

NUCLEAR REGULATORY COMMISSION

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Action Plan - Public Meeting

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BRIEFING ON STATUS OF STEAM GENERATOR

ACTION PLAN

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PUBLIC MEETING

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Nuclear Regulatory Commission

One White Flint North

Rockville, Maryland

Monday,

December 3, 2001

The Commission met in open session, pursuant to
notice, at 2:00 p.m., the Honorable RICHARD A.
MESERVE, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

RICHARD A. MESERVE, Chairman of the Commission

NILS J. DIAZ, Member of the Commission

GRETA J. DICUS, Member of the Commission

JEFFREY S. MERRIFIELD, Member of the Commission

EDWARD MCGAFFIGAN, JR., Member of the Commission

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1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

2 ANNETTE L. VIETTI-COOK, Secretary

3 KAREN D. CYR, General Counsel

4
5 WILLIAM KANE, Deputy EDO

6 BRIAN SHERON, Associate Director for Project
7 Licensing & Technical Analysis, NRR

8 MAITRI BANERJEE, Lead Project Manager for Steam
9 Generators, NRR

10 LOUISE LUND, Materials & Chemical Engineering
11 Branch, NRR

12 JACK STROSNIDER, Director, Division of
13 Engineering, NRR

14 MIKE MAYFIELD, Director, Division of
15 Engineering Technology, RES

16 DR. JOE MUSCARA, Materials Engineering Branch,
17 RES

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

(10:30 a.m.)

CHAIRMAN MESERVE: Good afternoon. On behalf of the Commission, I would like to welcome you to today's briefing on the status of the NRC Steam Generator Action Plan. Before we get underway, I did want to extend a welcome to Commissioner Diaz who has -- this is the first public meeting we have had since he has resumed his seat to my left here on the Commission. And I wanted to say on behalf of the Commission how much we welcome his return.

COMMISSIONER DIAZ: Thank you so much, Mr. Chairman.

CHAIRMAN MESERVE: The NRC views steam generator performance as an essential element in pressurized water reactor safety. The Action Plan represents a comprehensive program involving the Offices of Nuclear Reactor Regulation and Nuclear Regulatory Research to address regulatory and technical issues associated with steam tube integrity.

We will hear from representatives of both of those offices today. NRR staff will address progress on addressing enhanced regulatory framework for ensuring steam generator tube integrity, while

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1 RES will discuss the ways in which the NRC is
2 developing a better technical understanding of the
3 physical phenomenon that affect steam behavior. With
4 that, why don't we get underway. Mr. Kane?

5 MR. KANE: Thank you. It's been quite
6 some time since the staff last briefed the Commission
7 on steam generator activities. Since that time, there
8 have been a number of changes and we have informed the
9 Commission on our efforts to develop an improved steam
10 generator regulatory framework through several
11 Commission papers.

12 As you are aware, we have developed an
13 integrated Steam Generator Action Plan that you
14 discussed, and that involves many of the offices and
15 cuts across many of the technical disciplines.

16 The Offices of Nuclear Reactor Regulation,
17 the Office of Research and the Regions and others
18 offices are working in close cooperation in addressing
19 the activities in that Action Plan. With me today we
20 have Dr. Brian Sheron, Jack Strosnider, Louise Lund,
21 and Maitri Banerjee, from the Office of Nuclear
22 Reactor Regulation, and Michael Mayfield and Dr. Joe
23 Muscara, from the Office of Research. With that, I
24 will turn over the briefing to Brian Sheron.

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1 MR. SHERON: Thanks. I would like to just
2 kind of set the stage if I could for the briefing with
3 a little history. We've been working on steam
4 generators for quite some time now. Back in the 80's
5 when we first started to see cracking which was a new
6 form of degradation which we had not really
7 anticipated when most of these plans were designed,
8 the difficulty there was that the inspection methods
9 that were being used at the time were really not
10 capable of seeing some of the cracks that manifest
11 themselves in stress corrosion cracking, and we found
12 ourselves in a very reactive mode with the industry.
13 They would go into an outage not knowing what they
14 would find. They would be coming in looking for
15 alternative ways to deal with this cracking. We would
16 be under a very short fuse to try to approve
17 something.

18 At that time, in the late -- I'm sorry --
19 in the early 90's, a decision was made that perhaps we
20 needed a rule to dictate our -- the way we deal with
21 generators, and the staff embarked on a rulemaking in
22 around 1993. We did a number of studies to support
23 that rulemaking.

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1 What we concluded was that we really did
2 not need a rule. We had an adequate regulatory basis
3 upon which to regulate the
4 industry and the steam generators, that we did not
5 need to impose
6 any new requirements through a rulemaking.

7 At that point, we decided perhaps the best
8 vehicle was
9 through a Generic Letter, and we ceased the rulemaking
10 with the Commission's concurrence, and started with a
11 Generic Letter. We were pursuing the Generic Letter
12 and, at that point, if you remember, I believe it was
13 DSI-22 -- I can't remember which one, but it had to do
14 with industry initiatives -- 13, I'm sorry -- and we
15 decided at that time rather than pursue a Generic
16 Letter with the industry, we would pursue working the
17 steam generator issue as an industry initiative.

18 We then stopped work on the Generic Letter
19 and embarked on a course with the industry to
20 basically have them provide a
21 guidance document. This was submitted to the staff by
22 NEI in December of 1997, it was Document 97-06, and
23 that provided a set of guidelines that the industry
24 was proposing to manage their steam generators under.

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1 We had extensive interactions with the
2 industry on this document, starting in when it was
3 received. We continued these
4 interactions with the industry until around February
5 of 2000. At that time, we had -- the industry had
6 submitted to us what they call a Generic Licensing
7 Change Package -- you'll hear a little more about that
8 -- but also, more importantly, Indian Point 2 had
9 their steam generator tube failure and, as you know,
10 the staff basically had to put a lot of effort into
11 the analysis of that event and the aftermath. As you
12 know, we prepared, for example, Lessons Learned Report
13 and the like, and then an Action Plan.

14 In a nutshell, that put a delay of about
15 one year into our schedule. We stopped working on 97-
16 06. It was a deliberate decision. We wanted to make
17 sure we captured all the lessons learned as well as
18 the other items in the Action Plan before we moved
19 forward and approved 97-06.

20 In about February of this year, we resumed
21 our review of 97-06 with the industry. As a matter of
22 fact, just last week, we had a meeting with the
23 Executive Committee, Mr. Tuckman (phonetic) at NEI,
24 and other executives. Basically, right now, we're
25 down to two issues with the industry, and I think they

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1 are both pretty much resolved. I know one is -- these
2 have to do with the inspection intervals in
3 particular, and you will hear more about this. With
4 regard to the type of generators. Obviously, the
5 concern is that

6 if you have a new steam generator that uses the new
7 material Alloy-690 and the like and if it's thermally
8 treated, then perhaps you don't have to do inspections
9 as frequently as if
10 you had an older generator with Alloy-600.

11 The other issue was the commitment to
12 those intervals. We wanted that the industry would
13 commit to follow these intervals and, if they intended
14 to deviate, would receive NRC concurrence before they
15 did.

16 We resolved the latter part, the industry
17 has agreed to that through an administrative Tech Spec
18 change, and we are fairly well resolved with the
19 inspection intervals, and you will hear a little bit
20 more about that.

21 Our current schedule is to -- the
22 industry, I believe, is going to submit revisions to
23 97-06 hopefully in the spring, and by

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1 the summer of this year -- I'm sorry, of next year --
2 hopefully we have completed our review and approval of
3 97-06.

4 It's been a long process, longer than I
5 like, but I think we need to recognize that when we
6 work with the industry through an
7 industry initiative, I think, by definition, it is a
8 time-consuming process. For example, when they come
9 to a meeting, they cannot commit right then and there
10 for the industry but, rather, they need to go back,
11 meet with their own committees and so forth, bring
12 back perhaps what the staff is looking for, what the
13 staff's proposals are. Typically, they will come back
14 with a counter-offer, counter-proposals we need to
15 iterate. It so it is an iterative process, it takes
16 time. But we are, I think, about 90 percent there.

17 So with that, I'm going to turn it over to
18 Maitri to start the discussion.

19 MS. BANERJEE: Thank you, Brian.

20 Good afternoon, Chairman, Commissioners.
21 We appreciate the opportunity to present to you the
22 status of the Steam Generator Action Plan and the
23 progress we have made in this area.

24 I will provide some background and overall
25 status information, and then, Louise Lund, next to

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1 me, will discuss the staff activities related to NEI
2 97-06 whereby we are developing a steam generator
3 regulatory framework that's improved. And then Dr.
4 Joe Muscara will discuss the research activities, some
5 of them are recently completed, and the long-term
6 actions related to the ACRS recommendations on the
7 steam generator DPO.

8 As Brian probably mentioned, this is an
9 information brief to update you before the briefing we
10 will be doing prior to issuing the safety evaluation
11 on NEI 97-06 as you directed us to do. Next slide,
12 please.

13 (Slide)

14 Okay. As Brian mentioned, the Action Plan
15 and staff activities in the area of steam generator
16 tube integrity have evolved since mid-1990's,
17 resulting into our review of NEI 97-06, and here are
18 some of the significant actions taken since the IP2
19 failure, as Brian mentioned, the Indian Point 2
20 Lessons Learned Task Group report, the OIG report
21 and, finally, the ACRS report on steam generator DPO,
22 all of this resulted insignificant changes to the
23 Action Plan, and also impacted our review of NEI 97-
24 06.

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1 Since early earlier this year, the staff
2 is again actively involved with the industry,
3 resolving issues related to 97-06. We are also
4 completing the milestones related to the Indian Point
5 2 Lessons Learned Task Group report, and the Steam
6 Generator DPO. As you know, ACRS is also reviewing
7 our progress and in their October 18th letter, they
8 stated that the Action Plan appropriately and
9 adequately responded to their recommendations on the
10 Steam Generator DPO. Next slide, please.

11 (Slide)

12 As Mr. Kane mentioned, the Action Plan is
13 a consolidated
14 multi-disciplinary, across-the-agency effort where
15 NRR, Research and the Regions are working with each
16 other, sometimes with the help of others offices, and
17 also working with NEI and the industry.

18 As the second bullet indicates, our
19 objectives is to integrate the results of all these
20 activities into the existing
21 regulatory program. As the Action Plan milestones are
22 being completed, the related program areas are revised
23 and up-dated to incorporate the results. For example,
24 the industry will submit a Generic License Change
25 Package, as Brian mentioned, and the revised

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1 Tech Specs. Once we approve those changes, individual
2 licensees will revise their individual license
3 amendment packages.

4 Currently, the staff actions in response
5 to the ACRS
6 recommendations on the DPO are integrated into the
7 existing research efforts and the overall object of
8 these research activities is to confirm and improve
9 our understanding of risk related to steam generator
10 operation and also to develop improved tools for
11 assessing risks, and once these activities are
12 completed, the necessary changes will be made to the
13 risk-informed decisionmaking processes that we have in
14 our licensing inspection and assessment.

15 The last bullet deals with anticipated
16 future revisions. After certain research activities
17 are completed, we will develop detailed milestones for
18 addressing some generic safety issues related to steam
19 generator operation and also develop a regulatory
20 guide to address risk-informed decisionmaking in the
21 area of steam generators. The next slide, please.

22 (Slide)

23 The Action Plan provides a tool and a
24 process for managing staff generic efforts in the

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1 steam generator tube integrity area. These generic
2 efforts support our strategic plan performance goals.

3 As the first bullet indicates, the Action
4 Plan milestones are tracked and dispositioned. The
5 Commission tasking memorandum contains the major
6 milestones which is reviewed and updated on a monthly
7 basis. And then the NRR Director's Quarterly Report
8 contains the entire Action Plan. That is reviewed and
9 updated on a quarterly basis.

10 Regarding the second bullet, I'd like to
11 mention that our meetings with NEI and the industry
12 are scheduled frequently and provide for an
13 opportunity for public input. As of last February, we
14 had a Steam Generator Workshop with some external
15 stakeholder participation and, based on their
16 comments, we have developed a Steam Generator Service
17 List to keep them informed of the activities in this
18 area, and they are mostly the meetings and summaries
19 of the meetings, letting them know what is going on.
20 We also have a Steam Generator Web Page.

21 The last bullet, to provide for
22 appropriate management oversight, the completion of
23 significant milestones in the Action Plan are
24 documented via memo from the responsible Division

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1 Director to the Associate Director or the Deputy
2 Office Directors. Next slide, please.

3 (Slide)

4 The Action Plan major elements. The
5 Action Plan is primarily divided into three major
6 elements and activities. The first element deals with
7 shorter-term activities that resulted mostly from the
8 Indian Point 2 Lessons Learned Report and also the OIG
9 report, and it deals with modifications and revisions
10 to the existing regulatory processes. And I will
11 discuss a little bit of these items in the progress
12 made in this area in the next slide.

13 And the second major element deals with
14 revising the regulatory framework via NEI 97-06
15 efforts, and Louise will discuss that in the next
16 presentation.

17 And the third element deals with the Steam
18 Generator DPO activities, and Joe will talk about
19 that. Next slide, please.

20 (Slide)

21 The first element includes items related
22 not only to steam generator tube integrity, but also
23 other process issues, such as risk communication,
24 developing a Steam Generator Web Page, which are some
25 of the Strategic Plan Performance Goal of improving

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1 public confidence related activities, in addition to
2 improving the licensing amendments review process.

3 We have completed about 87 percent of the
4 milestones in this category, 20 out of 23. For
5 example, we recently issued an Information Notice
6 related to steam generator operating experience.
7 Issuing these types of generic communications to the
8 stakeholders because it keeps them informed of what's
9 happening in our steam generator experience in this
10 area.

11 We also recently revised an inspection
12 program in the steam generator area, and provided
13 specific guidance to the inspectors on what to look
14 for during the inspections.

15 We have provided some training material to
16 the inspectors before the fall outages, and we are
17 planning to do some classroom trainings before the
18 spring outages. We have developed a significant
19 determination process for dealing with results of
20 steam generator inspections, and we are also -- we
21 have also developed guidance for technical reviewers
22 and project managers related to the review of steam
23 generator reports.

24 Although we have made significant progress
25 in this area which had already improved our steam

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1 generator regulatory program, there are still several
2 open items that need to be completed. These deal
3 with, I guess, the remaining 3 of the 23. This deals
4 with the risk communication to the public and
5 developing a process for requesting Research to review
6 NRR safety evaluations. The issues involved with
7 these are very well understood, and we expect to
8 complete these items in the near future.

9 At this point, I'm ready to conclude my
10 presentation and let Louise continue on the next major
11 element, which is developing a regulatory framework
12 under NEI 97-06, unless you have any questions.

13 MS. LUND: Good afternoon. As Brian and
14 Maitri indicated, I'll be talking about the NEI 97-06
15 Steam Generator Generic License Change Package. First
16 slide, please.

17 (Slide)

18 The intent of this particular slide was to
19 show the present regulatory framework for steam
20 generators. In looking at the first one, 10 CFR Part
21 50, Appendices A and B address the general design
22 criteria and quality assurance.

23 10 CFR Part 100 provides values for
24 offsite release, and ASME Code, Sections III and XI
25 address requirements on design and analysis of steam

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1 generator tubing and requirements for in-service
2 inspection and repair. Use of the ASME Code is
3 specified in 10 CFR 50.55(a). The reactor oversight
4 process -- I'm skipping down to the bottom one because
5 I'm going to come back to the Plant Tech Spec -- the
6 reactor oversight process addresses NRC inspections of
7 the processes used by licensees to examine their steam
8 generators.

9 I've left the Plant Tech Spec as the last
10 topic because this is the part of the current
11 framework that will change under this new framework.
12 And in my presentation today, I'll discuss how they
13 will change.

14 Under the current Tech Spec, the focus is
15 on surveillance. Under the revised steam generator
16 regulatory framework, the focus is on tube integrity
17 during the time period between tube inspections. And
18 we believe that this change is consistent with the
19 strategic goal of maintaining safety. Next slide,
20 please.

21 (Slide)

22 Just looking at this, this is just a
23 presentation of actually what Brian mentioned earlier,
24 the history of the steam generator regulatory

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1 framework before Maitri made her presentation. I'm
2 just going to make a few quick points.

3 The NEI informed the NRC in December '97
4 of the industry's intent to commit to a formal
5 industry initiative called NEI 97-06, with all BWRs
6 implementing it no later than the first refueling
7 outage starting after January 1, 1999. What this
8 means is that the industry is currently implementing
9 NEI 97-06 with the current Tech Specs. In the next
10 few slides, I'll discuss the components of the
11 industry initiative, which are the NEI 97-06 document
12 itself, the Generic License Change Package, and the
13 EPRI Guidelines, and I'll discuss what parts that the
14 industry is currently implementing and what we are
15 working on right now. Next slide, please.

16 (Slide)

17 And as I just mentioned, these quick
18 bullets, NEI 97-06 will be discussed in the Generic
19 License Change Package, and what we'll be doing is, on
20 a regulatory sense, formalizing the revised framework
21 through revised Tech Specs. Next slide, please.

22 (Slide)

23 As I mentioned on an earlier slide, there
24 are three components to the industry steam generator
25 program initiative. The NEI 97-06 program document

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1 contains high-level guidance for development and
2 management of licensee steam generator programs. The
3 NEI 97-06 program document refers to EPRI guidelines
4 which provide detailed guidance on day-to-day steam
5 generator management activities.

6 The third element is the generic license
7 change package which will formalize the industry
8 initiative into our regulatory framework.
9 Specifically, the generic license change package will
10 provide a framework for taking advantage of the
11 flexibility envisioned by NEI 97-06. As proposed, the
12 Tech Spec in the generic license change package
13 provide a framework for a fully performance-based
14 approach. Currently, NEI 97-06 and the EPRI
15 guidelines are implemented in conjunction with the
16 existing Tech Specs, which are prescriptive, with the
17 expectation that soon they will be implemented with
18 the new Tech Specs and the generic license change
19 package.

20 The advantage to the generic license
21 change package to industry is a streamlining process
22 for gaining NRC approval of longer steam generator
23 inspection interval strategies, alternate tube repair
24 criteria, new tube repair methods. For example,
25 licensees will be able to implement performance-based

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1 strategies for determining inspection intervals which
2 have been reviewed and approved generically by the
3 staff, without the need for submitted changes to the
4 Tech Spec.

5 The NRC also benefits in that it is
6 assured that steam generator programs will be focused
7 on tube integrity rather than simply following
8 prescriptive surveillance strategies. Next slide,
9 please.

10 (Slide)

11 Now, the high-level document and how it
12 describes the program, as you see it, incorporates a
13 balance of these elements of prevention, inspection,
14 evaluation, repair, maintenance, and leakage
15 monitoring. Next slide, please.

16 (Slide)

17 And, also, NEI 97-06 establishes
18 performance criteria that define the basis for steam
19 generator operability. The performance criteria
20 include structural performance criteria, accident
21 leakage criteria, and operational leakage criteria,
22 which are essentially the same for everyone. The
23 performance criteria are located in the Steam
24 Generator Program, which is a licensing control
25 document. However, the proposed administrative Tech

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1 Spec in the Generic License Change Package will
2 require NRC review and approval before alternative
3 criteria may be implemented. Next slide, please.

4 (Slide)

5 This slide just defines how the revised
6 framework will be implemented, and will rely on the
7 NEI Steam Generator License Change Package, and the
8 utilities will submit revised Tech Specs based on an
9 NRC-approved Generic License Change Package. The
10 cover letter will contain a commitment to follow the
11 higher level guidance in NEI 97-06, and the NEI 97-06
12 program guidelines will be translated into plant
13 procedures. And that's what's currently going on with
14 the high-level guidance being put into plant
15 procedures. Next slide, please.

16 (Slide)

17 With the change coming with the Generic
18 License Change Package, you'll see revised Tech Spec
19 and bases. The revisions will include a revised
20 limiting condition for operational specification for
21 operational leakage, and a new LCO for limiting
22 condition for operation for steam generator tube
23 integrity.

24 The new Admin Tech Spec states that the
25 Steam Generator Program must be implemented to ensure

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1 that tube integrity performance criteria are
2 maintained. The licensees will be explicitly required
3 to assess the conditions of the tubes versus the
4 performance criteria. And that shall be performed at
5 each steam generator inspection outage. Changes to
6 the performance criteria, tube repair criteria, and
7 repair methods are subject to NRC review and approval.
8 Next slide, please.

9 (Slide)

10 In this slide, all we were trying to point
11 out is that technical issues will continue to be able
12 to be resolved under the revised framework. We have
13 been working a number of technical issues, and
14 technical issues will exist under the new current
15 framework, and it gives us a way to work the issues as
16 they arise under this new framework. Next slide,
17 please.

18 (Slide)

19 So, at the point Brian discussed earlier,
20 the initial part of the staff review, both the
21 industry and the NRC, are intending a review of the
22 performance-based inspection intervals as we became
23 aware of changes to the guidelines, it was apparent
24 the predictive methodologies to support performance-
25 based inspection intervals had not been fully

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1 developed. However, the industry is proposing a
2 reference inspection interval strategy for the newer
3 steam generator tube materials, and these are the ones
4 Brian mentioned earlier, 600 thermally treated and
5 alloy 690, than those currently allowed in the
6 Technical Specifications.

7 The industry is currently addressing both
8 NRC comments and internal industry comments with
9 respect to this proposal. And the staff believes that
10 this approach must ensure that tube integrity
11 performance criteria will continue to be met, and that
12 tubing conditions not meeting the performance criteria
13 will be promptly detected. And I think that Brian
14 said that we have made a lot of progress in this
15 particular area, and we expect to receive a signal
16 from industry in the near-term, and I'll discuss that
17 in just a moment. Next slide, please.

18 (Slide)

19 In looking at the review status, as Brian
20 had mentioned, the staff concluded that regulatory
21 controls were needed, and we needed to incorporate a
22 provision in the Administrative Technical
23 Specifications regarding the use of NRC-approved
24 inspection intervals. We have reached agreement on
25 these issues with the industry and a resolution path

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1 and schedule have been worked out to reach conclusion
2 of the review of the Generic License Change Package.
3 Next slide, please.

4 (Slide)

5 As far as the near-term actions, based on
6 our recent meetings with industry, we're looking at
7 the staff to review and anticipated package which we
8 expect in mid-2002 from industry defining generic
9 inspection intervals. Based on recent meetings with
10 industry, we expect this submittal and, after the
11 submittal is made, we will use the process of issuing
12 the safety evaluation that we previously informed the
13 Commission that we would follow -- this is in SECY-
14 0078 -- sending it out for public comment, resolving
15 comments, briefing the Commission, and publishing it
16 in a regulatory issue summary. We anticipate that
17 this will take approximately six months.

18 As it says up on top, we had a recent
19 meeting with NEI on the final Generic License Change
20 Package, and we have agreed to a schedule. Next
21 slide, please.

22 (Slide)

23 And then our longer-term actions and plans
24 are to resolve the outstanding issues with the EPRI
25 guideline documents to permit use of intended

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1 performance-based approach and removal of prescriptive
2 inspection interval requirements.

3 So, at this point, I guess to summarize,
4 we think that we've made a tremendous amount of
5 progress, and we have the completion of this underway,
6 and agreement with industry on how to approach
7 resolving the remaining issues. Thank you.

8 MR. KANE: At this point, we'll go to Dr.
9 Muscara, who will talk about the Steam Generator
10 Action Plan for Differing Professional Opinion Issues.

11 DR. MUSCARA: Thank you. Good afternoon.
12 As a way of introduction, I would like to make a few
13 points on events related to the DPO. On October 12
14 and 13, 2000, the staff provided detailed
15 presentations to ACRS Ad Hoc Subcommittee on the DPO
16 Issues, including detailed presentations and ongoing
17 research that are relevant to the DPO issues.

18 The ACRS provided its conclusions and
19 recommendations in NUREG 1740, dated February 2001.
20 The report provided support for the ongoing research
21 and planned research and helped us to focus on future
22 research.

23 In May 2001, the NRR and RES staff
24 developed a Joint Action Plan to address the comments,

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1 conclusions and recommendations of the ACRS. Next vu-
2 graph, please.

3 (Slide)

4 The NRC research in steam generator area
5 from the three divisions in RES addressed both current
6 issues and some other research that is anticipatory in
7 nature. The objective of the research is to provide
8 NRC with an independent capability for evaluating
9 industry proposals, to confirm the effectiveness of
10 current regulations, to support ongoing regulatory
11 activities, and to make recommendations in
12 improvements as needed. Next, please.

13 (Slide)

14 The Office of Nuclear Regulatory Research
15 has a broad-scope program on steam generator tube
16 integrity. Research studies are conducted in the
17 areas of materials behavior and structural integrity,
18 on accident analysis and thermal hydraulics, and on
19 improved risk methods. The information from these
20 areas is integrated into risk assessment for safety
21 evaluations of various steam generator actions and
22 proposals.

23 With respect to the Action Plan, about 80
24 percent of the DPO milestones are addressed by
25 Research within its broader research on steam

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1 generators. Today, I will provide only a brief
2 overview of some currently completed research that has
3 addressed DPO issues, some ongoing research that will
4 be completed over the next year to year and a half
5 that will address other issues, and some long-term
6 research. Next, please.

7 (Slide)

8 One issue that evolved as the staff
9 addressed the DPO was the potential for propagation of
10 existing cracks by dynamic loads and cyclic loads that
11 are imposed on the tubes from a main steam line break,
12 which could propagate the cracks and result in
13 multiple tube failures.

14 To address this issue, we will estimate
15 the loads including cyclic loads acting on tubes
16 during an MSLB from thermal hydraulic analyses in
17 Codes. Work will be conducted by area staff and by
18 its contractors. As a starting point, staff will use
19 the track M-Code, however, the staff is aware of
20 concerns with the ability of this Code to actively
21 predict the conditions very early in the transient.
22 Therefore, the staff is reviewing other Codes for
23 potential use in this study.

24 When using these loads, displacements and
25 cycles, in addition to the pressure stresses, we will

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1 estimate crack growth, if any, for a range of crack
2 types and sizes. Structural integrity correlations in
3 models developed earlier in NRC research will be used
4 for these calculations. We will also estimate the
5 loads required to propagate the cracks to obtain
6 margins over and above the MSLB loads. And, finally,
7 we will conduct some tests on the graded tubes under
8 pressure and with axial and bending loads that
9 simulate the MSLB loads to validate the analytical
10 results. Next, please.

11 (Slide)

12 One of the DPO conventions was that the
13 jet emanating from a leaking tube under accident
14 conditions would impinge on and cut adjacent tubes,
15 resulting in cascading failures of the tubes. Leakage
16 from tubes under accident conditions can result in
17 containment bypass and is an important safety
18 consideration. To address this issue, we have
19 completed jet impingement tests under both severe
20 accident conditions and under MSLB conditions. Tests
21 under simulated severe accident conditions were
22 conducted at the University of Cincinnati. The
23 erosion rates are 2-5/1000ths of an inch or mils per
24 hour. Steam generator tubes are typically 50 mils
25 thick. In times of interest under these conditions of

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1 30-45 mils. Tests under MSLB conditions were
2 conducted at Argonne National Laboratory. Results
3 show 5 percent wall loss and 25 percent wall loss for
4 the hot leg and cold leg temperature, respectively,
5 after two hours testing at 2430 pounds per square
6 inch. This is a long-duration test and the high
7 pressures compared to MSLB conditions.

8 Based on the results of the low erosion
9 rates, we have concluded and ACRS has agreed that
10 damage progression from jet impingement on adjacent
11 tubes is a low enough probability that it can be
12 neglected in accident analysis. Next, please.

13 (Slide)

14 In conducting risk analysis, it is
15 important to know the conditions experienced by steam
16 generator tubes under normal operation and accidents,
17 including severe accidents. The conditions of
18 interest are the times temperatures and pressures are
19 experienced by the tubes. This information is needed
20 to evaluate the structural behavior of the greatest
21 steam generator tubes under severe accident
22 conditions. To improve our knowledge of the
23 conditions experienced by steam generator tubes, RES
24 staff has been conducting computational fluid dynamic
25 studies of the hot leg and steam generator to

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1 determine temperatures experienced by the tubes. The
2 CFD results were in good agreement with Westinghouse
3 1/7th scale test data showing that the model is able
4 to simulate the mix phenomenon in the inlet plan. A
5 full-scale CFD model is now under development and it
6 will be used to evaluate the effects of scale and for
7 sensitive disparities of pipe geometry and location of
8 tube leakage. Next, please.

9 (Slide)

10 Because in-service inspection is not
11 perfect, Generic Letter 95-05 requires an adjustment
12 to the as found flaw distribution to take into account
13 the flaws that were missed by the in-service
14 inspection. Generic Letter 95-05 used a constant
15 probability of detection of .6 for all flaws.

16 At the time the Generic Letter was
17 developed, there was no data on the probability of
18 detection as a function of voltage, and very little
19 data on the probability of detection of functional
20 crack depth. A probability of detection of .6 was
21 selected for detection for a range of different crack
22 sizes. In reality, probability of detection will vary
23 as a function of flaw size and signal response.

24 We have been conducting research at
25 Argonne National Laboratory on a steam generator mock-

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1 up to evaluate the reliability of in-service
2 inspection. Probability of detection curves have been
3 developed from the study as a function of flaw depth,
4 voltage, and possible variety of parameters that takes
5 into account both the depth and the length of the
6 flaws.

7 A technical report on the reliability of
8 in-service inspection has been prepared, has been
9 reviewed, and is currently in publication. Next,
10 please.

11 (Slide)

12 Some of our anticipatory research
13 addresses stress corrosion cracking mechanisms. We
14 are seeking a better understanding of future steam
15 generator tube behavior. In particular, we need to
16 understand how Alloys 600 and 690, which is the
17 replacement material, will perform in the operating
18 environment so we can avoid the problems of the past.

19 Understanding of cracking mechanisms was
20 also a DPO issue. Research to evaluate crack
21 initiation, evolution and growth will be initiated in
22 the new calendar year under the NRC's Third
23 International Cooperative Steam Generator Tube
24 Integrity Research Program. Cracking mechanisms in
25 steam generator tubes are not well understood. On the

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1 secondary side, cracks often occur in crevices. Very
2 little information exists about the chemical nature of
3 the crevices. For example, is there water, steam, or
4 both bases in the crevice, and what is the chemistry
5 in the concentration of impurities in the crevice.
6 This information is needed to conduct tests that are
7 realistic.

8 Under realistic conditions, crack
9 initiation takes a long time, and crack growth rates
10 are slow. For example, crack initiation times in
11 crevices in operating plants can be as long as ten
12 years. So, it takes a long time to conduct realistic
13 tests, thus the research continues through 2006.
14 Testing will be conducted using realistic loads and
15 environments for both Alloys 600 and 690.

16 Using the operating experience and results
17 from laboratory testing, we will develop models for
18 predicting cracking behavior of steam generator tubes
19 in the operating environment. The notion here is that
20 if we can understand the behavior of 600 and 690 in
21 the laboratory with the extensive data we have
22 available in 600 with field experience, we can then
23 find a bridge to be able to predict the behavior of
24 690 in the operating environment based on laboratory
25 data. Next, please.

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1 (Slide)

2 To conclude, some research has already
3 been completed to resolve the DPO issues, for example,
4 the jet impingement work in the probability of logic
5 action. Research to address most of the DPO issues
6 will be completed by the end of 2003. Next, please.

7 (Slide)

8 Long-term research on degradation
9 mechanisms will continue through 2006. Finally,
10 Research and NRR have worked closely together to
11 implement research results into the resolution of
12 technical issues. This close working relationship
13 will continue in the future through the establishment
14 of a Technical Coordinating Group made up of staff
15 members both from NRR and RES and the Regions so that
16 the research program can be reviewed on a periodic
17 basis, so the information can be used on a timely
18 basis, and so that the regulatory needs are addressed.

19 MR. KANE: Mr. Chairman, Commissioners,
20 that concludes the staff presentation.

21 CHAIRMAN MESERVE: Thank you very much for
22 a helpful presentation. In honor of Commissioner
23 Diaz' return, I'll give him the first crack.

24 COMMISSIONER DIAZ: Well, I don't know if
25 you want to be talking about cracks, one of my

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1 favorite subjects. Thank you very much, Mr. Chairman,
2 a pleasure to be here with all my colleagues again,
3 and a pleasure to be with the staff one more time on
4 an old issue that I have a few gray hairs on -- steam
5 generators and tube integrity which has always been a
6 concern.

7 Let me, now that I have this opportunity
8 to, take one minute in here and talk of some of the
9 things that I realize have been evolving through the
10 years, and one of the things that is I think we
11 realize since like half a century ago but was five
12 years ago, was that there was a connection between the
13 maturity of the industry and the NRC and the evolution
14 to a more risk-informed, more performance-based.
15 Those are not independent issues, they actually
16 complement each other. One of the things that I
17 always insisted is that maturity and that evolution
18 would have to have as a result the fact that we should
19 not be event-driven in our regulations, that we would
20 have the maturity and would have the body of knowledge
21 to be able to avoid events, especially events that are
22 not safety significant to drive us beyond our normal
23 pattern of behavior. And in that sense, I hope that
24 is the objective of this project because I do see that
25 Indian Point did take us a little bit away from the

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1 path that we were going and, again, we responded to an
2 event.

3 I think that fundamentally, when this is
4 put together, I would like to see that the staff
5 responds to how do we respond to one event, not only
6 that we are preventing an event because an event will
7 happen. There is no amount of inspection, no amount
8 of NRC regulation that will prevent a tube failure on
9 a steam generator. They are going to take place, they
10 are going to happen and, therefore, we need to be
11 ready for that eventuality and not be caught like, oh,
12 we were not ready, it's not going to happen, and we
13 need to be able to respond to the public. The main
14 issue of Indian Point 2 was how do we respond to the
15 public.

16 There is no doubt that you have resolved
17 many things and I look forward to your final report
18 and look at it, but I certainly would ask the question
19 now, are we ready to respond to the public in the case
20 of an event tube failure? Do we have the capability
21 to technically and from the communications viewpoint
22 assess the safety, and be able to clearly interdict
23 the communication issues -- if I use now a word that
24 is used quite frequently -- and avoid propagating
25 beyond what I believe it should if the event does not

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1 have safety significance -- anyone?

2 MR. STROSNIDER: I think I can at least
3 give you a status of where we are on that action item
4 because it was an action item that was identified by
5 the Indian Point 2 Lessons Learned Task Force, and
6 staff has developed the technical message, if you
7 will, that we want to deliver, and it's been provided
8 to the communications specialist within NRR and I
9 believe also the EDO staff, for working into the
10 Agency's communications plan. So, this is one that's
11 not totally complete yet, but I think it was one we
12 expect to have finished in the fairly near future.
13 But, as I said, the technical message that we want to
14 give people in terms of the technical -- the risk
15 associated with tube ruptures and that sort of thing
16 has been developed and it's being worked into the
17 communications plan now.

18 COMMISSIONER DIAZ: Is that something that
19 we should expect in the near future just because, you
20 know, like I use one of my favorite words, this is a
21 random event and it will take place no matter what the
22 thickness of the wall is? It will happen, no matter
23 what -- you have a full wall or just a little thing
24 because you can't predict it. So, are we ready, if it

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1 happens, to be able to properly communicate the safety
2 significance of the event?

3 MR. KANE: That's an interesting question,
4 are we ready. I think I would answer the question,
5 yes, we are, but I believe that -- as Jack indicated
6 -- I believe we're doing more work and I think we can
7 continue to refine the information and be in a better
8 position than we were earlier. But I think there's
9 more work to do.

10 COMMISSIONER DIAZ: Well, I certainly hope
11 --

12 MR. KANE: Certainly, I agree with the
13 premise of your question, and certainly to be able to
14 do a good job in that area is important really from
15 the public confidence standpoint one of our major
16 goals, of course, as you are aware, improve public
17 confidence, and it is extremely important.

18 COMMISSIONER DIAZ: Well, I think it is
19 one of our major responsibilities because, if not,
20 what will happen is things will escalate, and then we
21 will spend more time, you know, searching a ghost and
22 finding the reason of it. And I think that is a hope
23 that will be resolved in the near future because it is
24 --

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1 MR. STROSNIDER: If I could add just one
2 comment. There's several people at the table here who
3 participated in town meetings in the area to following
4 that event and who did discuss with the public the
5 risk implications and the consequences and health
6 implications of the event, so we have done that. And
7 I think having done that, we're looking for ways to
8 improve the way we do it. Certainly, it's one of the
9 more difficult things to explain to people, but we
10 learned some lessons there, and so we're looking at
11 improving our ability to communicate that message.

12 MS. LUND: I just wanted to mention, in
13 addition to what Jack said, is that the
14 recommendations that we've made, we've indicated that
15 they should be memorialized in a communication plan so
16 they are readily available to the staff. So, that is
17 part of the work that we've done in putting together
18 the recommendations based on the lessons learned and
19 suggesting that they be made part of the communication
20 plans that are being revised.

21 COMMISSIONER DIAZ: Let me just make a --
22 I realize I might be confusing terms -- there is no
23 doubt that the NRC has to be very responsive to
24 events, that is obviously always the case. There is
25 a difference between being responsive to an event and

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1 having our regulations being driven by events,
2 especially by those who safety-significant and,
3 therefore, it is very important to tell the
4 difference, and it is more important to tell the
5 difference to the public which might not have the
6 understanding that all our experts have on the issue,
7 and I think that's a formidable task, but one that I
8 hope you are able to put down to rest soon.

9 On the issue of how do we put our arms
10 about the entire project -- I can see we have things
11 going into 2006 -- and I believe you have put your
12 arms around the issue very well. I think it is
13 obvious you have progressed to that point. However,
14 there is another effort, which is wrestling the
15 subject to the ground and putting it in a position
16 that it will not rise and kick you in the back. So,
17 that is something that I think needs to be further
18 defined -- how do we put closure to an issue, not that
19 it's always closed. I realize there will be further
20 technical issues, further actions required, but how do
21 we close the issue to the point that our regulations
22 and our requirements of licensees and our
23 communications provide confidence that we are assuring
24 public health and safety with the appropriate amount
25 of burden? And I think that is something that I have

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1 not seen in here, where are we going to finish all of
2 these things to the point we say yes, there is more to
3 be learned, but we are going to close it at this
4 point. Closure is something that is necessary to
5 avoid being event-driven. Anybody?

6 MR. SHERON: I can start maybe. I guess
7 my opinion would be that we have a performance-based
8 approach through NEI 97-06 which, recognizing that, I
9 would certainly expect down the road to see other
10 forms of degradation -- for example, every time you
11 open up a generator, you kind of get surprised
12 sometimes.

13 So, the whole idea is to have a framework
14 in place that will allow licensees to be able to
15 effectively deal with what they
16 find when they go into generators without having the
17 staff be in a
18 reactive mode. And this gets into the whole question
19 of what kind of an inspection do you do, can you then
20 through your assessment, operational assessment,
21 basically try and ensure that regardless of what you
22 find, you can now forward predict, you might say, and
23 assure yourself that there is a low likelihood of a
24 failure during the next operating cycle. And that's
25 what the whole approach is really geared towards okay.

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1 That's why we talk about inspection intervals, so when
2 a licensee goes in, they will have a process they can
3 follow. Hopefully what comes out of that process will
4 be how long they can operate for the next cycle. In
5 some cases, they may have to come down in nine months
6 and do another inspection; in others, they may be able
7 to justify going much longer.

8 But, again, the whole thing is premised on
9 having an effective process in place that the staff
10 does not have to go in and constantly change every
11 time we learn something different. I don't know if
12 Jack or Louise want to --

13 MS. LUND: I thought that was a good
14 explanation.

15 COMMISSIONER DIAZ: I think that certainly
16 will be very worthwhile. On a specific issue on the
17 interval between inspections and the Tech Specs, I
18 understand that there's still some differences.
19 Certainly, a mature process will take us to a set of
20 Tech Specs that if there is change in the interval, I
21 agree that the NRC should be able to have concurrence
22 on the issue. However, I personally don't see a need
23 for going into license amendments if the process is
24 mature enough. Do you have any comment on that?

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1 MR. SHERON: Do you want to speak to that,
2 Jack?

3 MR. STROSNIDER: Well, the process that's
4 been proposed and which I think we have, based on the
5 meeting last week, I think we have some agreement with
6 the industry -- that needs to be confirmed -- but the
7 idea is that the technical specification would have --
8 would, in the program, the administrative program,
9 would lay out the expected inspection intervals, but
10 that those could be changed, and what's in the
11 technical specifications is that once NRC approve a
12 change at one plant, or generically, if you will, that
13 other plants will be able to adopt that without coming
14 for a Technical Specification amendment, as long as
15 they can demonstrate that the basis for that interval
16 extension is applicable to their plant in terms of
17 material or whatever is driving the limit on
18 inspection intervals. So, in terms of trying to
19 accomplish more efficiency, we think we can eliminate
20 a large number of Technical Specification amendments
21 because, in the past, anytime somebody wanted to
22 change that, they had to come in and change their
23 Technical Specifications. This will allow it to
24 happen on a more generic basis.

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1 COMMISSIONER DIAZ: Okay. Well, thank
2 you, Mr. Chairman, I don't want to over extend my
3 welcome.

4 CHAIRMAN MESERVE: You needn't worry.
5 Commissioner McGaffigan.

6 COMMISSIONER MCGAFFIGAN: Thank you, Mr.
7 Chairman, I'm trying to sort out if I were asked --
8 and so I'm going to ask you -- by member of the public
9 at Plant X, who fears that their steam generators are
10 like Indian Point, what these new Tech Spec
11 changes/EPRI guidelines/whatever mean for improved
12 safety of the steam generators at my Plant X that I'm
13 worried about, what would you say? What is it that
14 these revised Tech Specs, this generic change package
15 is going to do to help ensure that there's lower
16 probability that I will have a steam generator to
17 rupture at Plant X next to my house here.

18 MS. LUND: I think that is a very good
19 question. I think that for plants like Indian Point
20 2 that have older steam generators, the inspection
21 intervals are not going to change. The ones that are
22 looking for inspection interval changes are the ones
23 with the new material 600 thermally treated and Alloy
24 690.

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1 I think it's also important to realize,
2 too, with the guidelines, the guidelines are a living
3 document, and they've had a lot of this experience
4 factored into the guidelines. In fact, what they are
5 looking at, the revision to the Steam Generator
6 Examination Guidelines from Rev. 5 to Rev. 6, in
7 Revision 6, which is now they are working out the
8 comments and that's what we are
9 expecting in mid-2002 from the industry, they
10 specifically deal with topics like data quality and
11 noise level, things that were big issues for Indian
12 Point 2. So, the guidelines will no longer be silent
13 on those particular topics.

14 So, I think that the new framework is
15 conceptualized to have these guidelines that are
16 living documents and include this experience and have
17 the condition monitoring that we were discussing
18 during the inspections to see where you are and
19 project forward.

20 COMMISSIONER McGAFFIGAN: So, I'm going to
21 get better condition monitoring. I'm going to get
22 better inspections. I'm just trying, to you know,
23 figure out what it is -- I know I'm not going to get
24 -- hopefully I'm not going to get longer intervals,
25 you said I'm not. I'm going to get the same intervals

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1 or perhaps shorter, if any, but what is it I'm going
2 to get at a plant that might have steam generator
3 issues? I'm going to get better condition monitoring,
4 better inspections when they occur, more consistent
5 inspections. I'm just trying to put words in your
6 mouth. I'm trying to figure out what the sound bite
7 is.

8 MS. LUND: Right. And I think the --

9 COMMISSIONER MCGAFFIGAN: He wants to sell
10 what it is you guys have been doing, why this is safer
11 from the point of view of this resident next to Plant
12 X.

13 MS. LUND: Well, I think the framework
14 does contain these elements. And I think as far as
15 when you shut down and you look at the condition of
16 your steam generator tubes against this performance
17 criteria, as I think that Jack mentioned earlier, that
18 will give you an idea of how long you can run. And
19 instead of just having surveillance intervals that
20 really are not predicated about the condition of your
21 tubes, this is one of the changes, and also looking at
22 --

23 COMMISSIONER MCGAFFIGAN: Is there any
24 change in the Tech Specs? I'm trying to remember the
25 Indian Point experience. My recollection is that

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1 their leak was something like 2 gallons per day. It
2 had gone up from half a gallon per day to 2 gallons
3 per day. Are those number approximately, correct?
4 And the Tech Specs are something like 130 gallons per
5 day.

6 MR. SHERON: It's a very low number, well
7 within their Tech Specs.

8 COMMISSIONER MCGAFFIGAN: It was a very
9 low number, well within their Tech Specs, and yet my
10 recollection is that you all had said that -- weren't
11 residents sort of attuned -- the resident was attuned
12 to the half-gallon going to 2 gallons and had even
13 remarked at the time, are you guys on top of your
14 procedures in case there's a rupture? Hadn't that
15 occurred before the rupture? Am I for getting
16 something? It was way below Tech Specs, it wasn't
17 appropriate to try to shut the plant down or anything,
18 but we were attuned to something going from half a
19 gallon per day to 2 gallons, and just wanted to be
20 sure they were on top of their game in case this was
21 an indication of things to come. Is anything like
22 that getting into the new Tech Specs, you know, be on
23 top of your game if you see -- even though it's still
24 well below Tech Spec level, a change?

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1 MS. LUND: Well, I think we can also
2 address that in the EPRI guidelines because there are
3 action levels contained in the EPRI guidelines, and I
4 believe they start at actually 5 GPD, and what it does
5 is gets everybody sensitive to something going on.
6 It's not only the number itself, but it's also the
7 rate of change that people should be aware of, and it
8 actually talks the licensees through how you evaluate
9 this type of situation, so it's being the
10 primary/secondary leakage guidelines.

11 I think it's important to realize that as
12 they developed 97-06, they've also developed all these
13 different guidelines and some are very new guidelines,
14 too, like the integrity assessment guidelines, and
15 what they are meant to is strengthen the program so
16 they can address issues like are you discussing.

17 COMMISSIONER McGAFFIGAN: How do these
18 guidelines get captured in our regulatory framework.
19 We are going to have this Generic License Change
20 Package that then individual licensees are going to
21 submit amendments for changes to both their
22 Administrative and regular Tech Specs consistent with
23 that Change Package that presumably will go very
24 rapidly itself, and then you have these guidelines
25 from EPRI that tell the licensees how they should go

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1 about staying consistent with these Tech Specs which
2 -- are we going to endorse these?

3 MS. LUND: Or how to meet the performance
4 criteria, I guess, is a better way probably to state
5 it. It is a way to achieve that.

6 COMMISSIONER McGAFFIGAN: Right. Are we
7 endorsing these guidelines?

8 MR. STROSNIDER: The framework, the
9 Technical Specifications have requirement for a steam
10 generator program that's supposed to have certain
11 elements in it. In fact, I think one of the vu-graphs
12 talks about those elements in terms of inspection and
13 leakage monitoring and various parts of the program.

14 The expectation is that when the change
15 package comes in, that the licensee will be committing
16 that program will, in fact, incorporate the EPRI
17 guidelines, which means that those guidelines will
18 somehow be translated into their plant operating
19 procedures. And so from there, in terms of regulatory
20 controls or effectiveness, you have the same controls
21 that are normally in place with regard to any of the
22 plant's normal procedures for operating, surveilling
23 and maintaining their plants. So, in other words, we
24 would be look at it in terms of the -- from an
25 inspection point of view in terms the revised

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1 oversight process would drive that. But the other
2 thing is, we have been careful, as we were just
3 discussing, to make sure we have regulatory controls
4 over what we think are very critical parameters, such
5 as the inspection intervals, and making sure that we
6 understand what changes are being made there.

7 A similar approach in the Tech Specs has
8 to do with the repair criteria and the repair methods,
9 the same approach being taken there that if a licensee
10 wants to implement new repair criteria -- that is,
11 instead of repairing a tube at 40 percent through wall
12 degradation, to change that somehow -- that would
13 require NRC review and approval first. One approved,
14 it could be applied by other plants. But we wanted to
15 make sure we were able to look at that, and one of the
16 things driving that, in fact, was understanding the
17 risk implications because some different repair
18 methods and repair criteria could have different risk
19 implications which we can't really understand until we
20 see them. We don't know ahead of time what they might
21 look like.

22 So, I think we've been careful to try to
23 keep the regulatory controls in those important areas
24 where we feel we need
25 them.

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1 COMMISSIONER MCGAFFIGAN: How will you --
2 and I'm not going to over-stay my welcome here either
3 -- but how do you keep track of what we have approved?
4 Is there going to be an annual update as to this is
5 what we approved in the way of new repair criteria, or
6 new inspection techniques, or new whatever? Is NEI
7 going to do it for the licensee? You know, NRC just
8 approved a plant-wide new criteria and anybody who
9 thinks they can meet it should apply? Whose job is it
10 going to be to sort of keep track of this -- what the
11 rules are if they are -- if they are tied to
12 guidelines that we don't really control, which we want
13 to be living documents, and tied to safety evaluation
14 reports that we issue on specific licensing cases. Is
15 that maybe no more complicated than the Appendix R at
16 the moment, but that's not a good example.

17 MS. LUND: I guess I'll take a stab at it.
18 I think what I'm hearing you say is how do we keep
19 track of all the approvals, especially the generic
20 type of approvals, because we have given generic
21 approvals and specific approvals to alternate repair
22 criteria as well as to different --

23 COMMISSIONER MCGAFFIGAN: Have we done
24 that in the past by like a Generic Letter or
25 something?

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1 MS. LUND: Not that I'm aware of -- as far
2 as voltage-based criteria, we have.

3 MR. STROSNIDER: Yes. In fact, that's one
4 example where we've done it by Generic Letter. We
5 could use a regulatory information summary, but I
6 think --

7 MS. LUND: Safety evaluations are a
8 typical mode of doing that.

9 MR. SHERON: But the other way is we meet
10 usually about twice a year Steam Generator Executive
11 Committee of NEI, and typically we will discuss issues
12 such as what have we approved recently and the like.
13 And, quite honestly, that message gets back to all of
14 the BWR licensees and they will decide whether they
15 want to avail themselves of something we've already
16 approved.

17 COMMISSIONER McGAFFIGAN: I'm trying to
18 think in terms of the public, being able to convey to
19 them what the current state of play is. Let me just
20 ask one last question. Did the scheduling of this
21 meeting have anything to do with the progress that was
22 made in the last month on this interval issue between
23 you guys and NEI -- you know, the interval length
24 issue?

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1 I have these graphs from last Friday, or
2 Thursday, and it looks like a lot of progress is made
3 between November 2nd and the current date.

4 MR. STROSNIDER: Well, we had a meeting
5 scheduled, and it was scheduled sometime ago, to go
6 over these issues, and we've been working with the
7 industry to try to come to resolution of this. But,
8 frankly, we were hoping to be able to come and say we
9 have a success path laid out, which I think we do.

10 COMMISSIONER MCGAFFIGAN: Okay. Thank
11 you.

12 CHAIRMAN MESERVE: Commissioner
13 Merrifield.

14 COMMISSIONER MERRIFIELD: I would like to
15 follow on and first compliment the staff for obviously
16 a significant amount of time they been wrestling with
17 a myriad of issues associated with this. While he's
18 not here, I would also want to put a plug in for all
19 the work that Region I, particularly Hub Miller, had
20 to deal with in responding to the events at Indian
21 Point. It was a significant amount of time that they
22 took over the course of the last year, and Hub should
23 bear much of the credit for that.

24 I appreciate the comments and the unique
25 perspective that Commissioner Diaz brings back with

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1 him to the Commission, and it is welcome. I agree
2 with many of his observations. There is much for us
3 to learn regarding IP2 and how we may move forward in
4 many layers. I would layer on top of what he said
5 also that I think our licensees have some things to
6 learn about that event as well. And as we think about
7 reassessing our own ways of enhancing the public
8 confidence and the way in which we engage with the
9 public, I think our licensees, NEI, and certainly now
10 the incumbent at Indian Point, should think as well
11 about how they engage with the public because that has
12 a big impact going forward as well.

13 The first question I have involves --
14 we've had some more
15 attention more recently on some of the issues coming
16 away from the TMI steam generator concerns within the
17 last few months -- and I'm wondering to the extent, if
18 any, they are being factored into our Steam Generator
19 Action Plan and our steam generator research going
20 forward?

21 MR. SHERON: I'll start out, maybe staff
22 could chime in, but the I think the answer is yes. We
23 take kind of a multi-layered approach here. The
24 first, obviously, is we need to determine if there is
25 a safety issue associated with this. In other words,

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1 why should I not assume other plants have this kind of
2 problem and why shouldn't they by doing something
3 right away?

4 When we met last week with the Executive
5 Committee, that question was put to them. We asked
6 them to put together a program that told us how they
7 would deal with it, or how they intend to deal with it
8 and, more importantly, between now and when they
9 proposed to deal with it, why is it okay for plants to
10 continue to operate? Likewise, we're doing our own
11 assessment of, for example, risk, to justify why we
12 believe we either need to justify why we need to do
13 something very quickly, or we can wait and do that.

14 So, obviously, whenever we get new
15 information, the first step is to basically understand
16 the safety significance and risk, and that kind of
17 sets the stage for how we operate in terms of whether
18 we need to do something right away, whether we have
19 time to study it, and the like. Obviously, you always
20 have to wait for root cause and the like. That's been
21 done.

22 The industry has committed to get back to
23 us with what their program is. We will have more
24 information from our own risk analysis probably
25 shortly.

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1 The next step then, obviously, is to, once
2 we identify this program, is to factor it into our
3 Steam Generator Action Plan, if it's appropriate, and
4 also to identify if we need any confirmatory research
5 to help us in terms of our evaluations, and that would
6 be factored into the research program usually via a
7 User Need Letter. Jack, do you want to --

8 MR. STROSNIDER: I just would like to make
9 one comment, though, which actually follows up on
10 Commissioner Diaz's comment on this area, that this
11 regulatory framework that we are working on not being
12 event-driven, that the framework that we want to put
13 in place should have a process for addressing these
14 sort of issues and, in fact, we think it does. And the
15 TMI, the recent event, is probably a good example
16 where the licensees have taken action, the owners
17 group have taken action, staff have taken action.

18 I don't believe, at this point at least,
19 that we have seen anything come out of that that
20 requires to us change the
21 framework that we're talking about putting in place.
22 So, the notion being that there will be other issues
23 that come up, technical issues, things that come up
24 during inspections that we hadn't anticipated, and the
25 process needs to be able to handle it, that's the

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1 important thing. For that matter, there will be
2 improvements in technology which could allow
3 licensees, if they want to take advantage of it, the
4 process needs to allow that, too. And I think that as
5 Dr. Sheron just indicated, when this event came up,
6 the process seemed to have worked pretty well.

7 COMMISSIONER MERRIFIELD: I agree with the
8 aforesaid point that we should not be event-driven,
9 but I also agree we need to confirm, as you are, a
10 processes that ongoing events are captured within our
11 regulatory framework, and so I appreciate that.

12 I had a question, moving back to some of
13 the earlier presentation slides, particularly on the
14 first presentation Slide 6 -- presentation by Ms.
15 Banerjee. In that, you mentioned that we have made
16 significant progress, and you mentioned that 20 of the
17 23 milestones are complete, with open items scheduled
18 for completion by February of '02. That seems to
19 focus, for the most part, on milestones and outputs.
20 And I'd like to shift back from outputs to outcomes,
21 perhaps hearing from our former Chairman.

22 What were the outcomes that the 23
23 milestones were designed to achieve?

24 MS. BANERJEE: That is a very good
25 question. Let me try to answer that. One of the

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1 important ones is how we do inspection in the steam
2 generator examination area, tube examination area.
3 Before we put out the new guidance on steam generator
4 inspection, our inspections were primarily based on
5 how the licensee is doing the current testing. Now,
6 our focus will be how they are assessing the results
7 in terms of what we call condition monitoring and
8 operational assessment trying to figure out if the
9 degradation methods that are existing are understood
10 and the steam generator behave the way they predicted
11 it to behave previously and how it is going to behave
12 during the next operating cycle, so there will not be
13 any unpleasant surprises in terms of not meeting the
14 performance criteria, as Louise mentioned. So that is
15 a definite improvement to the inspection procedure in
16 the guidelines, and are giving us better capability.

17 We also developed the risk-informed
18 significance determination process, thereby all the
19 inspection findings under the new regulatory oversight
20 program will be assessed for their risk significance,
21 so that we know what is the level of engagement for
22 NRC. So that helps us improve our response to those
23 kind of events.

24 Then, there are other issues not directly
25 related to the steam generator, but also the

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1 processes, the regulatory processes we use. One is
2 risk communication, as Commissioner Diaz asked and we
3 responded to his questions. We are working -- we
4 developed the recommendations on it.

5 Then, there are other processes like the
6 licensing amendment review process. In order to
7 respond to what we call RAI, request for additional
8 information, we have improved and clarified the
9 management guidance in this area, so that now we are
10 focusing on putting together a RAI which is complete
11 and effective so that we don't have to iterate the
12 process, and other ways of getting information from
13 the licensee without engaging them in a detailed RAI
14 response which has to be docketed and goes a time-
15 consuming process.

16 So, these are a few examples of the little
17 improvements we made in our Steam Generator Program
18 and in the long-run will improve our effectiveness and
19 efficiency and also reduce unnecessary regulatory
20 burden.

21 MS. LUND: I just want to mention one
22 other thing, as Maitri had discussed this revised
23 inspection procedures, and we're having the Regional
24 inspectors come in in January for some additional
25 training on this procedure. And because they've been

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1 using this procedure during the fall outages, it will
2 give us an excellent opportunity to receive feedback.
3 We can also fine-tune the procedure based on their
4 feedback, so instead of it just being an output, us
5 hucking it over the fence at them, it gives us an
6 opportunity to engage the Regional inspectors and find
7 out how it performs.

8 COMMISSIONER MERRIFIELD: Speaking of --
9 you mentioned it occurring now, so I'm going to switch
10 back to Dr. Muscara -- you talked about some of the
11 work that's being undertaken Argonne. When I was
12 there last year, they had a program in which they had
13 -- a new computer tool that they were designing that
14 would take the current testing and provide a better
15 ability to analyze that and detect it. And I'm
16 wondering if you could provide a little bit of an
17 update about where that stands. You talked about a
18 report in publication, but I'm wondering about that
19 particular element of the research that Argonne is
20 working on.

21 DR. MUSCARA: That particular work was
22 done to help to us to characterize flaws in the mock-
23 up because in order to evaluate for better detection,
24 we need to know what flaws we are looking at, and we
25 do not want to destroy the sample. So, we needed to

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1 have a very accurate method for characterizing flaws.
2 And so this method has been developed. And, of
3 course, this is very useful in conducting official
4 assessments because we need to be able to characterize
5 the flaw so we can evaluate how it will behave
6 structurally.

7 Now, the work has progressed. The system
8 we have is really a laboratory system, it not really
9 intended for the field at this point. It is not very
10 user-friendly. However, EPRI, Westinghouse, our
11 partners in this program, are very interested in this
12 work. We have met with them. They are interested in
13 taking this information and applying it for field
14 inspections. So we are working with them and
15 transferring the technology and helping them make it
16 useful for the field.

17 COMMISSIONER MERRIFIELD: I remember at
18 the time having reviewed that, and it sounded quite
19 promising. So I'm certainly encouraging of efforts to
20 bring that into the field because it could take
21 current tests and really enhance the ability the to
22 detect those.

23 DR. MUSCARA: We have characterized --
24 maybe beyond the time that you've seen it -- by
25 comparing the ND result to destructive examination.

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1 And when we compare the flaw shapes and profiles, they
2 are very, very close. The standard deviation is quite
3 small, on the order of 2-5 percent for the larger
4 flaws. So, it is a very good technique and, as I say,
5 it's quite important to be able to do appropriate and
6 reliable operational assessments because a flaw shape
7 and size is quite important in the analysis.

8 COMMISSIONER MERRIFIELD: Okay, good. The
9 last question I had, there was a presentation at ACRS
10 on November 29th at which the staff indicated that
11 certain EPRI guidelines were not sufficiently well
12 developed to support inspection intervals
13 significantly longer than what was it being
14 implemented under current requirements or acceptable
15 alternatives.

16 I'm wondering if you can just give me an
17 update in terms of whether there is any resolution of
18 that matter, or whether it still is an outstanding
19 concern?

20 MS. LUND: Well, I think as we discussed
21 with the -- we have technical issues, and as we look
22 at the EPRI guidelines -- and we don't endorse them --
23 but through our review of NEI 97-06, we ended up doing
24 a lot of review of the guidelines. And we brought up
25 issues and we actually commented on Revision 6 to the

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1 examination guidelines. And I think specifically with
2 specifically with regard to the inspection interval
3 extension, I think that we had questions and we had
4 comments regarding using a performance-based approach,
5 and we discussed getting a technical basis developed
6 for the Alloy 600 thermally treated and 690. So I
7 think there is a lot of interaction back and forth to
8 provide input on this.

9 MR. STROSNIDER: There very specifically
10 was a concern about some of the proposed intervals in
11 that we thought they were too long, and that there
12 needed to be more technical basis for that. But one
13 thing I do want to point out, too, is that that was
14 in, I believe, Rev 6 of the guidelines which the
15 industry had not approved yet themselves, and so that
16 was still under review by the industry. And we had
17 been having these discussions, as we indicated during
18 the presentation, and I think we have come to
19 agreement that a different set of intervals would be
20 used. We made some comments on those, and I think
21 hopefully we are coming to resolution on those, that
22 set of intervals.

23 COMMISSIONER MERRIFIELD: Thank you, Mr.
24 Chairman.

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1 CHAIRMAN MESERVE: Thank you. Brian's
2 introduction to this talked about how this has been a
3 long time getting to the point where we now find
4 ourselves. And it does raise a question of the extent
5 to which the NEI Guidance 96-06 is, in fact, being
6 implemented by licensees in this time period. Would
7 you say something about that?

8 MR. SHERON: When we received 97-06, we
9 were told by NEI that the industry had already agreed
10 to implement that document, I believe, by January 1st,
11 '98 -- first refueling outage after --

12 MS. BANERJEE: 1999.

13 MR. SHERON: I'm sorry -- after 1999. And
14 the industry, in fact, has been moving forward on
15 that. We did remind them that if there were any
16 guidance in that document that that was inconsistent
17 with our regulations, they needed to be aware,
18 obviously. But they have been moving forward with it.

19 I would add to that, though, something I
20 was going mention before and that is that while we're
21 waiting to complete our review of 97-06 and hopefully
22 get it along with the revised licensing change package
23 and everything put in place, the staff has been
24 interacting with licensees on a case-by-case basis.
25 I imagine Louise could give a little more detail.

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1 This didn't come out in the briefing, but we had, for
2 example, conference calls with some of the licensees
3 at every outage, and this is where we discuss with
4 them things like, for example, the scope of their
5 inspection, what kind of probes they are using, are
6 these the appropriate probes for
7 the type of degradation they would expect to see?
8 This usually gets into a back-and-forth with the
9 licensee. Sometimes the licensee will make
10 modifications in their inspection program as a result
11 of these, but that's how we basically gain our
12 assurance that we believe that the plants can operate
13 safely for the next cycle.

14 So, you know, there's that combined with
15 the industry following 97-06, and then, as Jack said,
16 hopefully when we finally get this all approved and in
17 place, we will have a framework that, at least in my
18 feeling, hopefully will eliminate the need for us to
19 continually monitor and have these type of conference
20 calls.

21 MS. LUND: I would just like to make
22 another comment to that, too. It is very true that on
23 our phone calls that we have with the licensees during
24 their steam generator outages, that we do ask
25 questions such as what does NEI 97-06 tell you to do?

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1 What does the steam generator examination guidelines
2 tell you to do in this situation, so we do end up
3 having those type of conversations. And just about
4 every phone call, we have a list of questions that we
5 send to them that address a lot of these topics.

6 CHAIRMAN MESERVE: Let me say I think it
7 is a very important point that anyone in the audience
8 who is trying to understand what we're doing, I would
9 not want to have any implication that we been dead in
10 the water on this issue since
11 the early 90's and trying to figure out how to deal
12 with something, and this is something that has been
13 worked continuously and case-by-case or an ad hoc
14 basis since then.

15 MR. SHERON: And just to follow up, as
16 Brian indicated, we've had generic communications in
17 terms of information notices, Generic Letters, et
18 cetera, from the NRC's perspective, from a regulatory
19 perspective. But I think also we really do need to
20 credit the industry on this particular initiative.
21 And when we look what this from an industry initiative
22 point of view and our decision not to go with a
23 Generic Letter that, in fact, in '99 they were
24 implementing this. And that has, I think, really
25 improved safety. Typically, what they are doing under

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1 97-06 is more conservative, more aggressive than
2 what's required by our current Technical
3 Specifications. So, I think we do need to recognize
4 that and give them credit for taking that initiative.

5 MS. LUND: I want to follow up with just
6 one more thing, that even though they are working on
7 Revision 6 to the examination guidelines, they've also
8 put out interim guidance -- this is after Indian Point
9 2 -- for things like pressure testing and other issues
10 that have come up. So, these issues just didn't set
11 until a revision could be made, there is additional
12 guidance out there. When we've brought up issues,
13 we've interacted with the industry. Interim guidance
14 has gone out by NEI on these various issues.

15 CHAIRMAN MESERVE: I would like to ask you
16 one or two questions about an ACRS letter of October
17 18th, which has basically been supportive of what the
18 staff has been doing in this area. It does have a
19 comment about the lack of correlation between leakage
20 and voltage for 7/8th-inch tubes which it finds
21 perplexing, and later the correlation observed for the
22 3/4-inch tubes. This is a troubling sort of
23 statement, just sitting here, that the EDI current
24 testing, I guess, as this applies to the 7/8th-inch
25 tubes. Could you comment about what we're doing about

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1 this and where this stands today? You're smiling.
2 I'm troubled that --

3 MR. STROSNIDER: I think maybe one of the
4 problems is that there was a good correlation for the
5 other size tubes, but this is an empirical approach,
6 and it's true that the one size tube that the database
7 that supports the voltage-based approach does not have
8 as good a correlation. But, in fact, if you look at
9 what went out in the Generic Letter that allowed
10 implementation of this voltage-based approach, it's
11 empirical. There's a statistical analysis that takes
12 into account whatever level of correlation there is,
13 that's what you get credit for and you have to account
14 for the uncertainties in it.

15 Having said that, people would like to see
16 an improved correlation. The data that we have are
17 the data that we have, and it height be difficult to
18 force them into anything that is not there. But
19 having said that, I think maybe Dr. Muscara has some
20 comments with regard to some of the more fundamental
21 looks in this area.

22 DR. MUSCARA: We've had discussion in this
23 area for many, many years, and clearly what we see is
24 what we would expect out of the voltage correlation.

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1 The voltage really does not have a physical basis for
2 relating to structural integrity.

3 CHAIRMAN MESERVE: It's completely
4 empirical?

5 DR. MUSCARA: It's completely empirical,
6 and there are reasons why voltage in certain
7 situations may not work, may not tell us what to
8 expect as far as leakage first in failure pressures.
9 One of the advantages of the advance in E-techniques
10 for sizing flaws, it gives us a direct method of
11 evaluating the flaw size and shape, and that directly
12 can relate to leakage and to burst and failure
13 pressures. And so one direction we're going into is
14 to improve our integrity modeling and our NDE, so we
15 can get a better correlation, in fact, industry is
16 also following along with some of their newer repair
17 criteria are based on the profile of the flaw instead
18 of its voltage response.

19 CHAIRMAN MESERVE: So is this an issue
20 that you think over time then is going to resolve
21 itself?

22 DR. MUSCARA: Yes, definitely.

23 CHAIRMAN MESERVE: The other thing they
24 note is that they propose some work for better
25 understanding of radioactive iodine behavior on design

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1 basis accident conditions, and the implication here is
2 that staff is in disagreement with them as to the
3 iodine spiking phenomenon.

4 MR. SHERON: Dr. Rich Barrett --

5 MR. BARRETT: My name is Rich Barrett.
6 I'm with the NRR staff. The phenomenon they are
7 referring to has to do with the accounting for the
8 iodine that's released from the fuel as a result of a
9 pressure spike during an accident. And their comment
10 was that -- that the so-called spiking factors might
11 not be conservative enough for all possible regimes
12 where a plant might be operating.

13 We've been looking at that phenomenon
14 since that meeting, ever since we got the
15 recommendation. And we're in the process now of
16 finalizing that analysis, and we plan to publish a
17 response for public comment in the next few months.
18 And after we've gotten public comment, we are going to
19 evaluate whether further work is needed to refine that
20 guidance.

21 For the moment, however, we think that
22 what we have out there in the operating fleet is not
23 nonconservative, and we're prepared if any licensee
24 proposes to change their Technical Specification
25 limits to move into the area that the ACRS is

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1 concerned about, to deal those on a one-on-one basis.
2 So, we take this recommendation seriously. I think
3 the ACRS may have gotten a mistaken impression from
4 our status briefing recently that we've completed that
5 work and that we're not continuing, and that we're not
6 going to respond to them. But we certainly plan to,
7 and I'm looking forward to seeing the results of that
8 work myself.

9 CHAIRMAN MESERVE: Thank you.
10 Commissioner Dicus.

11 COMMISSIONER DICUS: Thank you. I guess
12 the first thing I want to say is, sometime ago I had
13 requested that there be a list of acronyms on
14 briefings and I appreciate the fact that you did
15 supply me, and the rest of us, of course, with a list
16 of acronyms, but just for the record, I do know what
17 NRC stands for.

18 (Laughter.)

19 COMMISSIONER DICUS: Now, I'm not so sure
20 about NEI, but anyway --

21 CHAIRMAN MESERVE: They wanted to be
22 complete.

23 COMMISSIONER DICUS: It was very complete,
24 and I appreciate that. I want to add my voice to the
25 ones you have been hearing that any regulations or

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1 guidance or where we go with something is definitely
2 -- is definitely safety risk-driven and not event-
3 driven. I think you've heard it from all of us, so
4 just put my voice in with it.

5 I would like to go to the first set of
6 slide, slide Number 4, and you mentioned resolution
7 coordinated with stakeholders, and you did have active
8 stakeholder involvement, and I kind of wondered who
9 those were outside, I know the industry.

10 MS. BANERJEE: Other than the industry
11 and, of course, our licensees. We had some meetings
12 last year in December, and our Steam Generator
13 Workshop in February, where we invited many concerned
14 scientists and a couple other external stakeholders
15 who are traditionally very involved in our regulatory
16 processes. And one or two of them attended the first
17 day of the workshop, but at the workshop they
18 indicated that they liked to be kept informed in a
19 directly participating minute. For that reason, we
20 developed a service list whereby we keep them informed
21 of all the activities that are happening in this area.

22 And then in the past couple of meetings,
23 the industry on NEI 97-06, we had some public
24 attendance. These meetings are open for public
25 observation only, and we had attendance from McGraw-

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1 Hill, that one I can think of right away. So, it's
2 sporadic involvement from the public.

3 MR. STROSNIDER: If I could add one thing
4 -- excuse me. I think one other important thing is
5 that when you look at the process we have laid out
6 reporting this generic Tech Spec change into place,
7 that we included going out in a Federal Register
8 Notice after we've developed a generic safety
9 evaluation requesting any stakeholder comments through
10 that process, which is not normally a necessary part
11 of the process, but we think important to make sure
12 that we do have everybody's input.

13 COMMISSIONER DICUS: Are you getting --

14 MR. STROSNIDER: Once we come to
15 agreement, we developed a generic safety evaluation,
16 it will go out in a Federal Register Notice for
17 anybody to make comments on, and we'll incorporate
18 those comments in the final evaluation.

19 COMMISSIONER DICUS: One of the places I'm
20 heading with this question, excluding IP2 because
21 we're all very much aware of legislative and local
22 interests because the event and perhaps TMI and
23 others, but, in general, are you getting public
24 concern or state legislative concern or governor's

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1 concerns over steam generator issues across the nation
2 where we have our stations?

3 MR. SHERON: I'll try that. I would not
4 say it is across the nation, but there are certain
5 plants where it is more of an issue -- Salem, for
6 example, is a good example. Last summer we held a
7 public meeting near the Salem Station, with a group up
8 there that was very actively concerned about the Salem
9 generators in the wake of the Indian Point failure.
10 Their concern was obviously that the Salem generators
11 may be degraded to the extent that the Indian Point
12 was, and they were very interested in the inspection
13 results. They wanted the inspection results released
14 for their own analysts and the like.

15 We interacted with that individual, and we
16 agreed to a public meeting, which the Region
17 participated in, as well as the Headquarters staff.
18 My guess is we didn't satisfy this individual or his
19 organization completely, but I think we did make some
20 gains, you might say, in terms of explaining what our
21 processes are.

22 I'm not aware of any other plants -- maybe
23 anyone else on the staff knows of any recently -- but
24 that's the only one that comes to mind right now where
25 there was active public concern.

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1 COMMISSIONER DICUS: I was just going as
2 to whether or not, given any number of events like our
3 liaison, our governor offices liaisons, had contacted
4 you expressing any concern that the
5 governors were asking about where we had stations.

6 MR. SHERON: I'm not aware of any.

7 COMMISSIONER DICUS: Okay. That's good.
8 Thank you, that's all.

9 COMMISSIONER DIAZ: Can I over-extend my
10 welcome?

11 CHAIRMAN MESERVE: You'd find it hard to
12 do that.

13 COMMISSIONER DIAZ: I just wanted to say
14 that although the words will come back to haunt me, it
15 is always a pleasure to be involved in steam generator
16 issues rather than other issues.

17 (Laughter.)

18 CHAIRMAN MESERVE: You might find
19 unanimity on the Commission for that.

20 COMMISSIONER MCGAFFIGAN: I heard, Nils,
21 that they are going to introduce legislation requiring
22 NRC conduct all steam generator tube inspections with
23 federal employees, and that all stem generator tubes
24 will be inspected at least every six months by this
25 massive workforce.

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1 COMMISSIONER DIAZ: Florida, here I come.

2 (Laughter.)

3 CHAIRMAN MESERVE: With supervision by the
4 Commission.

5 I would like to thank the staff for a very
6 helpful briefing, and on behalf of the Commission, I
7 feel confident saying that we're all pleased at the
8 progress you have made in resolving the technical and
9 regulatory issues, and that we very much look forward
10 to resolution of the issues associated with NEI 97-06.
11 And, with that, we're adjourned. Thank you.

12 COMMISSIONER MCGAFFIGAN: And I was not
13 trying to give any legislator an idea for a bill.

14 (Whereupon, at 3:40 p.m., the meeting was
15 adjourned.)

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