

ORIGINAL
UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

Title: BRIEFING ON INTEGRATED SAFETY
ASSESSMENT TEAM INSPECTION (ISAT) AT
MAINE YANKEE - PUBLIC MEETING

Location: Rockville, Maryland

Date: Friday, October 18, 1996

Pages: 1 - 85

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BRIEFING ON INTEGRATED SAFETY
ASSESSMENT TEAM INSPECTION (ISAT)
AT MAINE YANKEE

PUBLIC MEETING

Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, Maryland

Friday, October 18, 1996

The Commission met in open session, pursuant to notice, at 9:00 a.m., the Honorable SHIRLEY A. JACKSON, Chairman of the Commission, presiding.

COMMISSIONERS PRESENT:

- SHIRLEY A. JACKSON, Chairman of the Commission
- KENNETH C. ROGERS, Member of the Commission
- GRETA J. DICUS, Member of the Commission
- NILS J. DIAZ, Member of the Commission
- EDWARD McGAFFIGAN, JR., Member of the Commission

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1 STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

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- KAREN D. CYR, General Counsel
- JOHN C. HOYLE, Secretary
- JAMES M. TAYLOR, Executive Director for Operations
- EDWARD JORDAN, Director, AEOD
- ELLIS MERSCHOFF, Independent Safety Assessment
Team Leader
- HUBERT MILLER, Regional Administrator, Region I
- FRANK MIRAGLIA, Acting Director, NRR

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P R O C E E D I N G S

[9:00 a.m.]

1
2
3 CHAIRMAN JACKSON: Good morning, ladies and
4 gentlemen. Before I start talking about the purpose of this
5 meeting I'd like to introduce our Region I regional
6 administrator Hubert Miller, AKA Hub Miller, to the
7 Commission; in particular to the new commissioners,
8 Commissioner Diaz and Commissioner McGaffigan, and I don't
9 know if you've met Commissioner Dicus.

10 The purpose of this meeting is for the NRC's
11 independent safety assessment team to brief the Commission
12 on the process, findings and conclusions of their inspection
13 of Maine Yankee. Working with the executive director of
14 operations, I initiated a charter for this team, which the
15 Commission approved in late May of this year, primarily to
16 provide an independent assessment of the conformance of the
17 Maine Yankee plant to its design and licensing bases.

18 I have also personally kept in close contact with
19 the team, having received numerous briefings over the past
20 five months.

21 The Commission recognizes that much effort has
22 been expended by this team in generating an independent
23 assessment of the Maine Yankee facility. The inspection was
24 unique in its scope, independence, and in its coordination
25 with state representatives.

1 The Commission had the opportunity to review the
2 report prior to my signing it out to the licensee last week
3 and we're interested in hearing your comments on the process
4 used and discussing the safety significant findings and root
5 causes and their tie-in to the regulatory process.

6 Additionally, since much work went into
7 coordinating state participation in this inspection, the
8 Commission is also interested in your perception of the
9 states and the general public's reaction to the process
10 used.

11 We also look forward to discussing the aspects of
12 regulatory lessons learned that your inspection team gleaned
13 and which can be used to improve our own processes.

14 Now, I understand that copies of the presentation
15 are available at the entrance to the meeting. If my fellow
16 commissioners have no opening comments, Mr. Taylor, please
17 proceed.

18 MR. TAYLOR: Good morning. This briefing will be
19 given principally by Ed Jordan and Ellis Merschhoff and we'll
20 start with Ed.

21 MR. JORDAN: Okay. I would first introduce Ellis
22 Merschhoff as the team leader for this effort. He's also the
23 director of the Division of Reactor Projects in the Region
24 II office in Atlanta and he's been directly involved, fully
25 participating in this since the month of June, through the

1 month of June to today.

2 So I'll just recount a little bit of the history.
3 I was tasked on May 31 by the executive director for
4 operations, Jim Taylor, to manage this independent safety
5 assessment and to report directly to the Chairman with
6 respect to this effort, since it was to be independent.
7 Could I have the number 2' slide, please?

8 CHAIRMAN JACKSON: Are other members of the team
9 here today?

10 MR. JORDAN: Yes, they are, and Ellis will go
11 through the introductions.

12 CHAIRMAN JACKSON: Okay.

13 MR. JORDAN: The objectives of the presentation
14 are to, first of all, describe the process that was used to
15 evaluate Maine Yankee, to discuss the findings and
16 conclusions, and then to discuss the regulatory lessons
17 learned and, of course, to respond to your questions.

18 We're also compiling lessons learned in the
19 conduct of this effort for the NRC and our own internal
20 process. I think one embarrassing lesson along the way was
21 we had difficulty with distribution of reports and I'm
22 afraid some of the commissioners didn't get the final report
23 in a timely fashion. So we've learned that and that was an
24 error on my part.

25 In December of 1995 -- the next slide, please --

1 the Union of Concerned Scientists forwarded anonymous
2 allegations to the State of Maine and the State of Maine
3 then forwarded that allegation package to the NRC. The
4 allegations were that the Yankee Atomic Power Company
5 knowingly performed inadequate analysis to support an
6 increase in rated power of the Maine Yankee Atomic Power
7 Station.

8 After a technical review, NRR issued a
9 confirmatory order on January 3, 1996 limiting power to the
10 original license level of 2,440 megawatts while this issue
11 was being investigated.

12 On May 8, 1996, the Office of Inspector General
13 completed an inquiry that established that the Maine Yankee
14 Atomic Power Company had made modifications to the RELAP/5YA
15 computer code which was used in the emergency core cooling
16 system analysis for small break loss of coolant accident.
17 The problems were not reported to the NRC, as required, and
18 the code was not issued in accordance with the safety
19 analysis report and the TMI action plan. The Office of
20 Inspector General also reported weaknesses in the NRC review
21 and follow-up which contributed to NRC failure to detect
22 these deficiencies.

23 The RELAP issue raised questions of whether
24 similar undetected problems existed in other areas at the
25 Maine Yankee plant. In order to address this question and

1 to respond to the concerns of the governor of Maine about
2 the safety of the Maine Yankee plant and the effectiveness
3 of NRC regulatory oversight, the independent assessment was
4 initiated. Next slide, please.

5 MR. TAYLOR: May I add that the 2,440 megawatt is
6 a thermal --

7 MR. JORDAN: Yes, it is.

8 MR. TAYLOR: Just to make the distinction.

9 CHAIRMAN JACKSON: It would be quite a plant.

10 [Laughter.]

11 MR. TAYLOR: Bigger than I thought it was. Excuse
12 me.

13 MR. JORDAN: We started in the assessment with the
14 objectives and I'll talk about those on the next slide, but
15 the objectives, which were lengthy and detailed,
16 necessitated assembling a large multi-disciplined and
17 experienced team comprised of staff drawn from the Regions
18 II, III, IV, the Office of Research and the Office of AEOD.
19 And we received excellent support of these offices in
20 obtaining highly qualified team members.

21 This did, then, provide independence of NRR and
22 the individuals that staffed up the team and the Region I
23 staff. The individuals that staffed up this team were also
24 independent in terms of not having previous oversight of the
25 Maine Yankee plant.

1 The assessment was to be coordinated with the
2 state in order to facilitate participation by the State of
3 Maine on the team under the provisions of the Commission's
4 policy on cooperation with states. There were three levels
5 of participation by the state. Ellis will talk a little bit
6 more about them. There were three members on the technical
7 team itself who were participants, there was a two-person
8 process team that reviewed and observed the process and was
9 briefed along the way, and there was a five-person citizens
10 group that were appointed by the governor and were provided
11 with periodic briefings along the way, along with the
12 governor.

13 And I would say at this point that that was a very
14 satisfying interchange and I came away with a very pleasant
15 view of how that worked and a feeling that I would do it
16 again without any hesitation.

17 The process was a modified diagnostic evaluation
18 technique. We've done a large number of diagnostics in the
19 past and we use that methodology; that is, a functional area
20 review and a vertical slice of systems. In addition, we
21 added the analytic code review.

22 Then I'd like to go to the next slide because
23 that's the heart of the assessment, I would say, was to
24 develop a precise mission, set of objectives. And the keys,
25 I think, were that it was an independent assessment and it

1 was a review of the conformance of the Maine Yankee plant to
2 its design and licensing basis. And, of course, this
3 necessitated reviews at the site and corporate offices and
4 at the Yankee Atomic facility.

5 The next was to provide an assessment of
6 operational safety performance, including risk perspectives.
7 The risk perspectives was an added feature that we had not
8 done in that fashion previously.

9 The next objective was the effectiveness of
10 licensee self-assessments, corrective actions and
11 improvement plans, and that is an element that we normally
12 do on a diagnostic and we followed the same methodology.

13 Finally, to use those findings to develop root
14 causes of the issues and then to draw conclusions about the
15 overall performance.

16 CHAIRMAN JACKSON: Mr. Jordan, before you go
17 ahead, given that this was fairly unique, can you perhaps
18 make a brief comment, giving your assessment of how well or
19 how comfortable you are that the team was able to meet each
20 of these objectives? And do you feel, in retrospect, any
21 feeling about whether the work could have been accomplished
22 either with a smaller team or a shorter duration?

23 MR. JORDAN: Okay. First, these were the major
24 objectives and then those were broken down with more detail
25 and they were, in fact, the guiding principle for the team

1 that I would follow once again for similar work.

2 CHAIRMAN JACKSON: And you're satisfied that --

3 MR. JORDAN: So I'm satisfied that these
4 objectives were met and they're trackable through the report
5 and, in effect, the report is structured in that very
6 fashion.

7 In terms of whether the work could have been done
8 in a shorter time or with a smaller team, the work could
9 have been with a smaller team knowing what we know now, but
10 the problem with each one of these is you're going in to try
11 to understand the problems and you have to look broadly in
12 order to identify where problems exist. Where there were no
13 real problems, one could say that we spent resources that
14 were unnecessary, but you don't know until you've spent the
15 resources.

16 So the team could have been reduced very slightly
17 in size. This was a very large team and was, I think, a
18 tribute to Ellis that he managed it so well. But going in
19 with the same mission, I don't think we could do it with a
20 much smaller team. This was 23. Perhaps three less people
21 could have done it, in retrospect.

22 In terms of the time, absolutely not. This was
23 tight. This was a stressful thing for the team, the team
24 leader, in order to get it done on the schedule. The
25 schedule was laid out at the beginning. We used the

1 diagnostic methodology except we added another week in the
2 on-site review, so it was two weeks on-site, two weeks off-
3 site back here for examination of the first set of findings,
4 and then two weeks more on-site. And that was an ideal
5 arrangement. We learned that through time. So I would not
6 at all reduce that.

7 Preparation time -- absolutely essential, so that
8 you go in with a team that understands the plant, has
9 obtained from paper and interviews an understanding of the
10 previous work and hits the ground running when they get
11 there.

12 I think we have some observations about the
13 report-writing itself that would make it easier but not
14 shorter.

15 So I believe that we could have completed this
16 work with perhaps three less people but the same time, I
17 would maintain.

18 Then, at this point, I'd like to turn to Ellis and
19 let him go to slide 6, introduce the team members that are
20 here, and proceed.

21 MR. MERSCHOFF: Thank you. Good morning.

22 CHAIRMAN JACKSON: Good morning.

23 MR. MERSCHOFF: It's good to be here, at the end
24 of this process.

25 This was an extensive assessment by a large and

1 experienced team and I'd like to linger for a few minutes on
2 this organization chart and talk a little bit about the team
3 leaders and the depth of experience that we brought to bear
4 on this effort.

5 I have the team leaders here behind me. I'd ask
6 them to stand up as I go through each area. The operations
7 area was led by Mr. Kriss Kennedy from Region IV. Kriss has
8 a background as an NRC examiner and has also been a resident
9 at a Westinghouse plant and a senior resident at a
10 combustion engineering plant. That was an ideal background
11 to assess Maine Yankee in that Maine Yankee is a combustion
12 engineering plant with many characteristics similar to a
13 Westinghouse plant and, in fact, uses Westinghouse EOPs.
14 Kriss also has experience on a diagnostic evaluation at
15 Zion.

16 Within the team, under him, represented three
17 senior reactor operator licenses, ops management experience
18 at a CE plant, one IIT and three DETs.

19 The maintenance and testing area was led by Ron
20 Lloyd. Ron Lloyd brought shipyard experience in nuclear
21 construction, maintenance and testing to the area, extensive
22 diagnostic evaluation team experience. I think he's been on
23 every one that the agency has done.

24 The team members in the area of maintenance and
25 test brought resident inspector experience, architect

1 engineer design experience, probabilistic risk assessment
2 practitioner level experience, and three diagnostic
3 evaluations.

4 The engineering area was led by Tom Martin. Tom's
5 a senior manager in the Office of Research. He has industry
6 experience, operating experience and extensive engineering,
7 inspection and assessment experience.

8 Within that team we had shipyard experience,
9 industry level INC experience, architect engineer design
10 experience, four DETs plus two people who were on the
11 Millstone inspections, an SRO license and an RO license.

12 In the area of management and organization was led
13 by Alan Madison. Alan also brought extensive DET and IIT
14 experience to the team. He has resident inspector and
15 senior resident inspector experience and senior management
16 experience in the manufacturing industry.

17 The team members within the M&O area brought
18 senior resident inspector experience, regional management
19 experience, M&O consulting experience and two diagnostic
20 evaluations.

21 In the area of analytic codes, that was led by
22 Jack Rosenthal. Jack's the senior manager in the Office of
23 AEOD. Jack has experience at combustion engineering in the
24 analytic code area. He has PRA experience. He led the Nine
25 Mile IIT.

1 The team members in that area had combustion
2 engineering experience in code development, utility
3 experience and safety analyses, extensive thermohydraulic
4 code review experience.

5 Ola West is the administrative assistant. Ola is
6 back in the booth handling the slides. She's a division
7 secretary from Region II and a veteran of the Cooper
8 diagnostic.

9 The state team, the technical portion of the team
10 listed on this slide represented day-to-day participation in
11 the team in each of the technical areas. We also had, as Ed
12 mentioned, two members on the process team.

13 The process team's goal was to assure fairness,
14 balance and objectivity on behalf of the state of this
15 effort. They observed the team at virtually every key
16 point -- during the preparation phase, during the team
17 meetings, on site, during the team meetings and root cause
18 evaluation in Washington, and the interim exit meetings;
19 additionally, the citizens group, which were briefed along
20 with the governor at three different points.

21 Before I get into too much trouble in this
22 briefing, I'd like to say at this point that it was really
23 an honor to lead a team of this caliber. At times it was a
24 little bit like herding cats but we all got to the end
25 point. Next slide, please, Ola.

1 Now, as a complement or counterbalance to the
2 team, the licensee performed support organization and that
3 organization was intended and succeeded in providing
4 leverage to the ISA resources in order to maximize the
5 benefit of the assessment. They approached this assessment
6 as a learning opportunity and maintained that approach
7 throughout the assessment. And I think, in large part,
8 Maine Yankee's attitude and development of this extensive
9 support organization is as much a cause of the success of
10 the effort as the NRC efforts were.

11 They had senior level counterparts to each of the
12 functional area leaders whom I just introduced, as well as a
13 counterpart to me. They had good sized technical and
14 administrative staff to answer the questions and to develop
15 the technical library of answers that ended up probably over
16 100 shelf-feet of formal answers to specific issues that
17 were addressed. They provided a very effective link to the
18 line organization in terms of assuring that the extent of
19 condition of problems we identified were fully explored and
20 addressed and that any safety issues that we developed
21 through the course of this inspection were address in a
22 timely manner and satisfied before we left the site.

23 CHAIRMAN JACKSON: Was there any indication from
24 the licensee that the team's work in any way affected safety
25 as the work was going on?

1 MR. MERSCHOFF: It did not. The answer is yes,
2 the licensee indicated that it did not affect safety. That
3 was an area that Ed and I were very concerned with, along
4 with the licensee. We established some firm ground rules
5 relative to the number of people in the control room and
6 various areas, the level of impact on various key areas.

7 The senior managers knew that they could come to
8 me when they saw a problem. We had numerous discussions and
9 all were resolved to both the licensee's satisfaction and to
10 ours. So we saw what we needed to see and did not
11 interfere.

12 Next slide, please. This process started in June
13 and represents a level of effort equivalent to one and a
14 third times the total number of hours of inspection at Maine
15 Yankee in an entire year, about 17,000 hours in terms of
16 preparation, on-site inspection, documentation assessment.
17 About 4,500 of those hours were actually in the field, on
18 site.

19 The report was issued 45 days after leaving the
20 site, which is on target for a garden variety NRC team
21 inspection. The public entrance meeting and exit meetings
22 also effectively enhanced visibility of this process
23 throughout.

24 Key points -- the team preparation, a full month,
25 and I think we needed every day of it. This extensive

1 effort was performed by knowledgeable, prepared, well
2 supported inspectors, and that's what contributed to the
3 success of this.

4 I think the public entrance and at public exit
5 meetings were very effective, although one of the comments
6 at the final public meeting by a member of the public was
7 that they felt excluded, that this wasn't accessible, in
8 particular the entrance meeting, because it was held at the
9 site and some people were afraid to go to the site. It
10 seemed appropriate to us then and now to hold that meeting
11 at the site. It was a meeting with the licensee and the
12 support group.

13 The exit meeting I'll talk more about later. We
14 invested a full three hours of questions and answers with
15 the public and addressed every question from every person
16 that chose to speak.

17 There were two briefings of the governor in this
18 process, as well, one during the second on-site period in
19 early August and the second just following or just prior to
20 issuance of the report. Next slide, please.

21 I'd like to spend some time talking about this
22 process and what was really involved to give everyone a real
23 sense for the depth and scope of this. In terms of the
24 preparation, as I said, the full team, a full month, with
25 access to the licensing and design basis information FSAR,

1 SERs, tech specs, LERs, IPE, as well as a continuing
2 exchange process with the licensee in terms of requests for
3 information.

4 Those areas that we were developing the
5 preparation material for the inspection, we would ask
6 licensees for background information for procedures, for
7 results of tests, for drawings. We'd receive that and use
8 that so the time spent on site was time that we were well
9 prepared for and it was particularly efficient.

10 The team included both horizontal and vertical
11 inspection methodologies. In terms of the horizontal, that
12 was an assessment across the operational functional areas.
13 Performance-based assessments of operations, maintenance,
14 engineering, where we review the programs, the processes,
15 the performance. We had extended control room observations,
16 plant walk-downs, observation of work in the field,
17 independent calculations to draw the conclusions on the
18 performance in those functional areas.

19 In addition, we did deep vertical slices of two
20 systems -- service water and high pressure safety
21 injection -- and partial vertical slices of the aux
22 feedwater system and emergency diesel. A vertical slice is
23 a method to determine whether or not a system, as it's been
24 modified, maintained and tested through the years, whether
25 or not it continues to meet the original design basis.

1 We also added a new approach to this effort, the
2 analytic code review area, and that can be best reviewed as
3 a horizontal slab with two vertical supports. The
4 horizontal slab was a look at all of the codes, the analytic
5 codes, used to support the safety analyses at that plant as
6 to whether or not they had appropriately met the conditions
7 placed in safety evaluation reports. The problem, as you
8 recall, with RELAP 5, were the 12 conditions that were not
9 clearly met. So we looked at all the conditions for the
10 other codes.

11 Additionally, we took two vertical looks at the
12 implementation of codes. We chose two accidents. One was a
13 steamline rupture and the other was a control element
14 assembly drop. We chose those because for the control
15 element assembly drop, it provided the integration and
16 implementation of a large number of codes. This particular
17 cycle at Maine Yankee employed Westinghouse fuel, Combustion
18 Engineering fuel and Siemens fuel.

19 So it required the Yankee Atomic organization to
20 integrate the propriety data from those three fuel vendors,
21 along with six other code applications, to assure the
22 adequacy of the control element assembly analysis.

23 The second vertical slice or pillar we chose was
24 the steamline rupture, and the reason we selected that was
25 it employed a complex two-phased code RETRAN that was of a

1 similar vintage and similar complexity with RELAP.

2 Additionally, we performed interviews, over 100
3 across the full spectrum from the president down to craft-
4 level workers, each lasting one to two hours long, and
5 conducted a safety assessment and root cause evaluation, the
6 full team, for three days, in terms of assessing and
7 arriving at the final causes. Next slide, please.

8 The standards we employed to come to these results
9 were really a three-tier approach. The first, the
10 regulations, formed the foundation of the assessment and
11 were the primary measure in the design and the licensing
12 basis area.

13 The second, in terms of assessment of operational
14 performance, we used the NRC's existing benchmarks of
15 performance for superior, good and acceptable in the SALP
16 program, systematic assessment of licensee performance.

17 And the third of this three-legged stool was
18 probabilistic risk assessment employed to provide
19 perspective to the significance of the deficiencies found.

20 CHAIRMAN JACKSON: Let me ask you this. Under
21 this measure of the margin of safety, is that meant to say
22 that superior plants are those with the largest margin of
23 safety? Or are you referring to how each licensee maintains
24 their safety margins?

25 MR. MERSCHOFF: The intent of the SALP program was

1 to measure margin above minimally acceptable performance.
2 So it's a margin of safety not rigorously calculated in
3 terms of NPSH margin, for example, but in the quality of the
4 programs and the implementation of the programs and the
5 ability of an organization to find and fix and sustain
6 deficiencies, typically used as an input to our inspection
7 planning process, where a plant with a strong and superior
8 performance that has substantial margin above the minimum
9 requirements would receive less inspection effort.

10 CHAIRMAN JACKSON: Okay. So I just want to be
11 sure that what you're looking at is programmatic
12 performance, as opposed to a design margin in a plant.

13 MR. MERSCHOFF: That's correct, programmatic.

14 COMMISSIONER ROGERS: So these are qualitative
15 judgments, though. They're not based on a set of specific
16 numbers that determine what your assessment turns out to be;
17 is that correct?

18 MR. MERSCHOFF: That's correct.

19 COMMISSIONER ROGERS: I think that's an important
20 point to keep in mind.

21 MR. MERSCHOFF: And the next slide speaks to that
22 a little more. Eleven, please, Ola.

23 This was the toughest part, or one of the toughest
24 parts of this assessment in terms of being balanced and fair
25 and objective in what was really an unprecedented effort.

1 We intentionally chose existing benchmarks to not invent new
2 or establish new expectations.

3 Those standards that we used had been in place for
4 a long time, since the late '70s. As I said, they represent
5 the margin over minimally acceptable performance in a
6 programmatic sense.

7 Acceptable performance may exhibit one or more of
8 the characteristics under that column in the right in terms
9 of programs that exhibit instances of insufficient control
10 in important areas, a self-assessment that may not occur
11 until a problem is apparent, and root causes that do not
12 probe deeply.

13 Good represents some margin over those minimally
14 acceptable areas but does include problems that require
15 attention. Acceptable includes in our standards the
16 conclusion that attention is required by both the licensee
17 and the NRC to effect improvement because margins are small.

18 CHAIRMAN JACKSON: Let me just stop you for a
19 minute. This, in a way, goes back to Commissioner Rogers'
20 question about the qualitative judgment. This is actually
21 beyond the scope of this briefing but since it's here, I
22 can't resist the comment.

23 I think if you look at this acceptable column,
24 it's an optics problem. Other than your safety category, I
25 guess there's an issue having to do with pervasiveness in

1 the other categories because if you say instances of
2 insufficient control in terms of programs, self-assessment
3 may not occur until a problem is apparent, that the
4 corrective actions are not thorough and that the root causes
5 are not probed too deeply.

6 One could argue that there are some other famous
7 examples of plants where what we're arguing is that, in
8 fact, these, in fact, are just what lie at the root of the
9 problems. So I think there are some issues in terms of
10 categorization or what the qualitative judgment is that goes
11 into that categorization.

12 So it's not meant to take away anything from what
13 you're saying but --

14 MR. JORDAN: I agree. Maybe I could comment.

15 CHAIRMAN JACKSON: I know what you're doing.
16 You're using the existing assessment, SALP --

17 MR. JORDAN: That's right. We wanted to have
18 something that was comparable with previous work, a
19 benchmark.

20 CHAIRMAN JACKSON: Right. No, I appreciate that.
21 That's why I'm saying this comment is abstracted from you
22 two.

23 MR. JORDAN: Yes.

24 CHAIRMAN JACKSON: And from the team's work. This
25 is really an issue, I think, having to do with the overall

1 way assessments are done and what this, then, says to us and
2 what it presents to the public.

3 COMMISSIONER McGAFFIGAN: I was going to make the
4 same point. I had seen this chart and Dr. Diaz is about to
5 do the same, I think. This looks like grade inflation. I
6 mean, the acceptable is darned close to unacceptable, as the
7 Chairman just said, and we don't have an unacceptable
8 category. I guess we do, which is to shut it down. But you
9 may want to have that and then tell us what the difference
10 between acceptable and unacceptable is because it's --

11 MR. TAYLOR: I think we may need to schedule a
12 briefing of the Commission. This program has evolved over
13 how long?

14 MR. MIRAGLIA: Since TMI.

15 MR. TAYLOR: TMI.

16 MR. MIRAGLIA: I think the Chairman alluded to a
17 number of issues in her comments and I think you're right.
18 If these things are pervasive, if they're of high safety
19 significance, they wouldn't wind up being called acceptable.
20 It's instances and the significance of those.

21 There is an evaluation matrix within the context
22 of the SALP program and I think these are very broad-type
23 headings, and I think you're right, Madam Chairman and
24 Commissioner McGaffigan. If all of these are there and
25 there are significant safety --

1 CHAIRMAN JACKSON: Well, we have to understand
2 what significance means, what pervasiveness means. One
3 could say, as I say, there's another famous plant we're
4 dealing with where basically what we're saying is all of
5 these are tracking through but somehow we're saying it's in
6 the nonacceptable category.

7 I think Commissioner Diaz wanted to make a
8 comment.

9 COMMISSIONER DIAZ: It's the same comment. I was
10 just going to say where is the nonacceptable category shown
11 so that people can actually see it plainly and up front?
12 That's my comment.

13 CHAIRMAN JACKSON: It begs the question of why is
14 this acceptable, or when do you cross the line between
15 what's in the acceptable column, being acceptable, versus
16 nonacceptable.

17 But let the record show, Mr. Hoyle, that we are
18 going to have a Commission meeting on this.

19 MR. TAYLOR: I suggest we do that.

20 COMMISSIONER McGAFFIGAN: This will lead you into
21 the next page, but having used these categories on this
22 page, you get to the next page and you get to generally in
23 conformance, and I wasn't sure whether that was acceptable,
24 good or what you were getting at, since you create a new
25 category as soon as you turn the page.

1 MR. MERSCHOFF: Well, I'll refer you to the
2 previous one. I laid the groundwork for that, or attempted
3 to, Commissioner McGaffigan, in that the regulations form
4 the foundation of the assessment and were the primary
5 measure in the design and the licensing basis area. And so
6 we measured against conformance to the regulations in that
7 area and the assessment adjectives for the functional areas
8 aligned with operations, maintenance, engineering, testing.

9 COMMISSIONER MCGAFFIGAN: And very good is between
10 superior and good?

11 MR. MERSCHOFF: Yes, sir. We equivocated
12 substantially. But in terms of the assessments, we have
13 been careful to not impose rising standards and maybe it's
14 time to rethink whether 1970s expectations are appropriate
15 for 1990s operations.

16 MR. TAYLOR: I don't think we apply 1970
17 standards.

18 CHAIRMAN JACKSON: Mr. Taylor is taking issue.

19 MR. TAYLOR: I take issue with that.

20 MR. MIRAGLIA: I think what Mr. Taylor is
21 referring to is the SALP evaluation program, as most of our
22 programs, are not static programs. We have our own self-
23 assessments. We have improvements. We've come to the
24 Commission at least two or three occasions with changes to
25 the SALP program and the evaluation and the matrices and

1 that type of thing. I think that needs to be put in some
2 kind of --

3 CHAIRMAN JACKSON: I think, first of all, it's
4 clear that the way the assessment categories are laid out,
5 it makes it hard for those of us who are not down into the
6 grass to really assess the significance of it and when the
7 line gets crossed. From the point of view of our jobs as
8 regulators, where does the line get crossed and is it time
9 to relook at the categories somehow?

10 MR. TAYLOR: We did start the SALP system because
11 we really didn't have any systematic way. As the number of
12 nuclear power plants grew and to reach its current
13 population of 110, that was a clear post-TMI activity.
14 Special group was put together, labored with commissions
15 past, to run this program.

16 And, of course, what you do in a specific area,
17 you can't just read the word. You have to go into the
18 narrative, which usually has the details of what is wrong.
19 And as we all know, there are various problems that can be
20 very significant and problems that aren't that significant,
21 and that's where the judgment and evaluation process comes
22 in.

23 So I think what I'm leading to is I think it is
24 important to have a briefing on this subject and with
25 examples. It is employed throughout the regional system and

1 I think it's a very important program to make us sit down,
2 on a regular, periodic basis, and evaluate each individual
3 plant. That's what this whole program was set up for.

4 So I think it's an important enough topic to --

5 CHAIRMAN JACKSON: And yesterday, and I don't want
6 to belabor this any longer, but about our changing and
7 change being built on the foundation of our past, so we have
8 a SALP process. The question really is one of looking at
9 it, looking at perhaps some sharper delineation or some
10 other measures that would allow us to do some fine-tuning
11 and make it transparent to those of us, as I say, who are
12 not down into the grass, as to what is going on.

13 MR. TAYLOR: This subject of when is it
14 unacceptable has been discussed at numbers of Commission
15 meetings through the years and I think --

16 CHAIRMAN JACKSON: I think what we'll do is we'll
17 discuss it at a new Commission meeting.

18 MR. MIRAGLIA: May I make one more point? I know
19 you don't want to belabor this. I think the SALP process is
20 just one tool.

21 CHAIRMAN JACKSON: I appreciate that.

22 MR. MIRAGLIA: It's a continuum. Our assessments
23 of it are a continuum. This is just one point.

24 CHAIRMAN JACKSON: All right. I think the point
25 is -- I think where we're coming down is that we're going to

1 have a meeting to discuss this.

2 MR. TAYLOR: We'll prepare for that.

3 MR. JORDAN: Could I make sure that you understand
4 that we really were standing on the three legs --

5 CHAIRMAN JACKSON: Absolutely.

6 MR. JORDAN: The one of conformance with
7 requirements, the one of the SALP process, and then one
8 associated with risk.

9 CHAIRMAN JACKSON: Absolutely. And I think when
10 we have the follow-on discussion, in fact, that's a very
11 nice way for us to have that discussion, so thank you.

12 What you're telling us is that you actually did
13 use the three legs?

14 MR. JORDAN: Yes.

15 CHAIRMAN JACKSON: That's fine.

16 MR. MERSCHOFF: Now having laid the groundwork in
17 what we did and the criteria we used, I'd like to move on to
18 the results, slide 12.

19 Overall, we felt the performance was adequate for
20 safe operation at Maine Yankee and the constituent parts of
21 that assessment which led to the conclusion of adequacy were
22 the design and licensing basis generally in conformance, as
23 I said, measured against the regulations, and I'll discuss
24 each of these in a little more depth.

25 Operations, very good. Maintenance, good.

1 Testing was acceptable with significant deficiencies noted,
2 both compliance and safety. Engineering was good and self-
3 assessment and corrective actions also acceptable, with
4 significant weaknesses noted, both in the compliance and
5 safety issues -- as a matter of fact, issues being both.

6 COMMISSIONER ROGERS: Before you move on, I don't
7 want to get into it now but if you are going to talk any
8 more about maintenance and testing, there is a question in
9 my mind how one can come to a conclusion that maintenance is
10 good and testing is no good. I mean, if the testing is no
11 good, how do you know the maintenance is good?

12 I know you say it's acceptable. I'm just trying
13 to illustrate the point that if testing is flawed, how does
14 one know that the maintenance is good? You may have a
15 maintenance program that looks good but testing, in a sense,
16 is supposed to reveal whether the things are being
17 maintained properly.

18 So I think if somebody could speak to that during
19 the course of this, that would be good.

20 MR. JORDAN: I'd like to make one comment before
21 we leave that slide, though, because we used much the same
22 slides at the public meeting and you asked what the public
23 reaction was.

24 The discussion was insufficient for the public and
25 so I ended up giving my judgment and saying that in this

1 particular case, based on other diagnostics that we've done
2 and other plant reviews, that my judgment was that the plant
3 was average or slightly below with a declining trend, and
4 that was understood better than the words here.

5 And when pressed further -- there were other
6 people that weren't fully satisfied -- I made the statement,
7 "This is a plant I wouldn't mind living near," and that was
8 a compelling statement to make to the public.

9 So there is a problem in communicating between
10 ourselves, communicating with the utility, and then
11 communicating with the public. There are different
12 perceptions there that we struggle with.

13 MR. MERSCHOFF: And that was tough. In order to
14 assure the consistency, tying it to the SALP made sense.
15 But, just as Ed said, sometimes those adjectives were
16 troublesome in conveying --

17 CHAIRMAN JACKSON: I also think Commissioner
18 Rogers is making a point that in some sense what you say
19 about maintenance and what you say about testing seems to be
20 an oxymoron.

21 MR. MERSCHOFF: I will attempt to address that
22 oxymoron.

23 Slide 11, the licensing and design basis. We
24 found it generally in conformance with the requirements in
25 the regulations.

1 What we looked at, in terms of the licensing
2 basis, were the tech specs, the FSAR, the regulations and
3 written commitments. And although in general conformance,
4 we found a lack of specificity and consistencies and
5 generally not well maintained, types of specificity
6 problems, many tech spec interpretations to clarify the
7 meanings of their tech specs, some of which were
8 inappropriate. A very small FSAR, lacking detail, lacking
9 of detail in testing and operability definitions.

10 Inconsistencies, instances where stroke time for a
11 valve, you can find four different numbers in four different
12 places, two of which are in the FSAR, one in the IST
13 program, and one in the design basis calcs. Differences
14 between the tech specs and the FSARs for numbers on given
15 attributes.

16 In terms of not well maintained, the licensee had
17 had a program in place to look at their FSAR. They
18 accelerated that within the areas chosen for the vertical
19 slice by the ISA and found over 100 discrepancies in their
20 FSAR, requiring 50.59 reviews or changes to the FSAR.

21 In terms of the design basis, we found that
22 generally the quality of information was good, the
23 availability was good, the information was retrievable and
24 understandable.

25 In terms of the code work aspect of this, and

1 remember I described the horizontal slab with the two
2 vertical supports, the slab was to take a look at the SERs.
3 There were, in fact, 66 conditions imposed on the use of 13
4 codes. We determined that all of those 66 conditions had
5 been met, although none had an audit trail to show that they
6 were met.

7 COMMISSIONER ROGERS: Could you indicate just what
8 a condition is?

9 MR. MERSCHOFF: A condition might be use a given
10 time step in performing the computation of a millisecond or
11 to assume that only steam is released with no water in the
12 steam line rupture, or to assure that the computer is
13 validated against separate effects.

14 There are conditions that the NRC imposes through
15 the SERs. There are conditions that the authors impose,
16 boundary conditions essentially, for the use of these, and
17 there are author conditions and NRC conditions.

18 None of them had an auditable trail to show they
19 were met and some of them required new and original work
20 that relied on existing conservatisms and margin in the
21 calculation to show that they had been met.

22 Additionally, in the two vertical legs, we found
23 different results in the two. In the vertical leg for the
24 control element assembly that required the integration of a
25 large number of codes, we thought that work was excellent.

1 The codes are generally cycle-specific, meaning the analysis
2 used and applied every fuel cycle.

3 They tended to be simpler codes, single phase
4 application, and amenable to validation. Through the course
5 of the fuel cycle you can validate the predictions in terms
6 of the nuclear physics for those codes well. And the
7 incentive for precision is high in that these codes could be
8 used to calculate cycle length, fuel loading, et cetera.

9 So it was relatively straightforward codes. It
10 was important to get it right. They were used often and
11 they were done very well.

12 The other leg, the steam line rupture, was a more
13 complex code, two-phased application, used infrequently, not
14 each cycle but only when something significant changes in
15 the design to redo the calculation. That was handled
16 weakly, we thought. There were errors in the code. The
17 code was not well validated. But the errors did not affect
18 the end result, so that the result was acceptable, but the
19 knowledge and use of that code was substantially weaker than
20 for the control element assembly drop.

21 COMMISSIONER DIAZ: Excuse me a second. Did the
22 licensee themselves make changes to RETRAN or did they do
23 them through a contractor?

24 MR. MERSCHOFF: They applied it for the site-
25 specific application, so within the boundary conditions and

1 the inputs, they would make unique inputs for application of
2 Maine Yankee. In terms of rewriting code, no, I'm not aware
3 of any rewritten code.

4 COMMISSIONER DIAZ: They did not go into RETRAN
5 and change any conditions in RETRAN?

6 MR. MERSCHOFF: Jack?

7 MR. ROSENTHAL: That's right.

8 MR. MERSCHOFF: Okay. Additionally, since this
9 was a new area in terms of the inspection program, we formed
10 a panel of outside experts within the area of code
11 development and code application to critique the work of the
12 team in this area. The members of those panels were Dr.
13 Marvin Thurgood, former Pacific Northwest Laboratory
14 employee and developer of the COBRA code; Dr. Lothar Wolf,
15 University of Maryland and an expert in phenomenology for
16 code applications; Dr. Harold Sullivan from Los Alamos
17 Laboratory, developer of RETRAN and TRAC; and, as an
18 observer to that process, to the panel, was Dr. Novack
19 Zuber, ACRS and an expert in two-phased flow. That panel
20 concurred in all of the findings and conclusions of the ISA.

21 MR. JORDAN: But with a lot of discussion, I would
22 say.

23 MR. MERSCHOFF: It was easier to say that than to
24 do it. It was a good investment of time.

25 MR. JORDAN: Absolutely.

1 MR. MERSCHOFF: We had them at two points in the
2 process, one at the midpoint of our assessment, after the
3 first two weeks on site, and one at the final point, after
4 the second two weeks on site, when we had the outline of our
5 report and conclusions written, so that it could be
6 critiqued and peer-reviewed by the panel.

7 CHAIRMAN JACKSON: When you said that the quality
8 of the design basis was good, what do you mean?

9 MR. MERSCHOFF: The calculations were current,
10 accurate, retrievable.

11 COMMISSIONER DIAZ: Excuse me. Sorry to go back
12 but when you were talking about the very good results and
13 agreements on the control element assemblies for three
14 different vendors, were you referring just to the
15 calculation of the issues for the inventory? Was that the
16 main thing?

17 MR. MERSCHOFF: No, these were the calculations
18 for DMV, the cycle length, the full sweep of reload analysis
19 calculations. And, in fairness, that was a very challenging
20 application for Yankee Atomic, to integrate the three fuel
21 vendors' information in the codes that needed to be applied.

22 In terms of design deficiencies that were
23 identified, there were significant deficiencies identified
24 that are both compliance issues and safety issues. The next
25 page deals with them at some length.

1 The last point is that the team concluded that the
2 design basis supported operation at the current power level
3 of 2,440 megawatts thermal but that eroded margins prevented
4 the team from concluding that operation at 2,700 megawatts
5 thermal was appropriately demonstrated. And those problems
6 were in the areas of net positive suction head for the
7 containment spray pump and heat load removability for
8 component cooling water.

9 CHAIRMAN JACKSON: And those are what they would
10 have to deal with to operate at 2,700?

11 MR. MERSCHOFF: From this assessment. There are,
12 of course, other issues -- the RELAP 5 issue, the
13 containment pressure issues -- that are on the table, as
14 well, but those are the two issues that came out of this
15 assessment, yes, ma'am.

16 CHAIRMAN JACKSON: Okay.

17 MR. MERSCHOFF: Page 14, significant instances
18 were identified where Maine Yankee was outside its licensing
19 and design basis. Some of those instances were identified
20 by Maine Yankee; some of them were identified by the ISA.
21 Many of them were identified jointly as a result of that
22 leverage I described from the licensee support organization.

23 I'd like to go through them. They give you a
24 sense, in terms of safety and compliance, with the licensing
25 basis.

1 The first one was identified by the licensee in
2 the area we had selected for the vertical slice review just
3 prior to the team coming on-site. It was the lack of
4 thermal reliefs in the component cooling water system. It
5 would be a vulnerability during a LOCA and was fixed. The
6 plant was shut down and reliefs installed.

7 The second involves reactor water storage tank
8 level transmitters. The enclosure containing those
9 transmitters was maintained at too high a level, resulting
10 in an inaccurate level indication. It would be a loss of
11 coolant accident-related problem. You may not inject enough
12 or too much water and cause a problem in the inventory of
13 water inside containment. That issue has been fixed.

14 Equipment qualification was an issue in terms of
15 submergence of key instruments. During the loss of coolant
16 accident, of course, the inventory of primary coolant plus
17 the water injected from the water storage tank resides in
18 the sump, ultimately for recirc. There were key instruments
19 that were located too low, such that they would be submerged
20 by that inventory of water -- steam generator level, vessel
21 level indication and some containment isolation valves.
22 It's a LOCA-related issue and has been fixed.

23 Ventilation area, a number of deficiencies noted,
24 one involving ventilation to the building that contains the
25 low pressure safety injection and containment spray pumps.

1 It would be a loss of coolant accident vulnerability, and
2 compensatory measures have been put in place to address it.

3 CHAIRMAN JACKSON: But no fix yet?

4 MR. MERSCHOFF: Not yet. That's one where exhaust
5 dampers are blocked open.

6 The second is protected switch gear, a
7 vulnerability to a high energy line break, and it, too, is
8 being addressed with compensatory measures.

9 Control room ventilation had failed the test in
10 that it did not have positive pressure, as required. It
11 would be a vulnerability for a loss of coolant accident and
12 has subsequently been retested and passed.

13 And finally, emergency diesel generator
14 ventilation would be a vulnerability for loss of off-site
15 power and it has been fixed.

16 The next bullet down is logic circuitry. Many
17 systems were not adequately tested. This is obviously both
18 a compliance and a safety issue. When the systems were
19 tested, four problems were noted, the most significant of
20 which was a section of the wire that would give an actuation
21 signal for one of the high pressure safety injection pumps
22 had been mistakenly removed. So in the event of a loss of
23 coolant accident, where off-site power remained available,
24 that pump, the A high pressure safety injection pump, would
25 not have received an auto-start signal. It would have been

1 capable of being started manually.

2 In terms of risk base, that component -- and it
3 had been that way for a number of years -- would have raised
4 the risk for that plant about 6 percent, a very significant
5 change for one component.

6 The containment spray pump, adequate. Net
7 positive suction head for 2,700 was not demonstrated and
8 that would be a loss of coolant accident-related issue.

9 Service water was a material condition issue.
10 Poor material condition, missing hanger affecting one train.
11 It was addressed and really provides an indication of
12 standards and threshold of problem identification for the
13 licensee.

14 And finally, an issue of check valve testing,
15 where the tests performed on important systems -- high
16 pressure safety injection, low pressure safety injection,
17 component cooling and emergency feed -- were essentially
18 meaningless tests and did not, when completed, provide
19 indication as to whether or not the check valve would work
20 or would not. Each of those systems were retested and
21 performed satisfactorily.

22 CHAIRMAN JACKSON: Let me ask you this question.
23 With these various issues that were identified during the
24 course of your review, either by the team or by the
25 licensee, and if they involve regulatory issues these are

1 being followed up in enforcement?

2 MR. MILLER: Yes, ma'am.

3 CHAIRMAN JACKSON: And the issues, in terms of how
4 they were addressed, they were addressed to justify
5 continued operation, either with the compensatory measures
6 or the actual fixes?

7 MR. MILLER: Yes. There was great independence,
8 of course, of this team but the one thing that the region
9 stayed very close to were those issues that could
10 threaten -- impact on operability and functioning of
11 equipment. On that, there was very close coordination as
12 the team did its work, with long discussions with the
13 licensee to assure in every case that as these things
14 surfaced, that the equipment was operable, either by fixing
15 it or by an appropriate compensatory measure.

16 CHAIRMAN JACKSON: And what about these ones where
17 there were compensatory measures taken? Are we going to be
18 following up or are we just going to let them stay in the
19 compensatory mode?

20 MR. MILLER: No, ma'am. We will follow up. The
21 utility owes a response by December 10 and we will most
22 assuredly be following up on that and devoting resources to
23 it.

24 MR. JORDAN: And maybe we should explain how that
25 process works. When the team finds an operability issue,

1 they advise immediately both the licensee management and the
2 regional management and then the follow-up with respect to
3 the legal license and the issue of compensatory measures
4 falls back to the region and to the licensee.

5 So we had a continual handshake on each of these
6 issues as the thing progressed, so it was not when we
7 finished the work we told everybody what we found. As each
8 one of these unfolded, we immediately communicated with the
9 licensee and with the region and NRR to make sure that it
10 was handled.

11 CHAIRMAN JACKSON: Let me ask you three questions.
12 One, which of these are the most safety significant, just a
13 tick-off?

14 MR. MERSCHOFF: The ventilation issues and logic
15 circuit testing with the high pressure safety injection are
16 very significant and NPSH on containment spray may be, when
17 the final answer is learned.

18 CHAIRMAN JACKSON: And which ones involved what
19 you'd call compliance issues?

20 MR. MERSCHOFF: All three. There's a close
21 linkage between compliance and safety in these findings.

22 COMMISSIONER DIAZ: But they are all safety
23 significant.

24 MR. MERSCHOFF: Yes, sir.

25 COMMISSIONER DIAZ: Every single one of them.

1 MR. MERSCHOFF: Yes, sir.

2 One more thought on the hand-off in that the team
3 leader for engineering, Tom Martin, M&O Al Madison and I
4 went to Region I on Monday and invested the day with the
5 Region I folks to turn over these issues just so that items
6 wouldn't be lost in the hand-off. And Jack Rosenthal and
7 Tom Martin and I sat down with NRR on the key issues on net
8 positive suction head and, to some extent, CCW, for the same
9 reason. So we're working hard to assure that that hand-off
10 does occur.

11 I wanted to invest a significant amount of time in
12 the presentation up to this point to understand the
13 background and the design and licensing basis. I'm going to
14 try and go through quickly the areas, lingering a little on
15 maintenance and testing for the oxymoron issue, to get to
16 the lessons learned before the time expires.

17 CHAIRMAN JACKSON: Well, the time won't expire
18 until you're done.

19 MR. MERSCHOFF: Well, thank you. That could be a
20 big mistake.

21 [Laughter.]

22 CHAIRMAN JACKSON: But I'm assuming that you're
23 going to move along.

24 MR. MERSCHOFF: Yes, ma'am. I learned never to
25 say that with my team.

1 In terms of operations, as we said, overall
2 performance was very good. Start-up, shutdowns, routine
3 operations, command and control, use of procedures all
4 handled well. Good AO rounds. Good response to equipment
5 problems. Use of risk, on-line safety, shutdown safety
6 assessments we all thought were effectively implemented.

7 The problems in that area can be grouped into an
8 acceptance of existing conditions attitude, and that's what
9 you see in terms of the workarounds and compensatory
10 measures that unnecessarily burden the operator during
11 events or normal operation.

12 CHAIRMAN JACKSON: How significant were the
13 problems in those areas and how many workarounds are there,
14 compared to what you would find at some other typical --
15 whatever that means -- plant?

16 MR. MERSCHOFF: We found about 13 of some
17 significance. Plants have workarounds and compensatory
18 measures in place, so it's not grossly out, but it's on the
19 high side. Things like operators have a 350-foot extension
20 cord to rig temporary ventilation to the protected switch
21 gear room in the event of a loss of one of the fans. An
22 overloaded plant computer that causes them to lose the
23 automatic rod sequencing in a shutdown and have to go to
24 manual sequencing.

25 CHAIRMAN JACKSON: Say that one again.

1 MR. MERSCHOFF: They have a plant computer that
2 helps them control the rod sequencing so in the shutdown you
3 have rods step in in the right order, in the right
4 arrangement to suppress the flux. The plant computer is
5 heavily loaded and tends to lag in real time that need. And
6 during a shutdown that we observed, it was not effective, so
7 the operators had to resort to their procedures, which they
8 had, to manually perform that function, to sequence the
9 rods.

10 They did it properly and shut down, although it
11 slowed them up to the point that they felt the need to
12 manually trip the reactor to meet the timeliness of the
13 action statement.

14 CHAIRMAN JACKSON: Let me ask you this question.
15 You mention they make good use of risk information. If you
16 looked in the workarounds area and you looked at how one
17 workaround might complicate another, do they look at that
18 from the point of risk?

19 MR. MERSCHOFF: Not necessarily. They are very
20 knowledgeable of risk. They integrate it into their day to
21 day operations in terms of emerging problems and --

22 CHAIRMAN JACKSON: I understand it's a typical way
23 that you make the assessment of good use of risk
24 information. I'm actually asking a different question,
25 which specifically relates to workarounds and the

1 interaction of one workaround with another.

2 MR. MERSCHOFF: I can't tell you that they've
3 looked, in the risk sense, for the sum total of the effect
4 of their compensatory measures and workarounds. I don't
5 think they have.

6 MR. JORDAN: But I think it would be fair to say
7 that you didn't note interactions between the workarounds.

8 MR. MERSCHOFF: That's true.

9 MR. JORDAN: So they were each independent. But
10 if you summed the workarounds, then that, of course, leads
11 to one of our root causes, that the plant was willing to live
12 with a large number of workarounds which, then, burdens the
13 operator and --

14 CHAIRMAN JACKSON: But an honest and fair answer
15 is that nobody's really there looking at the interactions of
16 workarounds from a risk perspective particularly in some
17 kind of a transient or accident condition. Is that correct?

18 MR. MERSCHOFF: They are looked at as they come up
19 individually. I don't know that they look at the sum. I
20 suspect not, but I don't know for certain.

21 CHAIRMAN JACKSON: It's not just the sum; it's the
22 interaction, from a risk perspective, that is of interest to
23 me.

24 MR. TAYLOR: That may be something we'll have to
25 follow up on through the region system because I understand

1 we're not prepared to say they do it or don't.

2 MR. JORDAN: We could follow up on that.

3 MR. MILLER: That's a tough issue in all plants.
4 What is the significance of workarounds? That's something
5 we struggle with significantly.

6 CHAIRMAN JACKSON: I appreciate that but I think
7 that in terms of living with workarounds, you know, one has
8 to understand --

9 MR. TAYLOR: It's the sum total.

10 MR. MERSCHOFF: We developed proposed staff action
11 as a result of this, things that should be looked at and, in
12 fact, workarounds is on that in terms of the total and
13 guidance provided to the inspection area for what's
14 acceptable in manual versus automatic operations.

15 In terms of post-trip review, we found a lack of
16 rigor and completeness. The overloaded plant computer had a
17 role in that, as well, in terms of providing them all the
18 information they needed and had somewhat of a common theme
19 in terms of testing and a trip being a missed opportunity to
20 determine whether or not all your equipment is performing as
21 you expect it to perform.

22 In the area of maintenance, overall performance
23 was good. We saw good communication, coordination,
24 effectively identifying deficiencies, although some were
25 missed. The knowledge and use of risk was strong in this

1 area in terms of the planning and dealing with emerging
2 work.

3 We found a motivated and dedicated workforce
4 across the board, in all the areas at the site, including
5 maintenance. Good control of temporary repairs, very little
6 use of temporary repairs in safety systems.

7 We thought the quality of maintenance was good in
8 terms of limited rework, in terms of the performance of most
9 of the pumps in the valves and performance of containment
10 during ILRT. We drew a distinction from that from the
11 testing. When testing was done, some deficiencies were
12 found, but when I get the testing and speak to it, it's not
13 that there was no testing; there's a lot of testing done and
14 a lot of transients and opportunities for equipment to be
15 challenged. And typically the equipment performed well
16 historically at Maine Yankee. So that provided some input
17 to the team in terms of the quality of the maintenance.

18 Now, good means there's a margin above minimally
19 acceptable; there are important problems that needed to be
20 addressed. We felt, with a lot of debate, that good was the
21 proper characterization.

22 There are significant problems, though. The
23 declining material condition. Material condition is good
24 now but the trend is in the wrong direction. The service
25 water condition bay that we discussed. The auxiliary

1 feedwater, the steam-driven auxiliary feedwater pump's
2 performance was poor. And equipment has been adversely
3 affecting plant performance in terms of feedwater reg
4 valves, feedwater pumps, leaking valves, particularly after
5 the year-long shutdown for the steam generator sleeving
6 effort, and that was the basis for our conclusion of a
7 decline and the inconsistent equipment reliability.

8 As part of this effort we took a real hard look,
9 in a probabilistic sense, at the reliability of equipment
10 within our vertical slice systems to determine, if needed,
11 is equipment available or is it in maintenance? And if it's
12 available and called on to start, will it start? And if
13 available and called on to start, will it continue to run
14 for its mission time? And we used plant performance data to
15 establish those conditions and we found, as I indicated, the
16 steam-driven auxiliary feedwater pump was quite poor, down
17 around 76 percent, when 91 percent was the assumed number in
18 their IPE.

19 COMMISSIONER DIAZ: Excuse me. That is a very
20 safety-significant component, isn't it?

21 MR. MERSCHOFF: Yes, sir.

22 COMMISSIONER DIAZ: Very, very?

23 MR. MERSCHOFF: Yes.

24 CHAIRMAN JACKSON: Following on that, not wanting
25 to give you a hard time, but I must say this, given your

1 answer to the question that Commissioner Diaz just raised
2 and given that my statement is that excellence is as
3 excellence does, and you say the quality of maintenance is a
4 strength but you have inconsistent equipment reliability,
5 including in a system that you said is very safety
6 significant, that's an oxymoron.

7 MR. JORDAN: But I would comment that it's not
8 necessarily how it was maintained but it has some
9 engineering maybe changes that need to be made, rather than
10 simply maintenance. So it has some sensitivities --

11 CHAIRMAN JACKSON: I guess what I'm trying to get
12 at is some subtleties perhaps having to do with what we call
13 engineering versus what we call maintenance and how that
14 tracks to equipment reliability.

15 Hub is smiling because he knows that he and I have
16 had 1,000 discussions along these lines. And I guess it's
17 the kind of thing that --

18 MR. MILLER: The perennial problem is we lump and
19 split when we go to the categories in SALP. Every SALP
20 meeting has a long discussion over terms.

21 CHAIRMAN JACKSON: Okay.

22 MR. MIRAGLIA: These are not separable.

23 COMMISSIONER DIAZ: They're not separable but I'm
24 trying to make a point because for years I've been
25 considering the auxiliary feedwater pump as one of my last

1 lines of defense if I lost cooling water to the steam
2 generators and that is one pump and probably supported by
3 two centrifugal pumps, but if that pump is not working at
4 what it should be, then we have a problem. I think that
5 that should be in a category, and probably we'll get to that
6 sometime, but that jumps at me. It really jumps at me.

7 COMMISSIONER MCGAFFIGAN: Could I ask a question?
8 The debate that you had internally, was that between good
9 and acceptable, in terms of what your bottom line was going
10 to be in this category?

11 MR. MERSCHOFF: The debate dealt largely with the
12 boundaries between maintenance and testing and engineering.
13 Engineering is responsible for a lot of the testing
14 problems; maintenance is responsible for some of the testing
15 problems, and how to best characterize fairly and
16 objectively the performance.

17 So yes, we weren't -- well, there was some debate
18 on the superior side but it was really between where the
19 testing problems ought to reside. And if they resided in
20 maintenance, it's clearly an acceptable versus good
21 argument.

22 COMMISSIONER MCGAFFIGAN: Just a process point,
23 Madam Chairman. It strikes me if there's a significant
24 range of view on a team, it would be interesting to know
25 that. We end up with a chart that has a good or acceptable

1 or whatever in it and it might be interesting -- maybe this
2 gets to the briefing you're going to have on to SALP
3 process, but getting some of the range of views to be
4 brought to our attention.

5 CHAIRMAN JACKSON: I think that's an important
6 issue and we'll note that for the briefing on to SALP
7 process and other performance evaluation processes.

8 MR. MERSCHOFF: One of the strengths of this team
9 was the diversity of views. We had 25 people with 25
10 strongly held views and we achieved consensus at the end.
11 The consensus, with no disagreement, was good, but there was
12 a lot of healthy discussion along the way.

13 CHAIRMAN JACKSON: But I think Commissioner
14 McGaffigan's point is a valid one in terms of how the
15 diversity of opinion gets resolved. I think that's what
16 we're talking about here.

17 MR. MERSCHOFF: Moving on to testing --

18 MR. JORDAN: Before we leave that, since this is
19 one of my pets, the issue of reliability of equipment. We
20 did apply the methodology that we're proposing planning to
21 use on the reliability rule and the collection of data, we
22 applied that same methodology here. And it was through the
23 analytical method and showing an actual PRA-type reliability
24 value that the licensee recognized that that piece of
25 equipment wasn't performing to the level that they wanted it

1 to perform.

2 So they were very responsive to the clear
3 understanding that between availability, failure to start
4 and failure to run, there was a problem with this system.

5 COMMISSIONER ROGERS: Just one question on that.
6 Was there any evidence that it ever was better than it is
7 right now?

8 MR. JORDAN: Yes. I would say that the value that
9 you get from reliability estimates is -- you're doing some
10 averaging and you're making some analyses. It had been
11 better, I guess, a couple of years ago than it was at that
12 particular time. So it's a value that does change with
13 time.

14 The other equipment at the plant, the safety
15 systems that we reviewed, were well within the range of
16 their PRA statements but this piece, this piece of
17 equipment, was having a problem and had continued to have a
18 problem for a year and a half.

19 MR. MERSCHOFF: We looked from '92 on during this
20 time and the performance of this was a sawtooth variance.

21 MR. TAYLOR: That's why you back up with electric
22 pumps, too.

23 MR. MERSCHOFF: This plant has two electric
24 emergency feedwater pumps and it also has electric main
25 feedwater pumps, so it has some diversity of supply for

1 feed.

2 COMMISSIONER DIAZ: If you lose your --

3 MR. TAYLOR: I agree with that.

4 COMMISSIONER DIAZ: It's very important to the
5 steam-driven auxiliary water level.

6 MR. TAYLOR: That's right.

7 COMMISSIONER DIAZ: And therefore that component
8 becomes a major safety --

9 MR. JORDAN: Loss of off-site power with DC only
10 or total loss of power, black-out --

11 COMMISSIONER DIAZ: This is it. That's the last
12 line of defense.

13 MR. JORDAN: Yes, we see it the same way.

14 COMMISSIONER DIAZ: So that just jumps at me.

15 MR. MERSCHOFF: To move on to testing, overall
16 performance was considered acceptable, although significant
17 deficiencies exist that require attention.

18 They did some things well. The steam generator
19 tube testing applied state-of-the-art techniques, found
20 problems before they became self-revealing. And in-service
21 testing for the pumps and valves that are in the in-service
22 testing program were done well. Very few of the pumps were
23 in the alert range, indicating a good degree of maintenance
24 for the pumps and the valves governed by IST.

25 Our problems were with the rest. The scope of

1 their testing program was inadequate. The problems they
2 described with logic testing, diesel generator time delay
3 relays for block loads were not tested. Reg. Guide 197
4 instrumentation for power, not tested, although a lot of
5 instrumentation, however. Several instances of
6 instrumentation not in a calibration program.

7 Before we left the site a very extensive testing
8 program was implemented on key safety systems to assure that
9 the components would work as designed, and that's where the
10 four problems surfaced, from that testing program.

11 We saw weak rigor within the program, as well, in
12 terms of the test valve checking, testing that I've
13 described. For example, a test was done for years and
14 signed off; yet it was a meaningless test. Another test on
15 the recirc actuation signal switch that they performed, when
16 you get into the logic drawings you see that that test had
17 an automatic signal imposed, so you would have never known
18 if that switch was working or not when they performed the
19 test that they thought was testing the switch.

20 Then finally, in terms of evaluations, post-trip
21 reviews, control room ventilation where tests are performed,
22 in the case of control room ventilation, had failed, yet
23 that was not picked up and acted on in the evaluation.

24 Weaknesses in those three areas are very important
25 and very significant. They represent compliance issues and

1 safety issues.

2 CHAIRMAN JACKSON: Compliance issues are safety
3 issues.

4 MR. MERSCHOFF: Yes, ma'am. They're one and the
5 same.

6 CHAIRMAN JACKSON: I'm talking particularly with
7 these examples that you've been citing. It's not compliance
8 issues or safety issues.

9 COMMISSIONER DIAZ: Excuse me. Can I go back to
10 the logic circuitry? I'd like to understand when you see
11 failures or lack of appropriate testing, was it shown in the
12 reactor protection system and during safety injection and
13 actuation?

14 MR. MERSCHOFF: Yes, sir. The systems involved
15 were the -- actually, I've got a long list somewhere but it
16 was reactor protector system, safety injection actuation
17 system, emergency feedwater, main steam isolation. It was
18 all the key safety systems.

19 COMMISSIONER DIAZ: And that's major.

20 MR. MERSCHOFF: Engineering. Overall performance
21 mixed with good overall. We thought that the quality of
22 engineering work was good. The calculations were detailed,
23 comprehensive. Good day-to-day communication, coordination.

24 The electrical design work survived a very hard
25 scrubbing. We found problems but none that rose to the

1 point of operability. We found very strong support by the
2 Yankee Atomic organization, as compared to a typical nuclear
3 steam supplier. Yankee Atomic had an excellent knowledge of
4 the plant and a close relationship with Maine Yankee in
5 terms of providing the support.

6 But the weaknesses constituted another one of the
7 key problems and that's the inconsistent problem
8 identification and inconsistent problem resolution. They
9 failed to identify some significant problems and failed to
10 correct some significant problems that had been previously
11 identified. Those we've discussed along the way. The
12 ventilation examples fall into that category. The high
13 pressure safety injection cut wire does, as well.

14 Additionally, there was a limited ownership of
15 programs there within engineering. Equipment qualification,
16 for example, an area we found problems, there's no assigned
17 staff engineer for primarily responsibility for EQ.

18 The testing responsibility is distributed within
19 the organization. You'll find no clear advocate for a given
20 system. Is its testing thorough? Is it evaluated? Will it
21 work?

22 COMMISSIONER ROGERS: So they don't use a system
23 engineer arrangement?

24 MR. MERSCHOFF: No, sir, they don't. And fire
25 protection is an area that recently is receiving more

1 attention and more people from the licensee.

2 In terms of the third mission area, self-
3 assessment and corrective actions, overall the performance
4 was acceptable but significant problems identified.

5 Self-assessment was mixed. It's a fragmented
6 program, 29 different systems to identify problems that have
7 caused some confusion in the site -- which ones to use,
8 threshold too high. But they have made good use of some of
9 their external audits. The cultural assessment team that
10 they formed and implemented in early '96 was the right tool
11 at the right time to find problems at the site, and they
12 make pretty good use of outside experts on their audit teams
13 to get a different view of their problems.

14 They identified their fragmented problem
15 identification process, although other organizations helped
16 them, and have been addressing it over the course of about
17 the last year to develop a new program that was supposed to
18 be implemented in October. I understand it's now December
19 that the new program will be implemented to bring these
20 systems down to a fewer number.

21 The corrective action area is a key problem. Weak
22 implementation, fragmented, occasionally ineffective. We
23 saw backlogs there that were increasing, a large number of
24 late items within those backlogs, a weak trending of
25 corrective action problems. Twenty-one different systems,

1 in terms of their corrective action program, and
2 ineffectiveness in terms of correcting known problems, the
3 ones we've discussed along the way.

4 Now, improvement programs, they had many and
5 results mixed. They had good success in terms of things
6 like their shutdown risk, their use of risk, their
7 industrial safety program, maintenance reliability, the
8 learning process, which is the name they apply to their
9 corrective action and problem identification, new program
10 that will correct this fragmented issue.

11 We put it good in that they've maintained
12 committed to it over the whole year, in spite of the steam
13 generator shutdown. It has not yet been implemented but it
14 continues to receive attention, to be implemented.

15 In terms of the weaker ones, design basis
16 reconstitution, air-operated valve testing has been delayed,
17 erosion and corrosion, specialty training. And if you look
18 at the difference between these two, the ones that are well
19 implemented seem, at least to us, to be ones that the
20 licensee believes in, that they see as risk-significant,
21 that they bought into, that are important.

22 The ones, on the other side, that are weaker tend
23 to have regulatory roots that they're doing but don't
24 necessarily believe in and we need to be especially vigilant
25 to the response to this effort, that it falls into the

1 former, one that they believe in, rather than the latter.

2 CHAIRMAN JACKSON: How much of the issues in these
3 areas are due to the procedures, due to the organization or
4 organizational structure, or the management?

5 MR. MERSCHOFF: Well, it all falls to management.
6 Their procedures were in place for these programs. I would
7 put them under the management in terms of continuing to
8 stress them. These are programs that when the organization
9 came under stress, particularly the year outage for the
10 steam generator tube sleeving, they were shelved; they were
11 held in abeyance, and the more successful ones, that were
12 seen as important, continued on. So it was management
13 decisions.

14 CHAIRMAN JACKSON: Do you know why they're
15 programs as opposed to part of the way they do business?

16 MR. MERSCHOFF: Well, I didn't really necessarily
17 try to distinguish between the two. Some programs do become
18 your culture and some don't. The question is why are they
19 different? I think the answer is there wasn't full buy-in
20 at all levels.

21 CHAIRMAN JACKSON: Okay.

22 MR. MERSCHOFF: And that brought us to the root
23 causes. The first one was the economic pressure to be a low
24 cost energy producer, limited available resources to address
25 corrective actions and plant improvements.

1 The map through that that's illustrative of that
2 cause are the inadequate testing program that's a
3 significant problem in terms of safety, long-standing design
4 deficiencies, equipment qualification issues, willingness to
5 accept existing conditions, operator workarounds, et cetera.
6 A strong linkage between issues that are important safety
7 and represent compliance problems supporting this cause.

8 CHAIRMAN JACKSON: I have a question for Mr.
9 Miller and Mr. Miraglia. Do you believe that our current
10 inspection and oversight programs and processes are capable
11 of detecting adverse trends due to economic pressure?

12 MR. MIRAGLIA: I think that our view and focus has
13 been on the safety performance and we look for that impact.
14 In terms of issues, when we know there's economic pressures
15 or announced lay-offs and things of that nature, we try to
16 increase our attention to safety issues and look for those
17 sorts of things.

18 I don't know if we have programs looking at
19 precursors or performance indicators to say, "Are there
20 prewarning signals that we could use on these kinds of
21 things?" I think we're mindful of it, we've sensitive to
22 it, and it's the focus on the safety performance and changes
23 in the safety performance in the look-back kind of
24 mechanism.

25 CHAIRMAN JACKSON: Mr. Miller?

1 MR. MILLER: Well, I want to say I think so but
2 it's beginning more of a challenge, quite honestly. I
3 think, as Frank said, we're not out looking, taking polls of
4 people to judge what people's attitudes are and the like but
5 I think clearly we are mindful that the competitive
6 pressures are out there and we have charged the staff with,
7 as a by-product, really, of every inspection, to make some
8 assessment what the root cause is, not to go press the
9 licensees on this sort of thing -- it's got to be something
10 that they bring back to the region and discuss, but it's a
11 growing challenge.

12 CHAIRMAN JACKSON: I guess what I'm really getting
13 at is do we have some systematic way of, say, looking at
14 programs or plans that have been postponed and how they
15 track into what comes out of inspection or other oversight
16 findings, so that one knows that there is such a linkage?

17 MR. MILLER: Well, we're always looking for trends
18 and patterns and where there's a trend in the negative
19 direction with respect to compliance and execution of
20 programs, then I think there is a point there where we
21 express concern. But is there a systematic way of
22 evaluating this with the question being what impact are
23 economics playing on it? We don't have anything in a formal
24 and rigorous way.

25 CHAIRMAN JACKSON: Commissioner Dicus?

1 COMMISSIONER DICUS: My question is following up
2 on this. It's a little more perhaps general in nature but
3 were we looking at this plant with concern about safety
4 issues prior to the time we got the allegation?

5 MR. MIRAGLIA: The best of my recollection, we saw
6 this as kind of a middle of the road plant in that kind of
7 regard. I don't think it had come to significant discussion
8 with the region or headquarters.

9 MR. MILLER: I was obviously in Region III so I
10 can't really answer.

11 MR. JORDAN: I can say from the performance
12 indicators program and the measures, it was an average
13 plant.

14 COMMISSIONER DICUS: Which brings us to the
15 discussion we've been having -- you know, what is average?

16 MR. TAYLOR: This is a very important question
17 that as the divestiture and the change in utility system
18 comes to bear, it's something we've got to do a lot of
19 thinking about.

20 Now, we have on occasion seen -- you know, you
21 raise the question, why are you living with all these
22 operator workarounds? Because one of the things we go to is
23 safety of operations and everybody knows if you have a lot
24 of workarounds and the operators get a big event, then
25 they've got to remember all of the things that have to be

1 either manually initiated right or have some compensating
2 action for. That's always a bothersome thing.

3 I've been at plants and said, "Why are you living
4 with all these workarounds?" and part of it was the pressure
5 of money. I mean, it's come up before. That could be a
6 way.

7 We need to do more thinking on that because I
8 think it's going to get more prevalent, where the financial
9 pressures -- and they get translated. The management of the
10 company sort of sends signals and then you really find out
11 what's happening down on the plant floor, so to speak, where
12 things aren't getting fixed. Operators are very well
13 trained people, they want to make the plant run, and they
14 adjust their standard when they're told, "Hey, we're going
15 to put that one off up until the next outage and subsequent
16 outages."

17 Your question is a good one and I think we need to
18 do a lot more reflection ourselves.

19 CHAIRMAN JACKSON: Thinking about operational
20 safety, we'll go into a control room and observe the
21 decorum. We'll look at how they respond to transients, how
22 they control and go through mode changes and so on, and we
23 say, "Well, the operations are good." But there are
24 workarounds that are being lived with that no one seems to
25 have looked at the potential intersection and interaction

1 of, which would compromise the ability, however well trained
2 or however dedicated the operators are, and I agree with
3 you -- that's where we and the industry have focussed in
4 terms of their training, et cetera.

5 But if, in the end, you have conditions that are
6 allowed to exist and no one has even looked at whether or
7 not they net-net, increase the difficulties, as opposed to
8 one at a time at a time, then I have questions about what we
9 mean when we say operational safety is good because that's
10 the way we get ourselves into these valleys, these traps.
11 Good is as good does and --

12 MR. MILLER: We've got to be looking at the
13 precursors. I think that one thing that is of concern to me
14 is not so much situations where management is telling staff
15 to cut corners but where staff is, on their own account,
16 knowing the bigger picture and the kinds of pressures that
17 are out there, and I think we see that.

18 CHAIRMAN JACKSON: Commission McGaffigan.

19 COMMISSIONER McGAFFIGAN: I just want to call
20 attention to one part of your report that I thought provided
21 a lot of insight on this matter, on page 68. I'll just read
22 it.

23 "Unlike most utilities, Maine Yankee does not
24 retain earnings and does not set aside reserve funds for
25 unplanned requirements except those required by law." Then

1 the paragraph continues and it says just the decommissioning
2 fund, the pension fund and the nuclear waste trust fund.

3 It struck me that this owner-operator interaction
4 here is really sort of the heart of the matter, to some
5 degree. If they could retain some earnings, if it didn't
6 always go back to the owners instantaneously, which must
7 come from pressure from the owners, then some of these
8 workarounds might have been addressed earlier.

9 My worry, which follows up on something Mr. Taylor
10 said and the Chairman said, we may have more of this as time
11 goes on in the deregulation context because you're going to
12 have increasingly owners distant from operators, perhaps,
13 and demanding instantaneous return of earnings and all of
14 that.

15 So I thought that one of the biggest insights in
16 your paper really was on page 68.

17 MR. TAYLOR: That's a little bit of an unusual
18 financial arrangement. I don't remember when this plant was
19 licensed. It was many, many years ago.

20 MR. MIRAGLIA: I guess early '70s.

21 MR. TAYLOR: I can tell you I didn't understand
22 that until I read this report. I don't look at all the
23 financial data. Maybe we --

24 COMMISSIONER McGAFFIGAN: I'd suggest -- you say
25 unlike most -- it's something you may want to look at. If

1 there are any other utilities in this circumstance where the
2 owners demand the earnings back and don't have operating
3 funds, I'd like to know how they're doing.

4 CHAIRMAN JACKSON: Also, going forward, as the new
5 institutional arrangements are made, I think in your shop or
6 somewhere we're supposed to have hired some new people with
7 certain kinds of backgrounds. I don't know where that
8 stands, but it's this kind of thing that we need to monitor,
9 coupled with an ability, which you've managed to pull off,
10 to track back some of these issues to economic constraints,
11 and that gives us something that we have to look at.

12 We're not economic regulators and we're not trying
13 to get into that but we need to understand where there are
14 these pressure points. And if we can make these clear
15 linkages, then we're going to have to address them, but we
16 ought to make sure that we are sensitive to look for them
17 and that we have the requisite competencies to be able to
18 pick this out of what we've examined.

19 MR. MIRAGLIA: I think you've hit two points in
20 terms of looking at the economics for where potential
21 pressure points lie, and I think Hub used a key word. It's
22 the trending.

23 In terms of operator workarounds, plants are going
24 to have them, but the question is do they live with them?
25 Are they the same 13 for a long period of time or are they

1 getting fixed? Maintenance backlogs -- are they growing?
2 Are they prioritized in the right kind of way?

3 I think this is the focus of our program and I
4 think perhaps we need to look at that and the trending of
5 that and integrate it perhaps with a front-end look at some
6 of the economic considerations that are mentioned here, to
7 at least look in the areas of concern.

8 COMMISSIONER ROGERS: Just before we leave it, I
9 don't want to be the skunk at the picnic here on economic
10 issues, but I think we have to be a little bit careful here.
11 I think we've seen, over the years, that some of the most
12 expensive plants that operate are the worst ones and that
13 there has not been a clear connection between how much money
14 is spent and how well the plant runs.

15 I think we have to keep that in mind because I
16 think there is a management issue that's very important here
17 and I'm just a little hesitant to immediately jump to the
18 conclusion that it was economics. I'm not denying that we
19 have something to be very concerned about with the change in
20 the industry coming about and the effect of economic
21 pressures, but it's very easy to assign that as the root
22 cause when maybe that hasn't come about yet; maybe it has.

23 I'm not disagreeing with you, but I think it's
24 just very easy now for us to draw the conclusion that the
25 root cause is an economic one. It may very well be, but if

1 you want to draw that conclusion you'd better look to see
2 what they're spending their money on in totality. Then
3 you're going to get into the micromanagement of that
4 organization.

5 So we all know that there are lots of places where
6 money gets spent very often in systems that it didn't have
7 to be spent and yet a problem is not solved because of
8 economics.

9 So I just think we have to keep going at our
10 technical analysis here and get at it. I think the way
11 you're getting at it is very proper. I'm just saying that I
12 think we should be a little bit careful before we are sure
13 that the problem is purely economics. It may very well be.
14 With the same resources available, some of these problems
15 might have been solved.

16 CHAIRMAN JACKSON: That's why I asked the question
17 about management, process and organization because if there
18 is an economic constraint, the issue is what the response is
19 to it. And it's certainly true there are many licensees who
20 throw good money after bad and it doesn't result in any
21 improvement. But I think it is a heightened sensitivity and
22 not a one-for-one map, and I think that's what we're really
23 talking about.

24 MR. MIRAGLIA: And I think our focus ought to be
25 in trends of safety performance, declines in safety

1 performance, from a whole range of contributing factors,
2 including economics, and it's a sensitivity issue.

3 COMMISSIONER DICUS: You also have the ability to
4 read those trends. The point here is if we had not had the
5 allegation, from my view, and then responded to it, we
6 wouldn't be sitting here today with this plant, and that is
7 a concern.

8 COMMISSIONER DIAZ: In support of what's been
9 said, I think there is a wonderful table from OECD that
10 looks at different plants in different countries and how
11 much they spend in O&M and the status of the plant and it
12 shows that our plants spend a lot more money than our
13 colleagues in many different places.

14 So it might well be that it's a management process
15 issue, one that's impacted by the economics at a particular
16 point in time, rather than the entire economic picture.

17 MR. JORDAN: Maybe I can hopefully clear the
18 confusion rather than add to it.

19 CHAIRMAN JACKSON: We're the ones adding to it.

20 MR. JORDAN: This is a very tightly managed
21 economic operation. It has a small staff. It has a small
22 budget. It's one of the lowest cost producers of
23 electricity among the nuclear plants. So it's a very frugal
24 operation. The expenditures they have seem to be very well
25 prioritized and my perception is that they're limited

1 economically on what they can do.

2 So we see that there is a residual of things that
3 really need to be done that haven't reached their
4 prioritization. So I don't think we have an argument about
5 where they spent the money they had or even a concern that
6 they're not relatively efficient with the resources they
7 have. It's tight resources.

8 CHAIRMAN JACKSON: So that does track in this
9 case --

10 MR. MERSCHOFF: And we said that in the root
11 cause. We didn't see a whole lot of wasted money

12 Commissioner McGaffigan's point found its way into
13 the second root cause, that says there's a lack of a
14 questioning culture, complacency, and there does not appear
15 to be a clear incentive for improvement. That was the point
16 where if you have an organization that's particularly
17 efficient, the profits don't come back to Maine Yankee with
18 the incentive to do better. It's out at the owner level.
19 So it's clear that there's a close linkage between these
20 two.

21 To move along, the public meeting was an awfully
22 good investment in time. It went from 6:00 to 10:30 on
23 October 10 in the Wiscasset Middle School gymnasium, well
24 attended -- my guess is 250 people. I went with 250 hand-
25 outs and didn't come back with any. Roughly evenly split

1 between employees and supporters of Maine Yankee and
2 concerned citizens.

3 The first part of the meeting was the ISA team --
4 Ed and I, NRR and Region I -- meeting with the utility to
5 discuss, much as we have here, the results. The second part
6 of the meeting was question and answer with the public. All
7 people with questions were heard. Both meetings were
8 transcribed by a court reporter.

9 In terms of the licensee, after we presented our
10 findings, the licensee indicated they thought it was an
11 excellent effort, it was balanced. They had no significant
12 disagreement with the technical facts, that the root cause
13 statements were reasonable when viewed in the context of the
14 report, and they'd developed a commitment to excellence
15 program to address the findings and achieving excellence,
16 which would be submitted by December 10, as required.

17 The second part of the meeting, with the public,
18 was an investment of three hours to hear about 40 speakers.
19 Large number of topics covered, from the FastNet '79
20 offshore sailboat race with the force nine gale that showed
21 that sailboats had been optimized for speed and suffered in
22 a design basis condition for storm and are nuclear power
23 plants now optimized for cost, was the analogy.

24 Most of these -- not most -- many of these
25 statements were rhetorical or statements, as opposed to

1 questions. Comparison with the Titanic and knowledge of use
2 of lifeboats versus evacuation at Maine Yankee. Are the
3 evacuation procedures well known and can it be done? How
4 can the NRC ask for a corrective action from a plant that
5 has identified corrective action problems -- were issues
6 brought up.

7 Price Anderson limitations were discussed.
8 Economic comparisons between oil spills and those disasters
9 versus nuclear were discussed, with the thought being that
10 nuclear is safe and efficient.

11 Comments that the plant is safe, that workers are
12 not complacent, that post-trip reviews are thorough, that
13 conservative decisions are made, that operators would shut
14 this plant down long before management if they felt it was
15 unsafe were made on the pro side.

16 All in all, where was the NRC? Why didn't our
17 inspection program pick these up? NRC doesn't treat
18 allegers very well. These were the kinds of issues that
19 were discussed.

20 On the whole, it was very professional. I think
21 we, as federal regulators, were treated extremely well by a
22 concerned and involved citizenry at the meeting.

23 MR. JORDAN: And I would comment that we did have
24 one of the state representatives, in fact, one of the team
25 members from the state, as well as one of the program or the

1 process persons, who also participated in the meeting with
2 the public, very positively, and that was a benefit, I
3 believe.

4 MR. MERSCHOFF: And finally, we recognized five
5 regulatory lessons learned in the report itself because they
6 were linked to the findings and discussions in the report.
7 We have an additional five that are being addressed, all 10
8 in a memorandum that's being circulated will be generated to
9 follow up on these issues, and I can go briefly through them
10 if you'd like.

11 CHAIRMAN JACKSON: Yes.

12 MR. MERSCHOFF: Analytic code validation, we found
13 inconsistency. We found that our requirements were not
14 clear and inconsistencies in our implementation, and we need
15 to determine what are the appropriate standards and make
16 them clear.

17 In terms of compliance with safety evaluation
18 reports, the regulatory stature of those SER commitments is
19 not clear and we found inconsistencies in terms of what
20 we've accepted from different plants under the same
21 conditions.

22 Licensing reviews for power upgrades. The
23 process, scope and extent of the review for power upgrades
24 should be relooked at in light of the problems identified at
25 Maine Yankee.

1 Net positive suction head requirements for plants
2 are established in Safety Guide 1 and there were some
3 inconsistencies in that safety guide in terms of whether or
4 not credit can be taken even for the saturation pressure of
5 the fluid, which would be a very realistic assumption, but
6 the safety guide would tend to indicate that you could not
7 use that. And if that's the case, there may be more
8 problems with net positive suction headed plants that we
9 need to look at.

10 Inspection program issues -- is it adequate in the
11 testing area? Are we looking hard enough in the assessment
12 of design basis area? Could you put back-up slide 4 on,
13 please, Ola?

14 Other ones not addressed in the report are the
15 adequacy of the expectations for performance along the lines
16 of the SALP discussion we had, to rethink that. Agency
17 policy on the design basis reconstitution we need to look
18 at, along the lines of the 50.54(f) letter. The cumulative
19 effect of operator workarounds that we discussed and what is
20 a clear definition of acceptable for manual versus automatic
21 action.

22 In terms of the state participation, we thought
23 the lessons there was it worked very well and the three-
24 level -- technical, process, oversight -- give us a great
25 deal of credibility and established an exceptional working

1 relationship with the State of Maine that just would not be
2 achievable through another way.

3 In terms of the conduct of the team itself, we
4 learned a lot of things about a team that large and how best
5 to manage it and to write the report. The analytic code
6 area was very useful and needs to, as we did here, have
7 practitioner level inspectors involved in it.

8 The use of the peer panel that we had, the outside
9 experts, was very useful and provided good insights and a
10 sanity check for what we were doing. And the use of PRA, in
11 terms of the third leg of that stool we discussed, and to
12 view equipment reliability was a very useful tool.

13 That concludes my planned remarks, Dr. Jackson.

14 CHAIRMAN JACKSON: Thank you. I guess my question
15 is what is, then, the follow-up that's going to happen now?

16 MR. JORDAN: The comment I would make is that
17 that's really why Hub and Frank are at the table, as well,
18 is because this really is a hand-off and the hand-off was
19 made in front of the public, as well, to say that these
20 findings were conveyed to the licensee, the licensee is to
21 submit a response by December 10, and that the review of
22 that response, of their plans for action, lies with the
23 Office of Nuclear Regulation and with Region I.

24 And so we've communicated with both offices the
25 findings and we can provide additional support, but now it

1 really is theirs to follow.

2 MR. TAYLOR: I think we'll have to provide you,
3 when all this is worked on, we'll provide you with some
4 periodic reports of activities, either through Commission
5 papers --

6 CHAIRMAN JACKSON: Okay. I was going to put these
7 in my --

8 MR. TAYLOR: We'll have to lay that out between
9 the program office and the region.

10 MR. MIRAGLIA: And the generic issues are also
11 going to be tasked as appropriate. Most of them will be
12 coming to the office and we'll have to develop plans for
13 responding.

14 CHAIRMAN JACKSON: Well, I'm going to mention
15 something in my closing comments.

16 Any more questions?

17 COMMISSIONER ROGERS: Yes, a couple of things.
18 One is it sounds to me like there's a serious management
19 problem here because when I hear about meaningless
20 procedures for testing valves that are being religiously
21 followed, faithfully followed and they're meaningless, it
22 seems to me that the coordination between engineering,
23 testing and maintenance just is not there, that there ought
24 to be some engineering evaluation of testing procedures that
25 would turn that up.

1 So it seems to me that there is -- and the fact
2 that they don't have system engineers -- well, that's a
3 choice, an organizational choice, but certainly system
4 engineers, properly employed, would turn up something like
5 that, it seems to me.

6 So at any rate, it does appear to me that there is
7 a management deficiency here that I don't know that, in
8 terms of linking various functions together, that I haven't
9 heard anything about explicitly. Could you comment on that?

10 MR. MERSCHOFF: It's clear that management is
11 responsible for the lack of a questioning culture and the
12 complacency, and for changing that. So the roots for that
13 second cause or the solution resides with management
14 effecting change throughout all levels of the organization.

15 CHAIRMAN JACKSON: Any others?

16 COMMISSIONER ROGERS: I have another point, and
17 that is that in the report, on page 59, you referred to an
18 inputs and assumptions source document that they started in
19 1986 and then set aside, and it seems to me that that might
20 be a very important kind of exercise, not only for them but
21 for other plants, as well, particularly when we address the
22 kinds of concerns that we talked about yesterday with
23 respect to is there an adequate basis for applying PRA?

24 And what are the assumptions, inputs and
25 assumptions that they're living with? Those should be

1 explicit and I just don't know that it has to do with this
2 particular team's report, but it came out of that and
3 turning that up I think was very interesting. I don't know
4 if that is a report or a document that is generally being
5 produced in plants or not. Could you comment on that?
6 Perhaps Mr. Taylor, do you know whether --

7 MR. TAYLOR: I can't comment on that.

8 MR. MERSCHOFF: I can't tell you if it's common
9 among plants but this was an instance where, back in the
10 early '80s, due to problems recognized by the NRC, that they
11 developed, embarked on a course to establish, collect in one
12 place their input assumptions. The results of that had
13 errors. It was not well done, so they embarked on the
14 second, the safety assumption input document, which they set
15 aside, due to the financial complaints, but have
16 reestablished.

17 So it has its roots in a regulatory requirement.

18 One of my team members mentions that it's a
19 reflection of a three-volume FSAR. When you're dealing with
20 an FSAR that lacks specificity, you need another level of
21 detail to impose that specificity and discipline.

22 COMMISSIONER DIAZ: That leads me to precisely the
23 word that I wanted to use, which was specificity. Just a
24 very simple comment. I believe that we have been hearing
25 about lack of consistency or inconsistency, lack of

1 reliability, lack of performance, lack of this.

2 I think that basically, with the superb staff that
3 we have and the great job you have done in analyzing these
4 problems, that providing the specificity in whatever we're
5 recommending is of incredible need.

6 And I want to piggy-back on two issues. One is
7 the automatic initiation of the high pressure coolant
8 injection pump and the steam-driven auxiliary feedwater
9 pump. I mean, those are items that I believe once you
10 identify them, we should be very specific and indicate,
11 "This is not acceptable," and I'm sure you have, but I
12 haven't seen it reflected in here, those items not being
13 acceptable. Those are not acceptable from a safety
14 viewpoint; they're certainly not acceptable to me as a
15 commissioner trying to ensure adequate protection of the
16 public health and safety.

17 I think the licensees actually appreciate that
18 specificity. If we can be more specific in a series of
19 issues, I think they will actually love it.

20 MR. TAYLOR: This goes to the enforcement side,
21 too.

22 CHAIRMAN JACKSON: Thank you.

23 I'd like to thank you for briefing the Commission
24 on the results of a very important inspection job. And on
25 behalf of the Commission, it's been a vigorous discussion.

1 I would like to thank the members -- we all would -- of your
2 team for your dedicated work and effort. You've done quite
3 a job.

4 We realize the many stresses that inspections of
5 this length and this nature place on you, particularly with
6 the unusual way it came about and the unusual format that it
7 took. But I have to tell you that the governor of Maine has
8 expressed his appreciation for your team's experience and
9 for your professionalism.

10 Today you've presented a summary of your team's
11 work that, taken in concert, in fact, with the in-depth
12 inspections of the Millstone and Haddam Neck facilities, Mr.
13 Virgilio's team, has helped to clarify for the Commission
14 the picture of the status and the problems of not adequately
15 maintaining design bases. And the inspection findings have
16 helped us in those areas.

17 As you know, the Commission's approval of the
18 recent 10 CFR 50.54(f) letters that we sent to licensees
19 requesting information having to do with the adequacy and
20 availability of design basis information, in effect, was an
21 affirmation of your recent inspection findings and
22 underscores the Commission's resolve to ensure that there
23 are adequate processes in these areas that work, et cetera,
24 and that, in fact, the lessons learned from your review will
25 help to inform our review, NRC's review of licensee

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1 submissions.

2 Now, as you indicated, I understand that you're
3 generating for the EDO a tasking memo that will help direct
4 the program offices to follow up on the specific inspection
5 findings and potential enforcement issues, as well as the
6 regulatory lessons learned.

7 With respect to NRC follow-up with Maine Yankee, I
8 think it would be useful for the Commission to be briefed by
9 Maine Yankee on their plans to respond to the inspection
10 findings and the root causes. I think perhaps at that time,
11 after the gentlemen from Region I and from NRR have had a
12 chance to get this hand-off and put their heads together,
13 that as part of that, that I think we would like to hear
14 from you, in terms of regulatory follow-up.

15 And we've already talked, in terms of regulatory
16 lessons learned, that we obviously need to figure out an
17 appropriate way, not simplistic, to assess whether our
18 current inspection program is capable of detecting the
19 various issues and root causes, some of which you've
20 identified, of the type you're identified today.

21 And based on our discussion today, I have one
22 additional item to add for consideration, and I think it's
23 clear from the very extensive discussion you heard today,
24 and that is that we need to have a review of our assessment
25 categories in SALP -- we're already looking at the senior

1 management meeting process -- to look at these categories
2 and ask ourselves whether they appropriately categorize
3 performance in a way that gives the specificity that is
4 needed, that gives the consistency that is needed, and does
5 not allow things to go along in a subminimal state for an
6 unduly long time and resolves what I call some of these
7 oxymorons that can perhaps contribute to sending
8 inconsistent messages to licensees.

9 It's hard to say that the quality of maintenance
10 was good, and that was one of the conclusions, and that
11 there were mixed results in engineering but overall, it was
12 good, but yet you have the problem with something like the
13 steam-driven aux feed pump.

14 Those are the kinds of things that I think when we
15 go about doing our assessments, that those kinds of
16 disconnects need resolution.

17 MR. TAYLOR: May I add something?

18 CHAIRMAN JACKSON: Please.

19 MR. TAYLOR: First, I think bringing Maine Yankee,
20 the thought occurred to me as you were speaking. I fully
21 support that.

22 I think one of the things that I would add from my
23 experience is that this is again a demonstration of the
24 effectiveness of an overarching team inspection, through the
25 years, as we have faced various problems, the benefit of

1 putting together teams with various degrees of expertise.
2 In this particular case, the adjunct of the code examination
3 is a good example where we took typical team-type operations
4 and added to it.

5 So I would only point to the Commission this type
6 of review by the agency, we can't do it everywhere, at every
7 time or moment, but I think for a number of years there was
8 a regulatory impact survey. Commissioner Rogers will recall
9 that. When was that? About 1990 or so, was it?

10 MR. MIRAGLIA: 1989, '90.

11 MR. TAYLOR: And the industry said these were very
12 expensive and onerous to a degree. I think what we're
13 seeing today, and even for a plant such as Maine Yankee, is
14 the great benefit that comes from it. This is costly but
15 there is a great regulatory and frankly, potential safety
16 benefit through the operation of team inspections.

17 Mr. Virgilio's inspection was geared to a
18 different set of issues but again unearthed problems that
19 would have been very difficult for the individual small
20 resident staff and others to unearth.

21 So again, I would tell the Commission I think that
22 through the years, utilization of teams has been very
23 beneficial to the agency.

24 CHAIRMAN JACKSON: I think what we're trying to
25 get at, and I think it's already under way, is a

1 rationalization of how the various pieces of the program --
2 the resident inspection, the other oversight and inspection
3 functions that come out of NRR -- how all of these things
4 link, how they are rationalized, how they feed up the line
5 in terms of our overall assessment, and how the special team
6 investigations and inspections feed into that, what triggers
7 them. You know, what do we hope to learn? How do they then
8 feed back into these various parts? That's the task ahead
9 of us.

10 But in terms of specific follow-up here, we will
11 have Maine Yankee come in to talk about their response to
12 the findings and at that time we also would like to hear
13 wherever you are at that point in terms of the follow-up for
14 our regulatory program.

15 If there's nothing else, we're now adjourned.

16 [Whereupon, at 11:08 a.m., the meeting was
17 adjourned.]

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CERTIFICATE

This is to certify that the attached description of a meeting of the U.S. Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON INTEGRATED SAFETY
ASSESSMENT TEAM INSPECTION (ISAT) AT
MAINE YANKEE - PUBLIC MEETING

PLACE OF MEETING: Rockville, Maryland

DATE OF MEETING: Friday, October 18, 1996

was held as herein appears, is a true and accurate record of the meeting, and that this is the original transcript thereof taken stenographically by me, thereafter reduced to typewriting by me or under the direction of the court reporting company

Transcriber: Susan Harris

Reporter: Susan Harris

**THE INDEPENDENT SAFETY ASSESSMENT
OF
MAINE YANKEE ATOMIC POWER STATION**

Edward L. Jordan

Ellis W. Merschoff

October 18, 1996

PRESENTATION OBJECTIVES

- o Describe the Independent Safety Assessment process used to evaluate Maine Yankee**
- o Discuss the findings and conclusions of the Maine Yankee Independent Safety Assessment**
- o Discuss Regulatory Lessons Learned**

SELECTION OF MAINE YANKEE

- o Allegations Regarding RELAP/5YA**
- o Office of Inspector General Inquiry**
- o State of Maine Concerns**

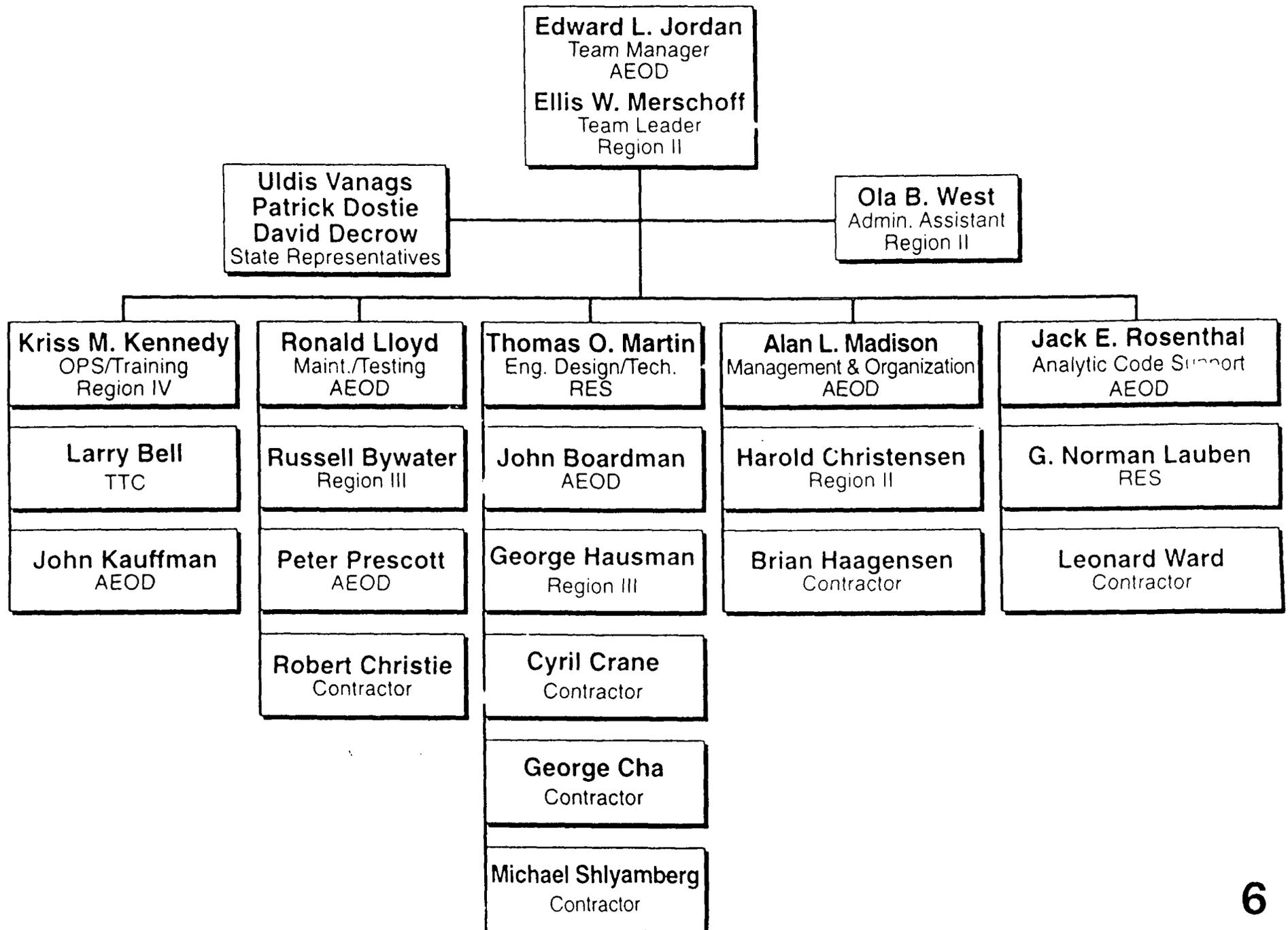
INDEPENDENT SAFETY ASSESSMENT

- o Large Experienced Team**
- o Independent of NRR and Region I**
- o Participation by State of Maine**
 - Technical Team**
 - Process Team**
 - Citizens Group**
- o Modified Diagnostic Evaluation Technique**

INDEPENDENT SAFETY ASSESSMENT MISSION

- o Provide an independent assessment of the conformance of Maine Yankee Atomic Power Station to its design and licensing bases including appropriate reviews at the site and corporate offices.**
- o Provide an independent assessment of operational safety performance providing risk perspectives, where appropriate.**
- o Evaluate the effectiveness of licensee self-assessments, corrective actions, and improvement plans.**
- o Determine the root cause(s) of safety significant findings and draw conclusions on overall performance.**

Maine Yankee Independent Safety Assessment Team



LICENSEE SUPPORT ORGANIZATION

- o Senior level counterparts**
- o Staff**
 - Technical**
 - Administrative**
- o Development of extensive response library**
- o Effective link to line organization**
- o Thorough extent of condition reviews**

SAFETY ASSESSMENT SCHEDULE

- o June 17-July 12 - Team preparation**
- o July 15 - Public entrance meeting**
- o July 15-26 - First onsite evaluation period**
- o August 12-23 - Second onsite evaluation period**
- o October 7 - Issue report**
- o October 10 - Public exit meeting**

SAFETY ASSESSMENT PROCESS

- o Extensive preparation**
- o Horizontal assessment across functional areas**
- o Vertical slice reviews for selected systems**
- o Analytic code review**
- o Interviews**
- o Safety assessment/root cause evaluation**

SAFETY ASSESSMENT STANDARDS

- o Regulations - Measure conformance**
- o Assessment - Measure margin of safety**
 - Superior**
 - Good**
 - Acceptable**
- o Probabilistic risk assessment - Provide perspective**

NRC ASSESSMENT STANDARDS

	SUPERIOR	GOOD	ACCEPTABLE
Safety	Properly Focused	Normally Well Focused	Acceptable Performance
Programs	Effective Control	Some Deficiencies Exist	Instances of Insufficient Control
Self Assessment	Effective	Some Issues Not Identified	May not Occur Until Problem is Apparent
Corrective Actions	Comprehensive	Some Not Complete	Not Thorough
Root Cause	Recurring Problems Eliminated	Normally Thorough	Do Not Probe Deeply

SAFETY ASSESSMENT RESULTS

- o Overall Performance Adequate for Operation**
 - Design/Licensing Basis - Generally in conformance**
 - Operations - Very good**
 - Maintenance - Good**
 - Testing - Acceptable**
 - Engineering - Good**
 - Self Assessment/Corrective Actions - Acceptable**

LICENSING AND DESIGN BASIS

o Licensing Basis

- Generally in conformance
- Lacks specificity
- Contains inconsistencies
- Not well maintained

o Design Basis

- Quality good
- Availability good
- Design deficiencies identified
- Supports operation at 2440 MWt

LICENSING/DESIGN BASIS OPERABILITY ISSUES

- o Component cooling water**
- o Reactor water storage tank**
- o Equipment qualification**
- o Ventilation**
- o Logic circuitry**
- o Containment spray pump**
- o Service water**
- o Check valve testing**

SAFETY ASSESSMENT OPERATIONS

o Strengths

- Operator performance**
- Use of risk information**
- Management involvement**
- Shift turnovers**
- Pre evolution briefs**

o Weaknesses

- Workarounds and compensatory measures**
- Post trip reviews**
- Log keeping**

SAFETY ASSESSMENT MAINTENANCE

o Strengths

- Knowledge/use of risk**
- Motivated/dedicated work force**
- Control of temporary repairs**
- Quality of maintenance**

o Weaknesses

- Declining material condition**
- Inconsistent equipment reliability**

SAFETY ASSESSMENT TESTING

o Strengths

- Steam generator tube testing**
- Inservice testing**
- Containment leak rate testing**

o Weaknesses

- Inadequate scope**
- Weak rigor**
- Weak evaluations**

SAFETY ASSESSMENT ENGINEERING

o Strengths

- Quality of engineering work**
- Qualified capable staff**
- Electrical design work**
- Support provided by Yankee Atomic**

o Weaknesses

- Inconsistent problem identification**
- Inconsistent problem resolution**
- Limited ownership of programs**

SELF ASSESSMENT/CORRECTIVE ACTIONS

o Self Assessment

- Internal/external effectiveness mixed**
- Fragmented problem identification process**

o Corrective Actions

- Weak implementation**
- Fragmented**
- Occasionally ineffective**

o Improvement Plans

- Limited effectiveness**
- Many individual plans**
- Results mixed**

SAFETY ASSESSMENT ROOT CAUSE

o Root Cause 1

Economic pressure to be a low cost energy producer has limited available resources to address corrective actions and some plant improvement upgrades. Management has effectively prioritized available resources, but financial pressures have caused the postponement of some needed programs and actions.

SAFETY ASSESSMENT ROOT CAUSE

o Root Cause 2

There is a lack of a questioning culture which has resulted in the failure to identify or promptly correct significant problems in areas perceived to be of low safety significance. Management appears complacent with the current level of safety performance and there does not appear to be a clear incentive for improvement.

SAFETY ASSESSMENT PUBLIC MEETING

o With Licensee

- NRC presented results**
- Licensee senior management responded**

o With Public

- Overall impressions**
- Key concerns**

REGULATORY LESSONS LEARNED

- o Analytic code validation**
- o Compliance with safety evaluation reports**
- o Licensing reviews for power uprates**
- o Net positive suction head requirements**
- o Inspection program issues**