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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

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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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PLANT OPERATIONS, RADIATION PROTECTION, AND FIRE

PROTECTION SUBCOMMITTEE

+ + + + +

WEDNESDAY

JULY 26, 2023

+ + + + +

The Subcommittee met via Teleconference,
at 1:00 p.m. CDT, Gregory H. Halnon, Chair, presiding.

COMMITTEE MEMBERS:

GREGORY H. HALNON, Chair

RONALD G. BALLINGER, Member

VICKI M. BIER, Member

JOSE A. MARCH-LEUBA, Member

ROBERT MARTIN, Member

WALTER L. KIRCHNER, Member

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JOY L. REMPE, Member

THOMAS ROBERTS, Member

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ACRS CONSULTANT:

STEPHEN SCHULTZ

DESIGNATED FEDERAL OFFICIAL:

KENT HOWARD

CHRISTOPHER BROWN

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Adjourn

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

1:00 p.m.

1
2
3 CHAIR HALNON: Good afternoon. This is a
4 meeting of the Plant Operations and Fire Protection
5 Subcommittee of the Advisory Committee on Reactor
6 Safeguards. I am Greg Halnon, Chairman of today's
7 subcommittee meeting. ACRS members in attendance are
8 Dave Petti, Jose March-Leuba, Joy Rempe, Matthew
9 Sunseri, Ron Ballinger, Walter Kirchner, Vicki Bier,
10 Bob Martin, Tom Roberts, and we have ACRS consultant
11 Steve Schultz with us. Did I miss anybody?

12 Kent Howard and Chris Brown of the ACRS
13 staff are the Designated Federal Officials for this
14 meeting. The ACRS reviews and advises the Commission
15 with regard to the licensing and operation of
16 production and utilization facilities on safety
17 issues. Also, the adequacy of proposed reactor safety
18 standards, technical, and policy issues relevant to
19 the licensing of evolutionary and passive plant
20 designs and other matters referred to it by the
21 Commission.

22 During today's meeting, the subcommittee
23 will hear presentations by and hold discussions with
24 the NRC staff at Region IV on operation experience in
25 the areas of the reactor oversight process, and you

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1 might hear this referred to as the ROP. The
2 applicant's license renewal (Audio interference.)
3 topics of interest. Although I do not anticipate the
4 need for the discussion of classified information that
5 is proprietary or security related pursuant to the
6 Freedom of Information Act. If attendants at those
7 meetings deal with such information, they'll be
8 limited to the NRC staff and its consultants and
9 organizations who have entered into the appropriate
10 confidentiality agreements with them. Consequently,
11 we will need to confirm eligible observers and
12 participants in the closed part of the meeting prior
13 to the start of today's meeting. And, again, I don't
14 anticipate the need for that with our agenda.

15 The ACRS was established by statute and is
16 governed by the Federal Advisory Committee Act (FACA).
17 The Committee only speaks through its published letter
18 reports. Because this is a subcommittee meeting,
19 participants should consider any remarks by the ACRS
20 members as their personal comments and not committee
21 positions. We hold subcommittee meetings to gather
22 information for preparatory work in the support of
23 deliberations at the full Committee meeting as
24 necessary.

25 The rules for participation in all ACRS

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1 meetings, including today's, are announced in the
2 Federal Register on June 13, 2019, the ACRS section of
3 the U.S. NRC public website provides our charter,
4 bylaws, agendas, letter reports, and full transcripts
5 of all full and subcommittee meetings, including
6 slides presented there. This meeting -- the agenda
7 for this meeting will be posted there, as well. We
8 have received no written statements or requests to
9 make an oral statement from the public.

10 Today's meeting is a hybrid meeting of NRC
11 Region IV with Microsoft Teams, which includes a
12 telephone bridge line allowing participation of the
13 public over telephone or over the computer. There
14 will be an opportunity for public comment, and we have
15 set aside time at the conclusion of the prepared open
16 presentations and member discussions to have those
17 comments.

18 This meeting is being transcribed. A
19 transcript of the meeting is being kept (audio
20 interference), and it is requested that the speakers
21 identify themselves and speak with sufficient clarity
22 and volume so that they can be readily heard.
23 Additionally, participants should mute themselves when
24 not speaking. To mute on a phone bridge line, please
25 push *6. Teams will simply unmute their selected

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1 microphone. Raising your hand virtually will be noted
2 as your cue to speak.

3 We will now proceed with the meeting, and
4 I'd like to start by calling on staff, specifically
5 the newly appointed Deputy Regional Administrator John
6 Monninger. Congratulations on your recent
7 appointment, and he's gone. There he is.

8 MR. MONNINGER: Came up around the other
9 side.

10 CHAIR HALNON: I had to rehearse passing
11 the microphone back to you.

12 MR. MONNINGER: So I apologize for that.
13 Good afternoon. I'm John Monninger, the Deputy
14 Regional Administrator for NRC's Region IV office down
15 here in Arlington, Texas. I have the honor of
16 welcoming you, the ACRS Subcommittee on Plant
17 Operations and Fire Protection, to our Region IV. It
18 really is a rare and important opportunity for us
19 within the region to host the ACRS, and we do thank
20 you all for your interest in coming out here and the
21 time that you're going to spend with us.

22 You know, over the past 34 years,
23 predominantly within Headquarters, I have had many
24 opportunities to brief and interact with the ACRS, and
25 for the vast majority of the time I've found those

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1 interactions enjoyable. You know, thinking about the
2 regional staff, you know, what I would probably
3 compare the interactions or the discussions with the
4 ACRS, it would be comparable to a qual board. We have
5 our inspectors that go through training and
6 development, et cetera. Prior to getting an official
7 certification, they have to go in front of a qual
8 board of their peers, management, et cetera. So to a
9 certain extent, I draw parallel between briefings in
10 front of the ACRS in terms of the NRC's technical work
11 to the qual boards that our inspectors in the field
12 do.

13 So how far back do I go? I guess, did you
14 hear the -- okay. So we're on slide two. I
15 mentioned, you know, NRC's staff are our greatest
16 assets, not just within Region IV but across the
17 agency, just in terms of their knowledge, skills, and
18 ability, and, above all, their commitment to our
19 public health and safety mission, in addition to that
20 their commitment to public service, public service for
21 the federal government, public service for our
22 country.

23 As you're aware, Region IV is one of the
24 four regional offices. To a large extent, the four
25 regional offices are identical. There are some slight

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1 differences between regions. Region I, III, and IV
2 are essentially identical. Region II has a little bit
3 of differences in terms of their responsibility for
4 fuel cycle facilities, and they're the lead for the
5 NRC's construction oversight programs within Region
6 II.

7 While Headquarters back in Rockville is
8 responsible for development of the policies and the
9 procedures, it's the regional offices that execute
10 those programs and policies, you know, be it the
11 inspection programs, the oversight programs,
12 enforcement programs, the allegations programs, the
13 investigative programs, et cetera. Again, they're all
14 covered by the regional offices. In addition, our
15 interactions with the states, the agreement states,
16 that occurs through the regions.

17 Region IV, I believe or I think we
18 believe, is a little bit different. You know, just
19 some interesting facts and figures. We cover 22 and
20 a half states, so the question is what is the half
21 state. Missouri. We had the Callaway reactor versus
22 the materials program for the state of Missouri in
23 Region III. So we have the 22 states, plus the
24 Callaway reactor, within Missouri.

25 Those states, when you look at that land

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1 mass area, it covers 75 percent of the land mass or
2 land area within the U.S. We cover 10 of the 24 time
3 zones across the country from, I guess, the Central
4 within Mississippi, taking us all the way across the
5 Pacific to Guam, the U.S. territory above Guam. Our
6 inspectors go up to the north slopes of Alaska to do
7 inspections, in addition to the territory of Guam,
8 and, occasionally, also will go out on oil rigs within
9 the Gulf of Mexico.

10 So there are some unique issues in terms
11 of that vast area and the travel time and the
12 resources and the time to support that. But other
13 than that, you know, Region IV operations are very
14 similar to the other three regions.

15 You know, I know we're going to focus on
16 the operating reactors, et cetera, but I did want to
17 mention, you know, briefly our materials program. Of
18 the 22 states within our Region IV area, 6 states are
19 under NRC jurisdiction and the 16 states are within
20 state jurisdiction, and then the state of Wyoming is
21 sort of split between NRC overseeing materials and the
22 state of Wyoming overseeing the uranium.

23 We have 500-plus materials licensees that
24 our Region IV interacts with and completes
25 approximately 300 materials licensing actions per year

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1 and also oversees the Air Force Master Materials
2 License. Going back to operating reactors, which is
3 more the purview of this subcommittee, there are 18
4 units, 18 operating units within Region IV at 12 sites
5 across 10 states. Eight are Westinghouse large PWRs,
6 six are combustion engineering designs, one BMW design
7 up in Arkansas, and four General Electric BWRs.

8 As I think we mentioned earlier today, we
9 have a staffing level of approximately 160 or so FTE
10 or staff. We're at our staffing level. With that
11 said, there is pretty significant hiring and attrition
12 across the agency, and Region IV is in the midst of
13 the hiring, training, developing, and qualification of
14 our staff.

15 So we do have, we established the Region
16 IV staff, actually, prior to me arriving down here and
17 developed a vision. It was a ground-level effort to
18 establish a vision and then some parties associated
19 with that. So our vision within Region IV is together
20 we foster a culture of high trust that maximizes
21 professional growth and development and inspires
22 leadership at all levels. So, you know, that really
23 encompasses three aspects: trust with one another,
24 trust with our licensees, trust with the general
25 public, maximizing professional growth, the next

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1 generation of individuals to come up through the NRC
2 and run the agency, and also focuses on leadership at
3 all levels. Leadership does depend upon the
4 supervisory level and managerial level. Leadership is
5 across all aspects of the agency. It's across all
6 aspects of the staff.

7 Our three parties are, of course, the
8 first one very much focused on our safety and security
9 mission, completing the materials and the reactors
10 inspection and licensing programs. We're on track for
11 that this year. The more recent, I guess, challenge
12 we've had post-COVID is working within the new hybrid
13 working environment. I guess we probably have a year,
14 year and a half under our belt since reentry and
15 currently we don't have any significant challenges in
16 terms of the hybrid work environment. The agency is
17 looking at changing that environment, and we'll
18 address that when it potentially comes around.

19 Probably, the biggest one I do think
20 across the agency and really for us in Region IV is
21 the management of human capital. You know, the
22 recruitment, training, development, qualification, and
23 even when an individual is qualified, you know,
24 they're essentially an apprentice or eventually a
25 journeyman. So, you know, it can be a year and a

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1 half, two years, until an individual is qualified, but
2 you really want those individuals to have three - four
3 years at the sites or three - four years doing
4 specialized inspections is what is really needed.

5 So we got a very, very strong focus on
6 staffing. The branch chiefs are, you know, really in
7 the lead for it, and they've been doing some pretty
8 significant accomplishments in terms of outreach and
9 in terms of really bringing in a fresh new set of eyes
10 to the agency and training and qualifying those.

11 And the last one up there was working
12 again towards our vision, and I mentioned, well, I
13 didn't mention our transformation action plan, but a
14 lot of activities underway in terms of what we're
15 doing to invest in ourselves within Region IV to make
16 us a better organization.

17 I think, with that, what we wanted to do
18 was to roll in to the presentations. As was mentioned
19 earlier, there are four presentations. I'd like to
20 just introduce the speakers for those four
21 presentations, and we'll go from there.

22 So the first presentation will be on the
23 trends and insights from the reactor oversight
24 process. Ami Agrawal and Dr. Natasha Greene will be
25 leading up those discussions. Ami is the team leader

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1 for inspection program and assessment team, and she's
2 been with the NRC for approximately 20 years now.
3 She's worked in Regions I, Regions II, Headquarters,
4 and was previously a resident inspector up at the
5 Indian Point site. Natasha Greene also has worked in
6 Headquarters and Region IV. She was previously a
7 senior health physicist within Region IV. She has a
8 Ph.D. in atmospheric physics and is currently a team
9 leader in her particular branch. So those two will
10 lead up our first discussion and our presentation.

11 The next session will be on our
12 preparations for Diablo Canyon license renewal and the
13 various activities that Region IV does to support
14 that, and that will be led by Mr. Greg Pick. Greg is
15 currently a senior reactor inspector in the
16 Engineering Branch. He has been an inspector for more
17 than 40 years. He's been involved in license renewal
18 inspections for the past 20 and, prior to that,
19 license renewal project management. So Greg brings a
20 lot of experience and run time in license renewal.

21 Following that, we'll have a discussion on
22 the Texas severe weather event from back in February
23 2021 led up by Mr. Sam Graves. Sam is also a senior
24 reactor inspector in the Engineering Branch, too.
25 He's had a lot of focus on fire protection and

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1 cybersecurity over the years, and he's been with the
2 NRC for, I guess, the past 18 years, has a strong
3 focus in electrical engineering and, prior to that, he
4 served in the U.S. Navy.

5 And then rounding us out in presentation
6 four is one of our branch chiefs from our Project
7 Branch, Mr. John Dixon. As Project Branch Chief, he
8 has oversight responsibilities for the Arkansas
9 Nuclear One site, the Palo Verde site, and the
10 Waterford site. He was previously a resident, a
11 senior resident inspector, and has been with the NRC
12 for more than 20 years.

13 So with that, we'll roll with the first --
14 we'll see if there's any questions, and then we'll --

15 MEMBER KIRCHNER: What I wanted to ask
16 John is how hybridized are you, so to speak? I would
17 just think that you, being, you know, a regional
18 office, you're working with the plants, so that's hard
19 to do virtually in many aspects.

20 MR. MONNINGER: So a lot goes into
21 definitions, you know, what is hybrid, what is
22 telework. If you think about the whole role of a
23 resident inspector, resident inspectors aren't within
24 this building, so the agency has had resident
25 inspectors since post-TMI. I'm not sure if it was

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1 before TMI; I think it was an action item -- they were
2 exploring it during TMI, the Three Mile Island
3 accident, and it was implemented afterwards.

4 So we've always had those remote staff out
5 there, you know. Prior to COVID, I would say the vast
6 majority of the staff throughout the agency was
7 probably, well, at least a CWS, you know, maybe a day
8 or two. So within our Region IV, the agency stance is
9 currently up to six days per pay period telework and
10 four days in the office. I think, in terms of our
11 staff, I think we've got about 60 percent or so that
12 take advantage of it.

13 I think one of the things you have to
14 recognize, though, you know, when you talk about
15 regional staff and inspectors, prior to that, you
16 know, 30 percent of their time was on the road. So,
17 yes, so the inspectors are still going out in the
18 fields. In terms of the hybrid environment, the vast
19 majority of that hybrid approach would have been more
20 time within the office, as opposed to time at the
21 sites. There are some, you know, some aspects of time
22 at the site that they're doing, but I would say the
23 vast majority of the on-site time is back to pre-COVID
24 levels. So, if anything, the major impact would have
25 been more staff that would have reported to the

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1 regional office. Did that make sense?

2 And so, with that, we'll roll to Ami.

3 MEMBER REMPE: John, before you switch
4 off, I just wanted to say, on behalf of ACRS, we
5 really do appreciate that you and your staff have
6 welcomed us and prepared all these presentations
7 because it is important for us to hear from the
8 regional offices as part of our mission.

9 MR. MONNINGER: And we do very much enjoy
10 having you guys come down.

11 MS. AGRAWAL: So I didn't realize there's
12 already a laptop here. I'm just going to make some
13 space for mine.

14 All right. So my name is Ami Agrawal.
15 Like John said, I'm the team lead for the inspection
16 program assessment team to share some insights on the
17 ROP trends. Don't ask too many hard questions that I
18 can't answer. No, just kidding. And then, obviously,
19 Natasha is going to, you know, speak on certain, like
20 the Columbia event on the radiation effluent data.

21 So to get started, so for Region IV,
22 currently Columbia and River Bend are the two plants
23 that are in the column two of the action matrix.
24 However, as you can see, we did have Callaway and
25 Waterford in 2022 and '23 were also in the column two

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1 of the action matrix. Callaway had a white PI for
2 unplanned scrams per 7,000 critical hours, and then
3 we'll talk about water for Columbia and River Bend in
4 a second, just to give you a background of, you know,
5 where they are. And those state plans had white
6 findings near the greenhouse.

7 Any questions on that one?

8 MEMBER KIRCHNER: Define what column one
9 and two mean and green versus blue and how to read
10 your chart in terms of, if I'm a member of the public,
11 what do I take away from that matrix you're showing
12 us.

13 MS. AGRAWAL: So column one is licensees
14 and the licensee response column, so they have all
15 green findings, all green PIs. And when a licensee
16 moves from column one to column two is one or two
17 white findings put them in column two of the action
18 matrix to a white finding; I just say white finding in
19 the column two. And the blue is the column two, green
20 is just indicating that all the indicators for that
21 licensee is in the green band for findings and PIs.

22 CHAIR HALNON: How many unplanned scrams
23 does it take to get a white PI?

24 MS. AGRAWAL: Maybe I could call a friend.
25 But 7,000 critical hours, yes.

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1 CHAIR HALNON: Is it one or is it two?
2 It's five. So that's pretty unusual nowadays to see
3 that. They had a 95001 inspection?

4 MS. AGRAWAL: Yes, they've had their
5 supplemental inspection, and that's why they've moved
6 from -- so once we complete the 95001 or the
7 supplemental inspection, which are 95001 one, two, or
8 three, depending on, you know which column of the
9 action matrix they are, once that's complete and the
10 report is out, the licensee moves the columns. So
11 they have had their supplemental --

12 CHAIR HALNON: Can you speak to what their
13 root cause was and what they did to fix it?

14 MS. AGRAWAL: That's a great question.
15 I'll have to call a friend because I'm not 100 percent
16 have the background on --

17 CHAIR HALNON: I don't recall --
18 (Simultaneous speaking.)

19 MS. AGRAWAL: -- information.

20 CHAIR HALNON: That's fine. The 95-001,
21 it's a public thing. I'll look it up. I was just
22 curious because an unplanned scram is unusual nowadays
23 because of how reliable the plants are.

24 MR. HAY: This is Mike Hay. I'm the
25 Deputy Director in the Division of Operating Reactor

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1 Safety. So the unplanned scrams PI, like we talked
2 about at Callaway, was due to a scatter failure they
3 had, and that was one of the scrams. And we did the
4 95-001, and the major cause of it was just improper
5 fabrication by the vendor. And, you know, it
6 basically catastrophically failed pretty shortly after
7 they were using it.

8 Is anybody else online that might have
9 more -- it was a while back that we did that so --
10 Sam, you might know more.

11 CHAIR HALNON: I'll look it up because
12 even that, when you have like a manufacturing defect,
13 it typically doesn't reflect back on the licensee's
14 performance to some extent. But I'll look it up. The
15 second quarter of '22? Third quarter of '22?

16 MR. HAY: Yes. So the licensee did have
17 some involvement in oversight of that scatter being
18 rewound.

19 CHAIR HALNON: Okay.

20 MR. HAY: And that wasn't the only scram
21 they had. There were other scrams, but that was the
22 last scram that crossed the threshold.

23 CHAIR HALNON: Okay. But it's plain
24 depths in ---

25 MR. HAY: Absolutely.

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1 CHAIR HALNON: Okay. Thank you.

2 MS. AGRAWAL: Thanks, Mike.

3 CHAIR HALNON: We won't ask any questions
4 now. Oh, wait a minute, I lied. Sorry.

5 MEMBER KIRCHNER: So you're talking in
6 your jargon. ACRS aren't out in the field frequently
7 enough. Could you just refresh our memories as what's
8 the implication of being at column two, and how do you
9 get back in column one? And you were just mentioning
10 the different levels of inspection. Could you just,
11 for the public record, just say what's the difference
12 and how does one of the licensees, you know, improve
13 their whatever corrective action, or what is necessary
14 to make the transition back into the green?

15 MS. AGRAWAL: Okay. Sure. So once a
16 licensee moves from column one to column two of the
17 action matrix, so if it's for a single or two white
18 findings, then we perform 95-001, which are the
19 supplemental inspections. There are three of them,
20 95-001, 2, and 3.

21 Now, at the completion of those
22 inspections, the NRC will issue an inspection report,
23 and we perform those inspections, obviously, we have
24 to coordinate with the licensee when they're ready for
25 us to go and inspect. So once they've completed their

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1 root cause or, you know, their causal analysis and
2 they're ready for us to go and inspect, that's when
3 the team goes on site to inspect and complete the
4 inspection.

5 So once the report is issued, that's when
6 the licensee can move from column two to column one
7 and similarly for other columns. Once those
8 inspections are completed, that's when the licensee
9 moves from the higher column of the action matrix to
10 the lower.

11 Does that answer your question?

12 MEMBER KIRCHNER: Thank you. Just to
13 expand on that then, so you mentioned the different
14 types of inspections. How comprehensive are the
15 license inspections when a licensee is in, say, column
16 two to get back to one? You mentioned three different
17 levels. Does it depend on the events that caused them
18 to move to, in this case, the blue, and how
19 comprehensive is that inspection then? At some point,
20 it would be a much broader inspection of things, like
21 the quality assurance program, the effectiveness, and
22 so on.

23 MS. AGRAWAL: Yes. That's a great
24 question. So 95-001, I mean, each procedure has, you
25 know, specific inspection hours that are dedicated for

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1 that inspection. And it's also going to vary on, you
2 know, how complicated their event is and how expensive
3 that's -- so there's a range for each of the
4 supplemental inspections for how many hours the
5 inspectors are allowed to perform the inspection, and,
6 obviously, if they're going to 95-003, then, yes, we
7 would definitely look at their QA program, we would
8 look at their safety culture.

9 Some portion of that is going to be
10 looking at their corrective action and also their
11 safety conscious work environment on the site.
12 There's some aspect of that in each of the
13 supplemental inspections. But, obviously, the higher
14 the inspection effort, right, or the higher the color
15 of the finding, the higher number of inspection hours
16 that we're going to be spending at the site.

17 MEMBER KIRCHNER: I'll just hold on for a
18 while. I'm just intentionally drawing you out so
19 that, if I'm a member of the public listening to this
20 --

21 MS. AGRAWAL: Yes, that's fine.

22 MEMBER KIRCHNER: Are you limited to a
23 fixed number of hours for your inspection, or is the
24 inspection based on the issues that you're really
25 looking at and then you tailor your hours to fit the

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1 problem that you're addressing?

2 MS. AGRAWAL: Each inspection procedure
3 does have a set number of hours, but it's going to be
4 a range and it's going to depend on the significance
5 of the event how many hours we spent for that
6 inspection.

7 Any more on this one? Yes.

8 DR. GREENE: But the random inspection
9 hours would also depend on how engaged the licensee is
10 with the inspectors. So if we are awaiting
11 information, it can draw out that time because we're
12 still trying to interact with them and get information
13 back. So it really is a communication level, as well.
14 This was Natasha Greene.

15 MS. AGRAWAL: So moving on, I'm going to
16 share some data on the red findings and green findings
17 and then crosscutting aspects.

18 So for Region IV, like I already
19 mentioned, we had two whites for Waterford, Columbia,
20 and one white finding from Columbia, and then we just
21 issued a white finding last week on July 20th for
22 River Bend.

23 And so just to give a background on each
24 of the findings, for Waterford, for the first one, the
25 condenser exhaust wide-range gas monitor, the mid and

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1 high range detectors, had errors in its output that
2 could result in an over-classification up to a general
3 emergency resulting in unnecessary public protective
4 actions. Also, the licensee failed to use adequate
5 methods, systems, and equipment for assessing and
6 monitoring actual and potential off-site consequences
7 of a radiological emergency because those same errors
8 would result in inaccurate dose assessment for a
9 radiological release through the main condenser
10 exhaust. I know that was a lot, but just to, I guess,
11 wrap it up, for their wide-range gas monitor, there
12 was a potential for over-classification just the way
13 the monitors were calibrated up to a general
14 emergency, so it impacted their emergency action
15 level, and that's what the white findings were.

16 The second white finding --

17 CHAIR HALNON: Before you go on, can you
18 recall what type of inspection that was? Was it like
19 an engineering inspection or an EP inspection? Can
20 you recall what kind of inspection --

21 MS. AGRAWAL: Yes, our EP --

22 CHAIR HALNON: The EP did?

23 MS. AGRAWAL: Yes, EP inspection.

24 CHAIR HALNON: Thanks.

25 MS. AGRAWAL: The second white finding was

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1 for a calibration error in wide-range gas -- I know
2 they sound similar. The licensee failed to follow and
3 maintain the effectiveness of an emergency plan.
4 Specifically, they failed to use adequate methods,
5 systems, and equipment for assessing and monitoring
6 actual and potential off-site consequences of a
7 radiological emergency. The licensee had conversion
8 factor error that would result in inaccurate dose
9 assessments for a radiological release through the
10 plant vent stack exhaust path, and so that's the
11 difference. Any questions on that?

12 For the Columbia event, the licensee
13 failed to implement and follow written procedures for
14 radiation protection resulting in two uptake of
15 radioactive materials to work, resulting in doses
16 greater than 700 millirem committed effective dose.
17 And Dr. Greene is going to talk about it on the next
18 slide.

19 And River Bend white finding was just
20 issued on July 20th, and the background of that is,
21 during a routine surveillance test of the Division 3
22 HPCS, which stands for high-pressure core spray,
23 diesel generator transformer, the licensee identified
24 that the transformer feeder was damaged, resulting in
25 a fire alarm in the switch gear room. And there was

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1 a white finding and a notice of violation for failure
2 to adequately implement maintenance inspection
3 procedure for HPCS transformer.

4 Any questions? Okay. I'll turn it over
5 to Dr. Greene.

6 DR. GREENE: All right. So I'm going to
7 quickly give a (audio interference) of the Columbia
8 event and how they basically received their white
9 finding for this particular event. So this actually
10 occurred back on May 28th, 2021, so it's been about
11 two years coming on this particular issue. What
12 happened is, actually, they were performing some work
13 in the underwater clean-up heat exchanger room. There
14 were two pipefitters that were performing a task on a
15 platform in a locked high radiation area where they
16 were getting some oversight, not continuous as
17 required but some oversight. And as a result of all
18 of this, you basically had two pipefitters that
19 received what we call internal uptakes. So when we
20 look at those internal uptakes, we would say how much
21 dose was received and, as an assessment, each of those
22 individuals received over 700 millirem of what we call
23 committed effective dose equivalent.

24 So based on that, HP inspectors jumped
25 into action. We started to review all their

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1 information, received a root cause analysis from the
2 licensee. And as a result of that, we determined that
3 there was a preliminary white finding which we issued
4 in a report 2021-090 in January 13th of 2022.

5 That particular report actually documented
6 three apparent violations. One was of 10 CFR 20.1701
7 for failure to use (audio interference) Okay. I'm
8 good? Okay. All right.

9 So they were actually implementing an
10 engineering control, which was a glove bag, and the
11 two pipefitters that were implementing the use of this
12 glove bag really did not have adequate instructions on
13 how to do it, so they ended up basically installing it
14 inadequately. And as a result, they were not
15 protected from the uptake, really a puff, of
16 radioactive contaminants that came out of the piping.

17 So as a result of that, that was the
18 20.1701 violation. We also issued a 10 CFR 20.1501(a)
19 violation, which was a failure to have adequate
20 surveys for the area that those engineers were working
21 in. And then we also issued, and this was
22 preliminarily, Tech Spec 572(b) which basically says
23 that for a locked high radiation area, which means
24 that the dose rates in that area have to be at least
25 one per hour at 30 centimeters from the source. The

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1 controls there were not implemented continuously, so
2 that was documented.

3 As a result of receiving this preliminary
4 white finding, the licensee decided that they would
5 like to present their position in a regulatory
6 conference. So they came to the NRC on March 1st of
7 2022 and presented their position on these particular
8 apparent violations. During the public meeting
9 portion, comments were made which actually warranted
10 additional investigation by our Office of
11 Investigations into this uptake event, and that review
12 was completed on March 9th of 2023. So it went almost
13 an entire year to look into the issue.

14 As a result of that, NRC inspectors
15 continued their review. Once we received the results
16 of the Office of Investigation results and, once we
17 looked at that, we did identify at that time two
18 additional violations. One of those additional
19 violations was preliminarily determined again as
20 white, so this was a separate white from the first one
21 that we issued, for a violation of 10 CFR 20.1204(a),
22 and that particular regulation basically says that you
23 have to do an adequate internal dose assessment. So
24 we found deficiencies that they had within that
25 process.

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1 This was actually documented in an
2 inspection report on June 1st of this year. The
3 licensee has elected to respond in writing to that,
4 which I believe we just received their response today,
5 so we'll be looking at that in its entirety.

6 So as a result of all of this, inspectors
7 did make a final determination on the first
8 preliminary white, and we did determine that the final
9 significance was, in fact, white, which is for low to
10 moderate safety significance. And that also was
11 associated with the three violations that we
12 previously discussed, and that was issued in
13 Inspection Report 2023-90 on June 1st of 2023.

14 Any questions about the Columbia uptake --

15 CHAIR HALNON: Just one.

16 DR. GREENE: Sure.

17 CHAIR HALNON: I mean, the thing that
18 sticks out, obviously, is the time line.

19 DR. GREENE: Yes.

20 CHAIR HALNON: Two years. Can you address
21 what the site did in the interim or anything to
22 potentially plug any holes in their program and
23 performance so that those two years was just
24 administrative only?

25 DR. GREENE: Absolutely. So what we know

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1 that they've done to date, they've definitely taken a
2 look at their procedures, their ALARA plans, and also
3 their oversight process to see what enhancements can
4 be implemented to prevent this from happening again.
5 I would say that they did make some changes. I think
6 they're still working on some of those changes. We
7 actually had an opportunity to go out and visit just
8 a couple of months ago, and they offered some
9 additional insights. So I think the licensee is
10 actively still looking into this process and have made
11 changes, but we have not yet conducted the 95-001 that
12 Ami has had a lot of questions about. But in that
13 particular question, the inspectors will be looking at
14 all of the corrective actions that were implemented to
15 see if it basically would prevent recurrence of this
16 type of an issue.

17 CHAIR HALNON: Okay. And you're satisfied
18 that they're not having continuing uptakes problems at
19 this point? Because, you know, just from face value,
20 it looks like there's still vulnerability there for
21 personal safety.

22 DR. GREENE: I can't say we satisfied that
23 because we haven't conducted the 95-001, but what I
24 could say is we're actively monitoring their process.

25 MEMBER REMPE: I'm curious about that they

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1 requested this regulatory conference and, after this,
2 there were additional findings. Was that a surprise
3 to them, or did they anticipate findings would be made
4 and this maybe lowered the severity of the findings?

5 DR. GREENE: I think the reason for the
6 conference was probably a surprise to everyone. It
7 was a public conference, so this portion was public
8 comment. An individual came in and basically said NRC
9 needs to reevaluate what was just told to you, and so
10 we did just that.

11 MEMBER REMPE: Thank you.

12 DR. GREENE: Any additional questions?
13 All right. Thank you. And I just want to make one
14 additional comment. You had asked Ami about the
15 Waterford issues on the workgroups that were done.
16 That was actually a collective with EP and ROP. When
17 we go out and do HP inspections, part of that is under
18 our baseline inspection process, and so what we
19 actively do when we have those types of issues, we'll
20 look at where it's the most significant at. And so
21 those particular issues, the significance fell on the
22 EP side, so ROP supported EP in those efforts.

23 Thank you.

24 MS. AGRAWAL: So next on the trend, I'm
25 going to tell a little story here. There's three

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1 slides that go with this. So green findings, if you
2 look at, you know, from 2018 until 2022, it looks like
3 that we have an increasing trend under the green
4 finding, but this is only telling a story for those
5 years. There's an increase. But if we go a little
6 bit further out, so, taking a few more years back, you
7 can see where we were in 2015, right, we're back to
8 where we are in 2022 where we were previously.

9 CHAIR HALNON: How many fewer plants are
10 operating now, though? In 2015, did you have SONGS --

11 MS. AGRAWAL: And that is one of the
12 factors; you're right. And then if we look back
13 further, about 15 years of trend, it shows altogether
14 a different story where a clear statistical
15 significance decrease trend is apparent from 2006 to
16 2014 and then where we are today.

17 What could we say about that, right?
18 Well, there has been some improvements that the
19 industry has made in risk reduction due to new FLEX
20 equipment that have been incorporated. There are
21 certain applications that NRC has applied. For
22 example, the AV-8 flyer SDP. We have made
23 improvements to our LB evaluate performance
24 deficiency. Just a few years back, there was an
25 effort to revise the guidance for more than minor

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1 performance -- so there's a number of efforts that
2 have led throughout the years that could tell why we
3 are where we are today. Any questions?

4 Now, breaking this down for the regions,
5 there doesn't really appear to be anything noteworthy.
6 It seems to be equally distributed. Each region has
7 had at least one red and green finding since 2014.
8 Every region has been represented in the years since
9 then. Every region has had at least one year in the
10 time frame without any red and green findings, as
11 well. This is consistent with the analysis going back
12 to 2013. There was a GAO audit of inspection
13 findings. Any questions?

14 CHAIR HALNON: Does that include the
15 security findings?

16 MS. AGRAWAL: So I excluded the security
17 findings because it's a public meeting and the slides
18 cannot be publicly available.

19 CHAIR HALNON: And do you see any trend in
20 certain cornerstones, or is it pretty distributed?

21 MS. AGRAWAL: It's pretty distributed.
22 But, yes, since we've done, you know, cybersecurity
23 inspections, there has been an increase in the
24 security area for green findings, yes. And there has
25 been red and green in security, but I just chose not

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1 to --

2 CHAIR HALNON: Got it.

3 MS. AGRAWAL: The trend in security is
4 pretty similar to what you see here.

5 MEMBER REMPE: So this maybe isn't fair to
6 ask, but sometimes you hear licensees complaining
7 about differences in regional inspectors'
8 interpretation of the requirements. Do you have any
9 insights about that?

10 MS. AGRAWAL: Yes, that is accurate. So
11 in a few slides, I'll show you the breakdown for green
12 findings per region. And this is historically that
13 Region IV has had a higher number of findings in
14 general when we look at green findings. However, for
15 greater than green findings, it's been pretty
16 consistent for the regions. But in green findings,
17 yes. Obviously, every region is a little bit
18 different. You know, some regions, like, for example,
19 I mean, I've worked in three different regions. Some
20 regions like to take three issues, right, three
21 performance deficiencies, write one violation. Region
22 IV probably doesn't have, you know, we tend not to do
23 that. We try to separate those issues and write three
24 findings maybe, you know, versus combining them.

25 So, yes, there is historically some

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1 differences between the regions. However, I would
2 say, you know, was it three years, John, since we've
3 done the more than minor -- so we have updated our
4 guidance for how we evaluate the findings from minor,
5 more than minor, criteria. And that's going to bring
6 in more consistency amongst the regions, and I know in
7 certain inspections, for example, the engineering
8 inspections, there's some collaboration among the
9 regions when the findings are, you know, before the
10 findings are issued, you know, what kind of findings
11 are coming up. So there is some effort to kind of
12 bring all the regions together in more consistency,
13 but, yes, of course, there's going to be some
14 differences, yes.

15 Okay. So for green findings, there has
16 been a declining trend since 2017. And I think I've
17 already covered, you know, some of the reasonings, but
18 I'll just share and just kind of reiterate some of the
19 things I already said. So while we have kept most of
20 our analysis for green findings separate from any
21 consideration of more risk-significant events,
22 visually at least, there seems to be a relation to
23 what happened with red and green finding here. One
24 hypothesis in the 2018 time frame was that this was
25 just a reflection of several plants shut down, what

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1 you just mentioned, including several that were
2 historically not the strongest performers.

3 There was also NEI's contention that it
4 was obviously just, you know, plants have just
5 performed better, drastically improved over the years,
6 and so that's why the findings are low. However, you
7 know, I shared some other insights, you know, from the
8 NRC's perspective, what we have improved as far as our
9 program for the trend.

10 There's also, you know, historically,
11 there has been push also from the licensee side more
12 criticism or more, I don't want to say criticism but
13 more scrutiny for the findings, particularly the green
14 findings, and that has also impacted the inspectors
15 issuing findings. So that does impact the decrease in
16 the findings, as well.

17 And from the operating experience and
18 analytics perspective, just as we were skeptical of
19 the idea that 75 percent of the drop in the findings
20 was a result of 300-percent improvement in the
21 licensee performance over five years, it's obviously
22 not, you know, there's obviously some improvements,
23 but I wouldn't say that much. We do not believe that
24 the increase in re-findings is necessarily an
25 indication of a sudden decline in performance.

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1 However, a year ago, and what I mentioned, there's
2 been COVID obviously. There has been some move
3 because, you know, the outage work. So COVID is
4 definitely going to have some impact on all the work
5 that was pushed back that's the licensee cutting back
6 --

7 MEMBER MARCH-LEUBA: Yes, that was going to
8 be my question. Here they're -- they're in the
9 hundreds now. It's clearly a separation with COVID in
10 2020. There's two possibilities: that the work was
11 postponed or the inspections were less in person and
12 in less detail.

13 MS. AGRAWAL: I would say both. I would
14 say both.

15 MEMBER MARCH-LEUBA: When I look at this,
16 I don't see any reason 2022 wasn't it. And I usually
17 do this in 2020 for usual circumstances.

18 MS. AGRAWAL: So, I mean, I would say
19 about a year ago we actually started, as far as the
20 regional inspectors being present, right. And the
21 licensees were just starting to get all that deferred
22 work back into their outages so they're --

23 MEMBER MARCH-LEUBA: So, obviously, we can
24 table your previous conclusion that we keep going
25 down. We're not going down. When you go to the

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1 doctor, he says any unexplained loss of weight. If
2 you've lost weight because you've been on a diet,
3 that's not bad.

4 MS. AGRAWAL: Right.

5 MEMBER MARCH-LEUBA: This is explained.

6 CHAIR HALNON: And there's so many
7 dynamics. It's not misleading; it's just not telling
8 the story. There's three different types of these
9 findings: self identified, self revealing, and
10 inspection --

11 MS. AGRAWAL: NRC identified and licensee
12 identified.

13 CHAIR HALNON: And licensee identified.
14 And that tells a much more story. The self-revealing
15 ones, when something happens and it reveals itself,
16 that, to me, is the most serious of the statistics we
17 should be looking at. A lot of the programmatic
18 aspects, if you look at this, that's the decade of
19 people reaching a period of extended operation at
20 license renewal, so that's another dynamic is that
21 they've raked through their programs, they've got
22 their license in place, and now they're doing their
23 just before period of extended operation inspections
24 themselves, assessments, and getting their programs in
25 place. That's another thing that happened during that

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1 time frame, the ROP enhancement pushed by the industry
2 which came up with about a dozen things that,
3 surprisingly, would try to reduce the number of
4 findings that came out.

5 There's so many dynamics going on during
6 this decade that this, like I said, it's just not as
7 telling as it could be if you start slicing and dicing
8 it more.

9 MS. AGRAWAL: Yes, there's multiple
10 factors.

11 MEMBER ROBERTS: And this is Tom Roberts.
12 I've got here a question I wanted to ask, which is
13 kind of saying input loss of flex data on operating
14 experience based on things you didn't find. Have you
15 reconciled the state of affairs to see if there's
16 similar trends or whether there's some gaps that they
17 could fill in with their data that you're not seeing?

18 MS. AGRAWAL: So I cannot speak to that
19 because this data does not include the INPOs, but I
20 know that our Headquarters operating experience group
21 in the Division of Reactor Oversight does look at
22 INPOs data and, you know, hey, where we are, what is
23 INPO finding, what is NRC finding, if there is any
24 commonality or differences. So they do monitor that,
25 but I would say that, you know, I guess I can't really

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1 speak to that from this data.

2 And here's a breakdown by region and per
3 site. I know we already discussed some of the
4 differences. You know, you see Region IV has
5 historically been a little bit higher, not a whole
6 lot, but, yes, we have our differences in different
7 regions.

8 And for the crosscutting aspects --

9 CHAIR HALNON: Could you quickly just
10 define what crosscutting aspect is for the folks in
11 the public?

12 MS. AGRAWAL: Yes. So --

13 CHAIR HALNON: I asked that question
14 before Walt did.

15 MS. AGRAWAL: So each of the findings have
16 a crosscutting aspect. Well, if it's appropriate, we
17 assign a crosscutting aspect to the finding, and these
18 are the areas of the crosscutting aspects. So there's
19 three main areas, but these are the separate aspects
20 under each of the areas, and I don't want to go
21 through each one. And it just pretty much tells the
22 reasoning behind -- did you want to say something?
23 Oh, okay. Greg, it looked like you had something to
24 say. Okay.

25 So if it's appropriate for the findings,

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1 we assign a crosscutting aspect that may be the cause
2 of why the licensee failed in these areas. And unless
3 somebody else has a better definition of that -- so
4 every year, once a year we do an annual, end-of-cycle
5 meeting. We talk about each of the plants, how
6 they've done in their assessment pretty much for each
7 of the plants. And as part of that assessment, this
8 is internal to the NRC, as part of that assessment, we
9 actually do look at these areas for crosscutting to
10 see if there's some commonalities. I don't want to
11 say themes but there's commonalities under each of
12 these aspects. And if there are, then we talk about
13 what additional inspection efforts may be required for
14 that area.

15 CHAIR HALNON: So this was a post Davis-
16 Besse, I believe, corrective action. So we're trying
17 to get to be a leading indicator to focus inspection
18 resources and licensee assessment resources in areas
19 that are showing a decline, as opposed to a violation
20 or something to that effect.

21 MS. AGRAWAL: That's right. Okay. So
22 2018 - 2022 Region IV was approximately 33 percent of
23 all the ROP inspection findings. And the graphs, the
24 break line shows each of the crosscutting aspects,
25 what fraction of the total number of crosscutting

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1 aspects were for Region IV. And just overall, I don't
2 have all the obvious breakdown by the region, but it's
3 pretty consistent amongst the regions how we've
4 applied crosscutting aspects to the findings.

5 And unless there's additional questions --
6 yes?

7 MEMBER KIRCHNER: On this previous slide,
8 so what do you do with this? You know, from the
9 statistics standpoint, nothing stands out really. So
10 you collected this information. Is there something
11 actionable based on this that you'll change your
12 inspection procedures, you'll change your frequency,
13 you'll be more aggressive, you'll be whatever? What
14 takeaway do you get from this? Because all I see is
15 comparable statistics for each of the categories you
16 --

17 MS. AGRAWAL: Yes. Okay. So each of the
18 aspects, actually, it has maximum number of assigned
19 aspects that are associated with it. So let's say,
20 for example, under problematic condition, so the P1
21 (audio interference). If P1 has 12 findings that have
22 P1 assigned to it, right, now that's the maximum, and
23 so then that would tell us that they actually have a
24 theme associated with that aspect. And so if that's
25 true, if we get to that point, we would add additional

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1 oversight for that licensee.

2 MEMBER KIRCHNER: That does not leap out
3 to me from this view.

4 CHAIR HALNON: From a licensee
5 perspective, they're tracking it in a much lower
6 threshold than the NRC is tracking it. And this is a
7 per region, so you can pretend it's like a per site.
8 And if there's a trend or what they're calling a
9 theme, a current site will do a self assessment and
10 try to turn that trend around. The 12 is a backstop
11 that the NRC set, saying, if you don't fix it, we're
12 going to come in and help you. And they'll put some
13 resources into inspection. So it basically gives the
14 licensee time to chase their own problems, but the NRC
15 is in a monitoring zone, allowing the corrective
16 action program to work. And if it doesn't look like
17 it's working or it's in the PI&R area, then they're
18 going to put additional resources on inspection.

19 MS. AGRAWAL: So, for example, under PI&R,
20 so we have every two years we have an PI&R inspection
21 team that goes out. If the inspection is coming up,
22 then we would increase the oversight in that area. If
23 not, then we also have a number of samples in a year
24 that's allotted to PI&R. So we would, you know, we
25 would assign samples to look at, you know, that

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1 particular area, so that's how our oversight --

2 MEMBER SUNSERI: Thinking about Walt's
3 question, I mean, the takeaway for me is is that it
4 was brought up here earlier today that there's
5 potential consistency amongst the region and,
6 certainly, the assignment of a crosscutting aspect is
7 somewhat of a subjective call. This graph looks to me
8 like, within Region IV, there's good balance across
9 the country, which is the biggest takeaway for me. So
10 now that, you know, each licensee is treated fair, if
11 you will, but they still are exposed to oversight if
12 they get too many. Would you say that's a fair
13 assessment?

14 MS. AGRAWAL: That's fair. Anymore
15 questions? And back to Dr. Greene.

16 DR. GREENE: All right. Before I go into
17 this, I did want to mention, on the crosscutting
18 aspect, another perspective of this is that the
19 residents themselves closely monitor at the sites
20 specifically that they're at. So the licensee will
21 get a strong message from the residents if they're
22 seeing a build-up in one particular area of CCA, what
23 we call crosscutting aspects, and let them know, hey,
24 we're seeing that you're having a lot of these right
25 here, so what are you doing. So that communication is

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1 definitely given to the licensee.

2 So what I'm going to quickly discuss on
3 the ROP umbrella is one of the things that we look at
4 for HP or radiation protection, and that's called the
5 three-year rolling average. Basically, it's a three-
6 year average dose for NRC sites per reactor per year,
7 and then it's ranked in four quartiles. So this
8 report is actually issued every year from NRC based on
9 data that they received from the licensees. And what
10 we do as HP inspectors or RP inspectors, however you
11 want to look at it, we look at the quartile rankings.
12 And so we used to, we used to have an inspection
13 procedure, which was 7112402, which was titled
14 Occupational ALARA Planning and Assessments. At this
15 time, that particular inspection procedure was retired
16 in 2020. However, aspects of that were still
17 incorporated to another inspection procedure.

18 And so whenever we have potential
19 violations or findings under the ALARA aspect, and for
20 those that do not know ALARA stands for as low as
21 reasonably achievable, which is particularly indicated
22 how much dose a licensee is allowing their workers to
23 receive, when we look at issues under the ALARA
24 aspect, we basically look at how much oversight or
25 inspection should be dedicated to this based on what

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1 quartile that particular licensee is in.

2 So, for instance, this right here is
3 showing it for two different type of light water
4 reactors. For those that don't know, commercial
5 reactors in the United States are particularly,
6 they're boiling water reactors or pressurized water
7 reactors, so we have two different charts here.

8 Under the boiling water reactors, the
9 first quartile is the top performer. We only have 41
10 person rem between 2019 and 2021, and that's an
11 average per reactor per year, down to the fourth-
12 quartile performers, which are the worst performers.
13 And the bottom of that was 230 person rem. Now,
14 what's important to note here is that we do have what
15 we call a threshold value for ALARA. That is found in
16 Inspection Manual Chapter 0609, Appendix C for
17 occupational radiation and safety. And what that
18 basically says is that, for boiling water reactors,
19 there's a threshold value of 240-person rem. So what
20 does that mean? That basically means that, if we have
21 a site that is exceeding 240-person rem, that
22 potential ALARA violation can potentially be white
23 versus green.

24 Fortunately, we haven't seen our licensees
25 exceed that 240 mark for BWRs or, in contrast, 135-

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1 person rem for PWRs in quite some time. So,
2 therefore, an ALARA violation wouldn't get them to a
3 white based on our Manual Chapter 0609 Appendix C.

4 So this is just a really quick overview of
5 how we look at licensees from the three-year rolling
6 average perspective. Any questions about that? All
7 right.

8 And just as a reference point, NRC Region
9 IV actually has four BWRs and eight PWRs that we're
10 actively operating, that we're actively monitoring.

11 All right. Next slide. Okay. There we
12 go. All right. So somewhat in contrast, the licensee
13 doesn't really look at three-year rolling averages.
14 They look at what is called collective radiation
15 exposure, and so this is sort of a chart to kind of
16 express what that looks like almost since the
17 inception of power plants. And so you'll see this is
18 ranging from about 1973 up until 2021, and you can
19 see, in general, it's a downward trend that we're
20 seeing. So what does that mean? That basically means
21 the licensees' source term is getting better. Over
22 time, we're seeing that their collective radiation
23 exposure is decreasing as we have gone over time.

24 So the first chart here is actually
25 showing the 2021 average collective dose, and,

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1 actually, that should be rem. But it's BWRs is about
2 108, PWRs is about 32. And then on the average
3 measurable dose per individual, so these are
4 individual average doses, you'll see that BWRs, their
5 individual staff is picking up an average of 206
6 millirem in a year and PWRs about 81 millirem in a
7 year.

8 So this is just another perspective that,
9 you know, you can look at it at a site and just kind
10 of see overall how licensees are doing in terms of
11 their dose. Any questions about that? Yes?

12 MEMBER BIER: This is Vicki Bier of ACRS.
13 This is not a question about this one slide, but kind
14 of overall the presentation so far. It sounds like
15 there is a lot of kind of procedural aspects to the
16 review. Like you compute all these things. You see
17 if any of the cross-cutting areas are way out of line
18 or you look at the dose relative to the reliable cut-
19 off, et cetera.

20 How much of the inspection or findings is
21 qualitative? Like maybe they don't have a lot of, you
22 know, hits on the training, cross-cutting area, but
23 the inspectors just say, well, I don't have a really
24 good feeling about the quality of the training at this
25 plant or, you know, somebody where their dose may not

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1 be outside of the limit, but you've observed, well,
2 you know, they seem to have poor practices on dose
3 control and so I would expect sooner or later maybe
4 they will exceed a limit. And, you know, kind of the
5 situational awareness side of inspection, I guess, I
6 would describe it as.

7 DR. GREENE: Thank you for that question.
8 So I would say it's a mixture of both, right? So we
9 sort of use the numbers and the quantitative data to
10 sort of risk inform our approach.

11 So if you look at our licensee and our
12 licensee procedures, most of them are risk-informed
13 procedures. So we may look at this data as I
14 demonstrated and say, okay, we're going to allow these
15 many hours to look at this particular program.

16 However, when we get into the program a
17 lot of that information then becomes qualitative
18 because we're looking at how they're implementing
19 different aspects of the program. And so then we can
20 get into things like the cross-cutting aspects to sort
21 of give way to, you know, what is the underlying
22 causes of some of these issues?

23 And as you mentioned before, some of those
24 may be training, some of those may be, you know,
25 oversight or resources or things of that nature. So

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1 it's not as much quantitative as that point, but it's
2 really how good is your program.

3 MEMBER BIER: Okay. Mm-hmm.

4 MR. DIXON: Just real quick, this is John
5 Dixon, the Project Experience Chief. To also answer
6 your question, the residents are frequently at the
7 site walking around the plants. So they will
8 frequently come across something that will change the
9 entire direction of their day.

10 Right, they may have planned to go do this
11 surveillance test because this is what was planned,
12 this is what was scheduled for last week. But because
13 of something they walked down, something they come
14 across, something that changes at the plant that day,
15 it will completely change their focus and their shift.

16 Training is a good piece that she had
17 mentioned. We specifically have an inspection
18 procedure where the residents will go spend time at
19 the control room and at the simulator observing,
20 monitoring, you know, paying attention to things of
21 that nature. But even that piece is more encompassing
22 than just doing those two types of activities.

23 It's looking at procedures. It's looking
24 at how they prepare to do the training for the
25 operators. So there is a lot of aspects that are

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1 quantitative and qualitative equally.

2 DR. GREENE: Any additional questions?

3 Thank you.

4 MEMBER MARTIN: This Bob Martin from ACRS.

5 I couldn't help but Google while we're listening here
6 and seeing that the budget trends for the NRC have
7 been downward, like as much as 15, 20 percent since
8 2014. Beside this data right here, you've shown
9 improving trends related to inspections and such.

10 And, you know, I won't use the word
11 statistics so, you know, there's, you know, lies, damn
12 lies and statistics. Is there anything you might say
13 that because of the budget reductions, you must feel
14 them everywhere, does it impact the inspections, the
15 amount of business and such like that, staffing?
16 Could that influence the trends that we've seen?

17 DR. GREENE: I'll give my opinion and then
18 I'm going to give you my personal opinion. This may
19 be a personal perspective, but I think we all feel it
20 as some point. Appearances by the scale of personal
21 reference, you know, we are probably one staff down.
22 So it makes us take on more inspections at times or,
23 you know, you have more FTE that is being lost because
24 you don't have inspectors out there. But it doesn't
25 really take away from the job in my opinion.

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1 You know, I think we work so well together
2 because we know what we need to pick up when we can't
3 get another inspector on board so we know how to
4 either do more inspection hours before we go onsite
5 or, you know, just better management and planning from
6 that perspective. But I think the crunch is felt in
7 some perspective from everyone.

8 MEMBER MARTIN: You walked that line
9 pretty well.

10 MS. AGRAWAL: So do I need to say more?
11 So, I mean, we haven't seen -- I mean, we haven't done
12 -- the inspection hours have been pretty consistent
13 actually so that's really what I would say. It's been
14 pretty consistent, you know, the hours and number of
15 inspections that we do.

16 Obviously, we've improved, right, under
17 the engineering inspections. But we focus on -- but
18 as far as how many inspection hours and what we
19 performed has been pretty consistent.

20 MR. PICK: Good afternoon, ladies and
21 gentlemen, and especially the members of the ops
22 subcommittee.

23 This is the plan to beat all plans. This
24 is the roadmap for discussing the plan. I'm using the
25 skills I've acquired over 22 years in Toastmasters is

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1 what I'm trying to do.

2 Aging progresses slowly. On a previous
3 slide was the Parthenon. It has been around for 3,000
4 years. If we look at the plant one month before they
5 cross that magical data four years into their period
6 of extended operation, which is just a term we use to
7 describe the original license period and the re-
8 license period or one year into it, it won't matter
9 that much when you think about concrete lasting for
10 3,000 years over in Greece.

11 We are presuming that the application will
12 be received in December, and the NRC will accept it.
13 We won't send it back. That would affect the time
14 limit. Aging measurements apply to both units. If
15 there is something that happens during the review that
16 stops us from verifying Unit 1, then we can do it
17 during the year two inspection.

18 I expected them to read the slides, sir.
19 Don't people on Teams have the slides? This is the
20 plan for the license renewal review of Diablo Canyon.
21 I won't last 10 minutes at this rate.

22 We review in Region IV 100 percent of the
23 aging management programs in the appendix. We only
24 have to review about 70 percent because we are a
25 sampling organization.

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1 The re-licensing set goes back to 2013.
2 I became aware of that. The licensee has already been
3 informed that as an inspector, I know they already
4 were licensed. I led that inspection. We're going
5 back to 2010. I'm sure there wasn't too much
6 significant that happened in that three years, but
7 they're going to factor into their license renewal
8 application and our inspections.

9 We anticipate a small number of changes.
10 Because the original licensing occurred in 2010 and it
11 was withdrawn in 2018, interim staff guidelines for
12 license renewal had been issued. And the staff had
13 issued questions to the licensee and they had
14 responded.

15 So they have already incorporated the
16 post-GALL, Rev. 2 guidelines into their living license
17 renewal application. And that's their baseline for
18 the re-submittal. I don't anticipate a lot of
19 changes. They've been inspected once in this area.
20 What allows us to inspect -- yes, sir.

21 MEMBER BALLINGER: I have a question.
22 Okay. Why is this costing billions of dollars?

23 MR. PICK: Why is what costing billions of
24 dollars?

25 MEMBER BALLINGER: The re-licensing of

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1 Diablo Canyon. They are (simultaneous speaking) a
2 couple billion dollars.

3 MR. PICK: I'm sure this is OGC stuff.
4 I'm not speaking for OGC. They applied, and they
5 withdrew. They got to reapply. So the staff hours
6 will have to be reviewed for the new application.

7 MEMBER BALLINGER: I guess I never could
8 understand because I didn't turn the lights on we.

9 MR. PICK: I agree with you, sir. I
10 agree.

11 MEMBER HALNON: They would suspend capital
12 expenditures for certain things that were long-term.
13 They would suspend working on aging management
14 programs that were required for the initial period of
15 operation. So there is probably a lot of things they
16 had to gear back up that it's --

17 MR. PICK: As a matter of fact, we have an
18 inspection ongoing this week and last week for us to
19 assess what they had started winding down and what it
20 would take to gear it back up relative to plant
21 operations that we are going to tag onto that
22 inspection to see if any of it affected the license
23 renewal. When I get that bullet, I'll go right past
24 it.

25 (Simultaneous speaking.)

1 MEMBER BALLINGER: I don't know. Somebody
2 said a billion there, a billion there, sooner or
3 later, we're spending a lot of money.

4 MR. PICK: That's beyond my pay grade.
5 That's beyond my pay grade. What authority gives us
6 the ability to conduct our inspections? That is the
7 licensing support inspection procedure.

8 If the aging management program audit from
9 headquarters or the scoping and screening audits in
10 headquarters has questions, then we will use that
11 procedure to follow-up on the questions because we
12 have already reviewed the first submittal. We don't
13 expect the full review because of this inspection. So
14 that's one answer to your question, Ronald.

15 Because they came in for timely renewal,
16 we issued a special inspection to accommodate for
17 timely renewal. What that really means is if we're
18 doing our review of their application and they cross
19 over that magic date where they should shut down, they
20 don't have to shut down because we're doing our
21 review.

22 But it has guidelines for us. That
23 inspection is to go out there during the outage and
24 look at the material condition. That was not done in
25 response to the original application under 71003

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1 because it was withdrawn. So those will be first-time
2 inspections.

3 To verify they implemented their
4 commitments effectively and correctly, these
5 inspections weren't done either because they withdrew
6 their application. We will do it this time with a
7 highly qualified four person team with over 90 years
8 of inspection experience in civil, structural,
9 mechanical and electric.

10 My peer in the audience did a great job
11 creating this team of inspectors in the Phase 3. Flow
12 evaluations have to occur. Sometimes headquarters is
13 doing a review of a program, and it's not done. We
14 can't review what is not completed yet.

15 Phase 3 allows us to do the unfinished
16 evaluations after they cross into the period of
17 extended operation. And in their letter, dated March
18 something of this year, there are two programs, buried
19 piping and selective leaching, that require two
20 outages for each unit to implement the program. We
21 will follow-up after each outage when they've done
22 their activities to see how well they are implementing
23 their aging management activities.

24 I'm going to click through this real
25 quick. You have one outage, we're going to do an

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1 inspection. If you have two outages, we're going to
2 do an inspection. We're going to do a 71002 for
3 things we haven't looked at before and assist our
4 peers in headquarters.

5 The Phase 2 commitment, that's going to be
6 four people onsite for two weeks to look at -- do they
7 got solid programs? Did they implement solid
8 programs? And for those that exist, are they
9 effective?

10 In Unit 1 license renewal, we get another
11 shot at verifying the implementation of their
12 programs. In two licenses, then they were in two
13 Phase 3 inspections.

14 What are we going to look at? The 2010
15 inspection had 16 observations. We're doing an in-
16 office review to see how well their corrective action
17 program corrected them back then. And for things that
18 were corrected back then that weren't just a change
19 out of a component, are they factoring it into the new
20 license renewal application?

21 We're evaluating the closed commitments in
22 that March letter. They have no commitments on the
23 docket yet because it's a new application. But they
24 did have 75. In their March letter, they had closed
25 25 of those original commitments.

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1 If it was an aging issue back then, then
2 it would be an aging issue now. We're going to check
3 on how well they closed those commitments and do we
4 agree? And by pre-application, I mean before we
5 receive the application in December.

6 Conduct an inspection during the Unit 1
7 outage, we may review programs that have little or no
8 changes. This goes to your question, Ron. A split
9 has existed for years. The GALL guidance hasn't
10 changed, and they already submitted it originally.

11 In talking to them before October if they
12 say, hey, we're going to come in with the same
13 program, I'm going to recommend, why don't we take a
14 look at it? Now would we close the (audio
15 interference) commitment in that report? Well, no,
16 because I'm going to wait until I verify in the new
17 application that it's what I expect. And we're going
18 to incorporate insights from the inspection ongoing
19 today, post-application.

20 So we've received their application.
21 We've accepted it. What kind of inspections are going
22 to occur? Headquarters has identified items if they
23 have any. If they have any questions they need eyes
24 on in the field instead of flying out of Washington,
25 we'll use our planned inspection to look at it.

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1 We're going to make sure they reflect the
2 current guidance in their programs. That the
3 commitments that they make in their application are
4 actually being implemented or can be implemented the
5 way they say. That they are effectively implemented.
6 That's what we do as inspectors. We talk to the
7 engineers onsite. We look at the programs. We look
8 at the completed work, and we conclude whether, yup,
9 it's working the way it should

10 MEMBER BALLINGER: I have another
11 question.

12 MR. PICK: Yes, sir.

13 MEMBER BALLINGER: We've had a number of
14 SORs going forward. And so have you folks taken a
15 look at those applications and the amps and issues
16 that have come up in those applications and then
17 normalized it with respect to Diablo Canyon to
18 statistically -- you know, you say you don't review
19 everything, but can you use the information in the
20 past to pick areas that you think you should review
21 that may be the more critical ones?

22 MR. PICK: We have not. And I'm not sure
23 that there has been a regional inspection of a plant
24 in SLR yet. I don't know the answer to that.

25 MEMBER BALLINGER: Well, and I'm not --

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1 well, I guess I'm not saying that. What I'm saying is
2 clients come in for subsequent license renewal. And
3 they say, well, we've got this many amps, and these
4 are issues. And we know which plants have had varied
5 piping issues for example or whatever. And you can
6 see what the plants are doing.

7 Have you been able to factor that
8 knowledge into well, now you're going to be out in
9 Diablo Canyon and you do your review. You say to
10 yourself, well, these plans historically in the past
11 are plans that have had issues. We'll use that
12 knowledge to select a statistically significant set of
13 amps to look at normalized to the Diablo Canyon.

14 MR. PICK: We're going to review all of
15 the aging management programs at Diablo. But we will
16 focus on those that more likely have problems based on
17 our inspection experience. We always do that on every
18 inspection. As a matter of fact, if we can figure out
19 what's the most important thing, we'll go there first.
20 Yes, sir. That's how inspectors work.

21 In the future, I've alluded to it earlier.
22 We review the outstanding commitments, those that we
23 couldn't get to prior to entering the PEO and any
24 questions we raise. Or maybe we hit the licensee with
25 a stumper, and they need time to resolve it so they

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1 can't say we're done. We verify that it will be
2 implemented effectively and that's after they earn the
3 PEO or we looked at that flow evaluation or we wait
4 for that headquarters review.

5 The other one I mentioned earlier is there
6 are two programs that they need, the timely renewal
7 period that they asked for to implement selective
8 leaching and buried piping. We know those are future
9 inspections. Each inspection will have a standalone
10 inspection report. Now any other questions?

11 MEMBER REMPE: You bet. I'm not hearing
12 you mention anything about your take on what will be
13 needed for seismic evaluation. So do you anticipate
14 that Diablo Canyon will have some activities that are
15 going to be a little more challenging in a subsequent
16 license renewal?

17 MR. PICK: On the safety side, no, because
18 I was the lead during original licensing until it was
19 withdraw. There was never any seismic concerns of 2
20 over 1 on the safety side. Those were environmental
21 issues being raised by the State of California. I
22 can't speak for the State of California, but this time
23 California wants it. That's my answer as Greg Pick,
24 an individual.

25 MEMBER REMPE: What about flex, they will

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1 have to make some of the improvements for flex which
2 I don't know if they started on that at all with --

3 MR. PICK: I don't know that either. But
4 my peer says yes.

5 MEMBER REMPE: It's already been -- okay.
6 Thank you.

7 MEMBER SUNSERI: Hey, Greg. Matt Sunseri.
8 I chair the license renewal subcommittee at ACRS. So
9 I'm not trying to pin you down with this, but just a
10 ballpark. When do you think you will be complete with
11 your evaluation because you lead us and then we follow
12 so any timeline?

13 MR. PICK: I suspect if it's accepted the
14 way the NRC says, I'm kind of speaking for DLR. But
15 they are probably going to follow the 22 month from
16 January of 2024 as close as they can. In preparation
17 for this, I reached out to Brian Harris, the DLR PM
18 and said, hey, when do you think you'll do your onsite
19 amp and scoping audit because that feeds into our
20 71002? He said we're planning it -- if everything
21 goes according to plan, March, 2024.

22 MEMBER SUNSERI: Okay. And from our
23 experience, the ACRS fits under that 22 month window
24 so somewhere in the order of about 20 -- okay, got it,
25 18 months. Thanks.

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1 MR. PICK: Any other questions. I'm going
2 to let my good buddy Sam come up to the lectern and
3 take over.

4 MEMBER HALNON: So just as a time check,
5 Sam, everyone has taken off your time so we thank you
6 for your time, and we appreciate it.

7 MR. GRAVES: Thanks very much. I
8 appreciate your time.

9 MEMBER HALNON: Yeah, we've got about 20
10 minutes. And I need five minutes to wrap up on the
11 staffing and then some public comments. So about 15,
12 20 minutes. And I'll give you a five minute warning.

13 MR. GRAVES: Okay. Well, thanks very
14 much. The clicker works. Yeah, I'm going to briefly,
15 now briefly, talk about the Texas interconnection and
16 some impacts from Winter Storm Uri on the Texas grid
17 and some reliability improvements.

18 But let me preface this with I'm an NRC
19 inspector. I am not an expert, not that there even is
20 such an animal that I've ever met. But anyway, I have
21 zero Toastmaster experience so mine will be a little
22 less than gray.

23 MEMBER HALNON: So notwithstanding that,
24 the reason we put this on the agenda was to discuss
25 really the impact on the nuclear units in Texas,

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1 specifically, towards that last topic was if, once you
2 describe the grid and how it's all isolated, weighing
3 -- when everything goes down, how do you get it back?

4 MR. GRAVES: Yeah, I have some of that in
5 here. It's called black start.

6 MEMBER HALNON: Right.

7 MR. GRAVES: And it is a significant
8 concern for us as well as ERCOT. Everything here, I
9 got from publicly available information and any
10 mistakes or anything else are obviously mine. And it
11 doesn't reflect the Commission or the regional
12 management or op.

13 I call this an agenda. Greg called it a
14 plan. But I'm going to talk a little bit about our
15 guide, something about a little review of the winter
16 event, the impacts of the Texas nuclear power plants
17 briefly on that. I'll talk a little bit about the
18 inquiry, the joint inquiry from FERC, NERC, and the
19 regional entities, especially ERCOT and then the black
20 start concerns and go over some recent improvements to
21 grid reliability.

22 So ERCOT is the Electric Reliability
23 Council of Texas. It is similar to NERC. But I'm
24 sure you probably know that there are three large
25 interconnects from the bulk power system in the United

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1 States, Eastern, Western and ERCOT, Texas. Ninety
2 percent of Texas is covered by ERCOT.

3 The Texas legislature sets the rules,
4 gives them to the Public Utility Commission who in
5 turn oversees ERCOT. ERCOT is the reliability
6 coordinator for Texas.

7 Yeah, Texas has a political system which
8 is a -- it does have some strong ties with the fossil
9 fuel entities. And usually, it has the highest
10 install capacity of generation from renewable source,
11 more than 38,000 megawatts in wind and more than
12 20,000 megawatts in solar.

13 The interconnect has more than 1,000 units
14 and 53 plus thousand miles of high voltage
15 transmission lines.

16 So the winter event in February 2021,
17 extreme cold weather. It was minus 5 degrees at my
18 house. That was the coldest it's ever been, and I
19 live 30 miles south of Dallas.

20 A huge amount of electrical load shedding
21 went on, in fact the largest ever in the United
22 States. The cold brought precipitation and snow here
23 and even down in South Texas.

24 The 2021 event was similar to a 2011 event
25 and 2014 cold weather events in Texas in addition to

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1 others. So this was not the first time bad things
2 have happened to the Texas power grid due to cold
3 weather.

4 It contributed to more than 4.5 million
5 customers being without power for up to four days, and
6 more than 200 people lost their lives because of this.
7 And within our pot, more than 350 generators were
8 taken offline and lost 52,200 plus megawatts power out
9 of the roughly 107,000 megawatts total available
10 capacity. And of the nuclear power plants, one unit
11 in South Texas tripped because of the cold weather.

12 So here is a little graph that I borrowed
13 from an ERCOT report. And on February 15, this is
14 when things really started to go wrong. You could see
15 it started out around 1:23 in the morning. We were
16 around 59.9 hertz, which is reasonable.

17 They tripped about 1,000 megawatts or so
18 on the load shed and frequency restored it to around
19 60 hertz. But these are brackets of 10 minutes. So
20 around 1:33 in the morning, bridge frequency started
21 to decay away, and ERCOT, the operators, they began to
22 manually shed some load. And you can see also where
23 some of the generators began to fail as temperatures
24 started to fall.

25 It was well below freezing at 1:33 in the

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1 morning on February 15. And it had been that way for
2 quite a period of time. The concern here is that red
3 shaded area down there at the bottom below this 59.4
4 hertz line.

5 There are various reasons for that, but
6 for the Texas plants, my understanding from a
7 mechanical perspective is that carbon blading begins
8 to overheat if the frequency drops down about that
9 far. So that was problematic for a lot of steam
10 turbine driven prime movers but also at 59.4 that's
11 when a 9 minute timer begins to engage with what we
12 call the underfrequency load shed relays, which is an
13 automatic protective function that all of the
14 interconnects have. And if it goes on for more than
15 nine minutes or so at that depressed frequency,
16 automatic tripping would start to take place, which
17 could be significant.

18 MEMBER BALLINGER: I'm not sure that it's
19 a steam turbine issue. I think it's a reactive power
20 issue, right?

21 MR. GRAVES: Oh, there are several reasons
22 why 59.4 hertz --

23 MEMBER BALLINGER: Once you get down below
24 that frequency, you get a lot of reactive power.

25 MR. GRAVES: The reactive power --

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1 MEMBER BALLINGER: (Simultaneous
2 speaking.)

3 MR. GRAVES: Yeah, there are a lot of
4 reasons why 59.4 for hertz is where they set that set
5 point. But the reason why 59.4 hertz is important for
6 us is because Comanche Peak, they set a timer at that
7 value. So I will talk about that here in a second as
8 a matter of fact.

9 Impacts due to Texas plants, we have
10 obviously Comanche Peak, South Texas Project.
11 Comanche Peak is about 40 miles or so from here, not
12 too far. And the South Texas Project is about a six
13 hour drive south, almost to the Texas Coast so, you
14 know, two different areas.

15 But Comanche Peak, they were pretty smart.
16 They proactively implemented their cold weather
17 procedures, recognizing that, you know, watching the
18 weather, knowing that every weather person locally was
19 telling them this is going to get much, much worse.
20 So they were proactive in this.

21 You know they began their cold weather
22 preparation procedures starting on the 14th when it
23 really began to get cold. And they built some
24 temporary enclosures around susceptible equipment.
25 They provided, you know, heat tracing and internal

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1 heating to these enclosures for some of these devices,
2 which was pretty smart.

3 They also, we talked about that was also
4 fairly smart, is they started one train of their
5 emergency diesel generators, both units, and
6 transferred one train of their vital loads to those
7 diesels in preparation for potential loss.

8 But they did have some problems with the
9 steam generator water level instrumentation line, you
10 know, the automatic level control of the steam
11 generator, but the operators were quickly able to
12 recover that. And it didn't cause a trip or anything
13 like that.

14 But here is where I understood they had
15 some restrictions at the 59.4 hertz involving the
16 turbine. And once they got to that, they started
17 their own timer. And they would have tripped the unit
18 off the line at that point, you know, nine minutes or
19 so into it.

20 Now it could have been associated with the
21 underfrequency load shed, but my understanding was it
22 had to do with the potential heating of blade problems
23 on their turbine. Now I'm definitely not a mechanical
24 guy so I could be wrong.

25 The South Texas Project, not quite so

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1 good. They did enter their cold weather preparation
2 procedures, but I don't know if it was complacency or
3 what. They are quite a bit further south, and they
4 don't freeze very often. But they didn't go to the
5 same lengths.

6 But anyway, on February 15, due to
7 extremely cold weather, they did end up tripping them
8 offline because the main feedwater pump suction
9 pressure line has a net positive suction pressure
10 sensing line, it wasn't insulated, and it froze. And
11 that caused essentially two of the main feedwater
12 pumps, they thought that they had a loss of suction
13 signal, and it tripped them off. And the branch wrote
14 an offsite violation, which was a finding for them.

15 They actually had a mod that they were
16 supposed to go out and check those exact lines to
17 ensure that they were insulated and had heat tracing
18 and everything on them, but well they didn't do it.
19 And it lost, and it tripped them off line.

20 Steam generator water levels, yeah,
21 equivalent of megawatts or so from their channel
22 radius, and it took them until the 18th at about 7:54
23 p.m. to recover. They had other problems going on at
24 that time.

25 Let's see. All plant safety equipment,

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1 especially safety-related equipment, it performed as
2 expected. Both Comanche Peak and South Texas Project
3 have since been inspected by, I think it's called a
4 Texas Reliability Entity, who works for ERCOT.

5 But, anyway, NERC and ERCOT have protocols
6 which now requires them to be inspected for winter
7 weatherization. But we asked about this, and we got
8 no formal feedback from ERCOT or the licensee. You
9 know, it was just informal from the regulatory affairs
10 folks who said everything was fine. So that is a
11 concern to my branch now.

12 The joint inquiry, I'm sure you are
13 familiar with this. FERC and NERC and the regional
14 entities, they came up with a pretty well written
15 report that had 28 recommendations to improve the
16 performance for extreme cold weather.

17 So some of the issues that still stick out
18 to us was the Public Utility Commission, it oversees
19 ERCOT. But the natural gas group in Texas was
20 overseen by something called the Railroad Commission.
21 And they each have their own little kingdoms, their
22 fiefdoms.

23 And they didn't really talk and, you know,
24 that latent disconnect was a significant problem
25 because the gas production facilities, they were

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1 supposed to be on a list of critical loads that were
2 not supposed to be tripped off, you know, under
3 weather-related events, but they were. So a lot of
4 them got divorced from power, you know, as things
5 started to go south on them.

6 But the Risk Reliability Report from NERC
7 in 2021 identified that natural gas delivery to
8 generate the units is one of their top four risks.

9 So recommendations, some of the ones that
10 are appropriate for NPPs that I thought were
11 important, require generator owners to identify
12 critical components to systems, SSEs, that could be
13 susceptible in, you know, freezing weather or adverse
14 weather. And not only do they have to identify it,
15 but, you know, they have to implement freeze
16 protection for those SSEs that they identified. And
17 these were all part of NERC project 202107, which is
18 like the first 10 pieces of Recommendation Number 1
19 out of that FERC report.

20 So it also required annual specific cold
21 weather preparedness plans and training, develop and
22 implement corrective action plans, which all of their
23 plants have anyway. So this was pretty simple for
24 them. But requiring the retrofit of any existing
25 units, and if you're going to have new ones, the

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1 design has got to integrate protections from, you
2 know, ambient chilled air weather events that they
3 have to analyze for now with this new data on how cold
4 it got. But these were all part of the same project,
5 202107, but these were particularly completed. The
6 Phase 1 is finished.

7 Of interest to us was the Study
8 Recommendation Number 26 and that has to do with the
9 black start capability in the ERCOT footprint.

10 Any questions so far? You can tell I'm
11 not a Toastmaster guru like my friend Greg. Oh, I
12 should have introduced myself earlier with a little
13 more color and said howdy y'all, but I didn't. But
14 here black start concerns. How are we doing? All
15 right.

16 So black start, essentially for anybody
17 that may not know is that if the grid collapses there
18 are certain little island units that can restart
19 without availability of offsite power, without the
20 grid being available, whether it's from batteries or
21 diesels or whatever.

22 They are designed, you know, to start and
23 then they will come up and power another unit that is
24 relatively too graphically close, which would have a
25 little more capacity. And then that would in turn

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1 feed another generating unit, which has more capacity.
2 And that process would continue until all these little
3 islanded areas can actually connect together and
4 restore the grid slowly but surely.

5 So ERCOT had 28 black start units at the
6 time and most of them unfortunately were powered by
7 natural gas. Several of them had alternate fuels, but
8 that was problematic, too. So 9 of the 13 black start
9 units operated sporadically or not at all. And 6 of
10 the 15 secondary units ran out of fuel or experienced
11 other outages with freezing natural gas lines.

12 So the problem that got our attention was
13 82 percent of all of those black start resources were
14 either outage, de-rated or failed, so 82 percent.

15 This also got our attention. The ERCOT
16 CEO testified in front of the Texas Senate that the
17 grid was about four minutes away from total collapse.
18 And that was that little red area that you saw the
19 grid frequency was collapsing down to 59.302 hertz.
20 But he told them that it could last for weeks or maybe
21 months.

22 So we're thinking offsite power
23 restoration to nuclear power plants, the models don't
24 go for months. So anyway, we questioned that. We
25 were curious about that. So we had a conversation

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1 with FERC and NRR.

2 And we brought that to -- of course, they
3 knew it. But we asked them about the interconnection
4 at the time, recognizing that Texas is not connected
5 to anything else. But, you know, some of the other
6 things that have since transpired, that the
7 recommendations of that report have been completed,
8 that's where that asterisk is, addressed by updated
9 reliability standards, the winterization protections.
10 But that doesn't say anything about the lack of
11 interconnect with the other large interconnections.

12 So NRC probabilistic models as you
13 probably know, they are sensitive to the restoration
14 of offsite power, typically, you know, in hours or
15 maybe a couple of days. It's not a long period of
16 time. And here is a graph that --

17 MR. MARCH-LEUBA: Can you back to that?
18 Will the flex equipment help on this long-term being
19 out of offsite power? The flex equipment is designed
20 to keep you going for longer than eight hours.

21 MR. GRAVES: Yeah. Loss of offsite power
22 is not the same thing as station black. Loss of
23 offsite power, they are diesel generators. Their
24 diesel generators are expected to function. That is
25 the power source that they would use, unless they ran

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1 out of fuel, in which case if they had flex equipment
2 that would carry, you know, the vital loads necessary
3 to cool the coolant, I guarantee they would use that
4 too, so yeah. But I don't think that's gone into the
5 calculation of the models.

6 MEMBER MARCH-LEUBA: Yeah, but you are
7 saying there is more on the assumption side that is
8 correct.

9 MR. GRAVES: Well, before this event, the
10 graph I'm going to show you from the INL guys and our
11 ERA folks and SRAs, I can explain that.

12 MEMBER MARCH-LEUBA: Okay. I'll wait.

13 MR. GRAVES: Yeah. This graph, right, it
14 is dated -- I got one earlier today that I didn't have
15 a chance to put it in, but it goes to 2020. But the
16 shapes of graphs are the same. There is some -- the
17 concern is the weather-related term, that blue line,
18 this is one of those graphs that graphs the negative
19 thing, right?

20 So essentially as time goes on, the
21 probability of non-recovery is what this shows. The
22 probability of non-recovery on the blue line goes
23 down, down, down. The presumption is that offsite
24 power would be restored, you know, within 30 hours,
25 less than that, 24 hours.

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1 The probability that it wouldn't be
2 restored is about a .3. But if it would have really
3 lasted for weeks or months, that graph would not be
4 correct any longer for that weather-related event. So
5 that's what we were still questioning, if the data
6 that we use for this model is appropriate with the new
7 information that we have.

8 So some recent improvements. Some
9 research conducted by S&P Global Intelligence, Texas
10 is second only to California with battery storage
11 capacity and that's a very, very good thing.

12 The reason why we still have lights now is
13 just about every day this month, we've been setting
14 records for electricity usage, and it's well above
15 80,000 megawatts. So the margin is fairly small, but
16 they've put in almost 4 gigawatts of storage, battery
17 storage, since that 2021 event, which is very good.

18 It already had the largest wind fleet in
19 the United States and is expected to add 78 gigawatts
20 to the existing 12 gigawatts solar generation
21 capability. We expect to have 36 percent by the end
22 of this year for our needs and, you know, rising to 43
23 percent in 2035, yeah, maybe.

24 MEMBER PETTI: Just really based on
25 capacity not on megawatt hours.

1 MR. GRAVES: No, it's capacity.

2 MEMBER PETTI: It's capacity, yeah, okay,
3 then multiply it by the capacity factor, yeah.

4 MR. GRAVES: And I think that's a stretch
5 because as I -- you may know this, but the political
6 system in Texas immediately during this cold weather
7 event, they blamed the renewables. They thought that
8 frozen turbines and all kinds of other things were the
9 real cause of why we were suffering. You know, it
10 took some time for them to recognize it was really
11 fossil fuel concerns.

12 But I'm hoping that trend -- this is me
13 personally. I hope that the trend in renewables
14 continues because it is helping out right now.

15 Anyway, one of the things that the Texas
16 political system did, they required the development of
17 a map of all the essentially -- all the critical
18 infrastructure associated with the supply chain for
19 electrical generation.

20 There was no map. They didn't know where
21 all of these things were. They weren't on the right
22 list to ensure they weren't divorced whenever tripping
23 started to take place. So anyway, they wisely came up
24 and said we're going to make a supply chain map. And
25 they did that.

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1 This map, which is not publicly available,
2 of course, so we take it on faith. But, you know, it
3 points out supposedly where all the generation is and
4 where all the gas power, the natural gas resources,
5 are that feed these generations and where they get
6 power from.

7 Well, in October 2022, they revised
8 emergency preparedness rules, implementing summer and
9 weather preparedness standards in alignment with
10 Senate Bill 3. The rule required the generation
11 entities and transmission providers to complete winter
12 weather emergency preparation measures. And then they
13 had to submit under oath and affirmation the
14 declaration that they are ready.

15 It also required the Texas Railroad
16 Commission to adopt preparedness standards, which was
17 new and help with the production of that supply chain
18 map. And essentially it mandated that the Texas
19 Railroad Commission designate what natural gas
20 infrastructure is now critical and natural gas
21 weatherization that that is in force via inspections.

22 So hopefully Texas will be prepared for a
23 cold weather event that could happen, you know, this
24 winter but any other time. They have made some
25 progress.

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1 MEMBER HALNON: Thank you, Sam. I'm going
2 to relieve you of your duties at this point.
3 Outstanding. I appreciate that.

4 MR. GRAVES: Thanks very much.

5 MEMBER HALNON: This topic was very
6 important.

7 MEMBER MARCH-LEUBA: I did have a
8 question. We don't have any bandwidth here.

9 MEMBER HALNON: You can talk to him
10 offline. The reason we wanted to do this was to
11 inform our weather-related discussions relative to the
12 advanced reactors we saw yesterday and the molten salt
13 reactor that is going to be built in. Could cold
14 weather affect that? Most certainly. So we want to
15 make sure we ask the right questions during use.
16 John?

17 MEMBER MARCH-LEUBA: That was where my
18 question was, which is more of a comment.

19 MEMBER HALNON: Okay. Go ahead.

20 MEMBER MARCH-LEUBA: We normally will --
21 it really is we are always fighting yesterday's war
22 when nobody was aware what the critical load
23 temperature is, what it is for high critical pipes.

24 Is there a high temperature threshold that
25 causes problems? I mean, are we going to have -- how

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1 do we know we won't repeat the same event? You know,
2 when you have a heat seeking or re-band that really
3 gets too high, you have to downgrade. Is anybody
4 thinking if we have three days continuous of 115, we
5 get problems?

6 MEMBER GRAVES: All of the new plants,
7 they're all --

8 MEMBER MARCH-LEUBA: Yeah, but in the same
9 frame of catastrophic failure that can cause somebody
10 trying to figure out how to prevent.

11 MEMBER GRAVES: Yeah. That's a very good
12 question. I do know that as part of -- in addition to
13 winter weatherization concerns, there were summer
14 weatherization concerns that they had to accommodate.
15 They had to do an analysis and, you know, identify
16 what the expected high temperature would be and if
17 they are prepared for that type of weather and then,
18 you know, probably add some margin. I don't know for
19 sure what ERCOT made them do. But, you know, other
20 than the broad strokes, I know they made a plan for
21 both hot weather and cold weather.

22 MEMBER MARCH-LEUBA: It certainly affects
23 maintenance.

24 MEMBER GRAVES: Oh, no question.

25 MEMBER HALNON: And personnel safety as

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1 well, I mean, heat stress on the workers themselves it
2 causes a lot of extra, extra time. So let's move on.

3 MEMBER MARCH-LEUBA: We're also fighting
4 less guesswork, and you have to think of what's going
5 to happen 15, 20 years from now.

6 MEMBER HALNON: Yeah. Good point. Yeah,
7 introduce the topic and tell us your guys'
8 presentation and then we'll be done.

9 MR. DIXON: All right. So my name is John
10 Dixon again. I'm a project experience chief
11 responsible for calibrating water for Arkansas Nuclear
12 One. So in general, I'm going to talk about staffing
13 today, primarily specific with the resident inspector
14 developer program. However, it also really applies to
15 our engineering branches, health physics and really
16 all of our technical staff in the regions as well.

17 MEMBER HALNON: And take your time. We're
18 going to extend a little bit so don't short change
19 your presentation.

20 MR. DIXON: It's quick. It's people.
21 It's important, but it's quick. So the resident
22 program in general, there are at least two residents
23 that are at every site. Some sites, the larger sites,
24 Palo Verde, Oconee, Vogtle, they have three or more
25 residents depending upon what specific is for the

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1 site.

2 The residents also have a seven year time
3 limit that we have to adhere to. And that's just to
4 make sure that they don't get too close to the
5 licensee, make sure they don't lose their objectivity
6 to be able to fully inspect, to be able to point out
7 problems and concerns with them.

8 In each region, you have up to eight
9 resident inspector development program candidates that
10 we hire specifically for the program. They get
11 priority choice for any vacant resident positions
12 before it goes to postings for other people that are
13 in the region or at headquarters.

14 All the regions are also trying to
15 overhire if possible because of all the current
16 vacancies just in general that are happening in the
17 regions.

18 So just a little bit of insight into how
19 difficult this is becoming. So in just this fiscal
20 year alone, we've done a pre-screen of at least 100
21 different folks. Out of those 100 folks, we hired 9
22 currently, 3 more that have accepted offers. So
23 that's 12. So that's just over 10 percent. That was
24 kind of at the start of the year though.

25 As of right now, we're actually looking at

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1 less than 5 percent. So we're having to go through a
2 whole lot more applications to bring folks in. Right
3 now in this slide, I did this last week and this is
4 already out of date.

5 It says we're trying to hire four more
6 this year, but because of moves that have already
7 transpired because of other things that have been
8 going on, that number is actually higher now. So
9 that's how quickly things are changing. And it's not
10 just Region IV. It's all four regions that are
11 dealing with this right now.

12 MR. MARCH-LEUBA: Sorry. Just me this
13 afternoon, I may be napping but you say that you only
14 hire 5 percent of the people that apply? Typically,
15 what we've seen now is you cannot find people to
16 apply, and you hire everybody.

17 MR. DIXON: Right so that's -- I'll get to
18 there in just a minute. But effectively, that's the
19 position that we're starting to get into right now.

20 So I might review 100 applications. But
21 out of those 100 that I actually get to meet, right,
22 so this is after human resources has already done the
23 first screen. I will look at it then. So out of the
24 100, I may only pick six to try to go talk to to
25 interview. Out of those six, we may offer all six but

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1 we may only get one or two that actually accept.

2 MEMBER MARCH-LEUBA: Because those 94 you
3 interview were not qualified?

4 MR. DIXON: A mixed bag. So remember the
5 resident inspector development program is very
6 specific. And I'll get to that in the very last
7 slide.

8 So we've had three individuals that have
9 actually left the agency and part of it is because of
10 the last slide that I'll get to in just a minute. But
11 the benefit is all three of those individuals got a
12 promotion. So the industry, just like you had talked
13 about before, really covets the experience of the
14 resident program. So we do have to be concerned with
15 that aspect.

16 These slides are also out of date already
17 in just the last couple of weeks that I put them
18 together. So residents that have moved to other
19 positions, so this is also part of the answer to your
20 question.

21 The agency is moving people around at a
22 really high rate right now. The expected number to
23 hire was 400 for this fiscal year. Well, that creates
24 all kinds of openings at all kinds of different
25 levels. The agency also covets the residents. So

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1 we're losing residents to other positions within the
2 agency.

3 So continued challenges, the big thing
4 here in my opinion is the requirements in the
5 telework. That is causing a lot of problems when we
6 call individuals and we say, hey, we expect you to
7 move to the DFW region. And then within six months to
8 two years, you've got to move to a site.

9 Oh, you can only be on the site for four
10 to seven years then you've got to move to another
11 site. That's it, tap, I'm done. I don't want to be
12 considered for this position any longer.

13 And then if they are, the very next thing
14 we talk about it this position is really not telework.
15 You are expected to show up to the site every day.
16 Yes, we do have some flexibilities. Yes, there are
17 some hours that you can do that are telework, but by
18 and large you show up to the site every day. That
19 cuts a lot more people out.

20 MEMBER MARCH-LEUBA: Sorry. I'm slow this
21 afternoon. What you are telling me is of the majority
22 of people that apply, after you explain to them what
23 the job entails, they don't want it.

24 MR. DIXON: Correct.

25 MEMBER MARCH-LEUBA: It's not that you are

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1 rejecting them because they are not qualified. They
2 are really not applying after they find out.

3 MR. DIXON: Correct.

4 MEMBER MARCH-LEUBA: Okay. That's more in
5 line of what I thought.

6 MEMBER BALLINGER: This is Ron Ballinger.
7 Let me try to get an understanding. The initial cut
8 set, the people that you get to see, are the ones that
9 pass some form of a minimum threshold.

10 MR. DIXON: Minimum threshold of
11 experience and education.

12 MEMBER BALLINGER: Okay. What is the
13 minimum threshold?

14 MR. DIXON: So from an education
15 standpoint, we are only looking at primarily folks
16 that have a bachelor's or greater degree.

17 MEMBER BALLINGER: Okay.

18 MR. DIXON: And we've looked at both,
19 right out of college, and we've not had good
20 experience with those. We have primarily tried to
21 focus on what we call mid-career, which is three plus
22 years of experience.

23 MEMBER REMPE: You mentioned several were
24 waiting for their security clearance. Once you
25 finally get someone who says yeah, I'd like to apply,

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1 how long does it take to get through the onboarding
2 process?

3 MR. DIXON: It really depends upon the
4 background of the particular individual. We've had it
5 go literally in one month if they have an existing
6 security clearance to over a year if they were from
7 Abu Dhabi or were working for the Chinese
8 construction.

9 MEMBER BALLINGER: Okay. What about --
10 now this is personal. What about a system whereby you
11 take a junior college graduate. You hire them into
12 the system at the plants or they do or somebody does.
13 And as a result of the training that they get during
14 their tenure at the plant, they become qualified for
15 the resident inspection position. Can you grow your
16 own in other words?

17 MR. DIXON: So the sites definitely do
18 that at the junior college level. For us, they would
19 not meet the minimum requirements with human resources
20 because they don't have a bachelor's degree.

21 MEMBER BALLINGER: So that is the cut-set.
22 You've got to have a bachelor's degree, that's it. So
23 has anybody actually looked at that? Is that an
24 absolute requirement?

25 MR. DIXON: The way the positions are

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1 currently posted right now, what we're looking for,
2 yes. But that's after they graduate with a bachelor's
3 degree. Correct. A ranked program will be kind of
4 another similar program to that.

5 MEMBER BIER: Following up from what Joy
6 was asking this morning about are there requirements
7 that seem either nonsensical or overly burdensome, I
8 mean, some of these requirements seem pretty clearly
9 necessary. But to what extent is the seven year
10 rotation necessary and is that something that somebody
11 should be re-evaluating or do you think it's really
12 important to have that?

13 MR. DIXON: So that has been raised
14 multiple times. And that actually has been extended
15 once already. It used to be five years, and it's been
16 extended to seven years.

17 We do have a separate working group that's
18 called the resident retention working group that looks
19 at different things to propose to how to make it more
20 advantageous to get people to want to apply to the
21 resident program. And the seven year time limit is
22 one that continuously comes up.

23 However, like I mentioned, the concern
24 about losing your objectivity to the site really is a
25 pretty big concern we have.

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1 MEMBER PETTI: Just going back to the
2 degree requirement, it's a science or engineering
3 bachelor's? You won't be accepting someone with an
4 agricultural degree or even a liberal arts degree?

5 MR. DIXON: So liberal arts, I would say
6 no, not categorically. However, generic STEM, so
7 math, science, engineering, we do tend to heavily
8 focus on nuclear mechanical or electrical. But we've
9 had chemical engineers. We've had biomedical, you
10 know, bioengineering.

11 MEMBER PETTI: You know, you read stories
12 in the press about large corporations are reevaluating
13 these sorts of requirements. And they have moved from
14 college degrees to not even have college degrees for
15 many of their positions. I've never drilled down to
16 figure out what it was, but I've read a lot about that
17 so. It's worth probably re-looking at that again
18 although this is highly specialized.

19 MEMBER BALLINGER: Yeah, kind of a more
20 holistic approach to say, well, we really would like
21 -- our experience is that college degree people work
22 out best. However, there may be some cases where that
23 requirement is -- somebody comes in with so much
24 experience, doesn't have a college degree, well,
25 that's a more holistic approach to that first initial

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1 cut-set. It might work in some cases.

2 MR. DIXON: I would agree.

3 MEMBER PETTI: Experience can be
4 substituted by the need.

5 MR. DIXON: The postings do provide for
6 experience to a certain extent. But in my
7 conversations with human resources, for all the
8 applicants that we've been getting in, they all have
9 to have a bachelor's degree.

10 So like with the Navy nuke experience,
11 what a lot of them do is they will go get the -- I
12 know Thomas Edison is one of them, and I forget the
13 other university, that basically gives them credit for
14 their experience as a Navy nuke and gives them a
15 degree.

16 MR. MONNINGER: So, John, maybe I could
17 also add in. So I think this is actually an issue
18 across the entire federal government in the hiring
19 process. You know, it's probably a relic from the
20 50s, 60s, 70s, 80s, 90s, et cetera. The current
21 administration and the previous administration with --
22 I'm not sure if it's OPM or whatever, they've been
23 issuing guidance in terms of, you know, trying to get
24 away from the explicit degree requirements to
25 experiential learnings, et cetera.

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1 However, it hasn't trickled down into all
2 of the federal agencies' hiring process. But it is
3 getting there, but we're not there yet. And I believe
4 many other agencies aren't there yet, but, you know,
5 that transition is occurring.

6 But, you know, in order to credit a
7 position being a 15, 14, 13, there is a scoring
8 system. And for jobs that require a degree, you get
9 more points. And that's one way that the NRC has be
10 it the 15, the 14, the 13s, et cetera. So the entire
11 system needs to change. And the current
12 administration, there has been guidance out there, but
13 it hasn't filtered all the way through the process.

14 MEMBER BALLINGER: How does it work in
15 Europe?

16 MR. MONNINGER: They have a very different
17 two track system in their educational system, college
18 versus technical. And the technical side is very much
19 appreciated, much more appreciated than it is in the
20 U.S., I think.

21 MR. DIXON: If a U.S. citizen was to
22 apply, for example, OECD to the NEA or IAEA, I would
23 say the requirements are actually higher. You read
24 any of those vacancy announcements, the entry level is
25 a master's degree in the -- you know, so NEA, Nuclear

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1 Energy Agency, and IAEA, but, yeah, they are pretty
2 explicit.

3 MEMBER BIER: I guess part of the reason
4 that I was questioning the seven year retention, I
5 certainly understand the idea captured by the locals.
6 But it seems like a career path that says, gee, you
7 can live in Dallas for five years whatever maybe or a
8 recent college graduate, a newlywed, you get the
9 nightlife and the excitement of the big city, and then
10 you know that you will move out to some place with
11 affordable housing, and you know, et cetera. It seems
12 like it's kind of a typical life path to say, sure, I
13 get my five years in the big city and then I will move
14 to a small town and raise my kids or whatever.

15 And it seems like without the seven year
16 relocation, that might be a lot more attractive for
17 people who say, you know, I'm not ready to settle down
18 yet, but I know that's coming. It's a thought.

19 MR. DIXON: I appreciate that. Any final
20 questions?

21 MEMBER HALNON: Thank you, John. We're
22 going to go ahead and move along here. I want to open
23 up the line for public comment at this time. The way
24 the public can make a comment is to virtually raise
25 your hand. The facilitator will unmute your mic and

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1 then you can introduce yourself and make your comment.
2 So at this point, is there any public comments? And
3 I will call on you by name if I see a hand raised.
4 Okay. Leigh, Lee, Lloveras? Can you unmute?

5 MS. LLOVERAS: There you go. Can you hear
6 me?

7 MEMBER HALNON: Yes.

8 MS. LLOVERAS: Hi, there. My name is
9 Leigh Anne Lloveras. I'm with the Breakthrough
10 Institute. And we'd like to offer the following
11 comment for your consideration regarding the winter
12 storm section.

13 The NRC should consider how nuclear power
14 plants can help to provide more resilience through
15 black start capacity to the grid. Currently, they are
16 required to trip during a loss of offsite power. The
17 best way to avoid long offsite power recovery time is
18 to avoid the loss of power in the first place.

19 A delay in the requirement to trip in the
20 event of a loop event would increase grid reliability
21 instead of exacerbating the issue by removing the
22 nuclear power plant capacity and frequency inertia at
23 the very time it's needed most.

24 In the event of a blackout, nuclear power
25 plants have supplies to maintain safety for extended

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1 periods of time. The site increase in risk as a
2 result of increased blackout probability pales in
3 comparison to the immediate danger and frequent loss
4 of life as a result of blackout events.

5 Thank you for the opportunity to comment.

6 MEMBER HALNON: Thank you for your
7 comment. Any other comments from the public? Leigh,
8 do you have another one or are you just -- okay.
9 Never mind. Okay. I don't see any additional hands.
10 I will ask the members if there are any final comments
11 or questions before we close.

12 Okay. First of all, thank you, John, and
13 your staff. Excellent presentations and information.
14 As you can see, the membership is about to pontificate
15 and explore, I guess, is the right word for it. We
16 certainly appreciate the facilities, the time that
17 you've put into it, the interactions we've had today
18 and we just wish you the best on your new assignment.

19 We have a lot of confidence in your staff
20 here. I appreciate it very much.

21 One last chance for members? I believe
22 that means I do this, the meeting is adjourned. Thank
23 you.

24 (Whereupon, the above-entitled matter went
25 off the record at 3:13 p.m. CDT.)

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ACRS Subcommittee on Plant Operations and Fire Protection

Public Meeting
July 26, 2023

NRC Region IV Presentations





Our People are Our Greatest Asset

Region IV Priorities

- Risk-informed completion of the materials and reactor inspection and licensing programs while adapting to a new “hybrid” work environment
- Proactive management of human capital for recruiting, hiring and professional development of staff that recognizes the value of diversity and inclusion
- Continued progress toward achieving the Region IV Vision using our Transformation Action Plan including well-defined Objectives and Key Results



Presentation Topics

Region IV ROP Trends

Ami Agrawal, Team Leader, Inspection Program and Assessment Team
Natasha Greene, Senior Health Physicist

Perspectives on Diablo Canyon License Renewal

Greg Pick, Senior Reactor Inspector

Impacts from Winter Storm Uri and Recent Grid-Related Reliability Improvements

Sam Graves, Senior Reactor Inspector

Residents and RIDP Staffing Challenges

John Dixon, Chief, Reactor Projects Branch D



Region IV ROP Trends

June 16, 2023



Action Matrix Status

Columbia and Riverbend are the two plants in Column 2 (as of July 20, 2023).

Region IV	3Q2022	4Q2022	1Q2023	2Q2023	Current
Callaway	Column 2	Column 1			
Waterford	Column 2				Column 1
Columbia	Column 2				
Riverbend	Column 1			Column 2	

Greater-than-Green Findings

2022/2023

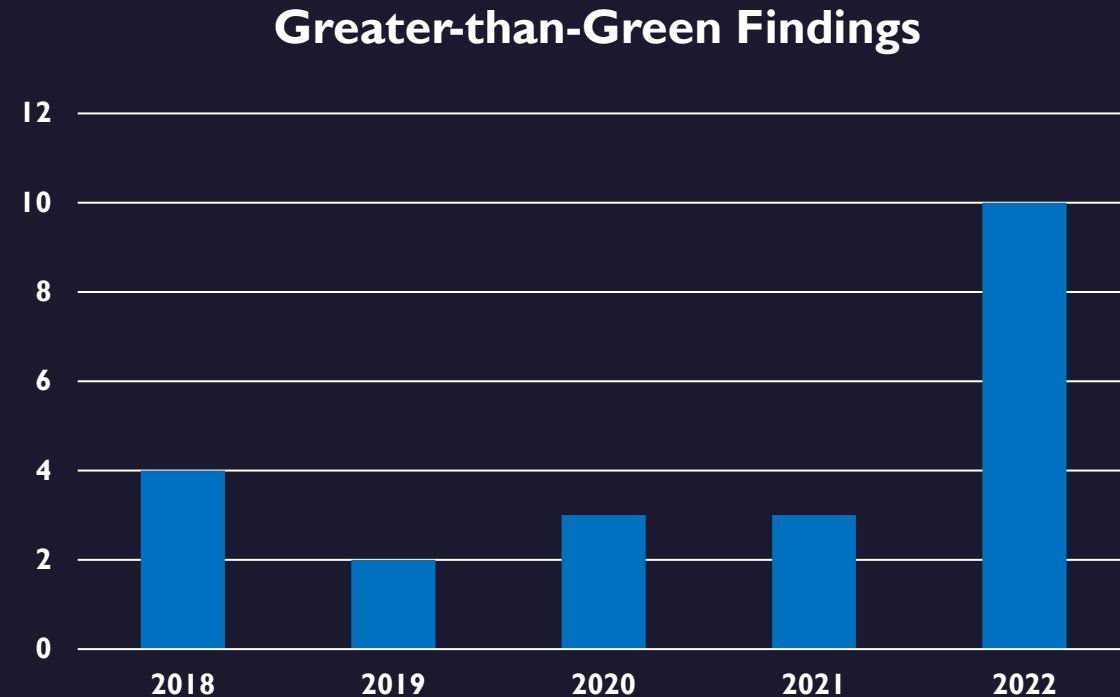
- Waterford radiation monitor non-conservative calibration issues (White)
- Waterford calibration errors in WRGMs (White)
- Columbia contamination event (White)
- River Bend HPCS transformer (White)

Columbia Generating Station's White Finding Timeline/Details

- The Reactor Water Clean-up (RWCU) Heat Exchanger (HX) Contamination Uptake event occurred on May 28, 2021. There were multiple uptakes of radioactivity, two deemed significant resulting in greater than 700 millirem CEDE each.
- NRC inspectors reviewed information and provided a preliminary White finding (low to moderate safety significance) with three apparent violations (10 CFR 20.1701; 10 CFR 20.1501(a)(2); TS 5.7.2.b), documented in report 2021-090 on January 13, 2022 (ML21347A988).
- The licensee requested a Regulatory Conference to discuss their position on the preliminary White finding. The conference was held on March 1, 2022. During the public meeting portion, comments were made which warranted an investigation by the Office of Investigations into the RWCU HX contamination uptake event. This investigation was completed on March 9, 2023.
- NRC inspectors continued their review of information and identified two additional violations. One of those additional violations was preliminarily determined as White for a violation of 10 CFR 20.1204(a) and was documented in a report issued June 1, 2023 (ML23139A121). The licensee has elected to respond in writing. The other violation is still under review.
- Inspectors also made a final determination of White significance on the three apparent violations from Report 2021-090, documented as a White finding, in a report (2023-090) issued on June 1, 2023 (ML23111A237).

Greater than Green ROP Findings Trend

- Noticeable increase in greater-than-Green ROP findings in 2022 compared to the previous few years

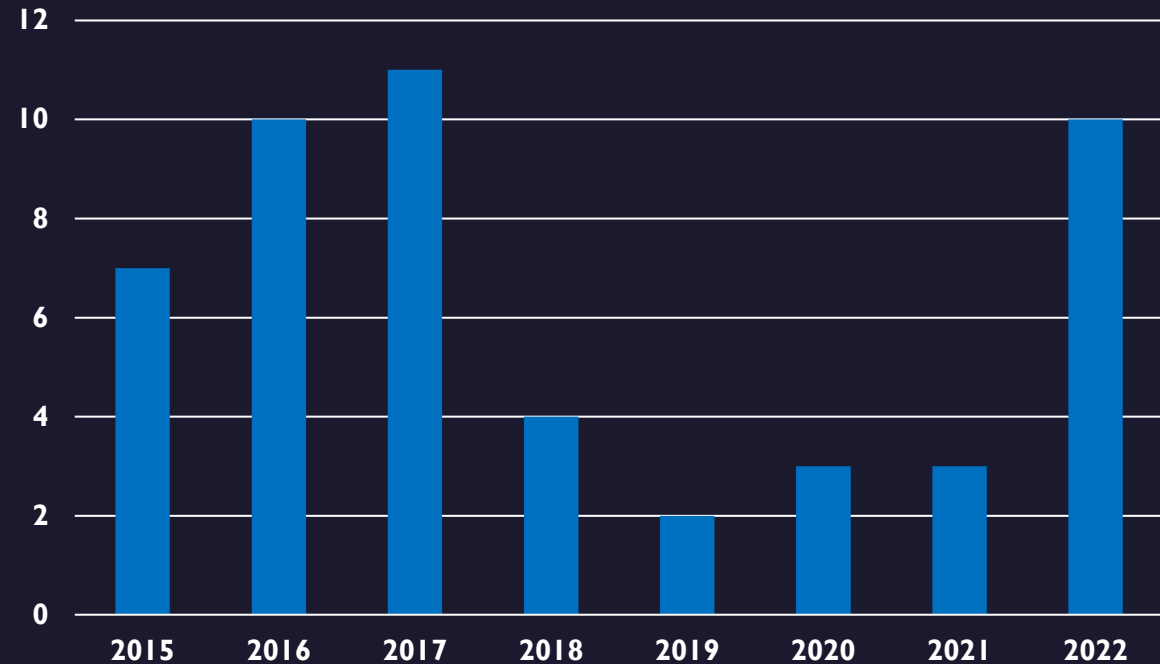


Greater-than-Green findings here are counted by site; the year is assigned based on the enforcement action case number.

Greater than Green ROP Findings Trend

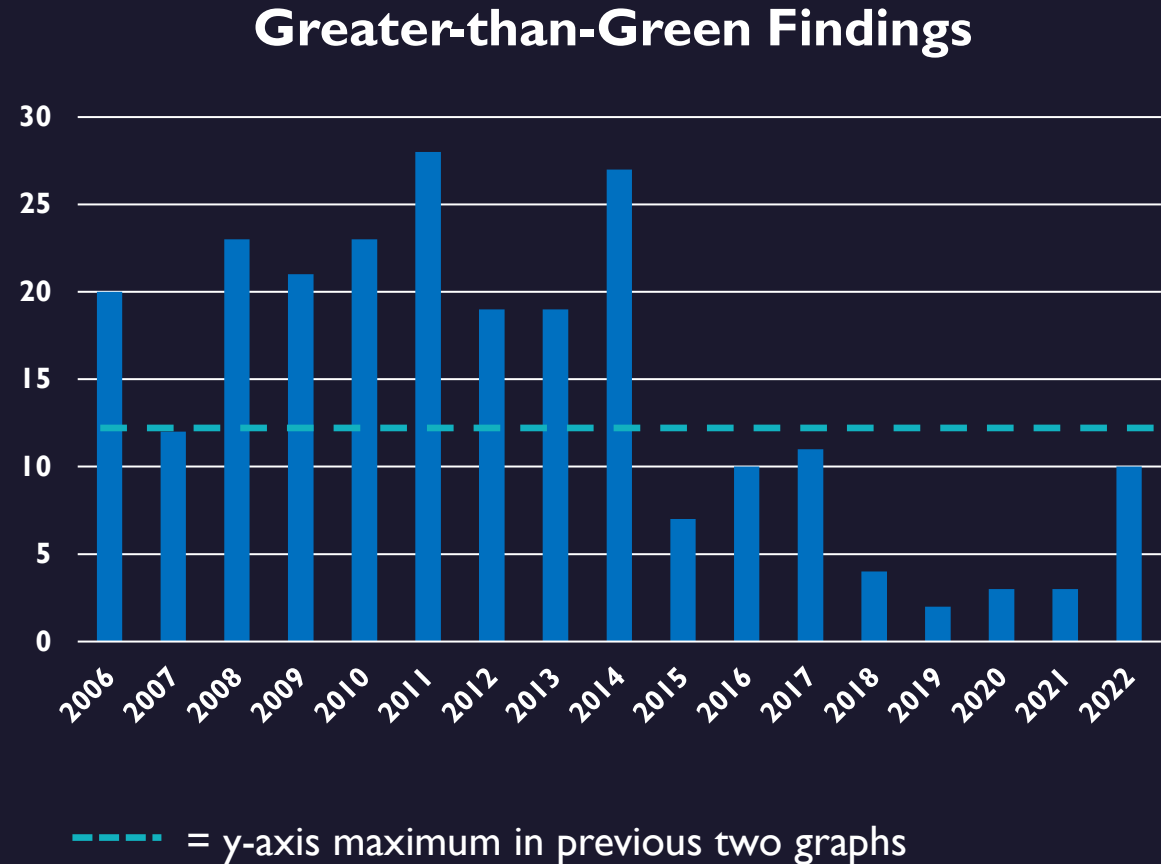
- Noticeable increase in greater-than-Green ROP findings in 2022 compared to the previous few years
- Looking a few years further back though, this appears to be in line with previous levels of performance

Greater-than-Green Findings



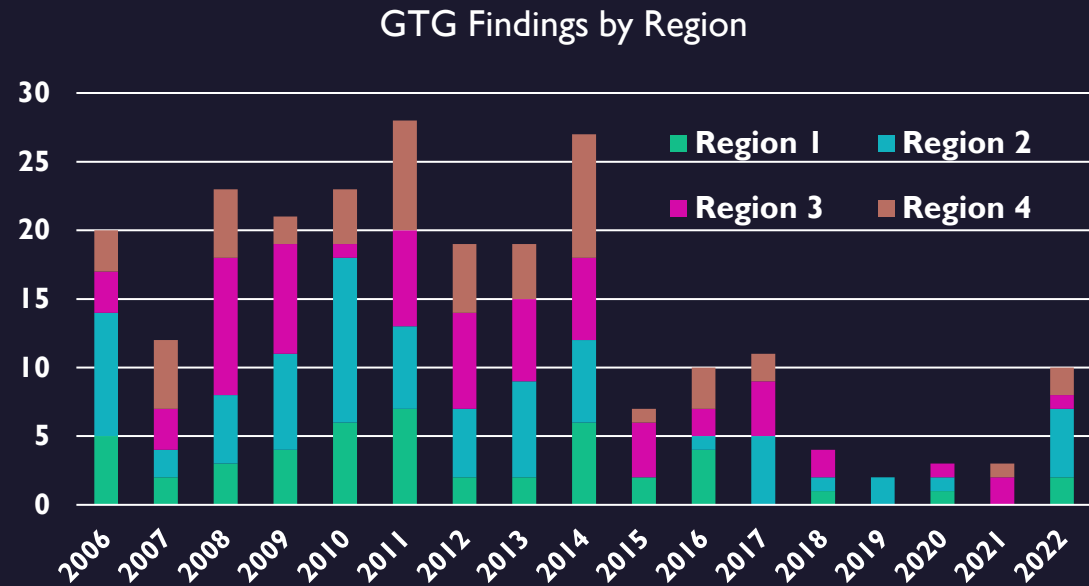
Greater than Green ROP Findings Trend

- Noticeable increase in greater-than-Green ROP findings in 2022 compared to the previous few years
- Looking a few years further back though, this appears to be in line with previous levels of performance
- Going back further yet shows a clear decreasing trend over a 15-year time frame



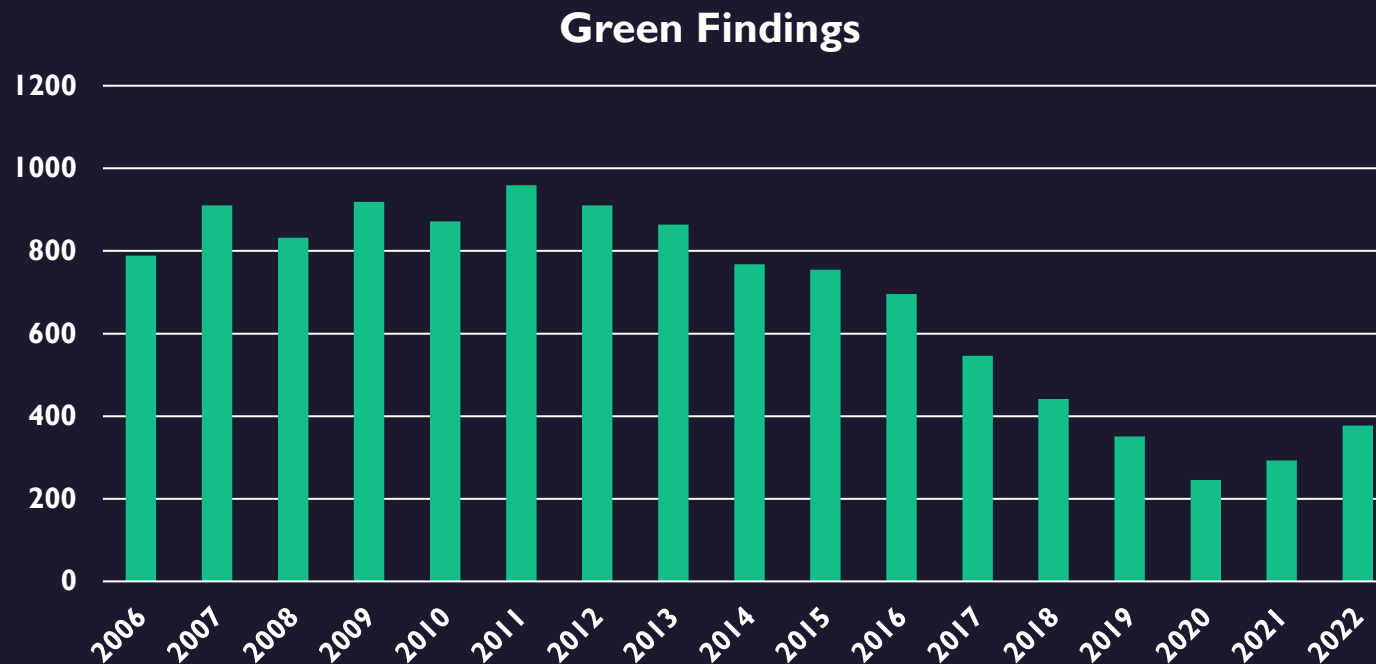
Breakout of Greater-than-Green Findings

- Nothing particularly notable about regional distribution

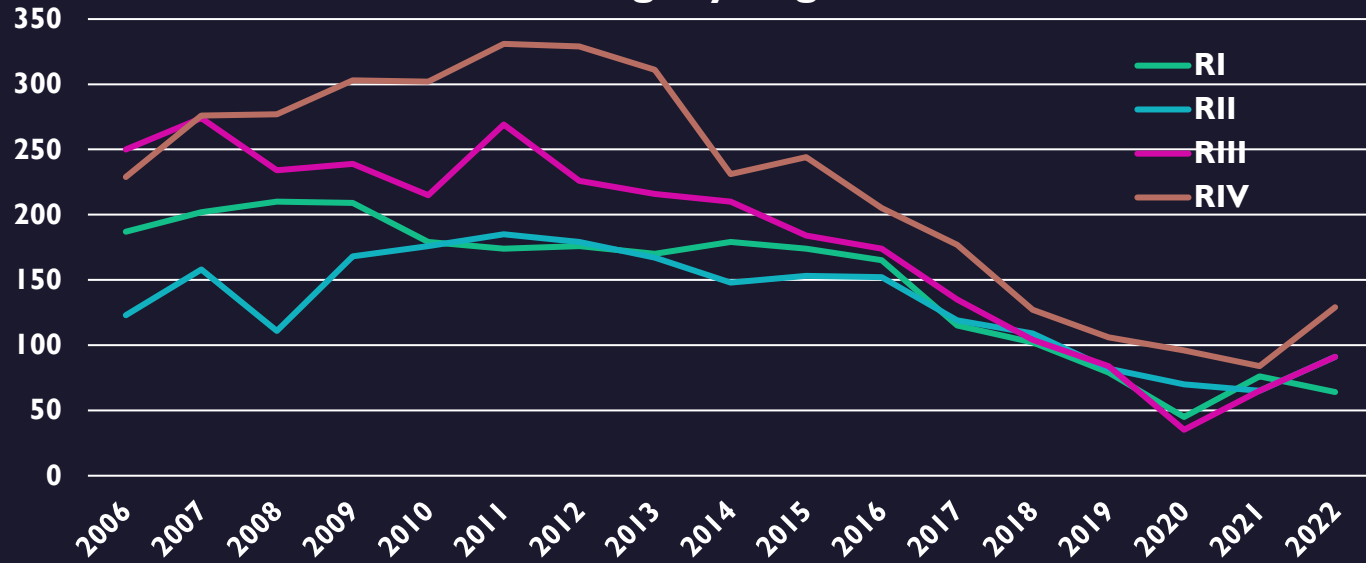


ROP Green Findings

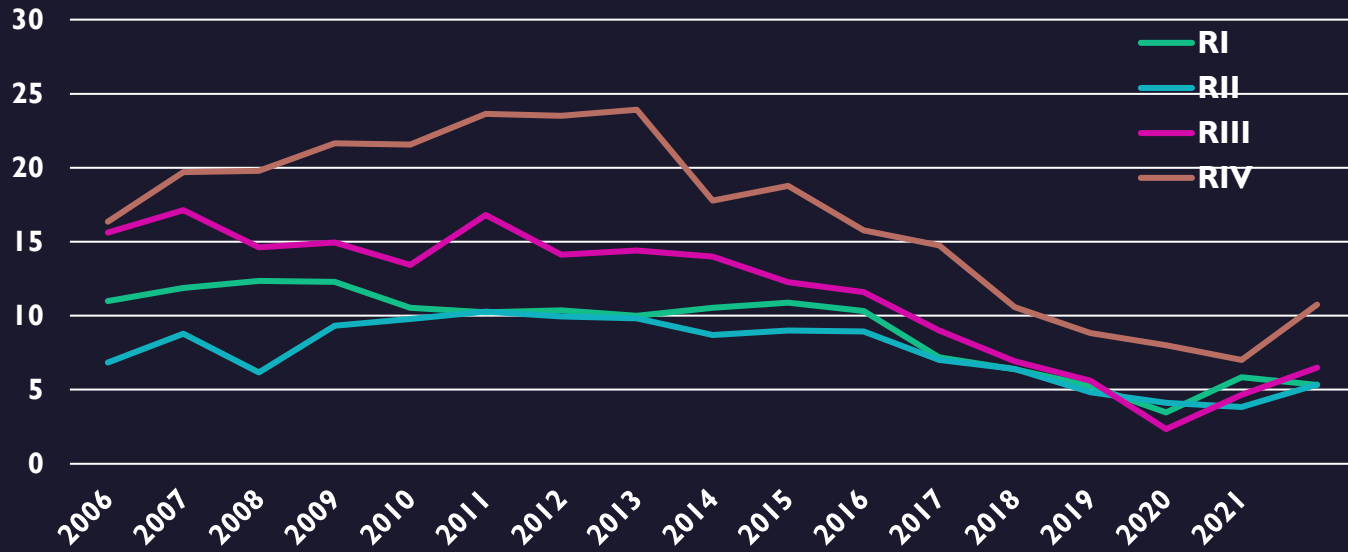
- Declining Trend clear by 2017
- 2021 first year-over-year increase since 2011
- Analysis determined trend driven by change in the application of the more-than-minor threshold



Findings by Region

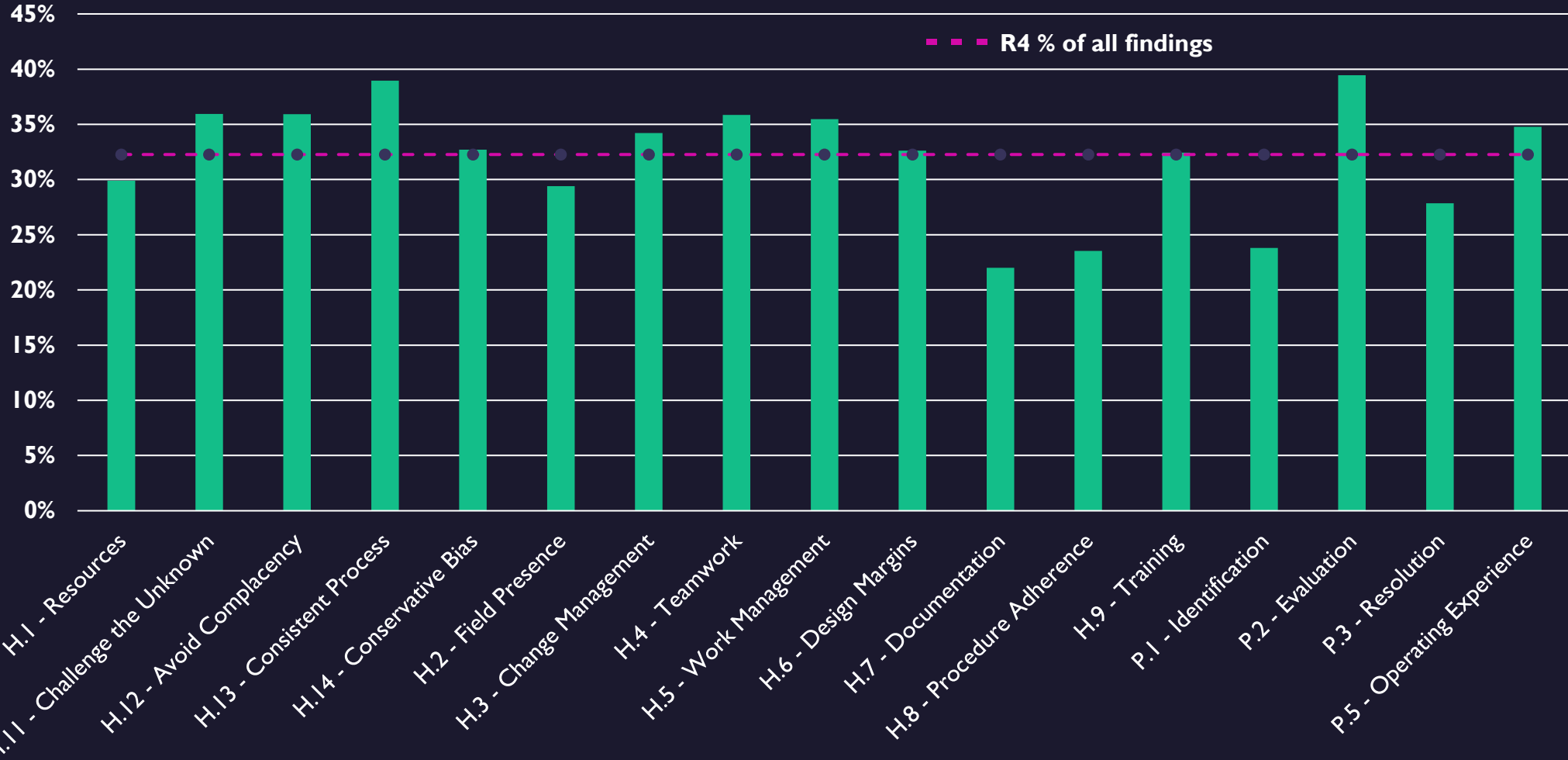


Findings-per-Site by Region



Region 4 Cross-Cutting Aspect Assignment

Region 4 Fraction of CCA Assignments 2018-2022



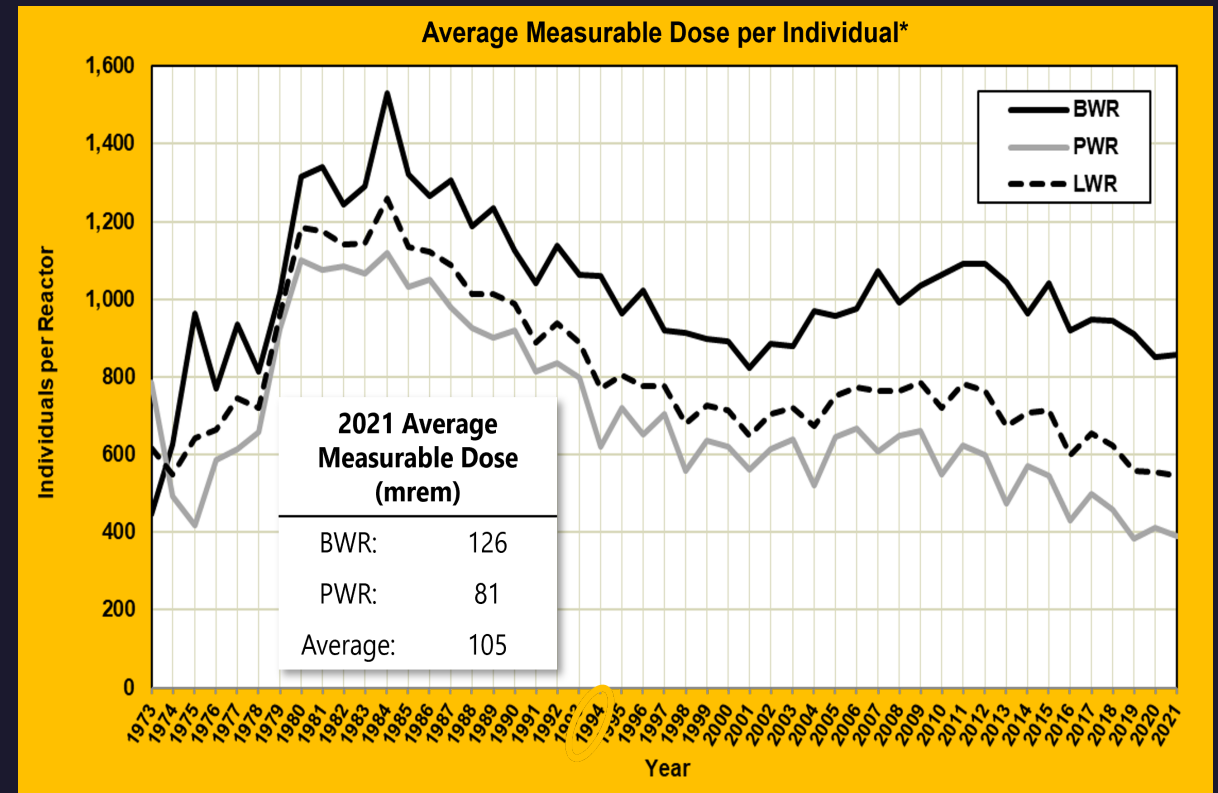
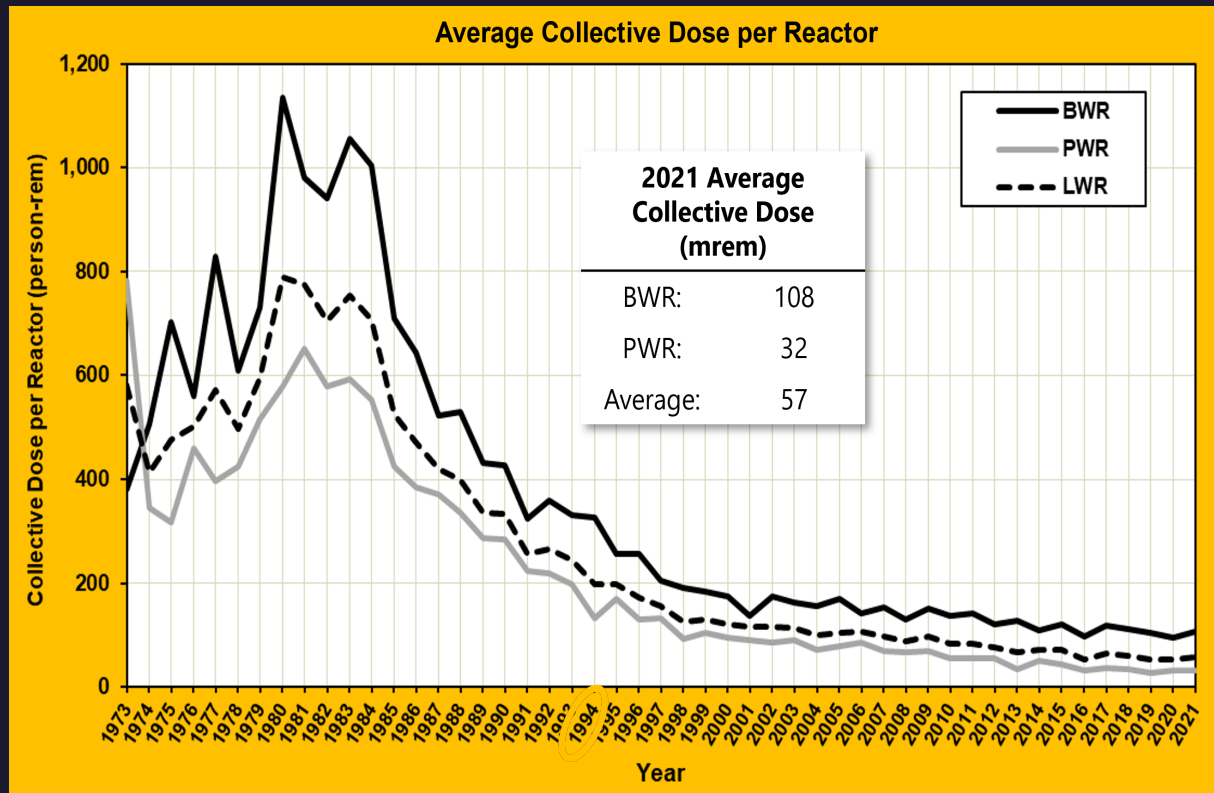
Three-Year Rolling Averages (TYRA)

The TYRA is the 3-year average dose for NRC sites per reactor per year, ranked in four quartiles for BWRs and PWRs.

BWR Quartiles	Plant	Three Year Collective TEDE per Reactor Year 2019-2021 (person-rem)	PWR Quartiles	Plant	Three Year Collective TEDE per Reactor Year 2019-2021 (person-rem)
1 st Quartile	Top	41	1 st Quartile	Top	13
	Bottom	70		Bottom	20
2 nd Quartile	Top	74	2 nd Quartile	Top	21
	Bottom	93		Bottom	27
3 rd Quartile	Top	93	3 rd Quartile	Top	30
	Bottom	111		Bottom	37
4 th Quartile	Top	167	4 th Quartile	Top	37
	Bottom	230 (IMC 0609 threshold is 240)		Bottom	84 (IMC 0609 threshold is 135)
Average per Reactor-Year		104	Average per Reactor-Year		30

Collective Radiation Exposure (CRE)

The sum of the individual doses received in a given time period by a specified population (i.e., reactor workers) from exposure to a specified source of radiation.



Questions?



Perspectives on Diablo Canyon License Renewal

(Region IV Inspection Strategy - Greg Pick)



Agenda

- Premises
- Inspection Guidance
- Inspection Milestones
- Pre-application Inspections
- Post-application Inspections
- Phase 3 Inspections

Premises

- Aging processes progress slowly
- Received Application in December 2023 and accepted
- Aging management programs apply to both units
- Review 100 percent of AMPs and related commitments
- Review operating experience from 2010
- Anticipate small number of significant changes



**CONDITION
MONITORING**



Inspection Guidance



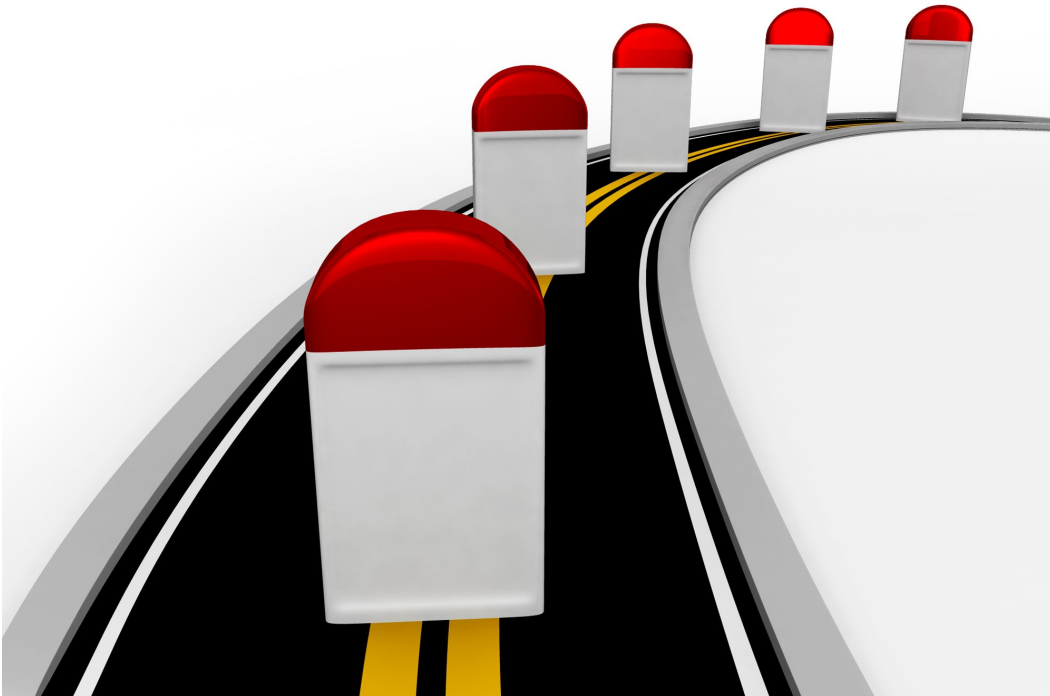
- **71002**, “License Renewal Inspection”
- **71013**, “Site Inspection for Plants with a Timely Renewal Application”
 - **Phase 1** – outage walk downs
 - **Phase 2** – commitments and aging management programs
 - **Phase 3** – unfinished evaluations

Inspection Milestones

- 10/23 71013 U1 Phase 1 Outage
- 04/24 71013 U2 Phase 1 Outage
- 06/24 71002 Licensing Inspection
- 08/24 71013 U1 Phase 2 Commitment



Inspection Milestones (cont'd)



- **11/2/24** **U1 License End Date**
- 02/25 71013 U2 Phase 2 Commitment
- **8/26/25** **U2 License End Date**
- TBD 71013 Phase 3 as needed

Post-Application Inspections



- Review HQ identified items, if needed
- Verify programs reflect current guidance
- Verify commitments implemented
- Confirm programs effectively implemented
- Conduct inspection during Unit 2 Outage

Phase 3 Inspections

- Review outstanding commitments and programs during timely renewal period
- Review selective leaching and buried pipe programs

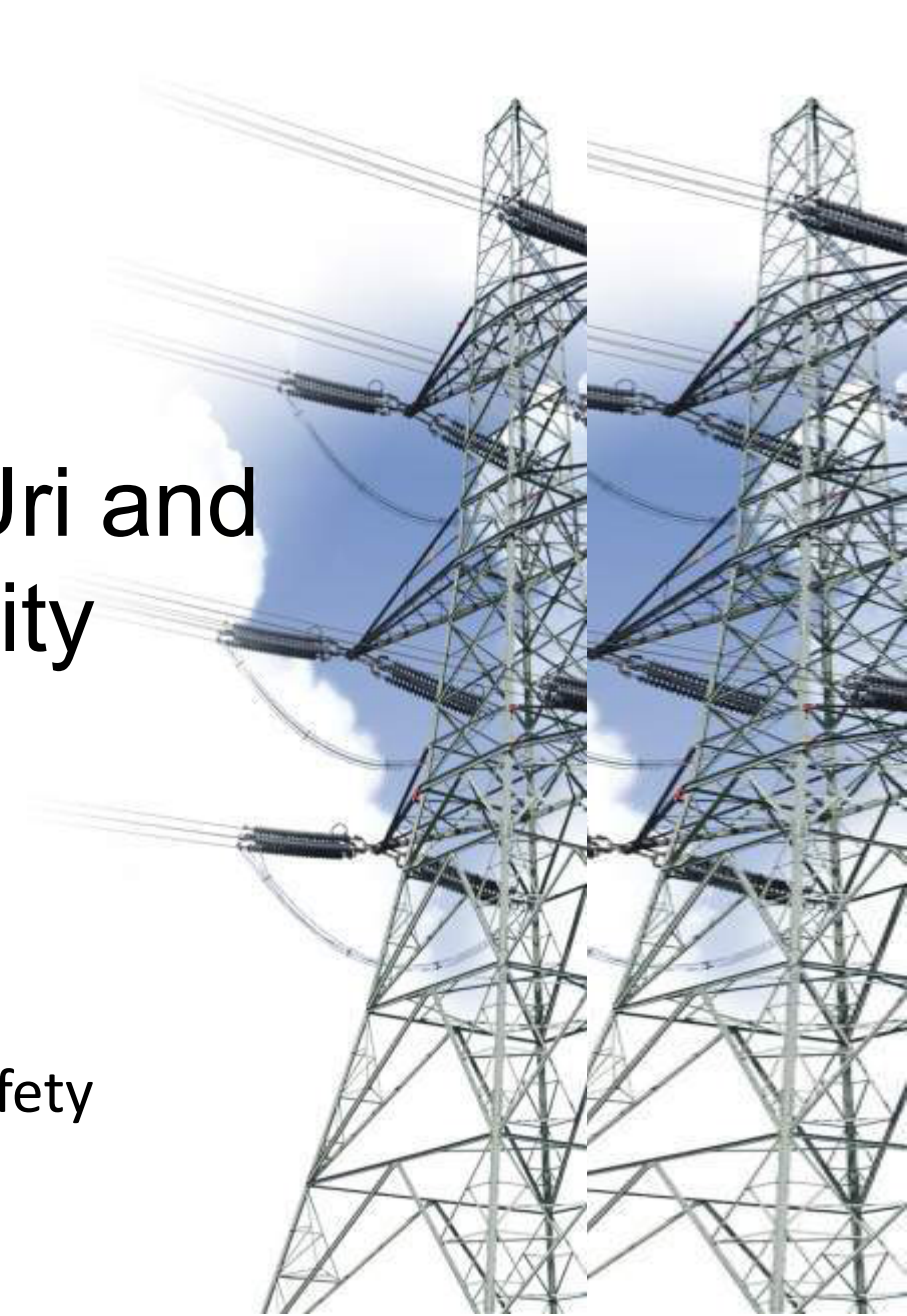




Texas Interconnection -

Impacts from Winter Storm Uri and Recent Grid-Related Reliability Improvements

Sam Graves
Engineering Branch 2
Division of Operating Reactor Safety
Region IV



Disclaimer

The information presented here was gathered from numerous publicly available sources and is not the official position of the Commission nor Regional Management.

Any mistakes or omissions are mine alone.

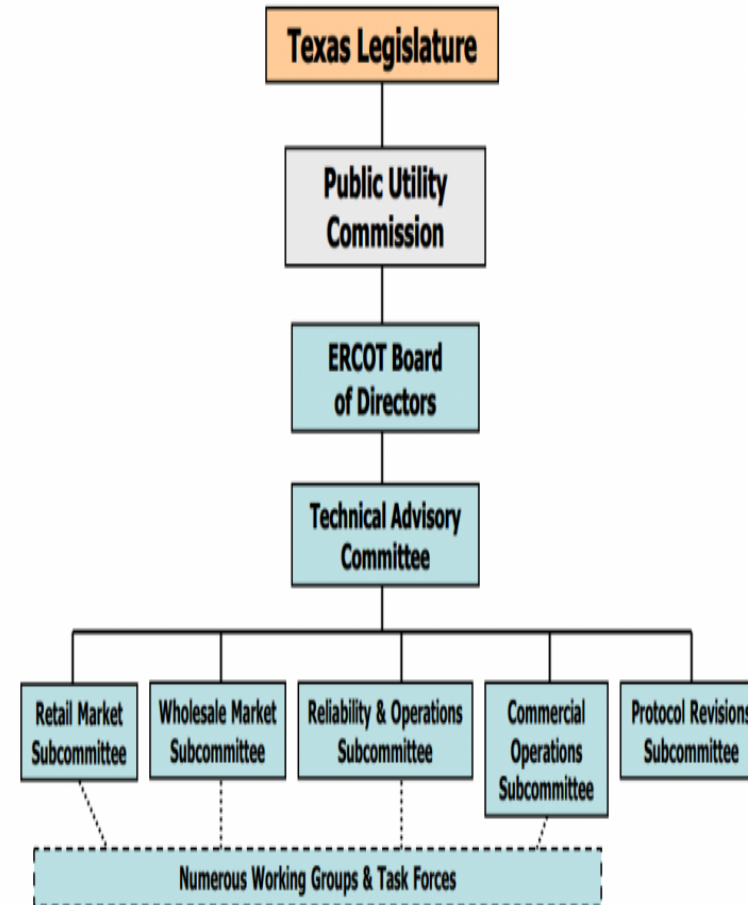
Agenda

- Texas Interconnect – ERCOT
- 2021 Winter Event Review
- Impacts to Texas NPPs
- Joint Inquiry – Issues, Recommendations and Updates
- Black Start Concerns
- Recent Improvements to Grid Reliability



Texas Interconnect - ERCOT

The Electric Reliability Council of Texas (ERCOT) operates the Texas Interconnection under rules established by the Texas Legislature, with oversight from the Public Utility Commission of Texas (PUCT).



Texas Interconnect - ERCOT

- Texas currently has a political system with “strong” ties to fossil fuels, yet it has the highest installed capacity of generation from renewable energy resources in the U.S. (>38,000 MW in wind, >20,000 MW in solar).
- The interconnect consists of more than 1,000 generating units and about 53,000 miles of high-voltage transmission lines.

2021 Winter Event Review

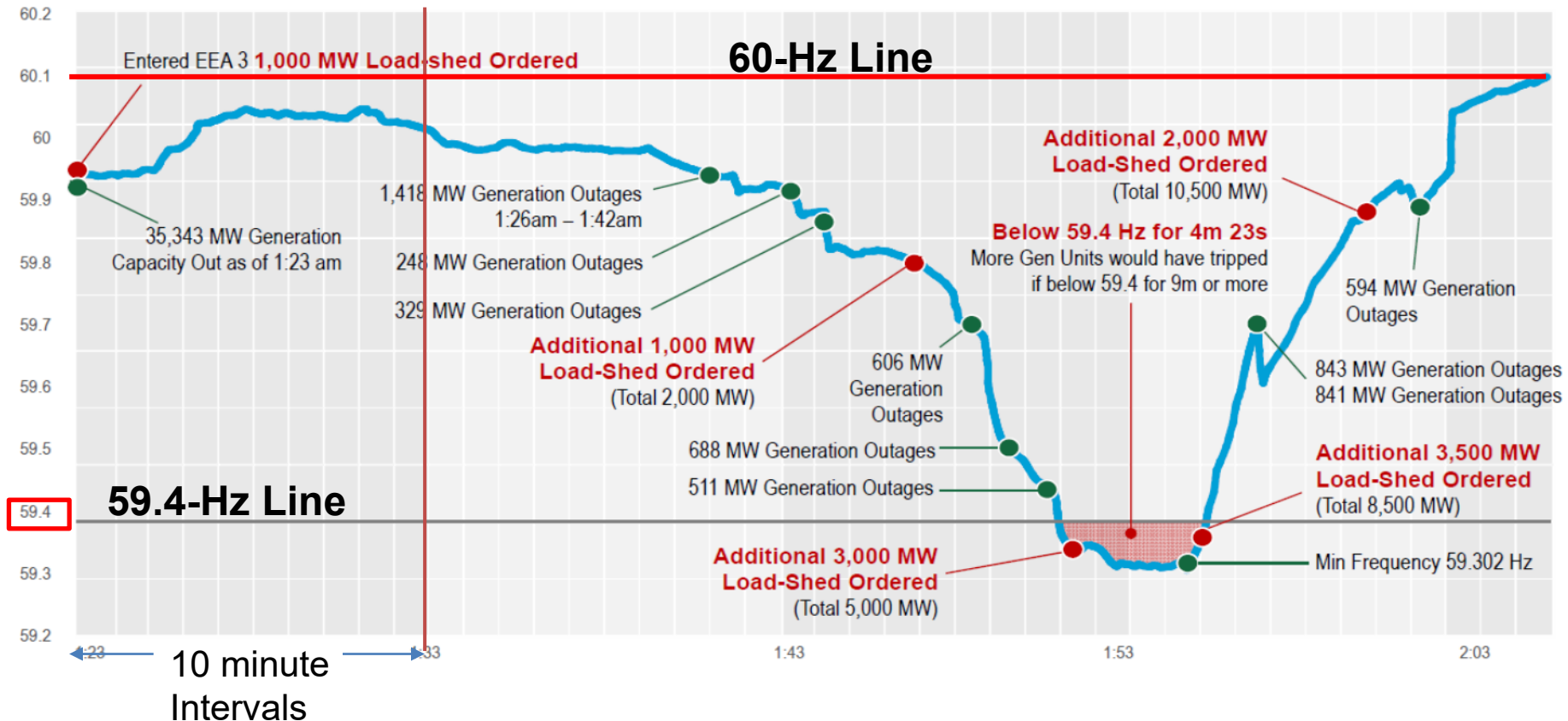
- In February 2021, a period of **extreme cold weather** caused the largest controlled electrical load shedding event in US history.
- In addition to arctic air, the cold front brought freezing precipitation and snow to large parts of Texas and the South-Central U.S.
- The 2021 event was similar to a 2011 and 2014 cold weather event in Texas.

Event Review

- The adverse weather contributed to power outages affecting more than 4.5 million customers throughout the ERCOT region, with some outages lasting longer than four days. More than 200 people lost their lives.
- Within ERCOT, more than 350 generators were taken offline resulting in a loss of >52200 MW out of 107514 MW total available capacity.
- One unit at South Texas Project tripped late in the event timeline due to weather impacts.

Event Review

Around 01:33 on 2/15 grid frequency was becoming problematic. Too little available generation capacity vs. loading was exacerbated by more generators going offline. Edging closer to 59.4 Hz (Red Shaded Area) and the UFLS timer.



Impacts to Texas NPPs - Comanche Peak

Comanche Peak (CP) implemented their procedures for cold weather preparation prior to the arrival of the cold front on February 14, 2021.

CP explained to us that they had expected the cold weather duration to be unusually long with temperatures lower than previously experienced.

CP had proactively built temporary enclosures around susceptible equipment and provided temporary heating to the enclosures.

Impacts to Texas NPPs - Comanche Peak

In anticipation of potential grid frequency anomalies, CP started and transferred one train of vital loads to an emergency diesel generator (EDG) on each unit.

On the evening of 14 February, CP had a steam generator water level instrument line freeze, which briefly impacted automatic level control of the associated steam generator; Operators quickly took manual control of S/G level and successfully thawed the line recovering the instrument.

CP had a further restriction involving main turbine operation with grid frequency below 59.4 Hz and had a 'timer' running that would have driven them to trip the generator.

Impacts to Texas NPPs - South Texas Project

South Texas Project (STP) also implemented their procedures for cold weather preparation prior to the arrival of the cold front.

On February 15, 2021, Unit 1 was at 100 percent power with three main feedwater pumps feeding the steam generators. Extremely low temperatures resulted in an **uninsulated** main feedwater pump suction pressure sensing line freezing (located outside on the turbine deck), causing two main feedwater pumps to trip on a *false loss of suction source signal*. **This was the subject of a non-cited violation:** FIN 05000498/2021002-01 Inadequate Cold Weather Procedures Leads to Plant Trip.

Reactor and main turbine automatically tripped due to low steam generator water levels, resulting in the loss of approximately 1200 MW to the grid. The unit returned to full power at 7:54 p.m. on February 18.

Impacts to Texas NPPs

For both CP and STP, resident inspectors tracked the weather and the impacts to the sites and kept regional management well informed of ongoing issues.

All plant safety equipment performed as expected.

Both Texas NPPs have since been inspected by the state reliability coordinator, as required by both NERC and ERCOT protocols, for winter weatherization. CP has recently been inspected for summer preparedness. No significant issues were shared with the Region. (In fact, we received no formal information at all...only informal feedback from the site)

NRC inspectors continue to review plant preparations for adverse weather (hot or cold...) as part of the Baseline.

Joint Inquiry – Issues, Recommendations, and Updates

FERC, along with NERC and regional entities including ERCOT, initiated a joint inquiry into Winter Storm Uri that resulted in a joint report in November of 2021.

The report included 28 recommendations aimed to improve extreme cold weather operations, preparedness, and coordination. Several apply to NPPs.



Issues, Recommendations, and Updates

- While the PUCT oversees electricity services (and ERCOT), the natural gas sector is regulated by the Texas Railroad Commission. This relationship (or lack thereof...) was a latent disconnect in event communications.
- Many gas production facilities were not identified as “critical loads,” and were **not protected** when manual load shedding became necessary. This information disconnect compounded the event with additional losses of generation capacity due to fuel issues.
- NERC’s 2021 Reliability Risk Priorities Report identified the ability to deliver natural gas to generating units supporting reliability as one of their top four risks.

Issues, Recommendations, and Updates

- Require Generator Owners to identify cold-weather-critical components and systems which are susceptible to freezing or otherwise failing due to cold weather, and which could cause the unit to trip, derate, or fail to start. (*NERC Project 2021-07 Phase 2, Due Winter 2023-2024) Applies to NPPs.
- Require Generator Owners to identify and implement freeze protection measures for the cold-weather-critical components and systems. (NERC Project 2021-07 Phase 2, Due Winter 2023-2024) Applies to NPPs.

* Project 2021-07 is a two-phase project to address the 10 sub-recommendations in Key Recommendation 1 of the Report for new or enhanced NERC Reliability Standards (EOP-11 and EOP-12).

Issues, **Recommendations** and Updates

- Require annual unit-specific cold weather preparedness plan training. (***Project 2021-07 SAR Phase 1**) – **Includes NPPs.**
- Develop and implement corrective action plan (CAP) for identified equipment outages, failures to start, or derate (**Project 2021-07 SAR Phase 1**) – **Similar program exists at NPPs.**
- Require the **retrofit of existing generating units**, and for new generating units, to design them to operate to a specified ambient temperature and weather conditions (e.g., wind, freezing precipitation). (**Project 2021-07 SAR Phase 1**) **Includes NPPs.**
- **Study Recommendation 26:** A joint FERC-NERC-Regional Entity team should study black start unit availability in the ERCOT footprint during cold weather conditions. (**Winter 2023-2024**)

* **Project 2021-07 SAR Phase 1 has been implemented.**

Black Start Concerns

ERCOT had a total of **28** Black Start resources - all used natural gas as their primary fuel, while some had an alternate fuel.

Nine of the 13 primary Black Start-capable generators were operating sporadically, and six of the 15 secondary generators were experiencing outages or **lack of fuel**.

Over the course of the event, **82 percent** of the Black Start resources, comprising 1,418 MW out of a total 1,711 MW experienced an **outage, derate, or failure to start at some point**.

Black Start Concerns

ERCOT CEO testified in front of the Texas Senate that the grid was about 4 minutes from collapse and the condition could potentially last “weeks.”

The regional electrical branch questioned whether the potential failure of offsite power for an extended period (weeks or months) was appropriately captured in NRC risk models for Texas plants, given the additional concerns with the weather impacts to the dedicated Black Start units.

Black Start Concerns

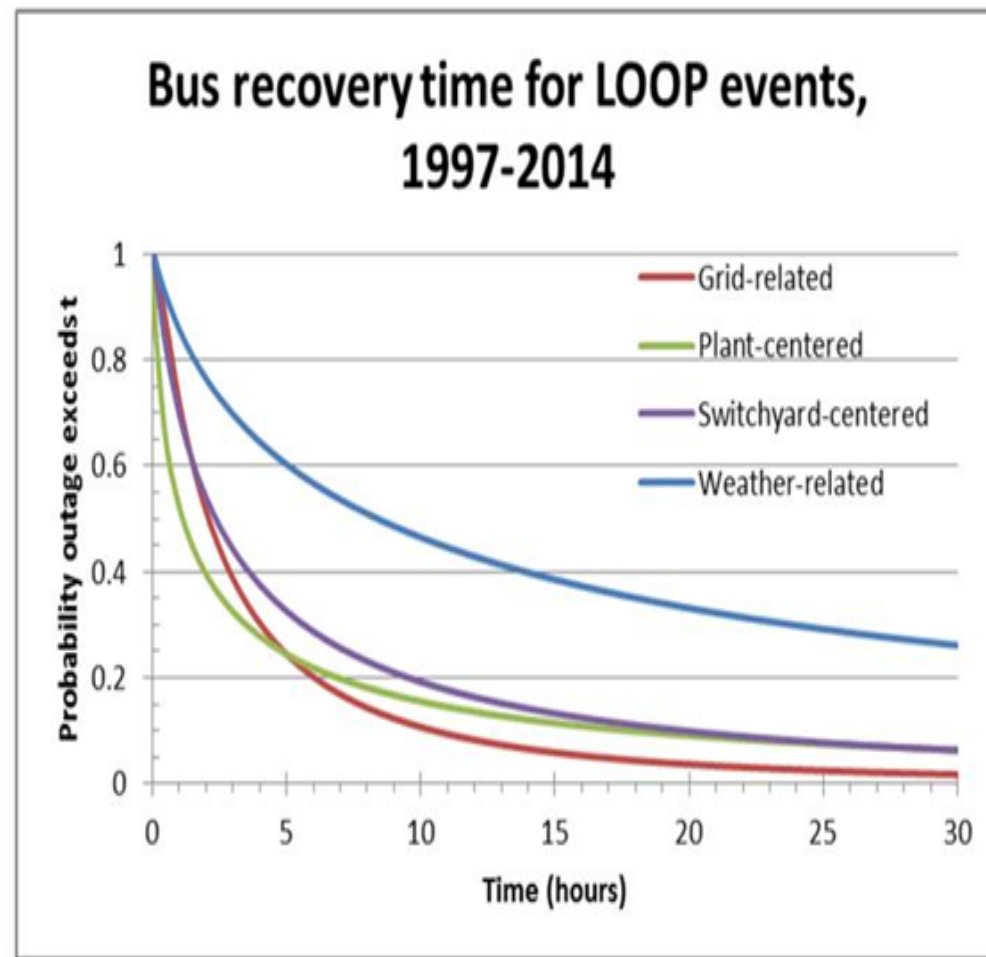
The branch voiced concerns with NRR and FERC staff that the lack of connection between ERCOT and the other Interconnects, combined with the lack of winterization protections for the Black Start units in the ERCOT system*, **may challenge our risk model assumptions** and substantially impact NRC regulatory activities.

NRC probabilistic risk models are sensitive to restoration from a loss of offsite power and include favorable estimates of recovery, usually within days, based on broad industry trends.

*Should be addressed by updated reliability standards

Black Start Concerns

NRC models the recovery of offsite power based on historical data from industry, producing a family of curves where the non-recovery probability trends towards lower and lower values as the time after initiation of the LOOP increases.



Recent Improvements to Grid Reliability

- Based on research conducted in May 2023 by S&P Global Intelligence, **Texas is second only to California in battery storage capacity**, with 2.2 gigawatts of storage and 29.2 gigawatts in the planning pipeline by 2030.
- ERCOT already has the **largest wind fleet in the U.S.** and is planning to add 78 gigawatts of capacity to its existing 12-gigawatt solar generation.
- In 2023, solar and wind power are expected to jointly account for 36 percent of the grid's needs, rising to >43 percent in 2035.

Recent Improvements to Grid Reliability

In April 2022, The Texas Electricity Supply Chain Security and Mapping Committee adopted an **Electricity Supply Chain Map** of critical infrastructure.

The map identifies **critical infrastructure facilities** that make up the state's electricity supply chain, including electric generation plants **and the natural gas facilities that supply fuel to power the plants.**

Texas Electricity Supply Chain Security and
Mapping Committee
Mapping Report



January 2022

Recent Improvements to Grid Reliability

In October 2022, the PUCT revised the Weather Emergency Preparedness rule (16 TAC § 25.55) implementing winter and summer weather preparedness standards in alignment with State Senate Bill 3.

The rule required generation entities and transmission service providers to complete winter weather emergency preparation measures and submit a declaration of winter weather preparedness.

Recent Improvements to Grid Reliability

- Texas State Senate Bill 3 (SB) also required the state [Railroad Commission](#) to adopt preparedness standards no later than 6 months following the production of the Texas Electricity Supply Chain Security and Map.
- Facilities subject to the rule were required to implement requirements including:
 - **Critical Designation of Natural Gas Infrastructure** (§3.65)
 - **Natural Gas Weatherization** (§3.66) – **Enforced via Inspections**

Questions?





Residents and RIDP Staffing Challenges

John Dixon



Resident Program

Each site has at least 2 residents

Report to the site everyday

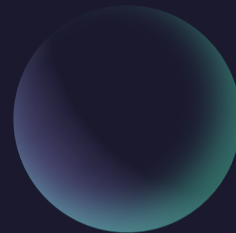
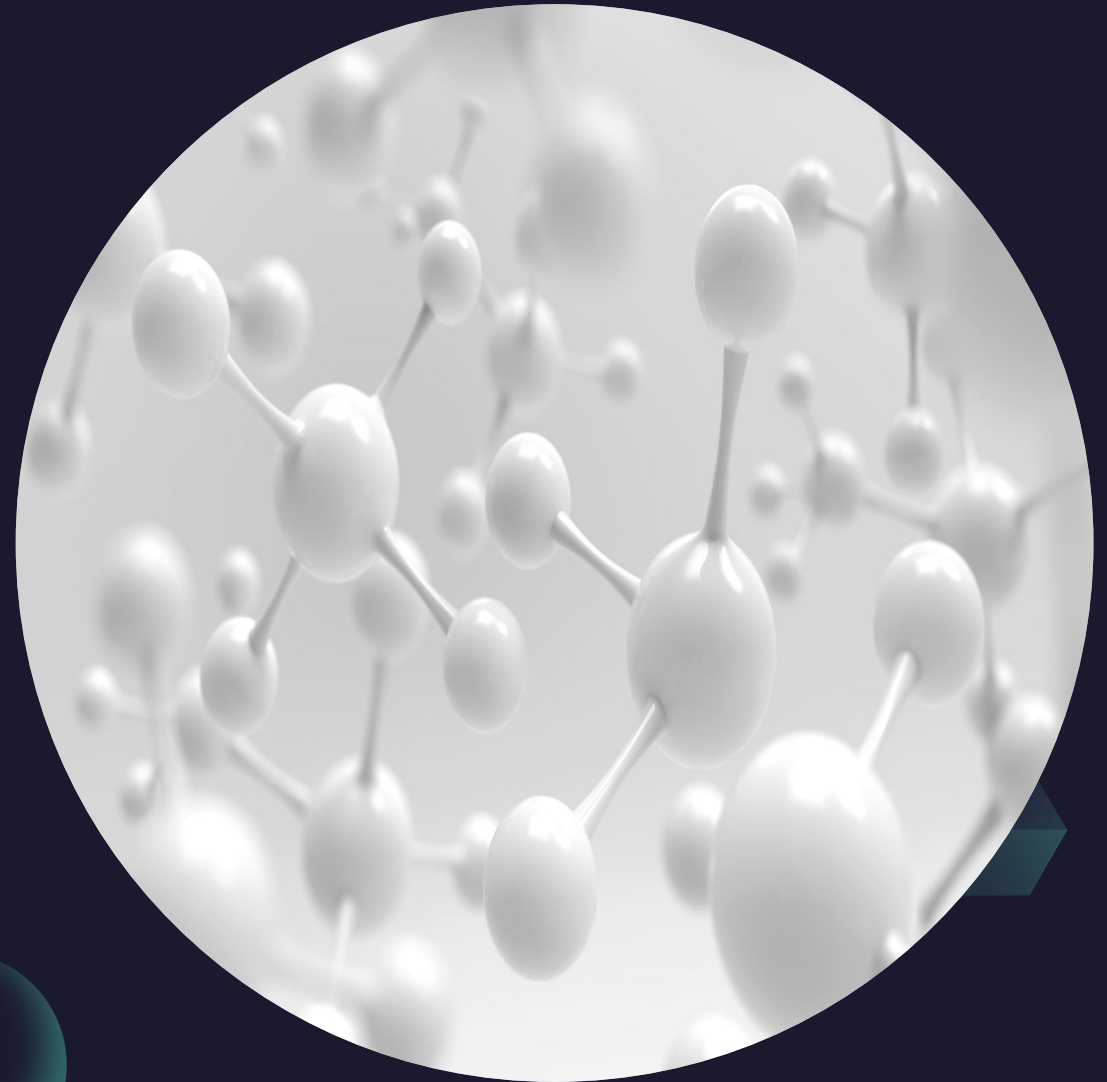
7-year limit

Resident Inspector Development Program

8 per region

Priority choice for vacant resident positions

Over hiring if possible

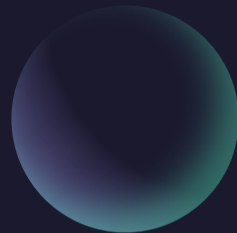


Prescreened over 100 applicants in FY 2023

Hired 9 RIDPs in FY2023 with 3 more that have accepted offers (waiting on security clearance). 4 have accepted RI positions, 2 moved to other positions.

Still trying to hire 4 more this FY2023.

Hiring getting more difficult.



Residents that left the Agency

STP RI (DNSB)

STP SRI (NR)

CP RI (INEL)



Residents to other Positions

CGS SRI

RBS SRI

CNS SRI

CP RI

CWY SRI

RIDP B

GG SRI

RIDP D

6 of 8 left Region IV

Continued Challenges

- Still have ANO SRI, GG SRI, and STP SRI to fill
- Had to post CNS RI and GG SRI at 50%
- Had to post ANO SRI at 30%, then 50%
- Sending almost all out as Basic qualified

Other Issues:

Move requirements
Telework Limits

Questions?

