

# **Official Transcript of Proceedings**

## **NUCLEAR REGULATORY COMMISSION**

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                              Structural Analysis Subcommittee

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UNITED STATES OF AMERICA  
 NUCLEAR REGULATORY COMMISSION

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ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

(ACRS)

+ + + + +

STRUCTURAL ANALYSIS SUBCOMMITTEE

+ + + + +

WEDNESDAY

APRIL 8, 2015

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Subcommittee met at the Nuclear  
 Regulatory Commission, Two White Flint North, Room  
 T2B1, 11545 Rockville Pike, at 1:30 p.m., Peter C.  
 Riccardella, Chairman, presiding.

COMMITTEE MEMBERS:

PETER C. RICCARDELLA, Chairman

RONALD G. BALLINGER, Member

DENNIS C. BLEY, Member

MICHAEL L. CORRADINI, Member

DANA A. POWERS, Member

JOY REMPE, Member

MICHAEL T. RYAN, Member

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STEPHEN P. SCHULTZ, Member

GORDON R. SKILLMAN, Member

JOHN W. STETKAR, Member

DESIGNATED FEDERAL OFFICIAL:

KENT L. HOWARD, SR.

ALSO PRESENT:

EDWIN M. HACKETT, Executive Director, ACRS

JUNE CAI, OEDO

YAMIR DIAZ-CASTILLO, NRO/DCIP

ACE HOFFMAN\*

BRIAN HARRIS, NRR/DPR

GREG KAMMERDEINER, First Energy

GLORIA KULESA, NRR/DE

JOHN W. LUBINSKI, NRR/DE

RICHARD P. MCINTYRE, NRO/DCIP/MVIB

ABY MOHSENI, NRR/DPR

EMMETT MURPHY, NRR/DE

EDWARD H. ROACH, NRO/DCIP/MVIB

REBECCA SIGMON, NRR/DIRS

\*Present via telephone

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

(1:30 p.m.)

CHAIRMAN RICCARDELLA: Welcome, all.

The meeting will now come to order. I'm Pete Riccardella, Chairman of the Structural Analysis Subcommittee. The Subcommittee will review and discuss the lessons learned from the San Onofre Nuclear Generating Station, steam generator tube degradation event.

ACRS Members in attendance include, Joy Rempe, Ron Ballinger, Mike Ryan, Dana Powers, Dick Skillman, and myself. Kent Howard of the ACRS staff is designated as the federal official for this meeting.

This afternoon we'll hear from the Office of Nuclear Reactor Regulation, Office of New Reactors, and the Executive Director for Operations regarding this matter.

This Subcommittee will gather information, analyze relevant issues and facts, and formulate proposed positions and actions, as appropriate for deliberation by the full Committee.

The rules for participation in today's meeting have been announced as part of the notice of this meeting in the Federal Register.

We've not received written comments or

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1 requests for time to make oral statements from members  
2 of the public regarding today's meeting. The entire  
3 meeting will be open to public attendance.

4 There will be a phone bridge line, but to  
5 preclude interruption of the meeting, the phone will  
6 be placed in the listening mode during presentations  
7 and Committee discussion. We will open the line for  
8 comments afterwards.

9 A transcript of this meeting is being kept  
10 and will be made available as stated in the Federal  
11 Register notice. Therefore I request that  
12 participants of the meeting use the microphones located  
13 throughout the meeting room when addressing the  
14 Subcommittee.

15 Participants are requested to please  
16 identify themselves, and speak with sufficient clarity  
17 and volume so that all may be readily heard. I also  
18 request that people mute any beepers, or cell phones  
19 that they have.

20 And Steve Schultz has just joined us,  
21 another Subcommittee Member.

22 We're now proceeding with the meeting and  
23 I call upon Aby Mohseni to begin the presentation.

24 MR. MOHSENI: Thank you very much, Mr.  
25 Chairman. Thank you for the opportunity to discuss the

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1 staff's findings. We will be briefing you on the  
2 staff's review of lessons learned from the SONGS tube  
3 degradation event.

4 Today with me are the following  
5 individuals, from NRR, Rebecca Sigmon from the Division  
6 of Inspections and Regional Support, Operating  
7 Experience Branch. Gloria Kulesa and Emmett Murphy,  
8 both from the Division of Engineering. June Cai, from  
9 Office of DEDO, and from NRO, Yamir Diaz-Castillo from  
10 the Division of Construction Inspection and  
11 Operational Programs.

12 And there are also members in the audience  
13 that have supported this review and will continue their  
14 support going forward.

15 On March 6th, 2015 the NRC staff issued a  
16 review of lessons learned from San Onofre steam  
17 generated steam tube degradation event. In response  
18 to the EDO's tasking memo dated March 20th, 2014. This  
19 report evaluated the NRC's response to the event, and  
20 identified possible improvements to NRC's processes  
21 and programs.

22 This review looked at how NRC programs and  
23 processes responded to the event as it unfolded, and  
24 whether or not changes to those processes could provide  
25 a more effective response in the future.

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1           As a result of this comprehensive review,  
2           the NRC staff identified 17 actions across eight  
3           topics. Those eight topics include, 10 CFR 50.59  
4           Process, Confirmatory Action Letter as a Regulatory  
5           Tool, Steam Generator Technical Review, Organization  
6           Rules and Responsibilities, Communication and External  
7           Interactions, Commission Separation of Function-  
8           Communication Challenges, Implementation of the  
9           Inspection Manual Chapter 351, and Vendor Oversight.

10           The actions range in scope from minor  
11           procedural changes, to broad evaluations of the  
12           inspection process. And many of them are already  
13           underway.

14           However, for the purposes of this briefing  
15           today, we are focusing on the following three topics,  
16           Steam Generator Technical Review, Communication and  
17           External Interactions, and Vendor Oversight.

18           (Off the record comment)

19           MR. MOHSENI: These topics are key  
20           elements in the review and we wanted to discuss early  
21           in the process. The overall conclusion in each of the  
22           topic areas was that NRC processes were sound. They  
23           were implemented as intended. And worked effectively  
24           to ensure health and safety.

25           The actions that were identified are

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1 enhancements that we hope can improve the efficiency  
2 and effectiveness of these processes, building on what  
3 we learned from this technically complex and highly  
4 visible event.

5 Now we'll turn it to Rebecca.

6 MS. SIGMON: Good afternoon. So to build  
7 on what Aby was saying, on March 6th, 2015, the NRC staff  
8 issued the review of lessons learned from the San Onofre  
9 steam generator tube degradation event. This was in  
10 response to the EDO's tasking memorandum from March  
11 20th of last year.

12 The report was made public on March 16th,  
13 and evaluated the NRC's response to the event and  
14 identified possible improvements to NRC processes and  
15 programs.

16 Note that this review is not looking at the  
17 actions of the licensee, Southern California Edison,  
18 or the steam generator vendor, Mitsubishi Heavy  
19 Industries. This review looked at how the NRC programs  
20 and processes responded to the event as it unfolded.

21 And whether changes to those processes  
22 could have prevented the event from occurring? Or  
23 whether improvements could be made to provide a more  
24 effective response in the future in any of the areas  
25 that were touched on in this review?

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1           To compile the report, eight topically,  
2           it's in four offices, NRR, NRO, Office of the General  
3           Counsel, and OEDO, worked to get directly with Working  
4           Group Members from several different offices. And  
5           gathered input from numerous staff across the agency.

6           The report touched on all aspects of the  
7           NRC's response to the SONGS event and the technical  
8           evaluation of the root cause of the steam generator tube  
9           degradation, to the public website updates, and the  
10          effectiveness of the oversight process, to the legal  
11          challenges that emerged.

12          As a result of this comprehensive review,  
13          the NRC staff identified 17 actions across the eight  
14          topics. This is a deliberate distinction that we're  
15          making here. These are not recommendations. They are  
16          actions, ranging in scope from minor procedural changes  
17          to broader evaluations of the inspection process. And  
18          many of these actions are already underway.

19          The overall conclusion in each of the topic  
20          areas, was that NRC processes were sound. They were  
21          implemented as intended, and worked effectively to  
22          ensure health and safety.

23          The actions that were identified are  
24          enhancements that we hope can improve the efficiency  
25          and effectiveness of these processes, building on what

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1 we learned from this technically complex and highly  
2 visible event.

3 Just to provide the basic background. On  
4 January 31st, 2012, operators at San Onofre Unit 3,  
5 noted indications of primary-to-secondary leakage.  
6 Following plant procedures, they trended the leak rate,  
7 and initiated a rapid shutdown when the leak rate  
8 reached 75 gallons per minute, with a technical  
9 specification when it was 150 gallons per minute, and  
10 isolated the affected steam generator.

11 Total radiation released to the  
12 environment was about .00005 millirem, a tiny fraction  
13 of the allowed regulatory dose to members of the public.

14 Once the plant reached cold shutdown on  
15 February 2nd, the licensee performed eddy current  
16 testing, and verified a leak in one tube of the affected  
17 steam generator.

18 Testing also found unexpected wear and  
19 degradation of multiple tubes in both steam generators  
20 for Unit 3. And similar degradation was found during  
21 similar testing on the Unit 2 steam generators that had  
22 been conducted a few weeks earlier.

23 At the time of the Unit 3 shutdown, Unit  
24 2 was already shutdown for a scheduled refueling outage  
25 and steam generator inspection. Based on these

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1 results, the licensee initiated in situ pressure  
2 testing with selected tubes in Unit 3 steam generators,  
3 to verify their integrity.

4 During these tests, the tubes were  
5 pressurized at successively higher pressures, up to  
6 three times normal operating pressure, to verify  
7 technical specification requirements from it.

8 Eight tubes in the affected steam  
9 generator failed the in situ pressure testing, with  
10 three of the tubes failing below the pressure expected  
11 during a main steam line rupture.

12 All tubes tested in the opposite steam  
13 generator, and in the Unit 2 steam generators, passed  
14 the in situ pressure testing. Following the results  
15 of this testing, the NRC charted an augmented  
16 inspection team to review the event, the licensee's  
17 response, and the root cause evaluation.

18 The NRC Vendor Inspection Program also  
19 performed an inspection of the Corrective Action and  
20 Quality Assurance Programs at Mitsubishi Heavy  
21 Industry, to verify that sufficient actions had been  
22 taken to preclude design interface control issues that  
23 had contributed to the San Onofre event.

24 Results of the augmented inspection team  
25 and follow-up inspection concluded, one design control

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1 violation, a 10 CFR 50, Appendix B, Criterion III, which  
2 was white for Unit 3, and green for Unit 2, for the  
3 failure to verify the adequacy of the thermal-hydraulic  
4 and flow induced vibration design of the replacement  
5 steam generators.

6 Two additional --

7 MEMBER SKILLMAN: Rebecca, if I could ask,  
8 why is the significance different between the two  
9 units, please?

10 MS. SIGMON: Basically it comes down to,  
11 the Unit 3 actually had, it had more severe degradation  
12 at Unit 3. And they also had the actual tube leak.

13 MEMBER SKILLMAN: Thank you.

14 MS. SIGMON: Two additional green,  
15 non-cited violations for deficiencies. One related to  
16 shipping and transport of the steam generators. And  
17 one related to post-scrum response actions. And one  
18 licensee identified violation related --

19 (Off the record comments)

20 MS. SIGMON: -- to retainer bar design.  
21 The vendor inspection also resulted in one notice of  
22 non-conformance, related to inadequate design  
23 interface control between the different design  
24 sections in Mitsubishi Heavy Industry.

25 The technical complexity of the event

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1 combined with the protracted nature of the shutdown,  
2 and the high visibility nature of events at San Onofre  
3 in general, led to significant public outreach efforts.

4 These required coordination among  
5 technical reviewers, and project management staff in  
6 NRR, inspectors in the Region IV office, and at the  
7 site, and Public Affairs staff and OPA.

8 The unique aspects of this event provided  
9 an opportunity for this lessons learned review, to look  
10 closely at several of the intersecting aspects of  
11 external outreach and coordination. To see where  
12 efficiencies can be gained while enhancing the overall  
13 effectiveness and communications effort.

14 The rest of today's presentation then will  
15 focus on these three areas, where the lessons learned  
16 review found that there were opportunities to enhance  
17 programs and prophecies, based on the lessons learned  
18 from the San Onofre event.

19 Gloria Kulesa and Emmett Murphy from NRR  
20 will discuss the technical aspects of the actual tube  
21 degradation mechanism, and efforts underway to both  
22 prevent their occurrence in future steam generators,  
23 and help NRC inspectors and reviewers find potential  
24 concerns earlier in the process.

25 June Cai from the Office of the Executive

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1 Director of Operations, will talk about actions that  
2 have already been taken to work with other agency  
3 programs, and incorporate lessons learned from the  
4 review of external communications efforts.

5 And Yamir Diaz-Castillo will discuss how  
6 the Vendor Inspection Program is reviewing its approach  
7 for selecting vendors for inspection.

8 Gloria.

9 MS. KULESA: Thank you, Rebecca. Let me  
10 begin with some introductions. I am Gloria Kulesa, I  
11 am the Chief of the Steam Generator Tube Integrity and  
12 Chemical Engineering Branch in the Office of Nuclear  
13 Reactor Regulation. And I'm going to bring you through  
14 the discussion on the Steam Generator Technical Review  
15 Team's efforts.

16 With me, seated by my side is Emmett  
17 Murphy. He is a Senior Materials Engineer within my  
18 branch. He was a very key member of the SONGS augmented  
19 inspection team, as well as a very key member of the  
20 SONGS lessons learned, steam generator technical  
21 review team.

22 Now I'm going to begin with the background  
23 on this team's effort. As stated before you on the  
24 background, the licensee and the vendor determined the  
25 cause of the Unit 3's tube-to-tube wear, was in-plane

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1 fluid-elastic instability of the U-bends associated  
2 with aggressive thermal-hydraulic conditions. This  
3 combined with the lack of effective in-plane support  
4 of the U-bends.

5 The team's approach. First I will  
6 acknowledge the membership of the team. They come from  
7 various offices amongst the Commission, representing  
8 operating, and new reactors, research, and Region IV.

9 The staff was chosen for their technical  
10 knowledge of the steam generator design and operation.  
11 And their involvement and the inspection activities  
12 related to this event.

13 The team's approach was to review relevant  
14 documents. You see a partial listing of them behind  
15 me. They also looked at operating experience.

16 Over the next five slides, I will cover the  
17 conclusions and actions that the Executive Director of  
18 Operations tasked this team to review and consider.

19 The first item is the additional NRC  
20 guidance needed for steam generated design,  
21 replacement, or modification.

22 The team started with the review of  
23 regulatory documents. Since regulations form the  
24 basis to address the adequate protection of the  
25 public's health and safety. This encompassed the

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1 review of regulatory guides, and standard review plans.  
2 As these documents provide the methods to meet the  
3 regulations.

4 And the review, the team noted that there  
5 was a lack of specifics in the current guidance related  
6 to fluid-elastic instability of the steam generator  
7 tubes.

8 The team focused on the need to change the  
9 regulatory guidance as it relates to the tube vibration  
10 that can lead to the damage from this phenomena. And  
11 the team took a two-tiered approach for considering.

12 The first is a general process that would  
13 identify qualitative considerations that a reviewer  
14 could use to determine whether a steam generator design  
15 is bounded by a proven design.

16 And if necessary there would be a second  
17 tier and that would provide more detailed review  
18 guidance on that. So the action for the first item of  
19 consideration was to write this two-tier approach  
20 guidance.

21 MEMBER POWERS: I'm not sure how you've  
22 bound vibrations?

23 MS. KULESA: Excuse me?

24 MEMBER POWERS: I'm not sure how you bound  
25 vibration? You said, you were bounded by a proven

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1 design with respect to vibrations, then they're fine.  
2 If not, then they go to this more detailed -- I'm just  
3 not sure how you go about bounding with respect to  
4 vibration?

5 MR. MURPHY: This is Emmett Murphy,  
6 NRR/DE. Three years ago you had your representatives  
7 of St. Lucie, and this was in the aftermath of SONGS.

8 MEMBER POWERS: Right.

9 MR. MURPHY: And a natural question was,  
10 what is your vulnerability? What is St. Lucie's  
11 vulnerability to similar type occurrence? And St.  
12 Lucie of course did not have a mathematical, you know  
13 model for us to say, this won't occur. But St. Lucie  
14 identified to you a whole list of qualitative  
15 comparisons, in terms of void fraction, circulation  
16 ratios, so on and so forth.

17 And the takeaway from that was that, while  
18 the subject of fluid-elastic instability in a  
19 particular in-plane U-bend instability, while the  
20 state-of-the-art and our understanding of the  
21 phenomena is still not very well developed, there  
22 seemed to be less much, you know significantly less  
23 potential for this type of occurrence at St. Lucie than  
24 at SONGS.

25 And I think that's what we're talking about

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1 here in this first flush, first stage, review. I mean  
2 a particular vendor may have developed, you know, built  
3 15 different steam generators. And for a given vendor,  
4 you know some of the plants have a more aggressive  
5 thermal-hydraulic environments than others, more  
6 benign.

7 You look at span lengths between supports,  
8 there are many qualitative comparisons you can make to  
9 see whether the steam generator of interest is, how it  
10 compares with its brethren. And what the performance  
11 of those other generators has been.

12 And you would take some degree of  
13 confidence from the fact that you're operating within  
14 a known envelope.

15 MEMBER POWERS: It's really not bounding.  
16 It's really going by analogy. I can't come in with my  
17 Slovakian generator and say it's bounded by Mitsubishi  
18 generator. I have to, I have to know something about  
19 Slovakian generators and their performance.

20 MR. MURPHY: These kind of qualitative  
21 comparisons are best made among steam generators from  
22 the same --

23 MEMBER POWERS: Understood. So if you  
24 had analogy, it's not so much --

25 MR. MURPHY: You have to be insightful in

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1 drawing your comparisons and understand sometimes you  
2 may be mixing apples and oranges, no question.

3 MEMBER POWERS: You've got to have  
4 similar, some similarity of design philosophy to  
5 extrapolate or interpolate here.

6 MEMBER CORRADINI: So to ask Dana's  
7 question, to how many, you go from Tier 1 to Tier 2,  
8 who was identically the same design, but a higher fail  
9 rate?

10 MEMBER POWERS: Well --

11 MEMBER CORRADINI: -- because at least in  
12 this example, you're using --

13 MR. MURPHY: You know, we can't, we're not  
14 prepared to be specific at this time. You know that  
15 we're the -- we think in general that you know, the first  
16 tier review would generally be sufficient.

17 The problem that we had at San Onofre was  
18 a unique occurrence after decades and decades of PWR  
19 experience. When one decides you know, what kind of  
20 you know, how much more review guidance we want to  
21 provide for, you know we had to consider the values and  
22 the impacts versus the expected, you know, what's the  
23 safety improvements we're going to get for the  
24 additional effort. These are all part of what we'll  
25 consider.

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1                   MEMBER REMPE:     So to summarize and  
2     paraphrase, I think what I hear you say is, you're not  
3     ready to, ultimate conclusions, but you're thinking of  
4     not only bounding conditions but also looking at the  
5     vendor experience and the proposed design? Or are you  
6     just looking at conditions?

7                   MR. MURPHY: We would consider the, well  
8     you know the industry-wide operating experience as well  
9     as the vendor experience. We would draw, you know as  
10    many meaningful qualitative comparisons as we could to  
11    assess -- you know there's always a challenge faced  
12    by the bigger applicant in having a generator that will  
13    perform adequately.

14                  MEMBER REMPE: Thank you.

15                  MEMBER SCHULTZ: Emmett, I think what  
16    seems important from this discussion is that, if it's  
17    described as an overview, qualitative evaluation, that  
18    is a first cut to determine whether additional work is  
19    done. That can give one impression.

20                         When you describe what that would be based  
21    upon your experience, and the number of things that you  
22    described would be appropriate to exam. You made it  
23    sound a lot more like a detailed review in a first cut  
24    kind of way.

25                         But you really described the evaluation as

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1 one which was, as I said before, based on your  
2 experience. You know that one needs to look at, and  
3 you mentioned five or six things off the cuff that you  
4 would exam for this part of the evaluation.

5 I think it's important to get that message  
6 across, that part A of the evaluation is not a  
7 qualitative evaluation to see whether this generator  
8 is like another. But it's really I think, from what  
9 you've described you would do, a very detailed level.

10 MR. MURPHY: Well we haven't made any  
11 conclusions you know. And not really prepared to  
12 discuss specifics of what we would be doing.

13 MEMBER SCHULTZ: Yes, but as you get to  
14 that, I think the way in which it's presented is  
15 important. Because you're talking about review  
16 guidance here. And so it's important to capture what  
17 that means in terms of who does the review, the  
18 experience base, the level of detail of investigation  
19 associated with it.

20 MEMBER CORRADINI: Can I ask each  
21 questions differently. So is it fair to characterize  
22 Tier 1 as qualitative and Tier 2 as more quantitative?

23 MS. KULESA: More detailed would be --

24 MEMBER CORRADINI: Yes, but I mean, so let  
25 me give you my example. My example is, I have vendor

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1 X that provides steam generators. And then somebody  
2 comes in and says, it's vendor Y. Same geometry, same  
3 quality but vendor Y. But then at least in this case,  
4 what I hear is I had vendor Y, plus I had a different  
5 geometry, plus I had an increased flow.

6 So at what point, so what I'm trying to get  
7 at is, is it a qualitative look at it and then after  
8 I get a qualitative look, and I have three changes to  
9 it that staff wants to think about more. Then you  
10 become more quantitative as to where you are relative  
11 to past experience? I'm still trying to understand the  
12 two tiers.

13 MR. MURPHY: Well you know, I can't give  
14 you a good distinction at the present time about the  
15 two tiers. We're not prepared to talk about that.

16 MEMBER CORRADINI: Okay, that's fine.

17 MR. MURPHY: I think as Gloria put it, a  
18 second tier, if found to be necessary to go into would  
19 be more detailed. I --

20 MEMBER CORRADINI: I have another  
21 question to help you out. So let's say staff looked  
22 at it and it was same vendor, same geometry, higher flow  
23 rate, and there was no leakage, but you saw excessive  
24 wear? Is that even an issue for NRC, or is that just  
25 an investment protection issue that the utility's got

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1 to deal with?

2 MR. MURPHY: Well, first you know, I'm not  
3 sure what kind of process we'd be in for the situation  
4 you just described. It sounds like a generator that's  
5 already operating.

6 MEMBER CORRADINI: Well, my only, I'm just  
7 trying to think of abstracting into how you would decide  
8 whether I would look more deeply? That's what I'm  
9 trying to get at.

10 And even if you look more deeply, or let's  
11 say you had to pass on it, and it goes into operation  
12 and I get excessive load but I don't get leakage, that's  
13 not necessarily a safety issue is it?

14 MR. MURPHY: That type of situation that  
15 you described should be managed by the SG Program in  
16 the specifications.

17 MEMBER CORRADINI: Okay.

18 MR. MURPHY: The kind of problem that  
19 we're dealing with here is a basic design or fabrication  
20 flaw that results in very rapid impairment of tube  
21 integrity. Something that can't be managed by  
22 periodic in-service inspection.

23 MEMBER CORRADINI: Okay.

24 MEMBER SKILLMAN: Emmett, let me make a  
25 comment and then ask a question. The interesting

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1 characteristic of the steam generator is, it is at the  
2 same time, reactor cooling system pressure boundary,  
3 and also secondary site boundary. So it's the  
4 assembled component that has these two very important  
5 boundary design formations.

6 In this case, a change was made. A  
7 seemingly insignificant one that turned out to be very  
8 significant. And so I'm wondering if for the rest of  
9 our meeting today, we could be discussing this issue  
10 on two tiers.

11 One, is the what is at San Onofre, what  
12 you've discovered in your lessons learned on the  
13 generators. Then at a different level, this could be  
14 a discussion on reactor coolant pump internals. This  
15 could be a discussion about reactor vessel internals.

16 It could be a discussion about the change  
17 made to fuel, but not discovered until after the fact.  
18 And so for at least this one Member's perspective, this  
19 event is a goldmine in terms of discussing how to  
20 prevent importation of latent defects.

21 And I would offer this as a perfect example  
22 of a latent defect. It got imported. It got  
23 engineered to the hilt. All the thought, all the  
24 details were what they needed to be for the rest of the  
25 plant life. And here we had basically a failure of the

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1 reactor cooling system pressure boundary.

2 Could we through these discussions, talk  
3 about two levels? The San Onofre event, but also what  
4 thinking might be in the back of the NRC's mind to  
5 prevent this type of event from happening anywhere else  
6 in procurement land?

7 (Off the record comments)

8 MEMBER SKILLMAN: And I'll bring your  
9 attention, the one thing I'm kind of holding onto here,  
10 is this Criterion III, in this Appendix B, the 10 CFR  
11 50. It is the tail end of Criterion III.

12 Design changes, including field changes,  
13 shall be subject to design control measures  
14 commensurate with those applied to the original design  
15 and be approved by the organization that performed the  
16 original design unless the applicant designates  
17 another responsible organization.

18 (Off the record comments)

19 MEMBER SKILLMAN: I can interpret that  
20 paragraph, I think from the perspective of Mitsubishi  
21 and the owner, as having been complied with. But I  
22 could also take a fairly aggressive view, and say, now  
23 wait a minute. That was a change. And unless all the  
24 details of that change were fully understood, that  
25 change didn't pass muster.

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1                   So again, what I'm suggesting is please  
2                   talk about the lessons learned from San Onofre. But  
3                   if you can, project how the NRC is thinking about how  
4                   these lessons learned are at a different level in terms  
5                   of prevention of importation of a latent defect.  
6                   Because I think that's the real lesson here.

7                   MR. LUBINSKI: If I could, John Lubinski,  
8                   Director of Division of Engineering. And I appreciate  
9                   the comment and I think as part of our presentation  
10                  today, you'll hear about vendor inspection.

11                  And with respect to that topic, the vendor  
12                  inspection will be looking more broadly, not just how  
13                  do we inspect steam generators. But with respect to  
14                  the specific topic, in asking Emmett and Gloria the  
15                  question, this specific topic really was on the steam  
16                  generator reviews.

17                  So if I take what you had as far as two  
18                  issues, I'd say maybe three issues. One, is specific  
19                  to SONGS, and what did we learn out of SONGS. The  
20                  second level is what do we learn out of SONGS with  
21                  respect to Steam Generator Technical Reviews.

22                  And that's where Emmett and Gloria are  
23                  right now.

24                  MEMBER SKILLMAN: Right, I see that.

25                  MR. LUBINSKI: And they're not going

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1 beyond that to say, have we looked as part of this  
2 review, at how we review all of the larger components?  
3 If you will, as you said whether you're talking about  
4 different pumps, different valves, steam dryers, so  
5 that's I'd say from a question standpoint, more  
6 appropriate in the vendor area.

7 What are we doing in the vendor area, what  
8 are we doing in the vendor area to look at those type  
9 of component vendor inspections?

10 Whereas this is what did we learn from a  
11 steam generator review guidance? Because again, as  
12 you said, it's a very important component. And looking  
13 beyond just what happened at SONGS, how are we taking  
14 those lessons and expanding it to steam generators?

15 MEMBER SKILLMAN: Thank you, John. Thank  
16 you, Emmett.

17 MEMBER POWERS: Well, I can be sympathetic  
18 but we need to focus in. Dick looks at this as,  
19 something importing defect, I think is the term you  
20 used. I tend to look at it as, one of those peculiar,  
21 how to define first of a kind engineering?

22 The way I look at it.

23 And I know how the Rand Corporation  
24 defines first of a kind engineering? It's not that's  
25 the time something's been built, it's the first time

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1       you built it.

2                   And that's why, maybe it comes to the same  
3       thing. It strikes me, that the agency needs to be able  
4       to flag when they're encountering first of a kind  
5       engineering.

6                   MEMBER CORRADINI: Say that louder again,  
7       Dana, I'm sorry.

8                   MEMBER POWERS: The agency needs to be  
9       able to flag when it's encountering first of a kind  
10      engineering.

11                  MEMBER REMPE: I think this will come up  
12      under Topic 8, but I agree with you, because it's my  
13      understanding what we were reading, is that they do spot  
14      checking under Topic 8 at this time.

15                  MEMBER SKILLMAN: Thank you.

16                  MS. KULESA: Thank you. So on to the next  
17      item consideration, Number 2. And that was does the  
18      agency=s Steam Generator Program effectively handle  
19      new degradation mechanisms?

20                  CHAIRMAN RICCARDELLA: I'm sorry to  
21      interrupt.

22                  MS. KULESA: You're good.

23                  CHAIRMAN RICCARDELLA: But you know, we  
24      talked about this two-tier process under Question 1.  
25      And I heard a lot about the first tier. I didn't hear

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1 anything about what that second tier would involve if  
2 you trigger it?

3 MR. MURPHY: Again, we're --

4 (Simultaneous speaking)

5 CHAIRMAN RICCARDELLA: -- setting up  
6 models, new models?

7 MR. MURPHY: -- we're not prepared to  
8 discuss the second tier today.

9 MS. KULESA: Right. This is still in  
10 staff deliberations, Peter. We're working on this  
11 right now. I'm looking at what guidance there is out  
12 there. And we've identified over the past several  
13 months, areas where we could see needed to be addressed.

14 But we really don't have hard and fast  
15 things that we wish to share. We wanted to do it  
16 community wide first within our staff level. And then  
17 come back, provide more accurate details when we're  
18 done.

19 Peter, really what's coming out of this,  
20 and if you would bear with me, there's going to be a  
21 point where you can hear more of the details. We're  
22 a little bit ahead of the curve on some of the  
23 discussions that are coming up to that. So you could  
24 hear me repeat the same part of information again.

25 But where we stand on this, it weighed

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1       whatever the document is that we're adjusting, putting  
2       guidance out or something like that, we're going to  
3       follow our NRC processes. And our NRC process might  
4       actually have us before you again.

5               So if we're changing a regulatory guide,  
6       we might be before ACRS with the discussion and Kent  
7       is acknowledging that over there from his experience  
8       base. So what I want to say is, even though we can't  
9       give you many details today, I believe we may have the  
10      ability to come back again.

11             And I understand there's interest here, so  
12      even if there's a topic that we would not by process  
13      come to you, if you're interested in this we would be  
14      very willing at that time to come back and give you more  
15      details. But not at this stage tonight.

16             CHAIRMAN RICCARDELLA: Sure. So let me  
17      maybe paraphrase. So the lessons learned report  
18      defines a series of actions. But you haven't taken  
19      those actions yet.

20             MS. KULESA: We're in the process --  
21             (Simultaneous speaking)

22             CHAIRMAN RICCARDELLA: You're defining  
23      those actions.

24             MS. KULESA: -- but this is not where we're  
25      reporting out, we're done. We're still a work in

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1 progress and this is really months still to come.

2 And I think you're going to hear that  
3 message repeated in each of these items that I'm  
4 covering.

5 CHAIRMAN RICCARDELLA: I still, I'm  
6 wondering what are you thinking in terms of that? I  
7 mean are you thinking of getting into the actual  
8 confirming the detail design that's performed by  
9 vendors?

10 I mean does NRC really have the staff and  
11 the budget to do that?

12 MR. MURPHY: Or the need?

13 CHAIRMAN RICCARDELLA: What?

14 MR. MURPHY: Or the need?

15 CHAIRMAN RICCARDELLA: Yes, that too.

16 As opposed to enforcing the regulations on  
17 the licensee and the vendor?

18 MR. MURPHY: Well this is all part of what  
19 we're trying to evaluate under this particular item.  
20 That you know, what should we be doing? What can we  
21 be doing? Are these consistent with the values and the  
22 impacts?

23 CHAIRMAN RICCARDELLA: So Tier 1 is fairly  
24 clear what you're going to do. You're going to look  
25 at you know, whether the design basically is beyond the

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1 envelope of successful industry experience.

2 And if it's not, or if it is beyond the  
3 envelope, then that would trigger the Tier 2, but you  
4 haven't really defined what Tier 2 is going to be.

5 MR. MURPHY: That's correct.

6 CHAIRMAN RICCARDELLA: Okay. Thank you.

7 MR. MURPHY: And incidentally, you know  
8 with Item 4, you know we'll be talking about the fact  
9 that the state-of-the-art you know, needs some work.  
10 And that's a related issue.

11 MS. KULESA: He's two steps ahead of me at  
12 this moment.

13 CHAIRMAN RICCARDELLA: Okay, thank you.

14 MS. KULESA: All right. So as I am  
15 addressing the second item of consideration here. I  
16 want to address this one along with item of  
17 consideration Number 3.

18 So I'm going to ask Rebecca to move to the  
19 next slide. And the reason why I am doing that, these  
20 considerations are very related. One being a subset  
21 of the other, if you notice on Item 3, I'll just read  
22 the consideration.

23 Does the existing Steam Generator Program  
24 effectively account for fluid-elastic instability?  
25 So you hearing between the two, that they are both

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1 addressing the Steam Generator Program. And they're  
2 both talking about a degradation mechanism, one more  
3 specific.

4 Stay on this slide, Rebecca. All right,  
5 so let me give some, a little bit more details on this.  
6 Certain degradation mechanisms can be effectively  
7 managed through a normal in-service inspection. But  
8 there are some that cannot. And that can be those that  
9 rapidly propagate.

10 You heard Emmett make those remarks  
11 earlier. And that is the example, fluid-elastic  
12 instability. As a result, some degradation mechanisms  
13 must be precluded in design. You know, if I were to  
14 like to preclude all degradation mechanisms in design,  
15 we recognize that some will occur. And they will be  
16 managed through the In-service Inspection Program.

17 As a result, the team concluded that the  
18 Steam Generator Program manages degradation mechanisms  
19 effectively. However, in the case of fluid-elastic  
20 instability, it must be precluded by design. Because  
21 it is fast growing and there are high uncertainties in  
22 the growth rates.

23 From the safety perspective, if such a  
24 rapidly propagated phenomena should occur, and I've a  
25 bullet on this, that the operational leak rate limits

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1 in the technical specifications and the established  
2 steam generator tube rupture emergency procedures  
3 should ensure that public health and safety are  
4 maintained.

5 Therefore the team does not recommend any  
6 further actions to items of consideration Number 2 or  
7 Number 3. Because the team believes the program is  
8 effective for the types of mechanisms it was intended  
9 to address.

10 I'm on to consideration Number 4, that  
11 states, does the agency or industry need additional  
12 standards for new or replacement steam generators?  
13 I've already addressed the Agency's side when I spoke  
14 of Item Number 1. So at this time, I will now address  
15 Industry's actions.

16 At least twice a year, NRC meets with  
17 representatives from Steam Generator Industry. Our  
18 last meeting occurred in February. At that meeting,  
19 Industry discussed their plans to generically  
20 investigate the onset of in-plane fluid-elastic  
21 instability through a series of tests at the Canadian  
22 Nuclear Laboratories.

23 This is where the Canadians are doing some  
24 of their own testing. I believe contracts are going  
25 in place right now. The work will begin in 2015 and

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1 this is a three year effort.

2 MEMBER POWERS: What laboratory is that  
3 being done in?

4 MS. KULESA: Excuse me, Dana?

5 MEMBER POWERS: What lab is that being  
6 done in?

7 MS. KULESA: Canadian Nuclear  
8 Laboratories?

9 MEMBER POWERS: Chalk River, you mean?

10 MS. KULESA: I had, this coming from  
11 Industry, I got the letter and that's how they  
12 identified the name of the laboratory.

13 MEMBER POWERS: Well if CNL's the name,  
14 CNL's the new, fancy name.

15 MS. KULESA: Okay. I'm not familiar with  
16 its former identification.

17 MEMBER POWERS: And where they're doing  
18 it, I would bet, Sheridan Park or --

19 MALE PARTICIPANT: I know we have a  
20 representative from Industry.

21 MR. KAMMERDEINER: Right, Greg  
22 Kammerdeiner, I'm representing the Steam Generator  
23 Task Force. I'm First Energy, it's the former Chalk  
24 River Facility.

25 (Simultaneous speaking)

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1 MEMBER CORRADINI: That's its new name.

2 MEMBER POWERS: The only trouble is --

3 (Simultaneous speaking)

4 MEMBER POWERS: The only trouble is they  
5 think everything's horizontal. We think it's  
6 vertical.

7 MS. KULESA: Okay. A prediction of the  
8 final result, the solution of this effort is difficult.  
9 The goal is to understand what leads to the onset of  
10 fluid-elastic instability.

11 And Industry recognizes that this a  
12 learning effort. They will adjust, they will stop at  
13 various phases depending upon the results that they  
14 see.

15 In a separate action, the Electric Power  
16 Research Institute, known as EPRI, are developing a new  
17 state-of-the-art steam generator thermal-hydraulic  
18 code, called Triton. This is expected to be an  
19 additional assessment tool for considering potential  
20 changes in the thermal-hydraulic conditions of  
21 operating steam generators.

22 This is as a result of two parking power  
23 uprights and or both ups of deposits on the secondary  
24 side of the steam generator. Also EPRI has initiated  
25 work on a flow vibration analysis package which is

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1 expected to help estimate wear, EPRI usage rates for  
2 steam generator tubing. Knowledge from the Canadian  
3 Nuclear Laboratory is expected to be included into that  
4 analysis.

5 And lastly, the American Society of  
6 Mechanical Engineers, known as ASME, has a Task Group  
7 on Flow Induced Vibration. The group meets every three  
8 months. It's a consensus codes and standards effort.  
9 We believe this to be a multi-year activity. We  
10 actually have staff on this team as well.

11 So in conclusion, for our item of  
12 consideration forum, we will continue to engage  
13 industry on the design and fabrication, standards and  
14 guidance to minimize the potential for in-plane  
15 fluid-elastic instability in a steam generator.

16 MEMBER POWERS: Does NRC have input into  
17 the testing that'll be taking place?

18 MS. KULESA: Dana, you're coming very  
19 softly, so that I --

20 MEMBER POWERS: Oh, I do that out of habit.

21 MS. KULESA: I'm sorry, sometimes I either  
22 have to ask you to speak up or I could try to repeat  
23 what I Dana was saying.

24 MEMBER POWERS: I was just wondering if  
25 the NRC has input into the testing that's going to take

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1 place in Canada?

2 MR. MURPHY: Not that I'm aware. They  
3 have the benefit of reading staff comments that were  
4 made in the context of San Onofre and the available  
5 testing and retesting at that time.

6 MR. LUBINSKI: John Lubinski, if I could  
7 add to that. As Gloria said, we do meet with the Steam  
8 Generator Task Force every six months. And the  
9 expectation is they will be updating us during those  
10 meetings on the testing. And that's usually an  
11 interactive session where we ask questions along the  
12 way.

13 So it's not really input, but if we have  
14 questions that may be of insight to them, they'll get  
15 those during those meetings.

16 MS. KULESA: And what I might add onto  
17 John's statement is basically we communicate with those  
18 in generator industry, not just through the various  
19 official meetings that we have. We also communicate  
20 emails and the like in between. So there is not just  
21 a once or twice during the year exchange of information.

22 MR. KAMMERDEINER: Greg Kammerdeiner  
23 again, First Energy, we will have an expert panel to  
24 develop the test configuration. But it was not our  
25 intent to specifically solicit NRC input in that panel.

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1 But as was stated, the twice a year meetings will be  
2 provided an update, and NRC will provide feedback at  
3 that time.

4 MEMBER CORRADINI: Is this an  
5 international effort? Or just U.S.?

6 MR. KAMMERDEINER: I believe at this time  
7 it's just U.S.

8 MEMBER SCHULTZ: Who is on the team, Greg?

9 MR. KAMMERDEINER: I can't tell you that  
10 at this time. I think we're still putting that team  
11 together.

12 MEMBER CORRADINI: So it's still being  
13 assembled?

14 MR. KAMMERDEINER: I believe so, yes.

15 MEMBER POWERS: Kind of surprises you when  
16 there's no activity in this area in France doesn't it?

17 MR. KAMMERDEINER: Why? I would, I  
18 agree.

19 MEMBER POWERS: As well you should.

20 MEMBER CORRADINI: Well, I mean you said  
21 it so I can't.

22 CHAIRMAN RICCARDELLA: And the ASME Task  
23 Group, that Gloria was referring to, is that Section  
24 3 or Section 11?

25 MS. KULESA: Three.

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1 CHAIRMAN RICCARDELLA: So it's design,  
2 Appendix N, I take it?

3 MS. KULESA: Yes.

4 CHAIRMAN RICCARDELLA: Okay, thank you.

5 MS. KULESA: And onto my last presentation  
6 slide. And this is the item of consideration for our  
7 enhancements to the Agency's Steam Generator  
8 Inspection procedures needed. And I'll read the  
9 statement, that we have on the slide to begin with. And  
10 the answer is Yes. The staff will revise the pertinent  
11 inspection procedures to ensure the two-tiered  
12 guidance discussed in Item 1 can be applied during the  
13 inspection and oversight process.

14 But I also could add to that remark that  
15 there are instances where the licensees can make a  
16 change to the steam generator without requiring a  
17 submission of the license amendment.

18 So it's possible that the change could  
19 affect the steam generator's susceptibility to  
20 fluid-elastic instability. So as a result, the  
21 guidance is needed for the inspector to use, better  
22 guidance. And what we identified in Item 1, we said  
23 we would make sure that this is consistent with the  
24 guidance that we're also providing for the inspectors,  
25 the inspection procedures.

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1                   MEMBER SKILLMAN:   Can you go into any  
2 further detail?

3                   MS. KULESA:   Not at this moment, I'm  
4 sorry, Gordon. Like I said this is all very early  
5 stage. As far as I'm just reporting out the facts and  
6 intents of the team, and our, pretty much the direction  
7 that we wish to go.

8                   MEMBER SKILLMAN:   Okay, thank you.

9                   MS. KULESA:   All right, well that  
10 concludes my remarks for the Steam Generator Technical  
11 Review. And I will then turn the discussion now to  
12 June.

13                  MS. CAI:   Thank you. Good afternoon. I  
14 will be focusing on the Agency's External Communication  
15 Interactions.

16                  As Rebecca mentioned, at the introduction,  
17 there was significant external interest during the  
18 extended shutdown from a variety of stakeholders,  
19 including Congressional, state, and local elected  
20 officials, the licensee, non-governmental  
21 organizations and members of the public.

22                  In responding to this large amount of  
23 interest, the Agency conducted a number of  
24 communications efforts. And formed a group comprised  
25 of staff from across the Agency, focused on

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1 communication.

2 This group spent significant resources and  
3 efforts conducting various communication activities  
4 and keeping products up to date. These types of  
5 communication outreach activities were not part of  
6 NRC's routine oversight processes. And available  
7 procedures provided only limited guidance to the staff.

8 So this review is focused on improvements  
9 that could be made to Agency processes to use, make more  
10 effective and efficient use of Agency's resources for  
11 conducting outreach and communications for future  
12 situations.

13 Because of the scope of this review  
14 centered on the Agency's internal processes, most of  
15 the input collected came directly from NRC staff and  
16 managers who had a direct involvement with the  
17 communication activity.

18 NRC's focus groups were held with current  
19 NRC staffing managers from multiple offices.  
20 Interviews were also conducted with some former senior  
21 managers, who have since retired. As well as  
22 facilitators for several of the public meetings.

23 A variety of documents were reviewed  
24 including communication plans, blog posts, press  
25 releases, public websites, public meeting documents,

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1 meetings presentations, and meeting feedback forms.  
2 There were also some recordings of the public meetings  
3 which we reviewed.

4 We supplemented the internal data sources  
5 with some external data collection efforts, including  
6 an online survey that was sent out to approximately 140  
7 individuals had interactions with the NRC during the  
8 extended shutdown, for whom staff kept contact  
9 information.

10 And of those 140 invitations, we received  
11 25 responses and 4 additional individuals provided more  
12 detailed written responses.

13 And the survey focused more on the areas  
14 that the staff had direct interactions with the public,  
15 which included the public meetings, NRC blog, and the  
16 public website.

17 In addition, I traveled out to San Onofre  
18 in October of 2014, during a public meeting we had on  
19 decommissioning, interactive with stakeholders and  
20 attendees at that meeting who attended some of the  
21 previous meetings, to get their insight.

22 MEMBER POWERS: It says you got a lot of  
23 unusual interactions with interested people. What I  
24 don't understand is why were they asking you questions?  
25 I mean you didn't design the steam generator, you didn't

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1 operate the steam generator or --

2 MS. CAI: Yes.

3 MEMBER POWERS: What were they asking you?

4 MS. CAI: Well they, there was a lot of  
5 interest on shutting the plant down permanently. So  
6 you know, we were under the process of eventually  
7 determining if they would be.

8 We felt that comfortable letting them  
9 restart. You know, authorizing the restart. So there  
10 was a lot interest in shutting them down permanently  
11 and not allowing them to restart.

12 There was also a very high level, you know  
13 in Southern California, high level of clean concerns  
14 on nuclear power, anti-nuclear views. So those were  
15 also in play as well.

16 MEMBER POWERS: So I know that's different  
17 from two years ago, or five years ago. The faulty  
18 generator, they had exactly the same number of people  
19 interested in exactly the same subjects.

20 So you really weren't talking to, about  
21 steam generators. That was just an excuse to ask you  
22 the question.

23 MS. CAI: In some cases, yes. In some  
24 cases if you watched some of the public meeting  
25 recordings, or look through the records, you know

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1 people came -- and this will be covered on when the  
2 public meeting discussion points.

3 You know, people didn't necessarily come  
4 to talk specifically on the topic at hand. They might  
5 have previous you know, statements they had planned to  
6 make. Or previous views that you know they were using  
7 as a platform to share --

8 MEMBER POWERS: Yes, I suspect few of your  
9 interlocutors had a clue what fluid and elastics and  
10 the instability was.

11 MS. CAI: Yes, it is interesting, the  
12 recordings are out there. It is quite interesting  
13 because sometimes you'll see a disconnect between the  
14 comments already made, especially a lot of members of  
15 public versus technical topics that were being  
16 discussed. So we'll go into some of that when we talk  
17 about the public meeting enhancements.

18 MEMBER POWERS: Well it just strikes me  
19 also as interesting, that the part of your outreach,  
20 you didn't outreach to the technical community that  
21 does know what fluid and elastics instability is.

22 MS. CAI: I, don't know that level of  
23 specificity. I know that you know, between NRR and the  
24 Regions, they did interact with a lot of different types  
25 of groups.

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1 I don't know if they, you know outreach  
2 that specific. I focused more on just the general  
3 public outreach efforts.

4 Okay. So the central takeaway from all  
5 the information --

6 MEMBER POWERS: Well maybe I get,  
7 interrupt you again and just comment, that a former  
8 Chairman of the ACRS once took the position, which I  
9 think I agree with, is that in new regards, the academic  
10 community is the public's representative on these very  
11 technical issues.

12 MS. CAI: Yes. Thank you.

13 So the central takeaway, so the main thing  
14 we heard from the staff feedback was that this level  
15 of communication effort consumed significant  
16 resources. Especially from the technical staff, that  
17 exceeded what had been anticipated or budgeted for in  
18 advance.

19 In general, the support fell on technical  
20 staff as collateral duty, which took away from doing  
21 technical work. And having individuals with specific  
22 communications expertise help in such efforts, could  
23 have provided some efficiencies and led to more  
24 effective communication products.

25 Would also have allowed technical

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1 expertise to remain more focused on the technical  
2 issues. Again, this would have been, allowed for more  
3 efficiencies and resulted in some more effective  
4 communications.

5 Overall, the external feedback received  
6 was generally positive once respondents were  
7 questioned directly about NRC's communication efforts.  
8 i.e., independent of their views on SONG or nuclear  
9 power.

10 So that was, you know I just wanted to make  
11 that clarification. If, there were you know, some  
12 negative feedback in general about some of our efforts.

13 But overall, it was actually surprisingly  
14 positive once you focused the feedback on, okay, this  
15 public meeting, this website, this blog. You know, put  
16 aside your views on nuclear power and SONG. So, and  
17 that was interesting finding.

18 And many of the individuals that we  
19 interacted with from the external, the stakeholders,  
20 expressed very positive interactions with NRC staff and  
21 the facilitators for the public meetings.

22 There were some concerns noted, some  
23 example included, there was two little opportunity for  
24 interactive communication. The timeliness of  
25 information sharing could have improved. And the

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1 information could have been presented in plain language  
2 to be more understandable.

3 MEMBER POWERS: There's many of us that  
4 wish thermal hydraulics was written in plain language  
5 and more understanding.

6 MS. CAI: It's challenging stuff. Yes.

7 (Laughter)

8 MS. CAI: Okay, so --

9 (Simultaneous speaking)

10 (Laughter)

11 MS. CAI: So the public meeting was the  
12 bulk of the efforts and so I have a little bit more  
13 extensive information on the public meeting.

14 So there were a total of eight public  
15 meetings held during the extended shutdown, four in  
16 California and four here at headquarters.

17 As I mentioned, external stakeholders  
18 didn't only appear to be satisfied with the staff and  
19 facilitator performance at these meetings, but they  
20 offered some suggestions and recommendations.

21 One of the things that we heard from staff  
22 was, in future situations, Agency should consider using  
23 other formats. For example, open house format in  
24 which, that's held with a specific purpose of listening  
25 to the attendees.

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1                   This type of format would allow more  
2                   opportunity for dialog exchange. With the attendees  
3                   to be able to provide their views. And be done in a  
4                   more informal conversational setting.

5                   There was also a suggestion to bypass the  
6                   sometimes lengthy introductory remarks and  
7                   presentations and move directly into a facilitated  
8                   question, answer sessions. And make the best use of  
9                   the time.

10                  This next one gets a little bit --

11                  CHAIRMAN RICCARDELLA: Introduction by  
12                  the NRC, or the staff?

13                  MS. CAI: It's staff, yes. Because you  
14                  know a lot of the meetings they might have several staff  
15                  or a panel you know. And everybody gets their ten or  
16                  fifteen minutes, but then they end up running over.

17                  So it's a two hour meeting, so the public  
18                  ends up sitting there you know for the first hour, hour  
19                  and a half just listening to presentations. And then  
20                  they only have a short portion for Q&A. And so the  
21                  suggestion is, just set it up to be very interactive.

22                  CHAIRMAN RICCARDELLA: And this feedback  
23                  came from the external stakeholders, or some of both?

24                  MS. CAI: So also internal as well, both.  
25                  Yes. They said, you know for the public especially,

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1 people often traveled very far. It took a long time.  
2 And said, I don't want to just come and sit here for  
3 an hour listening to, you know very technical, really  
4 I don't even know what they're talking about.

5 I'm here with my two, three questions and  
6 I really you know, want to ask them and have the  
7 discussion, so.

8 So the next one was interesting, conveying  
9 the meeting purpose more clearly. And this kind of  
10 gets at some of the ones that Dana made.

11 So that really emphasized the need to be  
12 more clear, to convey more clearly to the participants,  
13 to the public, on the purpose of each meeting.

14 Because many of the attendees who came to  
15 the meetings viewed them as some type of hearing. They  
16 wanted to make statements "for the record," quote, in  
17 quotes. And then give input to NRC for our decision  
18 making process, for deciding the restart.

19 So the staff emphasized, we need to be more  
20 clear in conveying that these are informational  
21 meetings. You know, we're presenting information,  
22 answering questions. But staff is not in the position  
23 to take inputs for decision making. And it's not any  
24 type of formal hearing process. So there was that  
25 disconnect.

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1                   MEMBER CORRADINI:     Do you think, I  
2     appreciate you're saying, but do you think when  
3     anything is occurring in nuclear power, do you have  
4     anything but this sort of reaction?

5                   I mean this is kind of back to Dana's point.  
6     This is always there.

7                   MS. CAI:   Yes.

8                   MEMBER CORRADINI:   The event caused it to  
9     essentially become, certain things occurred, but does  
10    this surprise you?

11                  MS. CAI:   No.   I don't think anybody was  
12    surprised, but I think we're looking for ways to --  
13    because we would expect this level of interest, if  
14    something similar happened we probably would see a  
15    similar level of interest -- to better plan for it, to  
16    better handle it.

17                  And I'll talk about it a little bit later,  
18    there's a public meeting effort.   And so some separate  
19    efforts to improve public meetings.

20                  And so we felt some of these lessons were  
21    anti to the effort.   And the thinking there is to better  
22    manage, like disruptive behaviors, and keeping people  
23    focused on the topic at hand.   Things like that to help  
24    mitigate and try to, you know bring the meeting back  
25    to the focus and --

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1                   MEMBER POWERS: If you've got some keen  
2 insights on that, we could use them here.

3                   (Laughter)

4                   MEMBER CORRADINI: Yes. We're always on  
5 task.

6                   MS. CAI: Think that.

7                   MEMBER POWERS: I'm being authentic.

8                   MS. CAI: The next one was, some of the  
9 feedback we heard both internal, external, was for in  
10 the future if panels are used, compositions to ensure  
11 a broad balanced spectrum of views directly relevant  
12 to the topic at hand.

13                   And in some of the cases there was  
14 perception that the panels that were setup were more  
15 focused on negative you know, aspects, versus  
16 supporting SONGS or restart, especially with the  
17 composition of some of the external speakers. It was  
18 skewed more heavily towards the opposition to restart  
19 and opposition to SONGS.

20                   And some of the speakers didn't  
21 necessarily stay on the technical topic or the specific  
22 topic of the meeting. So just more recognition that  
23 there should be more balance across different types of  
24 speakers and views that were presenting.

25                   MEMBER SCHULTZ: So this is more of the

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1        what, would be a good way to proceed, not the second  
2        part which is how we might want to achieve that?

3                MS. CAI: Right. But I will say when once  
4        we get into the actions, these insights I talk about  
5        and on the slide, have been incorporated in that  
6        separate effort of improving public meetings.

7                We're kind of jumping ahead but I'll just  
8        mention real quick. So there's a parallel effort  
9        there, the timing worked out really well. This was  
10       going on and then there was a parallel effort at looking  
11       how the Agency does public meetings. And what are some  
12       improvements we can make.

13               So we directly said, as both kind of  
14       proceeded, we were able to directly feed the insights  
15       from this, and you know many of these that we're  
16       discussing, entered directly into that effort. And so  
17       that other effort is capturing these points very well.

18               The next one we talked about already.  
19       Level of effort had not been anticipated in advance and  
20       the technical staff were heavily involved.

21               And many of the tasks, especially the  
22       logistical tasks, the technical staff ended up handling  
23       a lot of the logistical details. The setting up the  
24       meetings, locating venues, and gathering all the  
25       webcast and these things. So you know there could have

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1       been other staff to help with that and free them up to  
2       more do the technical work.

3               And then the staff ran into a lot of  
4       challenges due to the large crowds. And there was a  
5       lot of contentious interactions that came into play.  
6       So they had to work on it according to security and  
7       finding venues.

8               The facilitators also were challenged with  
9       the size at times, they were into the several hundreds,  
10      even a thousand, and in some cases they were faced with  
11      disruptive participants, and contentious  
12      interactions. So there was a lot going on.

13              And so some suggestions were made  
14      including requests for comments to be submitted ahead  
15      of time, so the facilitators could better manage the  
16      flow of topics and the use of time.

17              Conducting outreach in advance of meetings  
18      to better understand what people's concerns and  
19      interests were. And then better planning for  
20      overflow, security, and coordinating with the venues.

21              I should mention that ones that were wildly  
22      attended, you know, the hundreds, thousands was in  
23      California, not necessarily here at headquarters.

24              All right, also with that, a number of  
25      other communication efforts and we'll summarize some

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1 of the lessons learned in this slide there. The Agency  
2 had been in the process of planning non-public meetings  
3 with small groups of stakeholders, but SONGS announced  
4 their decommissioning decision before it actually  
5 occurred.

6 In talking to the staff, most actually  
7 expressed a lot of concern about this type of format,  
8 where only certain groups participate in a non-public  
9 setting. Because they felt this could detract from the  
10 openness and transparency that the Agency values so  
11 much.

12 And the selection process would be  
13 challenging to ensure you have fair representation and  
14 across a diverse group of stakeholders. There were a  
15 few people who did feel that it could have been  
16 beneficial to allow Agency to better understand  
17 different perspectives at a deeper level.

18 Most staff felt that if we were to pursue  
19 such meetings in the future, it really will require very  
20 careful deliberate consideration of the potential  
21 benefit and the resource impact. You really have to  
22 weigh the benefits you know, against the cost.

23 In general there was support, or very  
24 strong support for government to government meetings.  
25 There was some opposed but very positive feedback on

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1       that.

2               The blog was used several times for posting  
3       updates and information real-time. The SONGS, really  
4       the posts received a lot of interest, a lot of views  
5       a hit. So overall, staff thought it was very effective  
6       and valuable.

7               The challenge was responding to the  
8       comments. The majority of the comments received on the  
9       SONGS related posts, were negative. Often they were  
10      made by the same small group of people. And the content  
11      didn't necessarily provide a useful source of dialog  
12      on the topic. So that was a challenge, as a comment.

13              Communication plans were also a useful  
14      resource, however they were also very time consuming  
15      to keep updated. Also there was recognition that we  
16      need better awareness inside the Agency about where  
17      current comm. plans are maintained.

18              The group kept updated comm. plans but a  
19      lot of people outside the immediate communications  
20      group didn't know where to find them, didn't know where  
21      they were posted. And there's a central place where  
22      internal comm. plans are posted.

23              The external website also was found to be  
24      useful, as kind of one stop collection for background  
25      information and directing stakeholders there to find

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1 information.

2 But again, keeping the information updated  
3 was very resource intensive. It was also challenging  
4 to provide in plain language.

5 MEMBER POWERS: I'll just comment that  
6 when, at the time the Agency was working very hard on  
7 the issue of, some screen blockage. They set up on  
8 their website, a portion you could get to very easily,  
9 well flagged.

10 We had our technical data, all that  
11 corresponded to it, it was really nice. A very  
12 technical issue with a lot of interest, from  
13 non-technical people who need access to see what  
14 research was being done. It was fairly well done.

15 And you know that was one ad hoc kind of  
16 thing, largely at the behest of whoever was heading up  
17 the effort. It might be a good example when you're  
18 dealing with something, terribly technical issue which  
19 has a lot of non-technical interest.

20 MS. CAI: Yes. Thank you for that  
21 suggestion.

22 MEMBER POWERS: It's just a good example.

23 MS. CAI: Right. Okay. FOIA requests,  
24 external correspondence, the staff received a lot of  
25 FOIA requests, and external requests for information.

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1 It was very time consuming to respond to all these  
2 requests.

3 As far as FOIA is concerned, several  
4 recommendations were made, including assigning a FOIA  
5 coordinator early in the process. And having better  
6 desk top guidance documents to use.

7 And then for the Congressional  
8 correspondence, the Office of Congressional Affairs  
9 started holding, it was part way through the event, they  
10 started holding weekly calls for interest from  
11 Congressional staffers.

12 And they found that very helpful actually  
13 to cut down on the number of requests. Because you were  
14 holding these weekly, and people could just come, the  
15 staffers were coming to ask their questions. So that  
16 really kind of helped you know reduce the number of  
17 incoming requests.

18 MEMBER POWERS: It was technical briefing  
19 that they sometimes have for Congressional staffers,  
20 often are very good.

21 MS. CAI: Yes.

22 MEMBER POWERS: And I think they find them  
23 very helpful.

24 MS. CAI: Yes, so it was very positive  
25 feedback on that. Yes.

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1           The other thing that we looked at was, the  
2           licensee had setup multiple weekly calls with different  
3           levels of NRC staff and managers. So this presented  
4           some challenges for communicating clear and consistent  
5           messages.

6           So in the future, it was identified that  
7           we could have consolidated some of these calls and also  
8           we could have benefitted from having a single point of  
9           contact for coordinating all the calls for consistency.

10          And then just to make sure everybody is  
11          clear on their roles and responsibilities for these  
12          calls. So there's no, you know, crosstalk.

13          And then the last thing area we identified  
14          was the importance of effective coordination between  
15          staff and the Commission.

16          The staff we talked to, felt that  
17          Commission communications was most effective when  
18          staff was able to provide the Commission with  
19          background information, context, and additional  
20          insights related to the topic at hand. And the  
21          interactions were most successful when procedures were  
22          closely followed.

23          And then an overall theme is that a more  
24          coordinated effort to engage in more proactive  
25          communications, so earlier on, using greater variety

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1 of formats and not just the traditional public  
2 meetings, could have been very beneficial.

3 And doing efforts such as these will help  
4 us anticipate significant developments and stay ahead  
5 of emerging issues.

6 MEMBER SCHULTZ: June, have you got a  
7 handle on the resource issue that you raised earlier,  
8 yet? Or is that something you're still working on?

9 MS. CAI: That is, let's see, the next  
10 slide I think.

11 MEMBER SCHULTZ: Okay, thank you.

12 MS. CAI: Okay, so the actions. So the  
13 Number 1 action really is going back to this resource  
14 issue. Provide resources to assist technical staff  
15 when needs arise. So the Agency could really benefit  
16 from this type approach.

17 It would allow staff to be more flexible,  
18 adaptable. We could better tailor messages and  
19 strategies from the beginning. And then be able to  
20 keep our eyes on, in making adjustments as the situation  
21 develops.

22 And importantly, it would also allow  
23 technical staff to work on the, to focus on the  
24 technical work.

25 So implementation, there's two things that

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1 we're pursuing. One, is EDO's office is looking at  
2 options for leveraging existing agency communication  
3 capabilities, to be able to assist in outreach and  
4 communications when needed, on a proactive basis. And  
5 using these different variety formats.

6 Now as you know we're all under budget  
7 constraints and we are looking at this in the context  
8 of what's already available in the Agency.

9 And in addition, we at the end of last year,  
10 awarded an Agency-wide contract that can be tapped as  
11 needed for facilitation for public meeting and other  
12 outreach efforts. So if there's a need for an  
13 external, independent facilitator for a controversial  
14 meeting, we now have a contract vehicle to be able to  
15 lever it.

16 So did I answer your question?

17 MEMBER SCHULTZ: Yes, thank you.

18 MS. CAI: So we are looking into that.

19 Okay, some other activities we're working  
20 on, under Topic 7, it talks about revising Inspection  
21 Chapter 0351 to incorporate some of these lessons  
22 learned. So we have feed the communications related  
23 one into that activity. So these, some of these  
24 insights we talked about here will be feed into that  
25 revision.

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1 I mentioned, so there's been a parallel  
2 effort, separate but parallel, there was a task group  
3 formed to look at enhancing public meetings. So all  
4 the important insights from this effort have been feed  
5 into that one.

6 That group completed their initial report  
7 at the end of January, and the staff is in the process  
8 of developing an implementation plan and plan to  
9 provide that to the Commission very shortly, on how to  
10 implement some of the recommendations from the Public  
11 Meeting Task Group.

12 We're going to be looking to increase  
13 awareness and visibility of where our current comm.  
14 plans are posted, based on some of the feedback that  
15 people didn't know where to find it.

16 And there's also a number of improvements  
17 underway for FOIA responsiveness, including better  
18 working with the questioners to narrow down the scope  
19 of the request, better procedures for handling very  
20 larger crowds, better coordination, communication  
21 among different FOIA counterparts.

22 Also there was an Agency Working Group that  
23 was established back in 2013 to look at FOIA, the  
24 Truman-sensitive information, that's subject to FOIA  
25 requests. And that Working Group identified some

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1 recommendations and many of those are underway as well.  
2 So there's a lot going on there.

3 And that concludes my section.

4 MR. DIAZ-CASTILLO: Good afternoon,  
5 everybody. My name is Yamir Diaz-Castillo. And I'm  
6 a --

7 CHAIRMAN RICCARDELLA: You know, I think,  
8 excuse me for a second. You know we're doing real well  
9 on schedule, so I'm thinking maybe calling a break now  
10 for about ten minutes. So let's be back at five minute  
11 to 3:00.

12 (Whereupon, the above-entitled matter  
13 went off the record at 2:44 p.m. and resumed at 2:56  
14 p.m.)

15 CHAIRMAN RICCARDELLA: Okay, I assume  
16 some of the other Members are going to trickle in. And  
17 so why don't we get started, Yamir?

18 MR. DIAZ-CASTILLO: Sure. Good  
19 afternoon. My name is Yamir Diaz-Castillo. I am a  
20 Reactor Operations Engineer in the Mechanical Vendor  
21 Inspection Branch in the Office of Reactors. And I was  
22 the team leader for the Vendor Oversight Working Group  
23 that was formed in response to the SONGS lessons  
24 learned.

25 Prior to SONGS lessons learned we had a

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1 review of the NRC's Vendor Inspection Program.  
2 Providing recommendations, if applicable, on vendor  
3 oversight enhancements.

4 It's important to note that the licensees  
5 are ultimately responsible for the safety of the  
6 facilities licensed by the NRC. This includes  
7 inspection oversight of its vendors.

8 The NRC's Vendor Inspection Program  
9 verifies that a new reactor applicants and existing  
10 nuclear power plants that exist are fulfilling their  
11 regulatory obligations with respect to providing  
12 effective oversight of the supply chain.

13 It's also important to note that the  
14 current NRC's Vendor Inspection Program is not a  
15 substitute for licensee oversight of vendors, nor does  
16 it relieve the licensee of his responsibility for  
17 vendor oversight.

18 Appropriately, the EDO's tasking memo  
19 asked us to consider these two specific items. Did the  
20 SONGS steam generator event expose any new or unique  
21 vendor lessons that the NRC's Vendor Inspection Program  
22 should take into account?

23 And second, should the NRC's Vendor  
24 Inspection Program be more focused on design aspects  
25 of the major plant modifications at the vendor

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1 facilities?

2 Next slide please. As a result, the  
3 Vendor Oversight Working Group was formed to provide  
4 recommendations on vendor oversight enhancements.  
5 The Working Group was composed of staff from Regions  
6 II, Region IV, as well as from NRO and NRR.

7 Our review approach included the detailed  
8 review of the current Vendor Inspection Program,  
9 including the existing policy and practices, as well  
10 as interviews with several senior NRC staff.

11 Next slide please. In response to the  
12 first question from the ECO's tasking memo, regarding  
13 whether the SONGS steam generator event exposed any  
14 new, unique vendor lessons the NRC's Vendor Inspection  
15 Program should take into account?

16 The Working Group identified two  
17 attributes of large component design and manufacture  
18 that were factors in the San Onofre event, and that  
19 should be considered when selecting vendor for  
20 inspection.

21  
22 These attributes are not new or unique and  
23 neither of the attributes individually led to the  
24 design issues that resulted in the steam generator tube  
25 degradation at San Onofre.

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1                   Taken together though, they contributed to  
2                   the licensee and the vendor failing to identify and  
3                   correct weaknesses in the design before the degradation  
4                   occurred.

5                   These attributes will be considered in the  
6                   selection of a Vendor Inspection and will weigh in the  
7                   determination point of our NRC Vendor Inspection  
8                   priority.

9                   The first attribute was the use of the  
10                  FIT-III software by MHI, for the design of the steam  
11                  generators. The software had not been accepted as an  
12                  industry standard or approved by a regulatory body.

13                  The second attribute although not specific  
14                  to vendor inspection, was the lack of detail in the  
15                  final safety analysis report concerning the design  
16                  characteristics, functions, and acceptance criteria  
17                  of the various components within the SONGS steam  
18                  generators.

19                  Since each vendor has established the  
20                  design criteria and this criteria are generally  
21                  considered or treated as proprietary information,  
22                  minimal detail was described.

23                  The review guidelines developed, as  
24                  proposed by the recommendation for Topic 3 that Emmett  
25                  described, is intended to result in the release of

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1 vendor information being provided to the FSAR.

2 In response to the second question from the  
3 EDO's tasking memo regarding whether the NRC's Vendor  
4 Inspection Program should be more focused on the design  
5 aspects of a mega-plant modification?

6 The Working Group established, determined  
7 that even though the design worthy aspects of vendor  
8 issues of the magnitude identified at San Onofre are  
9 infrequent, the Working Group is sending a yes. The  
10 NRC's Vendor Inspection Program should be more focused  
11 on the design aspects of mega-plant modifications.

12 Consequently as a result of this review,  
13 the Working Group has identified two recommendations  
14 for vendor oversight enhancements to the existing NRC's  
15 Vendor Inspection Program that reflect the lessons  
16 learned from the SONGS tube event.

17 The first recommendation is to perform  
18 pilot design-aspect inspections at vendor facilities  
19 during the fabrication process for safety-related  
20 major plant modifications.

21 The NRC staff will evaluate the results  
22 from the inspections to determine if such inspection  
23 activities are warranted on a continuing basis. The  
24 initial inspections should use existing inspection  
25 procedures such as Inspection Procedure 37805 which is

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1 the Engineering Design Verification Inspections.

2 If a decision is made by management to  
3 continue, the existing procedure may need to be  
4 modified or a new procedures may need to be developed  
5 using lessons learned from the pilot and Design Aspect  
6 Vendor Inspections.

7 In support of the first recommendation,  
8 the second recommendation is to develop and pilot, a  
9 screening and evaluation processes to determine if a  
10 plant change is a major plant modification, and whether  
11 such a modification should be subject to an NRC Vendor  
12 Inspection.

13 Specifically in coordination with NRR, the  
14 regions and NRO, and also taking, we'll take into  
15 account Industry input and comments. The staff will  
16 develop identification areas and screening criteria to  
17 determining when a plant change can be considered to  
18 be a major plant modification.

19 MEMBER BLEY: Can I ask you a question?

20 MR. DIAZ-CASTILLO: Sure.

21 MEMBER BLEY: Earlier Doctor Powers, was  
22 talking of first of a kind engineering and brought up  
23 this idea that maybe it's not just first of a kind across  
24 an industry, but first of a kind for a particular  
25 manufacturer. And does that enter into your thinking

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1 at all? or have you talked about that concept before?

2 MR. DIAZ-CASTILLO: Yes, actually we  
3 clearly have a Vendor Inspection Program, this is what  
4 we used to perform vendor inspections. And one of the  
5 actions that we're taking is that, evaluate the  
6 experience that the manufacturing has with the  
7 component that they're manufacturing.

8 So that will come into play when we move  
9 forward with select vendors for inspection.

10 MEMBER BLEY: So both their experience and  
11 their experience with a particular product?

12 MR. DIAZ-CASTILLO: Right.

13 MEMBER BLEY: Thank you.

14 MR. ROACH: If I could add in, this is Ed  
15 Roach. I'm the Chief of the Mechanical Vendor  
16 Inspection Branch. There's at least two example  
17 within the new reactor realm, of some of the first of  
18 kind technology developed.

19 SPX Corporation developed squib valves  
20 under license to Westinghouse. And I know you've heard  
21 about those. Those basically were an up-sizing of  
22 traditional technology, but several challenges  
23 occurred in the course of that up-sizing that needed  
24 to be addressed and continued testing and development.

25 And then with the reactor coolant pump, if

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1 anyone has a Navy nuclear background, they would  
2 remember the type of pump used on submarines. However,  
3 up-sizing those has created some other challenges. So  
4 in our VIP, we used first of a kind development and  
5 technology as one of the weighting factors to evaluate  
6 whether we go out and look at that.

7 MEMBER BLEY: I'm not sure if NRC can bound  
8 it or not, but certainly a purchaser could. But at what  
9 point, what criteria would lean you toward thinking  
10 testing is required, rather than just a little more  
11 inspection and close follow-up?

12 MR. ROACH: Quite a few of the key  
13 components of, I'll take valves for example, if they're  
14 committed to ASME, there would be a QME1 test required.  
15 We have gone and observed those tests on squib valves  
16 as well as the nozzle check valves which are also used  
17 in the AP1000.

18 So, if as need testing, that may be a good  
19 indicator of when we would go observe that technology,  
20 because usually it's done on a prototype type valve.

21 MEMBER REMPE: I have a couple of  
22 questions. Correct me if I'm wrong, but what I think  
23 I read about this was these two attributes that were  
24 identified were a part of a process that was a randomly  
25 select spot check type of thing. It just happened it

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1       picked that item to go inspect.

2                   And it wasn't something where it was a  
3       focused spot check, where you would say now, if you're  
4       going to something where the vendor is going beyond  
5       their experience base, or the component is something  
6       that's for new conditions. There's not a process in  
7       place when a licensee buys something to decide smartly  
8       what NRC is checking. And is that going to be changed?

9                   Or is that still going to be a spot check  
10      for Appendix B procurements?

11                  And the second question I have is, when you  
12      identified these two attributes with this particular  
13      vendor. It wasn't the first time that they had  
14      designed, fabricated, and installed a steam generator.  
15      When you see something like this, does it trigger  
16      something where you go and check other? I mean they  
17      used new software that hadn't been approved, but will  
18      they do that the earlier steam generator that they  
19      designed and installed?

20                  MR. ROACH: I think since I was  
21      supervising the individuals who participated in the MHI  
22      inspections and the SONGS AIT also.

23                  My sense is that to your first question,  
24      these attributes were attributes that we did not take  
25      into account prior in our vendor inspection protocol

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1 or scoring. Because we hadn't seen it with some of the  
2 new reactor vendors.

3 This was an operating plant vendor, and up  
4 until about 2007, most operating plant vendors from  
5 about '99, '98 to 2007 were done on a reactive basis.  
6 And there wasn't a systematic inspection of operating  
7 plant vendors.

8 So when the New Reactors Program came in,  
9 they developed a more robust program which was a little  
10 more proactive since we do international. Components  
11 were being manufactured that we would go out and look  
12 at some of those also.

13 So these two attributes, were pieces that  
14 we drew out of the SONGS lessons learned, in that three  
15 were programs that people used that didn't receive  
16 industry acceptance. And we need to ask that question  
17 in the course of our reviews of all the vendors we deal  
18 with, just to make sure.

19 MEMBER REMPE: So maybe I'm not  
20 understanding what I read, but Appendix, this was a  
21 quality check on the procurement of a, this wasn't a  
22 50.59 Item that got, that they did the review. They  
23 were then because of the spot checking, a random  
24 selected spot check?

25 Or was there any sort of Appendix B check

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1 of quality?

2 MR. ROACH: Maybe I'm confused. Who went  
3 in and did a spot check? The Vendor Inspection Branch?

4 MEMBER REMPE: The NRC went in, but it was  
5 not something, the NRC does not inspect new  
6 procurements, regularly. It's just a random selection  
7 that they will do periodically. And that's how these  
8 two attributes got caught, I thought.

9 MR. ROACH: Actually these two came out  
10 of, I think a combination of the AIT, because we members  
11 of the AIT on our Working Group, and also in our lessons  
12 learned from the MHI vendor inspection.

13 MEMBER REMPE: But they were originally  
14 documented wasn't it because of a spot check. They did  
15 it back, and the augmented team caught it, but it was  
16 originally documented wasn't it, they just did a random  
17 check on the procurement?

18 MS. SIGMON: I think there was, there's a  
19 couple of different spots in the report where we talk  
20 about sampling. And this particularly in the 59  
21 Section on Topic 1, they talk about how when they  
22 initially did the steam generator replacement, we did  
23 a modification inspection.

24 And our inspection process, under the  
25 procurement side process, is to perform samples. So

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1 your modification inspection will take a sampling of  
2 the modifications and look at 50.59 evaluations that  
3 were done.

4 And usually there aren't that many 50.59  
5 complete evaluations, that will look all of them, but  
6 they'll only take a sampling with 50-59 screening.

7 So I think that's where it's at.

8 MEMBER REMPE: That's the issue I'm trying  
9 to get to, because I think it ought to be a smart  
10 sampling. And is that going to happen in the future,  
11 where you say --

12 MS. SIGMON: Well in this case, you know,  
13 in this case modifications inspections generally look  
14 at all of the 50-59 evaluations that were completed,  
15 then do a sampling of the screenings. But it's  
16 certainly a smart sampling process.

17 Where they say where, what were the safe,  
18 significant modifications? What do we need to go  
19 gather more data? And then as you're reviewing the  
20 evaluations, do we need to, you know, is there other  
21 questions being raised here that want us want to look  
22 deeper? But that was separate from the vendor aspect  
23 of it.

24 MR. ROACH: Yes, that's right.

25 MEMBER REMPE: Okay, right. So that's

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1 where I'm trying to go to. We've talked about first  
2 of a kind. We've talked about this vendor experience.  
3 And it seems to me that those ought to be triggers so  
4 that it's not a random selection anymore.

5 MS. SIGMON: And I think that's part of  
6 what we're working on here. Where Emmett and Yamir  
7 were talking about, was incorporating you know, the  
8 vendor inspection has to know that these things are  
9 happening.

10 And coordination between the Region and  
11 NRR to say, hey, there's this kind of modification  
12 that's going to be happening. Here's the flag to, you  
13 know, the Vendor Inspection Programs. This is  
14 something they might need to weigh, and whether they  
15 need to --

16 MEMBER REMPE: The problem's been  
17 recognized and it will be addressed is what I'm hearing.

18 MS. SIGMON: And so what Ed was saying was  
19 that prior to you know, the new reactor work, the Vendor  
20 Inspections had been reactive. So unless there was a  
21 problem, the Vendor Inspection wasn't going --

22 (Simultaneous speaking)

23 MEMBER REMPE: So are we going to be  
24 instructing more proactive?

25 MS. SIGMON: That's what this program is

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1 about.

2 MEMBER REMPE: And then the other thing is  
3 when you saw that, with this particular vendor, and it's  
4 not the first steam generator that they'd ever designed  
5 and up fabricated and installed. Is there a trigger  
6 to say, oh, we ought to go check and see if there's any  
7 issues? I mean how does the NRC function when they see  
8 something like that?

9 MS. SIGMON: I think Emmett could probably  
10 speak more to that, but there was a you know, who, what  
11 else had Mitsubishi done?

12 MR. MCINTYRE: Maybe I can help you out  
13 here. My name is Rich McIntyre and I was the Inspection  
14 Team Lead at the Inspection at MHI in Kobe and on also  
15 the MNES in Arlington, Virginia.

16 But a little history on the MHI design. We  
17 had done a vendor, a routine vendor inspection back in  
18 2008, to looking at the fabrication of the steam  
19 generators. We did not look at design. And that's  
20 what, you know, a fallout of this panel is to saying,  
21 design into the future is something we could be or would  
22 be looking at.

23 So we looked at the fabrication --

24 MEMBER REMPE: The Fort Calhoun steam  
25 generator was, quote. Does the Fort Calhoun steam

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1 generator was designed by Mitsubishi as well as  
2 fabricated and installed?

3 MR. MCINTYRE: Yes, it was. And that was  
4 probably, that was an ongoing there, during that  
5 inspection as it's a sample, we looked at the  
6 fabrication for the SONGS steam generators as well as  
7 some of the work they were doing for new reactors.

8 This was that time when we had just  
9 transitioned into the Office of New Reactors, so we were  
10 looking at what they were doing for new reactors as well  
11 as the San Onofre steam generators.

12 But we did not look at, you know, we did  
13 not look at the design aspect. But the utilities, San  
14 Onofre, Fort Calhoun, South Texas, they had done a  
15 number of supplier oversight of design activities at  
16 MHI over the years.

17 So that's it, we weren't doing the design,  
18 but as Yamir said, it's the responsibility of the  
19 licensees and in their meeting of Criterion VII, they  
20 were doing the oversight of the design activities.

21 Now, did they catch that? Obviously they  
22 didn't. Neither did MHI in supplying three other steam  
23 generators in Japan as well as San Onofre.

24 MEMBER REMPE: So I guess, again I'm not  
25 trying to focus as Dick mentioned earlier, just on steam

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1 generators or the 50.59 process. There's a lot of  
2 procurements that are done, and again I'm a lab rat,  
3 but doesn't Appendix B for the NRC, isn't it supposed  
4 to deal with quality procurements and does that come  
5 into play?

6 MR. MCINTYRE: No.

7 MEMBER REMPE: Or what does come into play  
8 with design, of a vendor design effort? And is there  
9 some way to --

10 MR. MCINTYRE: Are we talking design, or  
11 inspection now? Yes, Appendix is all, is from design,  
12 fabrication, construction, all the quality aspects.

13 MEMBER REMPE: Right. And so does NRC  
14 inspect on some of that design, on the procurements that  
15 designed it, is there any sort of random selection  
16 process or sampling process? Or exactly how is that  
17 enforced?

18 MR. MCINTYRE: Yes, we do. We do on a  
19 regular basis. We just did, like I was on one recently,  
20 Ukraine nuclear valves in Chicago. And we looked at  
21 the design aspect. All I'm saying is that for these  
22 steam generators we did not look from a vendor  
23 inspection perspective at design, at MHI. That wasn't  
24 something we looked at.

25 CHAIRMAN RICCARDELLA: Can I make a

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1 comment. It seems like the focus of the actions and  
2 response to Topic 8, have to do with direct oversight  
3 of the vendor by the NRC. But ultimate responsibility  
4 for compliance with Appendix B, lies with the licensee.

5 MR. MCINTYRE: Correct.

6 CHAIRMAN RICCARDELLA: And shouldn't the  
7 Agency be doing something to confirm that the licensee  
8 has properly qualified the vendor? And that he's  
9 monitoring the implementation of the Vendor QA Program  
10 during the design process? I think that was the big  
11 short coming.

12 MR. DIAZ-CASTILLO: That's currently the  
13 purposes when we go out and do inspections. Is that  
14 we verify that the licensee is actually monitoring his  
15 vendors. That's what we do. We issue either a  
16 violations, like an instance, in a Part 21, or we issue  
17 Notices of Non-conformances like in Appendix B.

18 So the purpose is when we go out to this  
19 vendor inspection, is to verify that the licensee is  
20 actually doing his job, by vendor oversight. And when  
21 we usually find this, like in Appendix B, Notice of  
22 Violation, or Notice of Non-conformances that's when  
23 we can tell whether licensees are doing an effective  
24 job.

25 CHAIRMAN RICCARDELLA: But you go to the

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1 vendor and you're independently looking at their QA  
2 Program.

3 MR. DIAZ-CASTILLO: Right.

4 CHAIRMAN RICCARDELLA: But shouldn't  
5 there be some level of oversight of the licensee to make  
6 sure that they have properly qualified a vendor?

7 MR. DIAZ-CASTILLO: Well --

8 CHAIRMAN RICCARDELLA: My understanding  
9 is that this vendor just did not have an adequate  
10 Appendix B, Quality Assurance Program.

11 MR. DIAZ-CASTILLO: We did, like I already  
12 said, we did a vendor inspection of MHI in 2008. And  
13 we did verify their QA Program. And the evidence that  
14 we verified, we verified when we went then, adequately.

15 MEMBER SCHULTZ: But you weren't looking  
16 at design.

17 CHAIRMAN RICCARDELLA: You weren't  
18 looking at design is what I heard.

19 MR. DIAZ-CASTILLO: We were not looking at  
20 design, because when we go do, we don't inspect the 18  
21 criteria of Appendix B, when we go on inspection, we  
22 do a sample of the criteria.

23 And in this case, with that inspection, we  
24 did not verify the specific design implementation, so.

25 CHAIRMAN RICCARDELLA: Your horse was

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1 already out of the barn in 2008, wasn't it?

2 MR. ROACH: And to address I guess, the  
3 vendor inspection is now a center of expertise within  
4 NRO, and so we're working closely with NRR in a couple  
5 of phases. One, is communicate. When we find vendors  
6 who haven't received adequate oversight, we notify the  
7 project managers for the affected sites, with a copy  
8 of the inspection report, or even call them.

9 For instance, we've had one where a crane  
10 equipment that wasn't, didn't meet specifications.  
11 Listened to over five of the operations and the project  
12 manager, and NRR immediately because we found that out.

13 So we do work closely with them to notify  
14 them of licensees who don't adequately implement vendor  
15 oversight when we find it.

16 So in this case, this was predating new  
17 reactors space, and there was a time when, I think after  
18 the transition to ROP, the value of vendor inspections  
19 on Quality Assurance Programs with vendors was maybe  
20 not as effective, or viewed as effective as it could  
21 be.

22 So I just, that's just the past history and  
23 so I think where we are today, is close coordination  
24 with NRR, and looking for a way to screen major  
25 modification whether it be a steam generator, digital

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1 I&C conversion, some other type of plant modification  
2 that's going to require a vendor construct ability or  
3 some vendor construction under Appendix B. We want to  
4 see if that screens in, then we want to go look at it.  
5 That's our ultimate goal out these recommendations.

6 MEMBER REMPE: So maybe I didn't  
7 understand, you had the right answer at first, because  
8 I'm slow. But you're saying that because of the new  
9 reactors, that you are now doing more focused Appendix  
10 B inspections for design?

11 MR. ROACH: Yes. Appendix B is  
12 incorporated in every one of our inspections. Unless  
13 we're going for, specifically if we go down to a company  
14 called NTS, in Huntsville, it does specific flow tests,  
15 seismic testing, or EQ testing.

16 We may focus on design control, test  
17 control, non-conformances, corrective actions. You  
18 know, aspects of Appendix B, because they're the ones  
19 that really fit. We don't do an entire program because  
20 we've been to that vendor probably a half a dozen times  
21 in the last two years, and looked at most aspects of  
22 their Quality Assurance Program.

23 MEMBER SKILLMAN: Let me pile on with  
24 Doctor Rempe, there are 18 points in Appendix B. You  
25 just mentioned a couple at this facility in Huntsville.

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1 But you didn't mention MT&E.

2 You can't have a good test program unless  
3 you have good instrumentation, and good data, and good  
4 output. And so I'm kind of where I was when we started  
5 this meeting.

6 MR. ROACH: Okay.

7 MEMBER SKILLMAN: Maybe it was the change  
8 between South and ROP, but there was a day in this  
9 industry after 10 CFR Part 50, Appendix B, was born,  
10 that everybody who was involved in design and  
11 operations knew the power of a violation.

12 And there were people that were assigned  
13 to make sure that every facet of Appendix B, including  
14 design control, including ensuring that the Vendor's  
15 Design Program and the Vendor's QA program were  
16 effective. It was highly important.

17 The almost 48 years in this industry, I  
18 have seen us move from a time when there was no Appendix  
19 B, to a new Appendix B with a huge amount of compliance,  
20 not only the letter, but the intent of the regulation.  
21 And then a slow move towards cherry picking, only those  
22 pieces that seem to make sense.

23 And when we've done that, we've lost  
24 something. The whole collage of Appendix B is a suite  
25 that needs to be enforced. And I would offer at least

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1 my years of consulting, there are times when industry  
2 is gaming to not comply.

3 I would also offer, that there's a wide  
4 variation in the degree to which a utility will fess  
5 up on an evaluation, under 59. And some utilities are  
6 very rigorous and thorough in using that as a screening  
7 criteria for whether or not a license amendment request  
8 is necessary.

9 And others treat 50.59 like it's a  
10 modification process. They don't fully understand or  
11 at least the evidence suggests, they don't understand  
12 what that regulation really is all about.

13 So I just want to kind of get where Joy was,  
14 and perhaps where Dr. Riccardella is, I think we've lost  
15 something in the industry. And that's why I asked in  
16 the early part of this, if somehow we can translate the  
17 San Onofre lessons to a higher level?

18 So that the industry really is being  
19 protected by regulation that they don't care for, but  
20 it was one that can really protect them.

21 MR. ROACH: Well, the first thing I'd say  
22 is that I did not mention MT&E, but MT&E is essential  
23 to any test-in-full program. And we evaluate that.  
24 We make sure they document their calibration, the right  
25 serial numbers, and they're calibrated to fire. So

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1 I'll spot you that.

2 MR. DIAZ-CASTILLO: Yes, because --

3 MR. ROACH: I can't imagine that you would  
4 do an inspection without that.

5 MEMBER SKILLMAN: I understand that.

6 MR. ROACH: And as far as your discussion  
7 as to the way the industry has possibly migrated, or  
8 their view of Appendix B has, I can't disagree with that  
9 might be the case.

10 I mean, I left the industry in 2006 so I  
11 would say that at the time I left, I understood the  
12 purpose of Appendix B, Part 21, and why we followed the  
13 regulations to the letter of the law. Because our  
14 license depended on it.

15 In the vendor world, there are subsets of  
16 the licensee and they have to follow the licensee's  
17 purchase orders. And when we, we do sample vendors.  
18 And I mean we go to vendors based on a prioritization,  
19 we can't, we don't have the resources to do every vendor  
20 who's supplying safety related equipment, components,  
21 parts, services.

22 But we do sample them. And there have been  
23 times when we've gone in to look at most of the 18  
24 criteria, and come away with an Appendix, a Criteria  
25 I finding. Because their organization didn't support

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1 all the other aspects of, and they had a Quality Program  
2 that was ineffective.

3 And so we try to look at all of those and  
4 at the same time look at their implementation of the  
5 QA Program and the fabrication of controls. Do we get  
6 it right every time? I can't guarantee that.

7 And in retrospect, whether we would have  
8 found this interface problem at MHI? I don't know. We  
9 would have had to dig really deep, but it was clear that  
10 some individuals within the staff recognized that the  
11 void fraction was different. And that keyed us looking  
12 for things.

13 So our lesson learned is that, if there's  
14 something that's not industry standard, we should be  
15 digging into it. And we should be trying to understand  
16 it, and get the right technical resources with us to  
17 do that.

18 To the other end, Appendix B, I think  
19 that's an Agency action and at a much higher level to  
20 reinforce to all the licensees, that Appendix B is  
21 necessary attribute of operating a nuclear power plant.

22 And I think INPO recently came out with  
23 some guidance or information that, you know, I'm just  
24 hearsay, I've read it once, that indicated that they  
25 recognized there's been limitations in some of the

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1 engineering and vendor oversight the licensees have  
2 provided.

3 MEMBER POWERS: Just recently came and  
4 talked to Tulsa in fact, over that issue.

5 MR. MCINTYRE: Sure you bet. This Rich  
6 McIntyre again, and you know I've been performing  
7 vendor inspections here at the NRC 30 years. So I'll  
8 tell you that the importance of Appendix B has not gone  
9 away.

10 I mean from 1984 to 2015, we had a time  
11 period there where we did less vendor inspections than  
12 we had, say in my first 15 years, but we always go out  
13 and use Appendix B criteria as our inspection  
14 guideline.

15 Whether we go to a valve manufacturer and  
16 we're looking at you know, since we're sampling, we'll  
17 choose criteria that are applicable to the scope of  
18 supply when we're there at that vendor. If they're  
19 designing and manufacturing, we'll look at design,  
20 we'll look at welding, NDE, and inspection tests, and  
21 we always look at calibration when we're looking at  
22 inspection tests.

23 So just to let, you could just say that  
24 we're always looking at calibration when they're doing  
25 any inspection and test activities. That is never not

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1 looked at during a vendor inspection where operational  
2 exams are going on.

3 So it's just that in once new reactors was  
4 stood up in 2007, we ramped the vendor inspection back  
5 up. So we had a leaner time there where we really  
6 weren't doing routine vendor inspections. We weren't,  
7 we were doing reactive inspections for a number of  
8 years.

9 And that's, and it is what it is. That's  
10 the way it was. We didn't ramp up. Now we've gone from  
11 new reactors and now we're doing the whole gamut where  
12 we're doing operational. So we're doing operating  
13 reactors, and new reactors on a regular basis.

14 So hopefully, we'll get back to what you  
15 remember, and what I remember when we had a you know,  
16 we had a full ongoing Vendor Inspection Program before  
17 we went into that lull. Thank you.

18 MEMBER SCHULTZ: Yamir, I'm slowly  
19 getting perhaps where I need to be with this, but on  
20 your Slide 24, I've still got some confusion. And  
21 that's the two attributes that should be considered  
22 when selecting vendor for inspection.

23 And then I've got these two bullets, and  
24 the first one I think I understand. I'm not sure how  
25 you find this out. Or I'm guessing that many designers

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1 have this characteristic. They may be using  
2 proprietary software that has not been reviewed by a  
3 regulatory body, might not be an industry standard.

4 Most I think, might have that feature. So  
5 I thought we would probably be trying to differentiate  
6 people that would be on the list, or be prone to  
7 inspection and those that would not. I'm not sure how  
8 this differentiates?

9 If I were looking at this I'd be very  
10 interested to know, of course if they have that kind  
11 of software. And if they do, then has the project been  
12 part of a quality program? Is it's software quality  
13 assured? And so forth, I mean that's kind of getting  
14 into it, but again I, for the purposes here, for  
15 selecting vendor for inspection, I'm not sure how that  
16 works.

17 The second one, I'm even a little more lost  
18 on. How does one determine analytical methods to use  
19 to develop, lacked rigorous acceptance criteria? Is  
20 this meaning that somehow one gets this information and  
21 then that vendor gets a mark that they don't have  
22 rigorous acceptance criteria that they're using for  
23 design A, B, and C? And we're looking at designs D?  
24 I'm not sure how this is workable.

25 MR. DIAZ-CASTILLO: Do you want to speak?

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1 MR. ROACH: I'm sorry if I dominate, but  
2 I think these two attributes are two additional  
3 attributes to what we currently use in our Vendor  
4 Inspection Program prioritization process.

5 And of those ones we currently use, it's  
6 the number of licensees who use them, it's the type of  
7 complex components they're manufacturing, it's whether  
8 they're involved in testing. There's a whole litany  
9 of them that we use as a matter to essentially develop  
10 a weighting factor.

11 And then where that, so the mid-point might  
12 be 20 points out of 42, so we tend to as thing go above  
13 that, we look at them, and in some cases people below  
14 that, we might go look at them because they're doing  
15 a one all special, first of a kind, squib valve flow  
16 test.

17 MEMBER SCHULTZ: Right.

18 MR. ROACH: So these two were two we're  
19 trying to figure out how to fit into our current Vendor  
20 Inspection Program. The first one, software, we do a  
21 lot of human intelligence where we call the vendor's  
22 quality manager, you know, about a month out, month and  
23 a half out, saying hey, we want to come and look at you.

24 We understand you're doing this testing  
25 you know, what software do you use, what equipment are

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1       you using, where's your facility? And we have to layout  
2       the ground work for our inspection.

3               The second one I think comes from the fact,  
4       of when we go to the design basis, whether it's in the  
5       AP1000 DCD, whether it's in the FSAR for that plant,  
6       whether it's in some other technical guide that was  
7       provided to the NRC, we started digging through that  
8       for the technical requirements that really govern this  
9       component.

10              MEMBER SCHULTZ: Right.

11              MR. ROACH: And I think in the case of the  
12       San Onofre, the PSR, as in many of the plants of that  
13       generation, really was absent a lot of detail. And the  
14       steam generator's is a steam generator that has X number  
15       of tubes. It's tube sheet is 12 inches thick, you know,  
16       it's recirculation design, it has a flow rate of x  
17       number of pounds mass.

18              And that's really all that was in there,  
19       was maybe a one sheet like that. So technical details  
20       about what the void fracture, you know, we might have  
21       got them once you carry over factors, things like that.  
22       So we have to dig and develop to find what the details  
23       are.

24              And so we relook at their purchase order,  
25       you know, we try to see what they, is there an ASME

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1 standard incorporated, is there some IEEE standard?  
2 Is there something else that they invoke as part of this  
3 purchasing and fabrication requirement.

4 There's a lot of human intelligence  
5 required.

6 MEMBER BALLINGER: You're saying you're  
7 being detectives. Because they're not likely to tell  
8 you the answer to those two questions.

9 MEMBER SCHULTZ: Right, I have a better  
10 appreciation as you described it.

11 MR. ROACH: And there have been cases  
12 recently, where we've actually had to perform what we  
13 call, free inspection visits, to get documentation.

14 MEMBER SCHULTZ: Sure.

15 MR. ROACH: Prominently in the industry as  
16 a diagram.

17 (Laughter)

18 MEMBER SCHULTZ: Well it begins to build  
19 and makes some sense.

20 MR. LUBINSKI: John Lubinski from NRR, and  
21 you know, and responsively you said being the detective  
22 if you will. One thing to point out is we're talking  
23 about the Vendor Oversight Program. It's really an  
24 accompaniment to the current Licensee Oversight  
25 Program. So where do we get this information about

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1 questions?

2 It comes from our current inspection  
3 programs. We have, you know, the residents in our  
4 special inspection teams that go out. And that's where  
5 they're asking the questions, and are seeing this.  
6 They're looking at what the licensee implementation is  
7 of their Appendix B Programs.

8 What is the licensee's oversight of their  
9 vendors? And then they're using that information to  
10 communicate with the folks here at headquarters from  
11 the Vendor Oversight, to say, we think this is an area  
12 where we want you to look at the vendor. But it also  
13 compliments is the licensee doing their job in looking  
14 at the vendor?

15 Because many of the findings are not just  
16 that the vendor did something inadequate, but did the  
17 licensee do something inadequate? So this is not meant  
18 to replace what we do in our current program. What's  
19 required of the licensees?

20 Because the licensees still have those  
21 requirements and our typical inspection programming,  
22 including our residents, as well as our Regional staff  
23 going out, are looking at these issues as well.

24 And when the response was about many of the  
25 operating reactor oversight programs, as far as looking

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1 at vendor, looking at the vendor as being reactive as  
2 Rich said. Those reactive based on either events or  
3 operating experience but it was also through inquires  
4 of our inspection programs where they say, you know,  
5 this is an area ripe for looking at vendor oversight.

6 So that's the other key to it. So when you  
7 say, you know, being a bit of a detective, it's the other  
8 inspectors at the Regions that are the detectives, in  
9 saying is this an area that needs additional oversight?

10 MEMBER BALLINGER: But that implies that  
11 those Regional folks have got the expertise and  
12 background to be able to notice a particular area that  
13 needs looking at.

14 MR. LUBINSKI: From that standpoint, when  
15 you're looking at the resident who know all the major  
16 modifications that are going on, they're looking at  
17 50.59's modifications as well as those coming to  
18 headquarters. And being able to look and have the  
19 questions open. You know, did the licensee go out and  
20 do an inspection at the vendor?

21 They have access to those records. Do  
22 they have enough detail to say, that they're an Appendix  
23 B expert? No they may not have that detail, but they  
24 know enough to question. And they don't have to  
25 necessarily do the inspection, but they call the guys

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1 at headquarters and say, here's what I'm seeing. Is  
2 this right or not?

3 So that gives the indication of should we  
4 do an inspection, shall we not. So they always have  
5 had access to the experts at headquarters to ask those  
6 questions.

7 MS. KULESA: That's what I was going to  
8 say, is that we routinely get that. We work for John  
9 Lubinski, in the Division of Engineering, and we  
10 routinely get outreach from either the inspectors or  
11 the Regions. They will call us to offer their  
12 technical expertise.

13 MEMBER SCHULTZ: That was a good  
14 discussion, that helped a lot.

15 MR. DIAZ-CASTILLO: All right. Where was  
16 I. Sorry.

17 (Laughter)

18 MR. DIAZ-CASTILLO: All right, so we were  
19 mentioning the actions, the staff will develop  
20 identification, guidelines and screening criteria to  
21 determine when the plan changes are a major  
22 modification. And this effort is currently led by NRR  
23 and the Regions.

24 Subsequently, the staff will develop a  
25 screening criteria to determine whether a major plant

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1 modification -- I mean just because a major mod,  
2 immediately we had to do vendor inspection -- we have  
3 to evaluate whether that major modification should be  
4 subject to a vendor inspection. And as well, this  
5 effort is led by NRR and Regions with support from NRO.

6 MS. SIGMON: All right. Thank you. Just  
7 to review, the overall conclusion of the lessons  
8 learned review, of steam generator tube degradation at  
9 San Onofre, is that they identified that NRC processes  
10 and programs were fundamentally sound and they worked  
11 as intended to ensure health and safety.

12 The review did identify some actions that  
13 could increase the effectiveness of some of these  
14 processes. These actions will be tracked through NRR.  
15 Many of them are already in progress, especially for  
16 actions that take place within the defined process,  
17 such as changes to the inspection manual or generic  
18 communication.

19 A project manager has been assigned to  
20 manage these actions to closure, and status free things  
21 on the product toward completion of these actions will  
22 be conducted as needed, for staff management,  
23 Commission PAs or closure as possible.

24 CHAIRMAN RICCARDELLA: Okay.

25 (Off the record comments)

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1 CHAIRMAN RICCARDELLA: We're opening the  
2 line up if we have any Members out there, the public  
3 or others who would like to comment or -- be opening  
4 the line in a minute. It's open now, would somebody  
5 please identify themselves just to make sure we can hear  
6 you?

7 MR. HOFFMAN: This is Ace Hoffman.

8 CHAIRMAN RICCARDELLA: Okay. Do you have  
9 any comments?

10 MR. HOFFMAN: Just a few.

11 CHAIRMAN RICCARDELLA: Okay.

12 MR. HOFFMAN: I'd like to start with just  
13 saying that the phrase, smart sampling, it sounds more  
14 like an oxymoron than anything I've ever heard in my  
15 life. I heard at the very beginning some disparaging  
16 remarks about the information of what the public would  
17 understand about what was I believe, fluid elastic  
18 instability. I believe the action word is fluid,  
19 elastic instability.

20 CHAIRMAN RICCARDELLA: Yes.

21 MR. HOFFMAN: Okay, so despite hard to  
22 understand something, and the key information is kept  
23 proprietary. So we never did find out what really  
24 caused one reactor, said steam generator's to vibrate  
25 and the other one to vibrate in a different way, but

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1 not with fluid elastic instability.

2 And it was only very recently if at all --

3 (Off the record comments)

4 MR. HOFFMAN: -- you know whether one went  
5 to a higher pressure and a lower flow rate, or lower  
6 flow rate and a higher, vice versa.

7 Without that kind of information, you  
8 can't expect the public to understand what was going  
9 on. It's just not possible. If you produce more  
10 proprietary of the so called proprietary information,  
11 if you want to have us, the public be able to back up  
12 what they're doing and make sure that everything is  
13 actually working correctly.

14 Otherwise we can't really take part. Even  
15 the people who were absolutely experts, because they  
16 haven't worked at the plant for 25 years, couldn't  
17 decipher what was going on. And even when they had  
18 connections with other experts. It's just impossible  
19 without the actual information.

20 So please don't knock us that way. And  
21 besides, NRC's Community Engagement Panel I doubt there  
22 was more than or two people there that had any  
23 understanding of what fluid elastic instability was or  
24 is. So those are my comments. Thank you very much.

25 CHAIRMAN RICCARDELLA: Okay. Thank you.

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1 Does anybody else from the public on the line, that  
2 would like to make a comment?

3 Okay. Thank you. With that we will close  
4 the line we'll go around the room to the Committee  
5 Members. Dennis do you have any thoughts or comments?

6 MEMBER BLEY: No. I appreciate the  
7 presentations. Especially it was valuable having the  
8 folks who do inspections here today to help explain some  
9 of what they do.

10 MEMBER SCHULTZ: I'll go ahead.

11 CHAIRMAN RICCARDELLA: Steve.

12 MEMBER SCHULTZ: I appreciated the  
13 presentations. All three of the areas that we  
14 discussed today were, I think as they were identified,  
15 very important topics for the Agency to be considering.  
16 And I thought that they were covered well.

17 I was glad to hear at the onset, Rebecca's  
18 statement that we're not talking about ideas here,  
19 we're talking about actions that are underway. I think  
20 that's very important given that we've spent some time  
21 evaluating the circumstances and situation. And it  
22 appears to that have in fact identified some important  
23 actions to be taken. So I'm glad to hear that we're  
24 moving forward with those.

25 With regard to public interaction, I also

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1 think that's an area, as was identified in the  
2 presentation, the Agency needs to provide additional  
3 focus. I think the lessons learned were right on. And  
4 I think that more good work needs to be done to identify  
5 better ways for that public outreach and communication.  
6 And I think this was a good discussion associated with,  
7 and that the actions are moving in the right direction.

8 With regard to the vendor oversight, I  
9 found that the discussion again, very insightful and  
10 useful once I understood the components and how they  
11 fit together. Again, I think the staff is headed in  
12 the right direction to move forward with some very  
13 important actions that will be helpful in the future.

14 MEMBER SKILLMAN: Thank you for your  
15 presentation, for your thorough work here. It always  
16 impresses me that the bulk of the NOV's are Criterion  
17 III, design control, out of Appendix B, CFR Part 50.  
18 And it just seems to me that, that is a hallmark of our  
19 business, and it reinforces the need for focus at every  
20 level on design, design basis, and change to design.

21 And this event in San Onofre is just a  
22 remarkable example of how important that issue is. So  
23 I appreciate these last several slide that point to  
24 actions to dig into that. And I'm eager to hear how  
25 the lessons learned from the SONGS event will be

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1 translated at a higher level.

2 And in fact, enforced isn't the right word,  
3 because that sounds pejorative. How there will be some  
4 renewed vigor around making sure that anybody in the  
5 industry that's making a design change really  
6 understands what's being changed.

7 What the original basis was, and how the  
8 reactor coolant system pressure boundary, the fuel  
9 boundary, and the containment boundary will be  
10 preserved. Thank you.

11 CHAIRMAN RICCARDELLA: Dana.

12 MEMBER RYAN: I'm certain my colleagues on  
13 the other side of the table covered all the key points  
14 I think. Thank you. I'm all set.

15 CHAIRMAN RICCARDELLA: Ron.

16 MEMBER REMPE: I don't have any additional  
17 comments. Except that I should also express my  
18 appreciation and not only for the presentations but  
19 also for interactions because as I've said before, it's  
20 nice to have meeting material ahead of time.

21 CHAIRMAN RICCARDELLA: Mike.

22 MEMBER CORRADINI: Thanks to the staff.  
23 I guess my only thought would be to you Pete, this is  
24 something that you want to revisit, is this a one shot,  
25 or is this something we're going to come back and hear

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1 about. Because a lot of the questions we've asked,  
2 staff is still thinking and developing. That seems to  
3 be that if this is really sometime we're concerned  
4 about.

5 You guys understand from code and a QA  
6 standpoint much more than I. What's the next step in  
7 terms of hearing back from the staff?

8 CHAIRMAN RICCARDELLA: You know I think  
9 what we heard was that this lessons learned report was  
10 just as start and it identified some actions. And now  
11 the staff is pursuing the details on those actions.  
12 And I think they'd certainly be willing to review the  
13 more details on those actions when they're available.

14 You know, I think a general comment, you  
15 know you say that the, several times that the processes  
16 worked and are sound to protect the health and safety.  
17 But I would point out that this incident was one that  
18 was inherently self-revealing in the form of a minor  
19 leakage.

20 And that it had, there's a possibility that  
21 you could have similar design issues in things that  
22 wouldn't reveal themselves under ordinary operation,  
23 but only an event say a design basis accident some kind.  
24 And if we find problems like this then, it might not  
25 be so self-revealing.

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1                   MEMBER SKILLMAN: Or be so self-revealing  
2                   that it's stunning in its consequences.

3                   MS. KULESA: Well as I had said earlier  
4                   during my remarks, it was all based on steam generators.  
5                   I was not commenting on other major systems or  
6                   components.

7                   CHAIRMAN RICCARDELLA: Yes. We  
8                   understand that, but I think that improvements in the  
9                   process of heading off, you know confirming the  
10                  Appendix B, and the vendor, their qualifications are  
11                  much broader than that. Okay. And with that, I thank  
12                  you all. and the meeting is closed.

13                  (Whereupon, the above-entitled matter  
14                  went off the record at 3:45 p.m.)

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**U.S.NRC**

UNITED STATES NUCLEAR REGULATORY COMMISSION

*Protecting People and the Environment*

# **Advisory Committee on Reactor Safeguards Sub Committee**

## **Review of Lessons Learned From the San Onofre Steam Generator Tube Degradation Event**

April 8, 2015

Division of Inspection and Regional Support  
Office of Nuclear Reactor Regulation

- Overview
- Key Actions
- Next Steps

- SONGS Lessons Learned Report issued March 6, 2015 (ML15015A419) examined NRC response to the events at San Onofre
- Identified 17 actions across the eight topics
- NRC processes worked as intended to ensure health and safety
- Specific areas identified where enhancements could result in more effective use of agency resources

- SONGS Lessons Learned Report issued March 6, 2015
  - Examined NRC response to the events at San Onofre
  - Multi-faceted inter-office review of all aspects of NRC response
  - Identified 17 actions across the eight topics
- NRC processes are fundamentally sound
  - Processes worked as intended to ensure health and safety
  - Specific areas identified where enhancements could result in more effective use of agency resources

- January 31, 2012 San Onofre Unit 3 initiated a manual scram due to indications of primary-to-secondary leakage.
- Following in-situ pressure testing that failed three additional tubes, the NRC chartered an Augmented Inspection Team
- AIT Report identified 10 unresolved issues which were resolved during subsequent followup inspections
  - Design control violation (10 CFR 50 Appendix B Criterion III) with White significance for Unit 3, Green for Unit 2

- Significant external outreach efforts stretched staff resources
  - Multiple public meetings, including several in California
  - Updates to public website
  - Web-based outreach
  - FOIA response
  - Interactions with Congressional/state/local leaders

- The three areas with the more significant actions identified in the report:
  - Topic 3 (Steam Generator Technical Review)
  - Topic 5 (Communication and External Interactions)
  - Topic 8 (Vendor Oversight)

### Background

The cause of Unit 3's tube-to-tube wear was in-plane fluid elastic instability of U-bends associated with aggressive thermal-hydraulic conditions, combined with a lack of effective in-plane support for the U-bends.



### **Approach**

- Staff involvement: NRR, NRO, RES, & Region IV
- Reviewed relevant documents (partial list)
  - Review of Safety Analysis Reports for Nuclear Power Plants
  - San Onofre Augmented Inspection Team Reports
  - Southern California Edison Root Cause Analysis
  - Mitsubishi Heavy Industries Technical Evaluation Report
  - ASME B&PV Code, Section III, Division 1, Non-Mandatory Appendix N
  - Regulatory Guide 1.20, “Comprehensive Vibration Assessment Program for Reactor Internals during Preoperational and Initial Startup Testing”

### Conclusions/Actions

1. Is additional NRC guidance needed for SG design, replacement, or modification?
  - Yes. Develop two-tiered guidance to assist licensees, and the NRC licensing and inspection staff, in determining whether SG modifications necessitate a detailed review. Develop additional guidance for a detailed review of a SG design if dictated by the initial review.

### Conclusions/Actions

2. Does the agency's SG program effectively handle new degradation mechanisms?
  - Yes. No modifications to SG program needed.
  - The SG program is not designed to address all degradation mechanisms. Some degradation mechanisms must be prevented during the design phase (e.g., rapidly propagating mechanisms such as fatigue and fluid-elastic instability).

### Conclusions/Actions

3. Does the existing SG program effectively account for fluid-elastic instability?
- The SG program was never intended to manage rapidly propagating degradation mechanisms.
  - Such phenomena must be precluded by design.
  - Should such phenomena occur unexpectedly, operational leak rate limits in the technical specifications and established SG tube rupture emergency procedures ensure that public health and safety are maintained.
  - Modifications to the SG program are not necessary to address fluid-elastic instability.

### Conclusions/Actions

4. Does the agency or industry need additional standards for new or replacement SGs?
  - Yes. As described in Item 1, the staff is developing two-tiered guidance that can be used in evaluating SG designs, with respect to SG tube vibration issues. The staff has engaged the industry on specific actions they are taking regarding SG design standards and guidance.
  - Industry has been working with various vendors in developing a test matrix for a research project on in-plane fluid-elastic instability. The testing will be completed in Canada. The phased project has an estimated completion time of 3 years.

### Conclusions/Actions

5. Are enhancements to the agency's SG inspection procedures needed?
  - Yes. The staff will revise the pertinent inspection procedures to ensure the two-tiered guidance discussed in Item 1 can be applied during the inspection and oversight process.

### Background

- Agency spent significant resources conducting externally focused communication due to high interest.
  - Activities were not part of routine oversight processes
  - Limited guidance available to staff
- Review focused on potential improvements to agency processes for more efficient use of resources and more effective efforts for future situations.

### Approach

- Conducted interviews and group discussions
  - NRC staff and managers (current and previous) involved with communications
  - Public meeting facilitators
- Reviewed relevant information
  - Various internal and external documents
  - Public meeting information
  - Webpages
  - Public meeting recordings
- Collected external input
  - Online survey
  - Discussions with attendees at Oct 2014 decommissioning public meeting



### Conclusions

- Level of effort needed to conduct communication and outreach efforts had not been anticipated or budgeted for in advance.
  - NRC technical staff heavily involved, which impacted work on other activities
  - More leveraging of specialized communication expertise may have improved quality of products and messaging
- External feedback on NRC's communication efforts was generally positive, with areas for improvement noted.

### Conclusions Cont'd.

- Public meeting insights
  - Consider alternative formats and other types of outreach
  - Convey meeting purpose more clearly
  - Provide more balanced opportunities for diverse views
  - Plan more effectively for amount of effort required for coordinating logistics
  - Plan more proactively for managing large crowds and potential disruptions

### Conclusions Cont'd.

- Other communication efforts – lessons learned insights
  - Small group meetings
  - NRC Blog
  - Communication plans
  - External Website
  - External correspondence and FOIA requests
  - Calls with licensees
  - Coordination between staff and Commission
- Importance of engaging in more proactive communications, in more varied formats, for future situations

### Actions

- Provide communication resources to assist technical staff when needs arise in order to:
  - Develop more effective tailoring of communication and outreach strategies
  - Increase capability to adjust as situations change
  - Allow technical staff to focus technical activities
- Implementation approaches:
  - Develop options for leveraging agency communication capabilities
  - Award of enterprise-wide contract for assistance with public meeting and outreach efforts complete

### **Actions Cont'd.**

- Improve guidance in Inspection Manual Chapter 0351 to incorporate communication related lessons learned insights.
- Public meeting insights incorporated into “Enhancing Public Meetings” Task Group effort.
- Improve visibility and awareness of location where current communications plans are posted internally
- Number of improvements underway for FOIA response effectiveness.

### Background

- EDO's tasking memo requested the staff to answer the following questions:
  - Did the SONGS steam generator event expose any new or unique vendor lessons that the NRC's Vendor Inspection Program should take into account?
  - Should the NRC's Vendor Inspection Program (VIP) be more focused on the design aspects of major plant modifications?

### Approach

- Vendor Oversight Working Group (VOWG) established to provide recommendations on vendor oversight enhancements
- VOWG composed of NRC staff from Region II and Region IV offices, NRR and NRO
- Reviewed existing policy and practices, held interviews with several NRC staff

### Conclusions

- VOWG identified two attributes of large component design and manufacture that should be considered when selecting vendor for inspection.
  - Use of proprietary software that had not been accepted as an industry standard or approved by a regulatory body
  - Analytic methods used to develop and evaluate the design lacked rigorous acceptance criteria



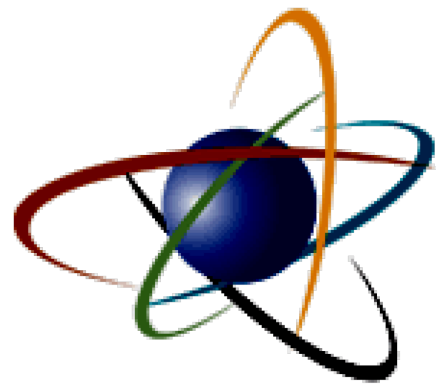
### **Conclusions cont'd.**

- VOWG identified that the VIP should be more focused on the design aspects of major plant modifications
- VOWG pursuing two actions related to vendor oversight enhancements to the existing VIP

### Actions

- Perform pilot design-aspect inspections at vendor facilities during the fabrication process for safety-related major plant modifications
- Develop and pilot screening and evaluation processes to determine whether a plant change would be considered a major plant modification, and whether such a modification should be subject to a vendor inspections

- Lessons learned review found NRC processes are sound and worked to ensure health and safety
- Actions identified that can improve the effectiveness of processes and programs
- NRR will track identified actions
  - Timeline to be developed with targeted completion dates
  - Many actions already in progress



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