a criticality
7 fatality essentially. You could use, like I say,
8 just frequency of high consequences and frequency of
9 intermediate consequences, or we could come up with
10 different things that were more aligned.

11 Like I say, the current system is kind
12 of biased towards radiological and we could come up
13 with stuff that's actually equivalent. So, you'd
14 have fatality and then maybe acute radiation
15 syndrome and the equivalent chemical. And then down
16 below that you would have exposures to say
17 radiological exposures that do not produce any acute
18 effects but simply give you a radiation dose that,
19 you know, presumably increases your risk of cancer.
20 So, you're going to have to multiple metrics and
21 it's not clear which ones you would want to use.

22 But like I say, the last bullet there,
23 that there's a wide variety of accident types and
24 consequences, and that's why you need the multiple
25 metric. But, when you have a deficiency to

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1 evaluate, it usually only affects one type of
2 accident because the controls are designed to
3 prevent that particular accident. And it usually
4 only affects a few accident sequences, which is why
5 I believe that in most cases we would be able to do
6 the evaluation of the risk impact at the time the
7 violation occurs. And what it would require is that
8 -- of course we're going to have to train people,
9 we're going to have to have criteria and how to do
10 these evaluations.

11 Next slide. I've already mentioned,
12 there's multiple metrics and we both have workers
13 and public, but usually it's quite clear which one
14 of these is going to be the dominant one of
15 significance.

16 And then the next step in the process is
17 to develop risk significance thresholds for these
18 metrics. And that is, for example, a quantitative
19 value such that if you incur an increased frequency
20 of say a fatality due to a criticality, well, at
21 what level is that a high significance and at what
22 level is that very low significance, and we have to
23 pick those numbers. Rudy and I worked on this a
24 couple years ago and we came up with some
25 preliminary numbers, but we never did any

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1 evaluations. One of the things we found is we
2 looked at the actual violations for the last five
3 years, but the inspection reports don't have in them
4 all the information you need to do one of these risk
5 evaluations.

6 So, that's one of the pieces of guidance
7 about what we have to develop is to train the
8 inspectors on what questions and what information to
9 gather at the time they're there doing the
10 inspection so that you can do a significance
11 evaluation. And one of the main things they have to
12 ask is what other controls have you got in this
13 process, because many of the licensees do not choose
14 to identify all their safety controls.

15 And now, the next-to-the-last bullet is
16 to test the -- and once you've developed guidance on
17 how to do these evaluations; this is an important
18 point, it's just test it on both past actual
19 violations and then we'll have to make up some
20 hypotheticals. Because what you find is in looking
21 at past violations, most of them are very low
22 significance. And so, you don't get enough of the
23 high significance ones to really test out a
24 methodology. You're going to have to make up some
25 hypothetical ones that are more serious so that you

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1 see how they would shake out.

2 And the bottom bullet there is, you
3 know, the outcome of this testing process is to see
4 whether in fact the thresholds and the metrics and
5 stuff, they really do what we want them to do. And
6 what we want them to do is to sort out inspection
7 findings in terms of their significance. And what
8 we really expect of course is that we would want a
9 lot of low significance ones and very few high. So,
10 we just want to see does it do that? Do we believe
11 the evaluations? And so, that's what I envision
12 here, is that testing is a very important part
13 because I think it would be I think a mistake to go
14 in and just, okay, let's go out and develop some
15 method of doing this and just go out and apply it to
16 actual licensees, to actual future inspection
17 findings before we did something more hypothetical
18 like this just to see how it would shake out.

19 And next slide. And I'll just mention
20 this concept of quantitative significance
21 determination process is strictly for what we call
22 the ISA-related cornerstones; that is, chemical
23 accidents, criticality accidents, radiological
24 accidents. That's what this is used for. We don't
25 propose to do quantitative significance of any of

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1 these other cornerstones.

2 MEMBER BLEY: And then one other, right?

3 DR. DAMON: What?

4 MEMBER BLEY: You only have five, but
5 you named three. So, there's only one missing. I
6 forget what it was. Emergency preparedness.

7 DR. DAMON: Yes. And of course
8 emergency preparedness -- I'll tell you a story.
9 There was a violation years ago by one of the
10 licensees and it was in the emergency preparedness
11 area. And they submitted a risk assessment saying,
12 hey, this is insignificant. Well, yes, that's the
13 way it way it always works out for emergency
14 planning, because you're doing a good job of
15 preventing the accident. So, my own view is how you
16 evaluate emergency preparedness should not be based
17 on a risk argument because it's a defense-in-depth
18 measure. Essentially you're saying, yes, you think
19 the risk is low, but what if you're wrong, you know?

20 MR. COLLINS: May I make a point before
21 we leave that? The two radiological cornerstones,
22 some of that is ISA-related and would fit into your
23 process. But some of that is Part 20-related, which
24 is not ISA-related, and the risk there is based on
25 dose. And so --

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1 CHAIRMAN RYAN: Based more on ALARA
2 though.

3 MR. COLLINS: On ALARA?

4 CHAIRMAN RYAN: Such as dose.

5 MR. COLLINS: Right.

6 CHAIRMAN RYAN: I mean, you have to
7 perform under the ALARA requirements.

8 MR. COLLINS: So, some of that, some of
9 the --

10 MEMBER BLEY: But wouldn't the scenarios
11 that would expose you to those doses though be in
12 the ISA?

13 MR. COLLINS: Not necessarily.

14 DR. DAMON: Not the planned ones.

15 MEMBER BLEY: Oh.

16 CHAIRMAN RYAN: Necessary, but not
17 sufficient. Good point.

18 MEMBER BLEY: Probably only those. The
19 others should be there, I would think.

20 DR. DAMON: Yes, the accident ones.

21 CONSULTANT FLACK: The accident-related
22 ones.

23 DR. DAMON: Anything that's unintended
24 exposure should be in there.

25 CONSULTANT FLACK: Unintended. Yes,

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1 right. But are these conservative analysis or
2 realistic analysis --

3 DR. DAMON: I mean, in doing the
4 significance determination I'm proposing this is
5 realistic. This is --

6 CONSULTANT FLACK: So, it goes beyond
7 the ISA because the ISA --

8 DR. DAMON: Yes, right.

9 CONSULTANT FLACK: -- by definition is
10 conservative.

11 DR. DAMON: That's what I'm saying, is
12 that you have to be very careful. Sometimes you can
13 use the ISA information directly because the
14 licensee has included everything and it's realistic.
15 But they don't necessarily have to be realistic, and
16 often they're very conservative. So, it's the
17 highly conservative ones I'm concerned about, where
18 they leave a control out. I mean, there's two
19 orders of magnitude right there. And doing worst-
20 case weathers, the same thing. It's a two-orders-
21 of-magnitude-kind of thing. So, if you don't
22 correct for it, you get the wrong answer. I mean,
23 we don't have to be extremely accurate with this
24 stuff, but we have to be, you know, within an order
25 of magnitude.

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1 CONSULTANT FLACK: Close enough. Got
2 it.

3 DR. DAMON: And this last bullet I think
4 is very important; and that is, if you're going to
5 move to the next stage, which is to try to actually
6 do this in a trial, you know, pilot study or
7 something, the inspectors are going to be the front
8 line of doing this stuff. They got to gather the
9 information and they got to take a first shot at
10 doing this significance evaluation stuff so that
11 they can determine what information they may be
12 missing. So, there's got to be guidance and
13 training of inspectors before we move to the next
14 stage of this stuff.

15 MEMBER BLEY: All of the regions now
16 have two or three risk analysts. They have a
17 special name for them, but there are people who have
18 been back here for a couple years and aren't --

19 PARTICIPANT: SRAs, yes.

20 MEMBER BLEY: -- that kind of stuff, so
21 they could help out.

22 DR. DAMON: Yes, they do. The problem
23 here is actually the same problem the licensees had
24 when they did the ISAs. There tends to be a
25 disconnect between the people who understand the

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1 processes and the design and risk analysts, you
2 know? You don't have like the overlap is the
3 problem. You have risk analysts that are very good
4 at that, but they're all reactor experience and they
5 don't understand very often even the -- you know,
6 what the strategies are for designing, you know,
7 making things stay subcritical or chemical safety
8 and things like that. You know, we have a
9 disconnect there. So, no matter which way you do it
10 you have to -- that's when I say guidance here.

11 I should have said guidance for the risk
12 analyst, too, you know? They either have to learn
13 the process -- I mean, I have been around fuel cycle
14 long enough so I do know some of the processes, but
15 to tell the truth, it's the inspectors who know
16 these facilities. They're the ones that go out
17 there every year. And over time and experience of
18 the inspector knows an awful lot about the plant
19 that I don't know, you know? But, you know, I know
20 crit safety because I worked in it, and I know the
21 strategies they use, but I'm not intimately as
22 familiar as an inspector is.

23 And so, you have this disconnect. We
24 got to train the inspectors to know how to do, you
25 know, at least some level of risk analysis and vice

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1 versa. We are in fact trying to create people like
2 myself who are risk analysts who know about fuel
3 cycle. I'll probably be retired before this thing
4 is implemented.

5 CHAIRMAN RYAN: Dennis, has the industry
6 done anything, you know, along the lines that you'd
7 see at NEI or other industry, you know, groups --

8 DR. DAMON: Oh, yes.

9 CHAIRMAN RYAN: -- to address all this?
10 I mean, what's coming out of their industry
11 activities as a whole?

12 DR. DAMON: Well, I mean, from the very
13 beginning, back when we were only in the stage of
14 proposing a rule to require ISAs be done, the NEI
15 developed a guidance document, they got working
16 groups together and talked about --

17 CHAIRMAN RYAN: So, NEI is still active
18 in this area?

19 DR. DAMON: Yes. And during the time
20 frame when the ISAs were being done, there were work
21 shops held regularly to discuss issues that came up.
22 You know, what do we do about this? What do we do
23 about that? So, there was a lot of information
24 sharing, even though, as I say, some of these
25 licensees are competitors with one another. So,

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1 they don't necessarily share detailed system
2 knowledge, but they definitely shared with one
3 another their lessons about, you know, what was
4 involved in doing these evaluations.

5 Last slide. This is sort of a very
6 crude top-level structure of what's in the
7 significance determination process and what the
8 inspector does. He starts with a finding that could
9 be a violation, does a qualitative screening, and
10 then if the finding doesn't screen out to a very low
11 safety significance, then you might proceed to doing
12 a quantitative screening that eventually is going to
13 probably involve consultation with risk analyst.
14 But I would like the inspectors to be able to do the
15 first cut at things.

16 And one of the reasons for that -- well,
17 of course it trains the inspectors; and gets buy-in,
18 for that matter, but it also -- by trying to do the
19 significance evaluation, that's how you're going to
20 learn what pieces of information may be missing that
21 you need to get while the inspector is right there
22 at the facility. And that's -- like I say, when
23 Rudy and I tried to do these significance
24 evaluations of past inspection findings, we weren't
25 able to do it because the inspection reports didn't

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1 have this information in it. And so, that's what we
2 got to do, is train the inspectors to do that.

3 MEMBER ABDEL-KHALIK: Do you expect this
4 structure to work regardless of the level of
5 complexity of the facility?

6 DR. DAMON: No, I think if you run into
7 something that's very complex to analyze, you may
8 have trouble, because unlike the reactors where we
9 did the PRAs in advance, you run into the problems
10 and you can have time to overcome them. If we run
11 into something complicated or there's some kind of
12 computer code that we need that we don't have or
13 whatever, I mean, you're just up a creek, you know?
14 So, I don't think you can guarantee that you can do
15 this quantitative significance evaluation stuff
16 every single time. However, I've been around fuel
17 cycle since the mid-nineties and because I am a risk
18 analyst I automatically try to evaluate things, you
19 know, from a risk perspective that happened to see
20 what significance I think they have. And I find
21 that most of the time you can do it, you know?

22 It's just once in awhile you run into
23 something; you know, shoot, I don't have a -- for
24 examples, I have not yet identified a computer code
25 that does probabilistic weather, you know,

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1 probability-weighted chemical consequence
2 evaluations. They've got ones that will do one
3 weather condition. You input the weather and it
4 will do the calculation. But what I want is
5 something like the MACCS code that does all 300
6 different weather conditions.

7 MEMBER BLEY: Sandia developed just such
8 a code for the Army for looking at the chemical
9 weapons facilities.

10 DR. DAMON: But it's probabilistically-
11 weighted weather?

12 MEMBER BLEY: I believe it is. Well,
13 it's sampled. It's like they did for the nuclear
14 power plants.

15 DR. DAMON: Okay. They sample?

16 MEMBER BLEY: Yes.

17 DR. DAMON: I think Monte Carlo --

18 MEMBER BLEY: Yes, and so does Monte
19 Carlo. Yes.

20 DR. DAMON: Okay.

21 MEMBER BLEY: And since Sandia developed
22 it; it was done for the Army, but I don't know, you
23 might be able to get it from them.

24 DR. DAMON: Yes, that's what we need to
25 get our hands on is something that will do, you

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1 know, UF6.

2 MEMBER BLEY: Yes. Now, they weren't
3 doing UF6, but it's heavier-than-air, so I think it
4 would probably have the models built into you'd need
5 with the properties for the gas and --

6 CHAIRMAN RYAN: Sanjoy made some
7 comments on some other models at a previous
8 Subcommittee meeting.

9 MEMBER BLEY: Yes, there are --

10 CHAIRMAN RYAN: -- on, you know,
11 heavier-than-air gases relative to a plant-related
12 issue.

13 MEMBER BLEY: Yes. Well, that comment
14 was that the code that was being used here didn't
15 account for the --

16 CHAIRMAN RYAN: -- about something
17 that --

18 MEMBER BLEY: He did.

19 CHAIRMAN RYAN: -- he was using instead.

20 MEMBER BLEY: And there is a commercial
21 package, but this was developed for the Government,
22 so it's worth looking at.

23 CHAIRMAN RYAN: Yes.

24 MEMBER ABDEL-KHALIK: But, you know,
25 back to the question I asked, whether or not this

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1 process is applicable to various facilities and
2 regardless of their level of complexity, based on
3 your response, admittedly this process may not work
4 for complex facilities, and yet it is these complex
5 facilities for which we need to understand the
6 significance of whatever events may take place. So,
7 coming up with something that we know may be
8 deficient for the very case or very cases that we
9 would like to understand is probably not the way to
10 go, is it?

11 DR. DAMON: Well, like I say, I've been
12 around a long time and looking at things. Even when
13 you have say a facility like MOX, it's complex only
14 in the sense that it's got an awful lot of different
15 processes in it. But often when you're talking
16 about a deficiency, it's in one process, you know,
17 and affecting one control, and the safety design of
18 most of the facilities is not that complicated. I
19 would say the dry conversion facilities tend to be
20 more that way, more complex because they can make
21 use of automatic controls. So, they often would
22 tend to have like say three controls on a process
23 parameter, or something like that; hardware, you
24 know, controls. So, it adds a certain degree of
25 complexity because they may have a diversity of

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1 these kinds of controls.

2 But an awful lot of process designs are
3 very simple. Like criticality safety, for example.
4 They usually keep it pretty straightforward, simple
5 controls. Like I say, occasionally it's not true,
6 you know? Some processes have a lot of sensors and
7 stuff on them and they tend to start to get looking
8 more like a reactor or whatever.

9 Well, that's all I've got.

10 CHAIRMAN RYAN: Any other last questions
11 for Dennis?

12 CONSULTANT FLACK: Well, just sort of a
13 comment. I think the issue that we're struggling
14 with is really the difference between the ISA-PRA
15 philosophy and just the way that's being done
16 differently. I mean, if you look at the ROP and the
17 way it's laid out, you're thinking PRA because
18 you're looking at an initiating event, mitigating,
19 barriers, emergency planning. It just naturally
20 brings you into that kind of setting.

21 With the ISA, looking at discrete
22 things, naturally it brings you to discrete
23 cornerstones. And it seems like the real issue is
24 the method that is being utilized to begin with.
25 And if there was a way you could simply convert an

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1 ISA to a PRA and then lay out the cornerstones like
2 the ROP, I mean, it would just be a natural thing to
3 do. I think that Said was kind of indicating why
4 isn't the logic there? And I think the logic isn't
5 there in this case because it is a different method
6 that's being used from day one and now we're trying
7 to make it something that it isn't. I don't know.
8 That's the kind of feeling I get from --

9 DR. DAMON: Well, yes, I wouldn't say
10 it's just the methodology of like ISA versus PRA.
11 How do I put it? Reactors all have a very similar
12 safety design philosophy. You know, prevent
13 initiating events. You know, have safety systems to
14 provide safety functions, and then have a
15 containment. But each one of these in a fuel cycle
16 facility, each process has a unique design
17 philosophy that can be quite different from some
18 other process. They just use completely different
19 strategies for different things. And so, you've got
20 a multiplicity of design approaches to safety. And
21 so, like you can't come up with one-size-fits-all,
22 you know?

23 MEMBER BLEY: Right, it's not a size. I
24 mean, when we had that session here awhile back on
25 ISA and PRA, we had the one fellow from one of the

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1 industry. And, my God, the worst thing would be if
2 somebody tries to take part of an ISA and turn it
3 into a PRA. The ISA is a big fraction of a PRA,
4 near as I can tell. And, yes, if you're going to
5 look at criticality, you certainly have different
6 models that you have to apply than you would for if
7 you look at some other process system. Most of the
8 process systems though have; I'm probably going too
9 far, but I don't think it's very far, a policy of
10 containment of the material. And either through
11 control by batches, so there's not much of it in one
12 place, or by structure of the facility it's built to
13 keep things inside and not get outside. And to get
14 to the public you got to somehow break through this.
15 So, it just doesn't strike me that the idea that
16 each of the processes has a different design means
17 that something like PRA can't be done. You still
18 develop scenarios and they start somewhere and they
19 go somewhere. And eventually either they affect
20 people or they don't.

21 DR. DAMON: No, no. I wasn't saying you
22 couldn't do PRA. What I was saying is the paradigm
23 of initiating events, mitigating systems,
24 barriers --

25 MEMBER BLEY: Yes.

1 DR. DAMON: -- doesn't necessarily fit
2 everything, you know? Sometimes there's no barrier;
3 sometimes there is.

4 MEMBER BLEY: Well, except I think it
5 was Doug earlier saying we talk and we generalize
6 about barriers, so there may be procedural barriers.
7 Within the administrative barriers there may be
8 other kinds.

9 DR. DAMON: Yes, they call them controls
10 typically, or IROFS, you know? But, yes, the
11 terminology of barrier in the sense of like
12 shielding or containment structure, or anything like
13 the automatic stuff. For example, they have
14 filtered ventilation systems on the plants to keep
15 -- you know, you don't want the uranium getting out
16 even. But what I've been told is those things are
17 not sized to like say contain -- if you had a
18 liquid, you have six cylinder rupture, it wouldn't
19 prevent that stuff from getting out. It's not
20 designed for that.

21 MEMBER BLEY: Yes.

22 DR. DAMON: So, there isn't any
23 containment of the --

24 MEMBER BLEY: So, you'd have a release
25 and you'd track it, see what it ran into.

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1 DR. DAMON: Right. I mean --

2 MEMBER BLEY: Yes.

3 DR. DAMON: -- there are barriers. Any
4 time there's toxic material, there's obviously going
5 to be a barrier.

6 MEMBER BLEY: Some kind of barrier, yes.

7 DR. DAMON: But like for criticality,
8 you know, the facilities we licensed are not
9 shielded.

10 MEMBER BLEY: I mean, it strikes me the
11 big difference is very often, as you said in the
12 beginning, the initiating event is the whole thing,
13 I mean, in a lot of cases.

14 DR. DAMON: Yes.

15 MEMBER BLEY: But it's not true in all
16 cases.

17 DR. DAMON: No.

18 MEMBER BLEY: But still you can use that
19 scheme.

20 DR. DAMON: There are processes in the
21 plants that are more analogous to what I would call
22 a reactor-type of thing, and they've been analyzed
23 kind of like that. They start with a process upset
24 in a machine and then they got mitigative systems to
25 contain or prevent whatever is the bad outcome. So,

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1 you've got just about everything in these plants in
2 terms of the different safety designs.

3 CHAIRMAN RYAN: Okay? Thank you very
4 much, Dennis.

5 Jonathan, I believe you're up.

6 MR. DeJESUS: Good afternoon. My name
7 is Jonathan DeJesus and I am the project manager for
8 the enhancement for the fuel cycle oversight
9 process. And today what I will present is the
10 staff's conclusions of this presentation.

11 And to conclude, the staff identified
12 and is developing a set of cornerstones that could
13 be applied to the fuel cycle oversight process.
14 Again, the current approach on our cornerstones is
15 criticality safety systems, chemical process safety
16 systems, emergency preparedness, public radiation
17 safety and worker radiation safety. And I just
18 wanted to make clear, earlier we said that we have
19 considered other approaches to cornerstones, but
20 that doesn't mean that we cannot consider those
21 approaches again. Just wanted to make that clear.

22 And also, the staff is developing a
23 process to give licensees credit for effective
24 corrective action programs. And again, this credit
25 is to disposition NRC-identified severity level IV

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1 violations as non-cited violations if, among other
2 criteria, the violation is entered into the
3 licensee's corrective action program. And this
4 credit will be reflected in the NRC enforcement
5 policy.

6 Next, the staff will provide the
7 Commission with a recommendation for next steps in a
8 SECY paper, and this SECY paper is due to the
9 Commission in early October of this year. And if
10 the Commission approves, the staff will develop and
11 test a fuel cycle significance determination process
12 to help assess the risk significance of inspection
13 findings. And this recommendation follows this
14 Committee's recommendation on the ISA-PRA comparison
15 paper.

16 And that's all I had to say. Thank you
17 very much for your attention.

18 CHAIRMAN RYAN: Any questions for Jon?

19 MEMBER BLEY: Not directly, but if I
20 could --

21 CHAIRMAN RYAN: Sure.

22 MEMBER BLEY: -- just kind of a recount,
23 since Jonathan did a recap?

24 Go to the second bullet, developing a
25 process to give licensees credit. To me the CAP is

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1 really important. And certainly you need to account
2 for it because it's a crucial piece of doing things
3 right, I think, so, I'm really pleased to see that.

4 I can't tell you if your cornerstones
5 make sense because you didn't show me this
6 framework, and I can't see how that fits together
7 and how the inspection scheme fits with the
8 significance determination process. I got a hint of
9 what an SDP might look like, and that kind of is
10 certainly a good step, and might be the right one.
11 The cornerstones are the thing that make me
12 uncomfortable because I don't see how it fits
13 together and I don't see an overall logic that's
14 convincing and orderly, and I hope you can do
15 something with that. And, you know, maybe the
16 framework does it; I sure hope so, but I don't get
17 it yet. That's about it.

18 CHAIRMAN RYAN: I think there's a second
19 and a third on that. And it's not that I think we
20 just need to see it laid out from what your
21 perspective is, and maybe we can figure out a time
22 to do that either in a short subcommittee meeting or
23 as part of a full committee briefing down the line
24 with us maybe having some paper copies to understand
25 that.

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1 MEMBER BLEY: We can do that before you
2 send your paper off, because otherwise I think our
3 comments on the paper won't be very helpful.

4 CONSULTANT FLACK: But I think that's
5 the key question. I think from what I heard before
6 -- I mean, it's the connection between the
7 performance indicators on a cornerstone and its link
8 to the action matrix. But I don't think you'll be
9 there by the time the paper goes up to the
10 Commission, will you? I mean, you said that's
11 something that -- yes, so that piece is not going to
12 be -- I don't think we're going to see that piece.

13 CHAIRMAN RYAN: They got a framework.

14 MEMBER ABDEL-KHALIK: But this is not a
15 case of bring me another rock. We just want to see
16 the logic, the structure, which doesn't come
17 through.

18 DR. DAMON: Well, and I think one of the
19 problems is we don't have an --

20 CHAIRMAN RYAN: Yes, I think we're not
21 going to solve it today, but the idea is we didn't
22 get that part. And we could maybe work together on
23 what will get us that part, that would be I think a
24 good way to just focus discussion on that aspect
25 which Dennis and --

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1 MEMBER BLEY: And if you don't that, I
2 don't know how you'd sell this very well.

3 CHAIRMAN RYAN: Right. Yes, it's tough.

4 MS. KOTZALAS: We'll work with the ACRS
5 staff to get that document and see what we can do to
6 address your information gaps.

7 CHAIRMAN RYAN: Thank you.

8 MEMBER BLEY: Anyway, thank you for
9 really good presentations. I enjoyed them and
10 learned a lot from them.

11 CHAIRMAN RYAN: Said?

12 MEMBER ABDEL-KHALIK: No.

13 CHAIRMAN RYAN: And again, I appreciate
14 the effort that went into having you all give us
15 some good detail today and the insight and benefit
16 of your experiences and your work, ongoing though it
17 might be for some long time ahead yet to come. But
18 we look forward to hearing from you as the process
19 moves ahead. Thank you all very much for your
20 excellent afternoon.

21 PARTICIPANT: Thank you.

22 CHAIRMAN RYAN: Thanks for the extra
23 half-hour, too.

24 (Whereupon, the meeting was adjourned at
25 4:03 p.m.)



SUMMARY OF COMMISSION STAFF REQUIREMENTS MEMORANDA (SRM)

Presentation to the ACRS Subcommittee on Radiation
Protection and Nuclear Materials

June 20, 2011

Margie Kotzalas

Acting Chief, NMSS/FCSS/TSB

SRM M100429



2

- Concise paper comparing Integrated Safety Analyses (ISAs) for fuel facilities and Probabilistic Risk Assessments (PRAs) for reactors
- ISA/PRA Comparison Paper submitted to Advisory Committee on Reactor Safeguards (ACRS) on December 15, 2010
- ACRS letter report on ISA/PRA Comparison Paper issued on February 17, 2011
- ACRS recommendation – Develop and test the use of focused PRA-like analyses to help assess the risk significance of inspection findings for fuel cycle facilities

SRM-SECY-10-0031



3

- Make modest adjustments to the existing oversight program to enhance its effectiveness and efficiency.
- Develop a set of cornerstones that could be applied to the fuel cycle oversight process (FCOP).
- Provide an assessment of the work accomplished and recommendations for next steps.



United States Nuclear Regulatory Commission

Protecting People and the Environment

CORNERSTONE APPROACH TO ENHANCING THE FUEL CYCLE OVERSIGHT PROCESS

Presentation to the ACRS Subcommittee on Radiation
Protection and Nuclear Materials

June 20, 2011

Douglas Collins

NMSS/FCSS



Cornerstone Selection

5

- Top-down approach using the NRC Strategic Plan
- Mission
- Strategic Goals
- Strategic Outcomes



Cornerstone Elements

6

- Objective
- Desired results
- Key attributes
- Scope of inspection activities
- Metrics



Cornerstones

7

- Criticality safety systems
- Chemical process safety systems
- Emergency preparedness
- Public radiation safety
- Worker radiation safety

Criticality Safety Systems Cornerstone Objective



8

- The objective of this cornerstone is to ensure that nuclear criticality safety (NCS) controls and items relied on for safety (IROFS) protect worker and public health and safety by preventing criticalities. This includes ensuring adequate NCS analyses and ensuring the availability, reliability, and capability of NCS controls and IROFS.

Criticality Safety Systems Cornerstone Key Attributes



9

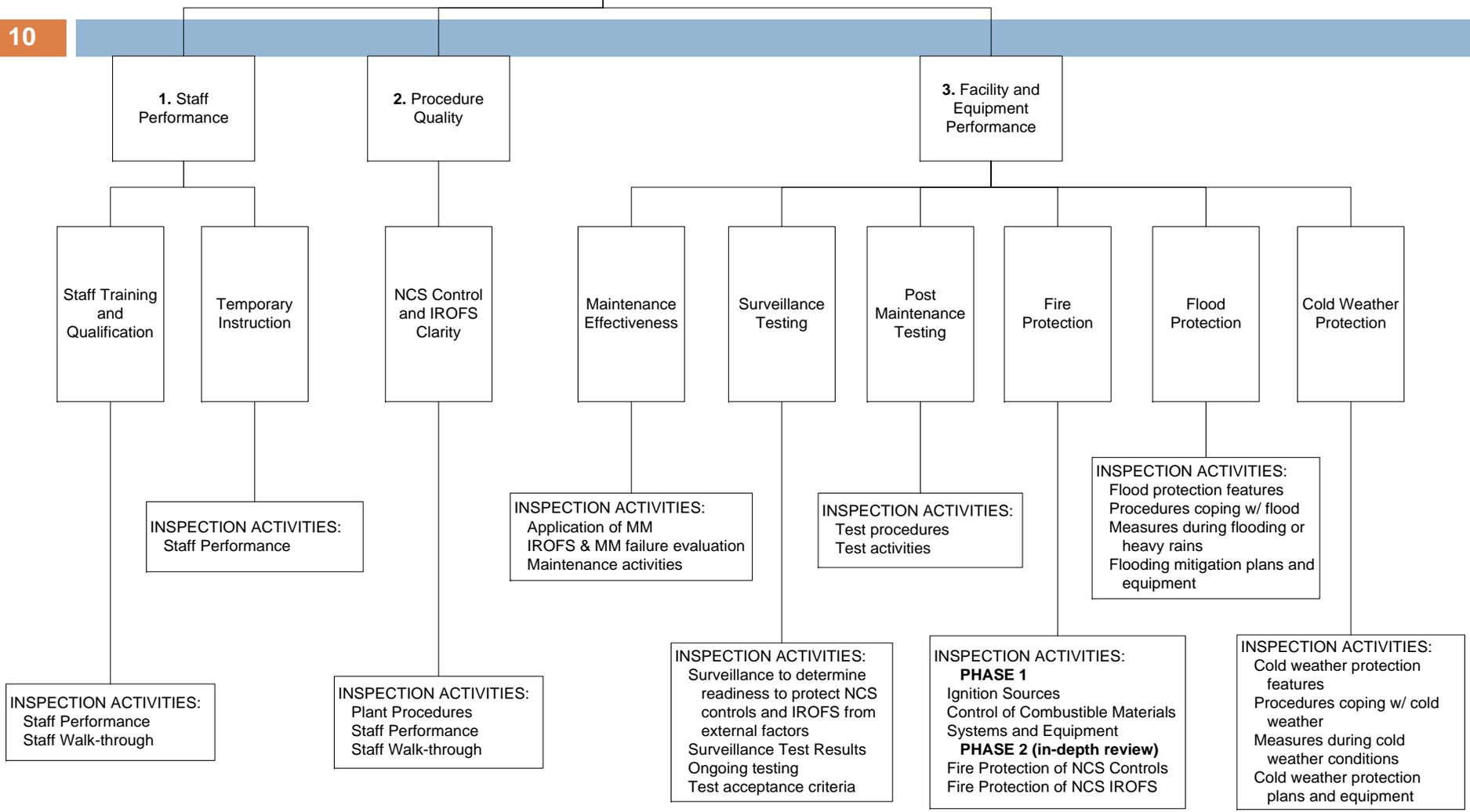
- Staff performance
- Procedure quality
- Facility and equipment performance
- Design
- Configuration control
- Criticality analysis
- Corrective action program



CAP – Corrective Action Program
 IROFS – Items Relied on for Safety
 ISA – Integrated Safety Analysis
 MM – Management Measures
 NCS – Nuclear Criticality Safety

Criticality Safety Systems

10



INSPECTION ACTIVITIES:
 Staff Performance

INSPECTION ACTIVITIES:
 Staff Performance
 Staff Walk-through

INSPECTION ACTIVITIES:
 Plant Procedures
 Staff Performance
 Staff Walk-through

INSPECTION ACTIVITIES:
 Application of MM
 IROFS & MM failure evaluation
 Maintenance activities

INSPECTION ACTIVITIES:
 Test procedures
 Test activities

INSPECTION ACTIVITIES:
 Surveillance to determine
 readiness to protect NCS
 controls and IROFS from
 external factors
 Surveillance Test Results
 Ongoing testing
 Test acceptance criteria

INSPECTION ACTIVITIES:
PHASE 1
 Ignition Sources
 Control of Combustible Materials
 Systems and Equipment
PHASE 2 (in-depth review)
 Fire Protection of NCS Controls
 Fire Protection of NCS IROFS

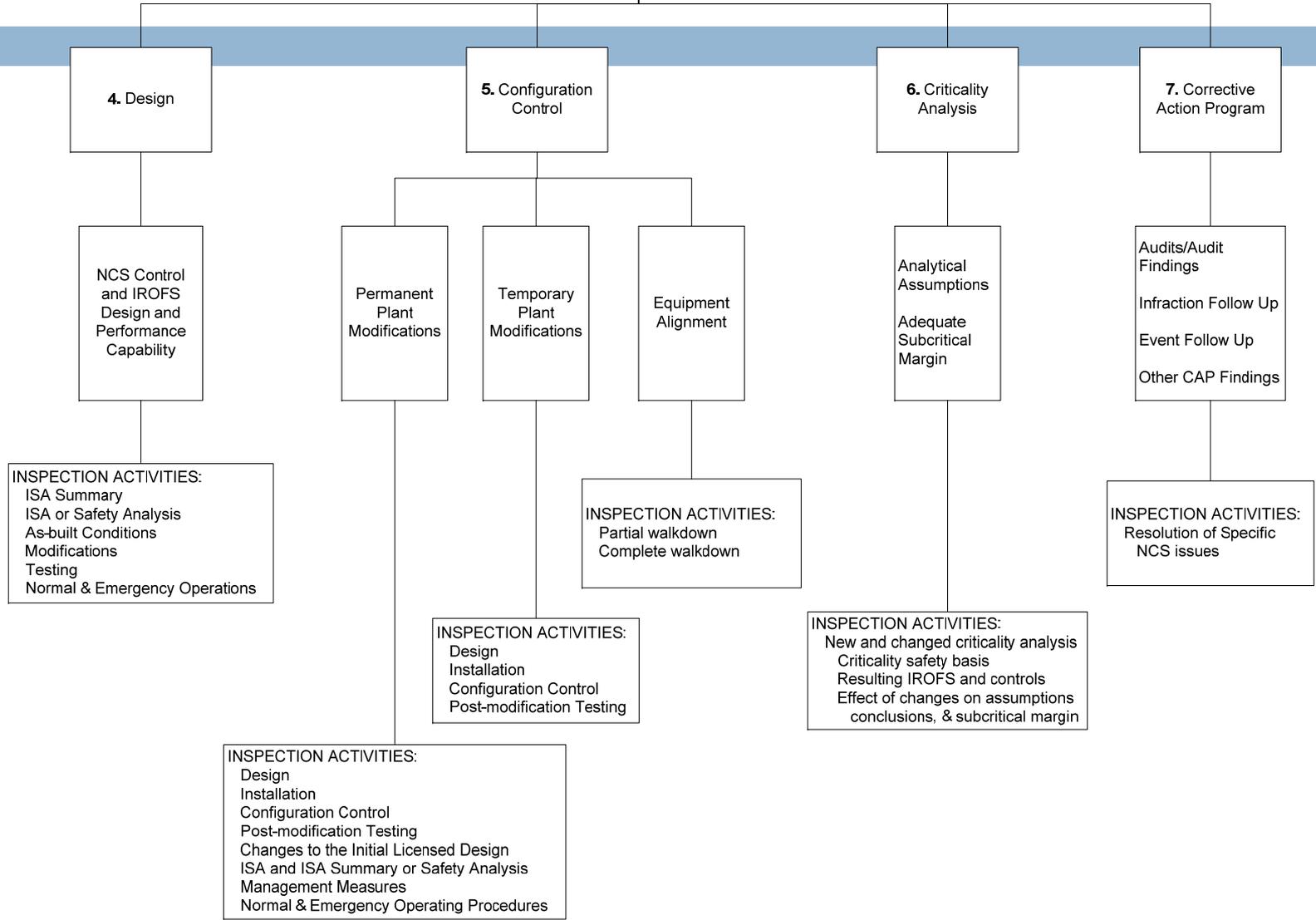
INSPECTION ACTIVITIES:
 Flood protection features
 Procedures coping w/ flood
 Measures during flooding or
 heavy rains
 Flooding mitigation plans and
 equipment

INSPECTION ACTIVITIES:
 Cold weather protection
 features
 Procedures coping w/ cold
 weather
 Measures during cold
 weather conditions
 Cold weather protection
 plans and equipment



CAP – Corrective Action Program
 IROFS – Items Relied on for Safety
 ISA – Integrated Safety Analysis
 MM – Management Measures
 NCS – Nuclear Criticality Safety

Criticality Safety Systems



Criticality Safety Systems Cornerstone Metrics



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- Part 70 Subpart H
- License
- ISA summary and ISA
- Licensee procedures

Summary



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- Developing cornerstones using a top-down approach using the Strategic Plan
- Currently have five safety cornerstones
- Seeking stakeholder input as the cornerstones are developed
- Will provide to Commission to support recommended actions

Questions?



United States Nuclear Regulatory Commission

Protecting People and the Environment

RECOGNITION OF FUEL FACILITY CORRECTIVE ACTION PROGRAMS IN THE NRC ENFORCEMENT POLICY

Presentation to the ACRS Subcommittee on Radiation
Protection and Nuclear Materials

June 20, 2011

Jay Henson

NMSS/FCSS



Commission Direction

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- Consider how to best reflect the fuel facility licensees' Corrective Action Programs (CAP) in the NRC Enforcement Policy
 - ▣ Provide incentives for licensees to maintain strong CAPs
 - ▣ Implement revisions to the baseline inspection program to credit licensees' effective problem identification and resolution programs

Staff Approach for CAP Incentive



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- Revise Enforcement Policy to non-cite NRC identified Severity Level (SL) IV violations if,
 - the licensee has established and implemented an effective CAP, and
 - the licensee enters the SL IV violation in its CAP for evaluation and correction

Enforcement Policy Revision



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- Draft policy revision will be issued for comment this summer
- Wording and conditions the same as that for reactor licensees who currently have a Non Cited Violation (NCV) policy on NRC identified SL IV violations or green findings
- Final policy due for publication in March, 2012



Benefits of a Strong CAP

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- More than NCV or baseline inspection program credit
- Identify and correct safety and security issues before they result in significant consequences
- Fuel facility safety is adequate with current corrective action efforts
- Opportunity to support continuous improvement of safety performance

Effective CAP Determination



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- Staff developed CAP criteria and elements that are indicative of an effective CAP
- NEI and industry in agreement with description of basic criteria
- Divergent opinions on some items in the more detailed description of the criteria
- All stakeholders agree that standard description of effective CAP needed to proceed

Effective CAP Determination



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- Staff is developing a process to apply the revised NCV policy to those licensee's who have voluntarily agreed to implement the defined CAP
- Challenge is determining if effectiveness determination should be based on
 - ▣ Licensing basis documents
 - ▣ NRC inspection
 - ▣ Combination of both
 - ▣ Some other alternative

Effective CAP Determination



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- Path forward
 - ▣ Publish standard CAP criteria document
 - ▣ Establish process to conclude licensee CAP is effective and to apply revised NCV policy
 - ▣ Establish inspection program to continue to assess licensee CAP effectiveness

Baseline Inspection Program



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- The revision of the fuel facility baseline inspection program to credit licensees' effective problem identification and resolution programs (CAP) will be addressed as the inspection program is revised as part of the cornerstone approach to enhancing the fuel cycle oversight process.



United States Nuclear Regulatory Commission

Protecting People and the Environment

FUEL CYCLE SIGNIFICANCE DETERMINATION PROCESS (FCSDP)

Presentation to the ACRS Subcommittee on
Radiation Protection and Nuclear Materials

June 20, 2011

Dennis Damon

NMSS/FCSS

FCSDP



25

- Fuel cycle facilities have ISAs not PRAs
- Some ISAs have quantitative risk information
- But ISAs were not done to be a realistic risk estimate
- This means we do not know how an SDP development will turn out exactly
- All thoughts here are thus preliminary

FCSDP Development Steps



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- These development steps will be carried out if the Commission approves
- Criteria and guidance for qualitative screening for significance of findings
- Metrics and guidance for quantitative screening of deficiency
- Delta frequency of x times duration summed over sequences affected by the deficiency
- Fuel cycle facilities have a wide variety of accident types and consequences, a deficiency usually only affects one type

FCSDP Development Steps



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- Thus multiple metrics for workers and public
- Develop risk significance thresholds for metrics
- Develop guidance on what can be credited
- Test preliminary SDP on past and hypothetical findings
- Test: does the process do what we want?

FCSDP Development Steps



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- Quantitative SDP is for ISA-related i.e. accident risk cornerstones
- Develop guidance and training for inspectors



Structure of an SDP

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- Inspector SDP steps
- A finding that could be a violation
- Qualitative screening
- If proceed to quantitative screening:
 - ▣ Consult with risk analyst



CONCLUSION AND RECOMMENDATION

Presentation to the ACRS Subcommittee on Radiation
Protection and Nuclear Materials

June 20, 2011

Jonathan DeJesus

FCOP Enhancement Project Manager

Conclusion and Recommendation



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- Staff identified and is developing a set of cornerstones that could be applied to the FCOP
- Staff is developing a process to give licensees credit for effective CAPs
- Staff will provide the Commission a recommendation for next steps in a SECY Paper due in October 2011
 - ▣ Staff, if approved by the Commission, will develop and test a fuel cycle SDP to assess the significance of inspection findings