

**In The Matter Of:**

*IN RE:*

*PREDECISIONAL ENFORCEMENT CONFERNECE*

---

*PROCEEDINGS BEFORE STEWART EBNETER, CHAIRMAN*

*March 27, 1996*

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*BROWN REPORTING, INC.*

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*1740 PEACHTREE STREET*

*ATLANTA, GA USA 30309*

*(404) 876-8979 or (800) 637-0293*

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## PREDECISIONAL ENFORCEMENT CONFERENCE

March 27, 1996

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[1] UNITED STATES NUCLEAR REGULATORY COMMISSION  
[2] REGION II

[3]

[4]

[5] IN RE: PREDECISIONAL )  
[6] ENFORCEMENT CONFERENCE, )  
[7] CRYSTAL RIVER. )

[8]

[9]

[10] PROCEEDINGS BEFORE  
[11] STEWART EBNETER, CHAIRMAN

[12]

March 27, 1996

[13]

8:00 a.m.

[14]

[15]

29th Floor  
101 Marietta Street  
Atlanta, Georgia

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[21]

Keth A. Wilkerson, CCR-B-1381, RPR

[22]

[23]

[24] BROWN REPORTING, INC.  
1100 SPRING STREET, SUITE 750  
ATLANTA, GEORGIA 30309  
[25] (404) 876-8979

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[1] APPEARANCES

[2] On behalf of the NRC:

[3] R. Butcher

K. Landis

[4] E. Merschoff

A. Gibson

[5] S. Ebnetter, Chairman

J. Lieberman

[6] B. Uryc

S. Richards

[7] G. Imbro

[8] On behalf of Crystal River:

[9] B. Hickie

P. Beard

[10] G. Boldt

P. Tanguay

[11] L. Kelley

B. Gutherman

[12] G. Halton

[13]

Also Present:

[14]

M. Weinberg, Esq.

[15] D. Steninger, Esq.

R. Gaddy, Esq.

[16] M. Jacobs

G. Becker

[17] J. Vorse

A. Boland

[18] R. Caldwell

C. Rapp

[19] D. Lanyi

G. Tracy

[20] L. Raghavan

J. Beall

[21] C. Evans, Esq.

K. Clark

[22] W. McNulty

B. Morris, Esq.

[23] B. Keeling

L. Clark

[24]

[25]

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[1] MR. EBNETER: It's a couple minutes after  
[2] 8:00. We'd like to get started. Pat, is your staff  
[3] here?  
[4] MR. BEARD: Yes.  
[5] MR. EBNETER: Gibson and Ellis, all your  
[6] staff's here?  
[7] MR. GIBSON: Yes.  
[8] MR. EBNETER: Good morning. I want to  
[9] welcome you to Region II. I'm Stu Ebnetter, regional  
[10] administrator for Region II of the Nuclear  
[11] Regulatory Commission. Of course Region II has  
[12] jurisdiction over licensed nuclear activities in the  
[13] southeast United States, and Crystal River falls  
[14] within the purview of that region.  
[15] This is a meeting this morning between  
[16] Florida Power Corporation and Region II, and the  
[17] purpose of the meeting is to discuss some apparent  
[18] noncompliances with the Agency's rules and  
[19] regulations is. This is a predecisional enforcement  
[20] conference, and the purpose, again, is to discuss  
[21] with you some events over the past year to two years  
[22] that have occurred at Crystal River 3, to discuss  
[23] the facts and circumstances surrounding those, and  
[24] to try to resolve some conflicting issues that we  
[25] still have as a result of some of our inspections

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[1] and investigations.  
[2] This is a closed meeting, and it is being  
[3] transcribed. I should caution you, if you get  
[4] questioned by the staff and if you don't know the  
[5] answer, you should say you don't know. You should  
[6] not try to get into a situation - you know what I'm  
[7] saying. If you don't know, we'll tell you to put it  
[8] on the record and request you to put it in writing,  
[9] of course, but don't get yourself into a situation  
[10] where you're trying to talk about something you  
[11] don't know about. Those issues frequently do come  
[12] up.  
[13] This meeting is predecisional. That is,  
[14] there has been no specific decision made yet with  
[15] regard to enforcement, and the meeting is for  
[16] Crystal River to present any facts, any of their  
[17] reasoning regarding the issues that are on the  
[18] table. You should also point out any mistakes or  
[19] errors that you may have seen that are in the NRC  
[20] documentation and inspection reports or other  
[21] material that you may have presented to us in the  
[22] past. You should also provide any new information  
[23] that we have not had access to, anything that would  
[24] help us reach a fair and accurate determination of  
[25] what actions we should take.

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[1] This case is a very complex one. It  
[2] involves not only the facility license but the  
[3] license of several of your operators. All of those  
[4] are under our purview also, and we will deal with  
[5] both of them partly in combination in this meeting  
[6] and in individual sessions with the operators.  
[7] This meeting, however, is focused on  
[8] Florida Power Corporation's license and the  
[9] management of the facility and its impact on the  
[10] actions that the operators took in their licensed  
[11] activities. Facility management of course is  
[12] ultimately responsible to assure that operations and  
[13] activities comply with the regulations and any  
[14] commitments that you have made to us applicable to  
[15] Crystal River 3's license, and that is the main  
[16] focus here: Florida Power's organization apparent  
[17] inability to comply overall with these regulations.  
[18] We have numerous inspection reports and  
[19] investigation reports on the docket, and there are  
[20] still some issues with those. The staff has  
[21] formulated some questions which will come out as  
[22] part of the presentation. Mr. Al Gibson, our  
[23] Director of the Division of Reactor Safety will  
[24] essentially run the conference, but I can't  
[25] overemphasize to you the importance of this

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[1] conference.  
[2] We also have today with us the Director  
[3] of the Office of Enforcement, Jim Lieberman, we have  
[4] representatives from NRR, and they'll all introduce  
[5] themselves. We have a member of the EDO staff, we  
[6] have the Office of Congressional Affairs represented  
[7] and the Office of General Counsel, to say nothing of  
[8] Region II counsel, Ms. Evans.  
[9] The issues before us are broad, and my  
[10] view is basically these actions that the operators  
[11] took were unacceptable. These operators were  
[12] functioning as your representatives. They worked  
[13] for you even though they are individually licensed.  
[14] Their actions represent your philosophy, and this is  
[15] my summary because they work for you. Either they  
[16] were working outside of your expectations or you  
[17] have as managers created an environment that allowed  
[18] them to do this, and we would like to hear about  
[19] that, and I'm sure you're going to address it.  
[20] Those practices, to violate the rules and  
[21] regulations of the Commission to prove a safety  
[22] point, were not acceptable, and there's no excuse to  
[23] violate the law to prove a point to someone. The  
[24] operators had many options available to them other  
[25] than pursuing this course of action. If they didn't

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(1) know those other courses of action, that's your  
(2) responsibility, too. But there's clear indication  
(3) to me that management, if you didn't know, that you  
(4) should have known of these types of practices. It's  
(5) your job as managers to perform the oversight in  
(6) that control room and to make sure that your staff  
(7) is complying with the rules and regulations of the  
(8) Commission.

(9) That's enough of my lecture for you.  
(10) want to get on with the meeting. We'll go through  
(11) some introductions. I'd commented that the meeting  
(12) is being transcribed. Al and I have discussed  
(13) briefly the conduct of the meeting. It's probably  
(14) going to be long, and I want to give you the  
(15) opportunity to make your story, your presentation,  
(16) so what we've decided is we've got it broken into  
(17) these apparent noncompliances. We'll let you get  
(18) through each one individually, the staff should hold  
(19) their questions to the end of that one violation,  
(20) and then we'll get to the questions and answers.  
(21) They're interrelated, those things, so  
(22) there will probably be some redundancy in the  
(23) questions. If we just let you make the presentation  
(24) for an hour or two and then go on, I don't think it  
(25) will be effective, but it's also not going to be

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(1) effective to have everybody jump in and say, What  
(2) about this or that. So I think that's how we'll  
(3) proceed.

(4) As we get toward the end of the  
(5) conference the staff will probably want to take a  
(6) caucus. The standard procedure that they give me is  
(7) a ten minute caucus, and my guess is it won't be a  
(8) ten minute caucus, it will probably take longer, but  
(9) we'll break and come back and have any additional  
(10) questions and then close the meeting. I do  
(11) appreciate your coming in. I know this has been a  
(12) very large job for your staff and the NRC staff.  
(13) Everybody involved has had a great burden to bear on  
(14) this.

(15) With that, we'll go through the  
(16) introductions, and then I'll turn it over to Bruno,  
(17) and then we will discuss with you the enforcement  
(18) policy.

(19) **MR. LIEBERMAN:** I'm Jim Lieberman, the  
(20) Director of the NRC Office of Enforcement.

(21) **MR. URYC:** Bruno Uryc, Director of Region  
(22) II Enforcement Staff.

(23) **MR. RICHARDS:** Stuart Richards.

(24) **MR. IMBRO:** I'm Gene Imbro, Project  
(25) Director for the NRR.

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(1) **MR. BEARD:** Pat Beard, senior vice  
(2) president, nuclear operations.

(3) **MR. HICKLE:** Bruce Hickie, director of  
(4) plant operations.

(5) **MR. BOLDT:** Gary Boldt, vice president of  
(6) nuclear production.

(7) **MR. TANGUAY:** Paul Tanguay, director of  
(8) nuclear engineering and projects.

(9) **MR. KELLEY:** Larry Kelley, director of  
(10) nuclear operation and site support.

(11) **MR. GUTHERMAN:** Brian Gutherman, manager,  
(12) nuclear licensing.

(13) **MR. HALNON:** Greg Halnon, also licensing  
(14) manager.

(15) **MR. BUTCHER:** Ross Butcher, senior  
(16) resident inspector on Crystal River.

(17) **MR. LANDIS:** Kerry Landis, chief of  
(18) reactor projects, branch three.

(19) **MR. JAUDON:** Johns Jaudon, deputy  
(20) director, division of reactor safety.

(21) **MR. MERSCHOFF:** Ellis Merschhoff, director  
(22) of reactor projects.

(23) **MR. GIBSON:** Al Gibson, director of the  
(24) division of reactor safety.

(25) **MR. MORRIS:** I'm just a general observer,

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(1) Bruce Morris.

(2) **MS. EVANS:** Carolyn Evans, regional  
(3) counsel.

(4) **MR. BEALL:** I'm Jim Beall for the Office  
(5) of Enforcement.

(6) **MR. TRACY:** Glenn Tracy, EDO staff.

(7) **MR. CALDWELL:** Bob Caldwell, project  
(8) engineer.

(9) **MR. RAPP:** Curt Rapp, regional inspector.

(10) **MR. LANYI:** David Lanyi, project  
(11) engineer.

(12) **MS. BOLAND:** Anne Boland, senior  
(13) enforcement specialist.

(14) **MS. KEELING:** Betsy Keeling, Office of  
(15) Congressional Affairs.

(16) **MS. CLARK:** Lisa Clark, Office of the  
(17) General Counsel.

(18) **MR. WEINBERG:** Sandy Weinberg. I'm an  
(19) attorney.

(20) **MR. STENGER:** Dan Stenger of Winston &  
(21) Strawn representing Florida Power.

(22) **MR. GADDY:** Rodney Gaddy, corporate  
(23) counsel for Florida Power.

(24) **MR. JACOBS:** Mark Jacobs, manager of  
(25) strategic communications.



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[1] MR. BECKER: Gary Becker, make-up tank  
[2] issue manager.

[3] MR. VORSE: Jim Vorse, special agent,  
[4] Office of Investigations.

[5] MR. RAGHAVAN: L. Raghavan, project  
[6] manager for NRR.

[7] MR. MCNULTY: Bill McNulty, director of  
[8] investigations, Region II.

[9] MR. EBNETER: Mr. Morris, would you  
[10] identify who you're affiliated with?

[11] MR. MORRIS: I represent the operators at  
[12] the plant, actually four operators. I'm an attorney  
[13] in Atlanta.

[14] MR. EBNETER: Bruno?

[15] MR. URYC: Thank you, Mr. Ebneter. I'd  
[16] like to take just a few minutes to go over the NRC  
[17] enforcement policy and procedure for you.

[18] After an apparent violation is  
[19] identified, it's assessed in accordance with the  
[20] Commission's enforcement policy which is published  
[21] as NUREG 1600. The assessment of an apparent  
[22] violation involves categorizing the apparent  
[23] violation into one of four severity levels based on  
[24] safety and regulatory significance. For cases where  
[25] there is a potential for escalated enforcement

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[1] action, that is, where the severity level of the  
[2] apparent violation is categorized as severity level  
[3] one, two or three, a predecisional enforcement  
[4] conference is held.

[5] There are three primary enforcement  
[6] sanctions available to the NRC, and they are notices  
[7] of violation, civil penalties, and orders. Notices  
[8] of violation and civil penalties are issued based on  
[9] identified violations. Orders may be issued for  
[10] violations or, in the absence of a violation,  
[11] because of a significant public health and safety  
[12] issue.

[13] Now, this predecisional enforcement  
[14] conference is essentially the last step of the  
[15] inspection and investigation process before the  
[16] staff makes its final enforcement decision. The  
[17] purpose of this conference is not to negotiate a  
[18] sanction. Our purpose here today is to obtain  
[19] information that will assist us in determining the  
[20] appropriate enforcement action.

[21] We would expect to develop information  
[22] that would provide us with a common understanding of  
[23] the facts, root causes and missed opportunities  
[24] associated with the apparent violations, a common  
[25] understanding of corrective action taken or planned,

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[1] and a common understanding of the significance of  
[2] the issues and the need for lasting comprehensive  
[3] corrective action.

[4] The apparent violations discussed at this  
[5] conference are subject to further review, and they  
[6] may be subject to change prior to any resulting  
[7] enforcement action. It's important to note that the  
[8] decision to conduct this conference does not mean  
[9] that the NRC has determined that a violation has  
[10] occurred or that enforcement action will be taken.  
[11] I'd also like to note at this time that the  
[12] statement of views or expression of opinion made by  
[13] the NRC staff at this conference or the lack thereof  
[14] are not intended to represent final Agency  
[15] determinations or beliefs regarding this matter.

[16] Following this conference the regional  
[17] administrator, in conjunction with the NRC Office of  
[18] Enforcement and other NRC offices, will reach an  
[19] enforcement decision, and this process should take  
[20] about four to six weeks to accomplish.

[21] Finally, if the enforcement action  
[22] involves a proposed civil penalty, the NRC will  
[23] issue a press release 24 hours after the enforcement  
[24] action is issued. Thank you.

[25] MR. LIEBERMAN: Good morning. My name is

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[1] Jim Lieberman, and I'm attending this conference  
[2] today because it involves significant regulatory  
[3] issues. I want to emphasize at the outset, as Mr.  
[4] Ebneter did, that the performance of your operators  
[5] on the evenings of September 4 and 5, which we  
[6] recognized did not perform acceptably, is not the  
[7] primary focus of this predecisional enforcement  
[8] conference. While we're concerned about them, our  
[9] main focus today is on the performance of Florida  
[10] Power Corporation.

[11] As Mr. Ebneter mentioned, we have a  
[12] number of issues to discuss today. I want you to  
[13] know six of the concerns that I'm especially  
[14] interested in.

[15] My first area of concern focuses on the  
[16] performance of the operations department that  
[17] permitted routine exceeding of operating limits in  
[18] several cases for more than an hour; that insisted  
[19] the plant operate on a curve knowing operators  
[20] questioned the safety in so doing and, rather than  
[21] insisting the matter be promptly resolved,  
[22] instituted frequent monitoring of true performance  
[23] to see who did not operate on the curve; that did  
[24] not investigate the root causes of the safety  
[25] evolutions and perform a human factors review of the

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(1) events; that did not interview each member of the  
(2) operating crew to understand what happened and why;  
(3) and that apparently did not investigate to determine  
(4) if there were other unauthorized evolutions to  
(5) obtain data with either the make-up tank or other  
(6) systems.

(7) My second area of concern is with the  
(8) communications between engineering and operations  
(9) that led to the failure of the engineering  
(10) organization to bring forward knowledge of the  
(11) September 4th evolution.

(12) My third area of concern is the  
(13) environment for raising concerns such that a manager  
(14) involved in licensed activities felt compelled to  
(15) use the employee concern program rather than bring  
(16) his knowledge of the September 4th evolution to the  
(17) attention of operations and that Florida Power  
(18) Corporation did not promptly and aggressively  
(19) resolve a safety concern raised by a senior reactor  
(20) operator.

(21) In that regard, I have to presume that a  
(22) licensed operator does not normally raise concerns  
(23) that operating limits are non-conservative, and when  
(24) that occurs I would have presumed that a licensee  
(25) would consider it a high safety priority to

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(1) resolve. However, in this case it appears that the  
(2) issue percolated without senior management assisting  
(3) and getting it promptly resolved.

(4) Fourth is the performance of the  
(5) engineering department. Notwithstanding repeated  
(6) opportunities, they did not aggressively pursue the  
(7) matter, promptly resolve it, and recognize it was a  
(8) design basis curve. Even after it was recognized as  
(9) a design basis curve, it was not initially properly  
(10) corrected.

(11) My 5th concern has to do with the LER  
(12) preparation, which was done with engineering's  
(13) assistance but did not describe the evolution on the  
(14) 4th nor stated that every time the plant operated on  
(15) or exceeded Curve 8 the plant exceeded its design  
(16) basis.

(17) Finally, I'm concerned why Florida Power  
(18) Corporation did not begin a real investigation of  
(19) this matter until after the originally scheduled  
(20) conferences were canceled almost a year after the  
(21) issue arose. Frankly, in my view, which I sincerely  
(22) hope is wrong, the actions of this company seem to  
(23) demonstrate an intent to place the focus on Mr.  
(24) Fields and his crew rather than on the significant  
(25) shortcomings of Florida Power Corporation.

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(1) I look forward to your explanations  
(2) today, because I hope they'll be helpful for the NRC  
(3) to make an appropriate enforcement decision. With  
(4) that, let me turn it over to Al Gibson.

(5) **MR. GIBSON:** What I'd like to do today is  
(6) first call your attention to a handout that you  
(7) should have been provided that includes the agenda  
(8) that you see and a brief summary of the notices of  
(9) violation that we are considering and then a more  
(10) detailed description of that apparent violation  
(11) which really has more information than we could get  
(12) up on a slide that could be viewed throughout the  
(13) room. I would like to go through each of the  
(14) apparent violations in summary with you.

(15) I'd like first, though, to reiterate some  
(16) of the things the others have said. I would like to  
(17) encourage you, if you believe that there is a  
(18) mistake or an error in any of the reports that we  
(19) have sent to you or in the proposed notices that  
(20) we're discussing today, to bring that to our  
(21) attention.

(22) I would offer that, although I'm going  
(23) through the apparent violations in a particular  
(24) order, you can change the order as you wish. We  
(25) will hold our questions and give them to you after

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(1) each of the four apparent violations have been  
(2) discussed. We will caucus, as Mr. Ebnetter said,  
(3) when the presentations are complete and the  
(4) questions are complete.

(5) I would like to remind the NRC staff that  
(6) if you believe there are errors, if you believe  
(7) something that FPC is stating is not correct, we  
(8) would like for you to raise that before we caucus.  
(9) I don't want to go to the caucus and then somebody  
(10) say, Well, I don't agree with that, that wasn't  
(11) really correct. I'd rather hear it here so that FPC  
(12) has an opportunity to hear it.

(13) **MR. EBNETER:** Let me stop a minute. Jim  
(14) Lieberman just mentioned something to me, and I want  
(15) him to make the comment right now.

(16) **MR. LIEBERMAN:** After Al gets through  
(17) with describing the issues of his concern, if  
(18) Florida Power wants to caucus to make sure that  
(19) they're satisfied with their presentation based on  
(20) any of our opening remarks, feel free to do so.

(21) **MR. BEARD:** Thank you.

(22) **MR. GIBSON:** With that, I'll proceed and  
(23) go through what we see as apparent violations at  
(24) this point.

(25) The first item I'll discuss is an

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[1] apparent violation of Tech Spec 5.6.1.1 for failure  
[2] to follow procedures on nine occasions. During the  
[3] period of June 1 through September 5, 1994 OP-103B,  
[4] Curve 8 was exceeded by more than one-half psig for  
[5] continuous periods of more than 30 minutes on these  
[6] nine occasions. Furthermore, the alarm response  
[7] procedure, AR-403, was not followed in that  
[8] operators failed to take action to reduce make-up  
[9] tank pressure on these nine occasions.

[10] The second violation that we would like  
[11] to discuss is an apparent violation of  
[12] 10 CFR 50.59. On September 4th and 5th, 1994  
[13] operators failed to comply with 10 CFR 50.59 when  
[14] they conducted tests not described in the FSAR of  
[15] make-up tank level and pressure without a written  
[16] safety evaluation to determine if an unreviewed  
[17] safety question existed. The limits of OP-103B, the  
[18] requirements of OP-402, and the requirements of  
[19] AR-403 were violated during these tests. Subsequent  
[20] analysis revealed that an unreviewed safety question  
[21] did in fact exist.

[22] The third violation is a violation of  
[23] Criterion XVI. Criterion XVI of 10 CFR 50, Appendix  
[24] B, requires corrective action for conditions adverse  
[25] to quality. The first example is Problem Report

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[1] 94-0149 dated May 10, 1994 which identified a  
[2] concern with the accuracy of Curve 8. An  
[3] engineering evaluation dated June 4th, 1994 found no  
[4] errors in the curve or its supporting calculations,  
[5] and subsequent evaluations in response to a later  
[6] problem report, 94-0267, dated September 7, '95  
[7] found significant errors in the curve and the  
[8] calculations.

[9] The second example of Criterion XVI  
[10] refers to corrections to the curve that were  
[11] subsequently issued. Revised guidance and curves  
[12] issued on three occasions between September 9, 1994  
[13] and January 30, 1995 were not adequate to prevent  
[14] operation outside the plant's design basis.

[15] The final example of Criterion XVI is for  
[16] failure to take timely corrective action on an event  
[17] that you had previously described in Licensee Event  
[18] Report 92-003. You may recall this was a licensee  
[19] event report that described your finding that some  
[20] of the fuel in the emergency diesel fuel oil tanks  
[21] was not usable because it was below the elevation of  
[22] the suction pipe in the tank, and as part of your  
[23] corrective action plan you stated that you would  
[24] review other tanks for this same condition. The  
[25] borated water storage tank was specifically listed.

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[1] We believe that, had you performed this  
[2] review, you might have identified a violation that  
[3] I'll discuss next, an example of failure to  
[4] translate design requirements into plant  
[5] procedures. Also, an NRC inspection in April of '95  
[6] found the same problem existed in a fire water  
[7] storage tank.

[8] With that, I'd like to move to the final  
[9] violation, which is a violation of Criterion III, an  
[10] apparent violation of Criterion III for design  
[11] control. This apparent violation includes four  
[12] examples where you apparently did not adequately  
[13] translate plant design information into plant  
[14] procedures.

[15] The first example is Curve 8, which we've  
[16] talked about previously. It did not provide control  
[17] to prevent gas binding of make-up pumps. The second  
[18] example is that as late as February of 1995 EOPs,  
[19] Emergency Operating Procedures, directed operators  
[20] to swap low pressure injection suction from the  
[21] borated water storage tank to the reactor building  
[22] at a borated water storage tank level of five feet.  
[23] This level was too low to prevent gas binding of the  
[24] HPI pumps due to vortexing of water in the borated  
[25] water storage tank.

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[1] The third example of the apparent  
[2] violation of Appendix B, Criterion III is that from  
[3] April 8, 1993 through March the 22nd, 1995 a  
[4] condition existed such that during post LOCA  
[5] operation with one LPI pump supplying two HPI pumps  
[6] and with the HPI crosstie valve open the reactor  
[7] building sump water level could be insufficient to  
[8] provide adequate net positive suction heads to the  
[9] LPI pumps.

[10] Finally, the fourth example is procedure  
[11] SP-300, requiring 35 feet of water to be maintained  
[12] in the fire water storage tanks. Because of the  
[13] elevated suction point in these tanks, 35 feet of  
[14] water was not enough to meet design basis  
[15] requirements.

[16] In summary, that's the four violations  
[17] that are apparent to us that we would like you to  
[18] comment on. With that, I'll turn it over to you,  
[19] Pat.

[20] MR. BEARD: I have one thing I'd like to  
[21] caucus with my people on, probably Gary Becker and  
[22] Paul Tanguay.

[23] (Discussion ensued off the record.)

[24] (A recess was taken.)

[25] MR. BEARD: Let me start off by saying

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(1) that we're glad to be here. You'd probably say, Why  
(2) is he saying that, and the answer is we're glad to  
(3) be here and settle this thing with you, take our  
(4) medicine and get it behind us. We're not glad the  
(5) apparent violations occurred, but it's been a  
(6) catalyst for change, we've learned from the  
(7) experience, and we're better off. As we go through  
(8) this, we intend to demonstrate that.

(9) We heard very carefully the words of Mr.  
(10) Ebnetter and Mr. Lieberman. We recognize that the  
(11) overriding issue here is not what the operators did  
(12) or didn't do or what calculations were right or  
(13) weren't right or why they weren't right. The issue  
(14) here, as you've said, and we recognize it and we  
(15) intend to address it, is what was our organization  
(16) doing then, what was management doing, and we will  
(17) address that.

(18) In fact, we plan to demonstrate that it  
(19) was not an environment where people were expected or  
(20) allowed to do what they wanted to. Mr. Lieberman,  
(21) you made the statement that you hoped that your  
(22) perceptions were incorrect, and we think that they  
(23) are to a large extent, and we intend to demonstrate  
(24) that. We accept the apparent violations, that's not  
(25) an issue; of course management accepts

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(1) responsibility for everything that happens at our  
(2) plant, and that's not an issue. Instead, our focus  
(3) will focus on the root causes, particularly the  
(4) management issues, and corrective actions to address  
(5) and prevent recurrence.

(6) We will of course include the concerns  
(7) that you have with management, and we will also  
(8) address what we had already in our minds felt were  
(9) three key questions: One, why did the make-up tank  
(10) test happen; secondly, why didn't FPC management  
(11) know of the September the 4th test earlier and tell  
(12) you; and third, why did it take so long to fix the  
(13) technical issues associated with the make-up tank.  
(14) As we go through our presentation, I think those  
(15) questions will be answered, but just in case, I will  
(16) specifically answer them at the conclusion of our  
(17) presentation.

(18) This conference of course is complicated,  
(19) and I think it's reflected in some of the remarks  
(20) that Mr. Ebnetter made and Mr. Lieberman made by the  
(21) fact that we have terminated two operators, and now  
(22) we have an adversarial condition between the company  
(23) and these operators. As a result of that, they've  
(24) made a number of statements reflected in  
(25) correspondence to you and in inspection reports and

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(1) in a recent letter to DOL. We realize that  
(2) complicates this whole thing, but as we go through  
(3) this we will present management's position and side  
(4) of the story.

(5) I'd like to briefly review the agenda;  
(6) you have a copy in front of you. I'm going to go  
(7) through the chronology next. I think it's important  
(8) right up front - Mr. Ebnetter has said it's complex  
(9) and it's been ongoing for a while - and I think it  
(10) would be beneficial right up front to go through the  
(11) chronology of the key things that happened and when  
(12) they happened and, in so doing, I'll also give a few  
(13) key facts that will be elaborated on further by Mr.  
(14) Hickie and Mr. Tanguay as they discuss the issues,  
(15) including management oversight.

(16) Right after I finish here, though, we're  
(17) going to have Greg Halnon just briefly show you the  
(18) make-up tank system and a couple of things that  
(19) might be useful, and then of course I'll give a  
(20) conclusion. We have copies of our overheads, and  
(21) we'll provide those to you at the end of our  
(22) presentation. I also have a book that I used in  
(23) preparing, and I'll leave a copy with Mr. Ebnetter.  
(24) It's that thick binder over there of correspondence  
(25) in chronological order that reflects what I'm going

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(1) to talk about next. We also have, although I can  
(2) see now that the print is not large enough for you  
(3) to see it at the back of the room, but we'll leave  
(4) it up here, the chronology.

(5) First, a little background. In the  
(6) '91-'92 time frame we received two IMPO  
(7) evaluations, and in both cases they recommended in a  
(8) finding, which is stronger than recommending, that  
(9) we follow chemistry guidelines with respect to  
(10) hydrogen concentration reactor coolant, which was 22  
(11) to 45 cc's per kg. We had been running somewhere  
(12) between 10 to 15.

(13) During this same time frame you'll recall  
(14) that the industry had a lot of focus on fuel  
(15) failures. The reasons for that, one of the reasons  
(16) was corrosion due to oxygen, and therefore this  
(17) issue was receiving a lot of focus, and  
(18) appropriately so.

(19) We committed in '92 to meet the guideline  
(20) recommendations, and in '92 and '93 we had a series  
(21) of meetings with engineering, operations and others  
(22) on how to do this. At our plant, due to our design,  
(23) which is somewhat unique compared to the other B&W  
(24) plants with a make-up system, it wasn't an easy  
(25) thing to do. And as we went through this we found



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[1] out that, every time we came back and wrestled with  
[2] it, it was harder than we thought. But we're not  
[3] using that as an excuse.  
[4] Anyway, the results of those efforts  
[5] culminated in April of '93 - well, I'll just use  
[6] this one. We provided the operators the curve, the  
[7] variable pressure temperature curve. There was a  
[8] curve prior to that, but it was sort of up here. We  
[9] just had a flat line at 15 pounds psi, so just keep  
[10] pressure below that. Very simple, period. That's  
[11] all their guidance was, and it was easy to follow.  
[12] However, we were only keeping hydrogen in the  
[13] coolant between 10 and 15 cc's per kg, so we gave in  
[14] the alarm. We asked that they strive to meet the  
[15] higher hydrogen pressure and therefore to get more  
[16] cc's per kg.  
[17] Now, that did impose an additional  
[18] operator burden. We had to manipulate things about  
[19] five times a day to do that. Yes, it was a burden,  
[20] but it was achievable, it was doable. Particularly  
[21] starting around January '94 we put increasing  
[22] emphasis on it. The operations manager was  
[23] involved, and we felt that it could be done, and it  
[24] was being done, and we had started as we began to  
[25] discuss what else we could do to alleviate the

[1] gave them. That's wrong. We should have given them  
[2] from the beginning an operating curve with plenty of  
[3] margin such that, as long as they stayed there or  
[4] below and during normal evolutions the tank drains  
[5] down, that it didn't cross the design basis curve.  
[6] But we didn't do that.  
[7] As a result of these anomalies a problem  
[8] report was written, Problem Report 94-149. During  
[9] the period of June to September there were a number  
[10] of management operations and engineering  
[11] interactions. In some areas I've heard that no one  
[12] was involved in addressing this. That's not  
[13] correct. There was a lot of involvement. Was it  
[14] effective in fixing the issue before September the  
[15] 4th? No. It wasn't effective, but there was plenty  
[16] of involvement, and you'll hear some more about  
[17] this.  
[18] In fact, as we now know, the curve was  
[19] reviewed in June '94 and erroneously reported by  
[20] system engineering that it was okay, and it wasn't.  
[21] I mean, at that point there were two things wrong.  
[22] We didn't know it was a design basis, and there were  
[23] some terms and what have you that were not correct.  
[24] There were in fact a series of documented meetings  
[25] between operations and engineering. There was a

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[1] operator burden. These discussions started as early  
[2] as January '94.  
[3] The next, I think, thing of interest is  
[4] in May of '94. During a refuel we ran a  
[5] surveillance procedure which called for a full flow  
[6] test of our high pressure injection, which is also  
[7] our make-up tank system, so we have a system that  
[8] has two purposes, again unique to Crystal River, and  
[9] during that test several anomalies were noted. The  
[10] level at the beginning dropped more quickly than was  
[11] expected. There were some evidence that the make-up  
[12] pump, or high pressure injection pump, same thing,  
[13] were cavitating, and as the system level was going  
[14] down in the make-up tank and the pressure was  
[15] plotting, the operating crew noted that the points  
[16] as they were plotting didn't appear to follow the  
[17] shape of this curve.  
[18] I'll note at this point, not to belabor  
[19] the point, that this curve is a locus of calculated  
[20] points per design basis as we now know design  
[21] basis. Any time you drain it down other than for  
[22] LOCA design action conditions, the fact that it  
[23] doesn't follow the shape of this curve exactly,  
[24] there's no reason why it should. The real issue is  
[25] and was that this was a design basis curve that we

[1] formal meeting on August the 8th, 1994 with  
[2] operations and engineering followed by a management  
[3] meeting with the plant manager, the manager of  
[4] operations, Mr. Halnon, and a manager of nuclear  
[5] plant technical support. Also, during these  
[6] meetings and as we were addressing Problem Report  
[7] 94-149, we more and more realized the complexity of  
[8] the system interactions, the competing operation  
[9] requirements. You'll hear a little bit more about  
[10] that.  
[11] The next thing, I think, of significance  
[12] occurs on September the 2nd. The manager of nuclear  
[13] plant technical support, Mr. Campbell, sent a memo  
[14] to Mr. Hickie, the plant manager, and this memo,  
[15] contrary to what the operators that we terminated  
[16] would lead you to believe, was not an ultimatum.  
[17] That was absolutely not the case. Nor did anyone  
[18] else tell this crew that it's going to be closed  
[19] out, you have one last chance to do something.  
[20] That's not true, and we can document that.  
[21] Instead, the memo focused on how could we  
[22] further relieve the operator burden through plant  
[23] modifications. And I might add that most of the  
[24] memo was focused on the operations suggestions from  
[25] the August 8th meeting. However, the memo again



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[1] stated erroneously that the operating curve appeared  
 [2] to be okay, and that was wrong. I'd also note that  
 [3] the memo also reflected that there was another  
 [4] remaining corrective action to Problem Report 149  
 [5] which said the curve would be reviewed again by  
 [6] September the 30th.

[7] Nevertheless, the make-up tank evolutions  
 [8] occurred on September the 4th and 5th. The crew, as  
 [9] a result of that, presented data that culminated in  
 [10] Problem Report 94-267. At this point I wasn't going  
 [11] to talk at length on why they did it, but let me say  
 [12] a few preliminary words because we're going to get  
 [13] back to that. In our view, there was no excuse for  
 [14] doing it, it was not in accordance with our  
 [15] expectations, and none of the other crew shift  
 [16] supervisors would have done it. We're convinced of  
 [17] that; they told us. We don't think that management  
 [18] had any inkling that they were going to do it. It  
 [19] was done on a weekend. Hydrogen pressure was  
 [20] normal. In fact, it was 30 cc's per kg. There was  
 [21] no reason to be doing anything, but they did it, and  
 [22] we'll come back again to this later. I'm going to  
 [23] answer that question fully in the end.

[24] On September the 13th the plant manager  
 [25] talks to the system engineer that's been involved in

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[1] this, and the system engineer was complaining that,  
 [2] "Hey, the operators ran this evolution to get data  
 [3] and they should have had me involved", and that  
 [4] keyed the plant manager that, "What, they did what?"  
 [5] Now, why didn't we ask on September the 7th, "How  
 [6] did you get the data"? We can't figure that out.  
 [7] But on September the 13th the plant manager said,  
 [8] "Wait a minute, this may be an unauthorized test."  
 [9] He notified the senior resident inspector and the  
 [10] branch chief and he convened a management review  
 [11] committee on the 15th. This is a new initiative.

[12] We had not had management review committees before.  
 [13] Bruce Hickie told me that probably on the  
 [14] 14th or so, he told me that he was going to review  
 [15] this management review committee. Gary Boldt at  
 [16] this time was attending an IMPO meeting, and I said,  
 [17] "Yes, I like that idea, let's do it." We realized  
 [18] the principle involved. In fact, as I recall,  
 [19] probably on the 14th, in talking with Mr. Hickie, I  
 [20] used the word Chernobyl myself. We said, "We've got  
 [21] to do something different on this, we've got to  
 [22] express management attention early, we need to focus  
 [23] on crew performance and the human performance  
 [24] issues." We wanted the management review committee  
 [25] to do that and also confirm whether or not they

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[1] thought it was an unauthorized test. Bruce and I  
 [2] were so angry, we wanted an ameliorating influence  
 [3] if that was needed.

[4] The purpose of the committee was to  
 [5] review the evolution, to address crew performance,  
 [6] and provide recommendations thereto. They concluded  
 [7] that it was indeed an unauthorized test. Now,  
 [8] remember, on September the 5th we didn't know about  
 [9] the 4th, and I'll get to why we didn't, and they  
 [10] developed recommendations to address the crew  
 [11] performance and the issue, and Bruce will talk about  
 [12] those, and to some extent, because the  
 [13] recommendations were very good and we completed all  
 [14] of them, and address the principle issue of human  
 [15] performance and the principles involved.

[16] Now, in hindsight, and I would agree with  
 [17] you or anybody who says it, our own investigation  
 [18] later came up with this conclusion. It was a good  
 [19] initiative, but there's one thing wrong. In our  
 [20] zeal to deal with this thing, the human performance  
 [21] issue, we circumvented our regular process of  
 [22] writing a problem report and doing a root cause, and  
 [23] we should have done that, written a problem report  
 [24] about why did they do it, and we've subsequently  
 [25] done that. If we had done it then, maybe - I mean,

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[1] you can hypothesize all you want to - we'd have  
 [2] found out about the 4th. But we didn't, and the  
 [3] reason, in hindsight, is because at the time the  
 [4] operators appeared to be very forthcoming, sincere,  
 [5] "Yes, we screwed up, we're sorry, we meant well, we  
 [6] were trying to help resolve this issue", and we  
 [7] accepted that. We believed them.

[8] Problem Reports 149 and 267 were still in  
 [9] place to address the technical issues, and so we  
 [10] mistakenly did not see the need to do more at that  
 [11] time.

[12] As we proceed, from September through  
 [13] December the corrective actions from the management  
 [14] committee, Problem Reports 267 and 149, there were  
 [15] still some things there. We were working on it.  
 [16] The corrective actions from the MRC included that we  
 [17] counsel all the operators. I personally talked to  
 [18] the shift supervisors. We reviewed other operating  
 [19] curves to see whether we were operating close, and  
 [20] there might be an issue with operators getting in  
 [21] trouble. We looked at that. We did a number of  
 [22] things. We were continuing to look at the technical  
 [23] issues, working on the calculations and what have  
 [24] you.

[25] In fact, as a result of those efforts, on

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[1] November the 16th at a meeting which I attended a  
[2] presentation was made, and we determined that Curve  
[3] 8 was in fact a design basis, and that resulted in  
[4] our LER 94-009. Mr. Lieberman made a comment  
[5] earlier about something along the lines of, "Well,  
[6] why in 149 didn't you recognize that there'd been  
[7] other possible design violations", and we did. I  
[8] just read the words in our caucus. We realized  
[9] there may have been other - we in fact were on the  
[10] curve in other occasions and we had evidence that  
[11] there were other possible violations of design  
[12] basis.

[13] We of course notified you within a one  
[14] hour report that same day and wrote the LER. And  
[15] let me say this, but this is something we're  
[16] certainly not going to harp on. The safety  
[17] consequences of September the 5th were something  
[18] like three times ten to the minus eleventh core  
[19] damage frequency.

[20] Now, the next thing that I think is  
[21] relevant is that on November the 22nd there was an  
[22] FPC/NRC management meeting here in Atlanta. Gary  
[23] Boldt represented us. Among other things, make-up  
[24] tank evolution was discussed. And by the way, back  
[25] when I said when we learned on September 13th of an

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[1] unauthorized test and we notified our senior and our  
[2] branch, there's one other thing that we, Florida  
[3] Power, failed to do. I failed to call Mr. Ebnetter,  
[4] and that was my failure.

[5] Anyway, after the November 22nd meeting  
[6] we sent a letter to you of December the 2nd  
[7] documenting what we did in our management review  
[8] committee meetings, what actions we were taking and  
[9] had taken and were taking. At the same time, in  
[10] fact on that same day, I signed out a memo  
[11] initiating a management self-assessment to look at  
[12] the issues that had been discussed in our meeting of  
[13] 11-22 and other issues that we'd identified, and  
[14] this self-assessment was led by a member of our  
[15] off-site safety review committee.

[16] During December '94 to March '95, the  
[17] first OI investigation was being conducted, and the  
[18] crew that performed the evolution was interviewed as  
[19] well as our manager of operations. As we continued  
[20] to follow the corrective actions from Problem  
[21] Reports 149 and 267, we continued to realize the  
[22] complexity of the interactions more and more, and we  
[23] were discovering some other things wrong, like the  
[24] borated water swap-over point and those kinds of  
[25] things.

[1] Two things came out of that. As part of  
[2] our evolving corrective action to have more  
[3] efficient management processes, we had embarked on a  
[4] process where key issues were so designated, an  
[5] issue manager assigned, and the key issues generally  
[6] were those that involved complex interactions  
[7] usually between cross organizations, an element of  
[8] management that's a challenge and that we needed to  
[9] do better. Then, in addition to the issue manager,  
[10] there was an issue sponsor who was a director of Mr.  
[11] Boldt or myself.

[12] We made Mr. Becker the issue manager for  
[13] all the make-up tank technical issues, pulled it all  
[14] together in one action plan, and I believe on the  
[15] first of February '95 we further modified the  
[16] operating curve, which we had modified previously,  
[17] once on September the 9th and once on September the  
[18] 5th, and we gave the operators a reduced curve and,  
[19] as has been pointed out, we don't know that was  
[20] still good enough. But finally, on February the 1st  
[21] we gave them a seven pound offset, and that has  
[22] subsequently proved to be conservative.

[23] Also, I will note for the record that  
[24] after September the 9th there had been no further  
[25] alarm violations of any limit or curve or any alarm

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[1] with regard to make-up tank evolution, September the  
[2] 9th, 1994. In February we also established what we  
[3] call our 49 step management corrective action plan  
[4] as follows on to our self-assessment that was  
[5] conducted in December of '94 that I mentioned  
[6] earlier. I mention this because we think it's very  
[7] pertinent that these actions address the broader  
[8] underlying factors reflected in the apparent  
[9] violations.

[10] As you know, the plan focuses on safety  
[11] and human performance. In March we had our first  
[12] meeting with the NRC, the region, to discuss this  
[13] management corrective action plan. There's been a  
[14] series of periodic meetings, four to date, and those  
[15] will continue. As we proceed, on July 7th  
[16] Inspection Report 9513 established the original  
[17] predecisional enforcement conference and, as we were  
[18] preparing for that, on July the 13th we became aware  
[19] that there'd been an evolution the day before, and  
[20] we became aware through two channels.

[21] One, the bargaining unit operators had  
[22] raised the issue through their attorney. I guess  
[23] they had read the inspection report, I believe  
[24] that's correct, and realized that September the 4th  
[25] was not discussed in it and properly brought it up.

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(1) and we became aware through that channel.  
(2) Concurrently and at the same time, the system  
(3) engineer who was involved back in September in  
(4) resolving and addressing Problem Reports 149 and  
(5) 267 - and yes, this is system engineer - and two  
(6) other system engineers back in the September time  
(7) frame did in fact know that it had been conducted  
(8) twice.  
(9) However, back in that time frame and up  
(10) until July they didn't put any importance on that.  
(11) They were focused on resolving the technical issues,  
(12) and to them the data and everything, it was all the  
(13) same. They were assuming that we all knew or that  
(14) management knew that it had been done twice.  
(15) Now, we personally talked to them, every  
(16) one of them. We're convinced that in their case  
(17) there was no intent not to tell, and we could say,  
(18) "Well, you didn't use good judgment." Well, okay,  
(19) fine. But I will say that when the system engineer  
(20) read the inspection report he noted also that, "Gee,  
(21) it didn't say anything about the 4th", and properly  
(22) he came forward. He told his boss, who told his  
(23) boss, who was a maintenance manager, who told Mr.  
(24) Hickie. All this was within a day or two, and Mr.  
(25) Suven also went through our employee concerns

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(1) program, so I got it through that channel and I got  
(2) it from Mr. Hickie.  
(3) Why did Mr. Suven use our employee  
(4) concerns program channel? Because he was the  
(5) manager of a large group of bargaining unit people  
(6) and realized that four of our operating crew were  
(7) bargaining unit people, and he was a little bit  
(8) concerned about, "Hey, you know, the union folks  
(9) were going to be angry with me for bringing  
(10) something up." Now, he then came forward within a  
(11) day and said, "I wrote it". We then found out, and  
(12) we told you immediately with a phone call.  
(13) MR. LIEBERMAN: Could I interrupt? You  
(14) said several things which I want to ask about. Were  
(15) any of these engineering system managers involved in  
(16) reviewing the LER, developing the LER response?  
(17) MR. BEARD: Yes.  
(18) MR. LIEBERMAN: Who was involved?  
(19) MR. HALNON: Phil Salzman and I believe  
(20) Pat Hinman.  
(21) MR. LIEBERMAN: That LER describes the  
(22) event, but at that time the 4th wasn't discussed.  
(23) MR. BEARD: I can't answer the question  
(24) as to what they thought about that. Can anyone?  
(25) MR. LIEBERMAN: Has anyone asked them

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(1) about that?  
(2) MR. BEARD: Has anyone asked them?  
(3) MR. KELLEY: It may have been asked -  
(4) MR. BEARD: Do we want to table that and  
(5) get back to you? Would you rite that down as  
(6) something to get back to them?  
(7) MR. KELLEY: We'll do that.  
(8) MR. BEARD: My understanding was that,  
(9) again, the LER was written with regard to what  
(10) happened on the 5th. Now, why the engineer involved  
(11) didn't think about the 4th or come forward, I can't  
(12) say at this point, and we'll get back to you with  
(13) our understanding of that.  
(14) MR. LIEBERMAN: The other issue is you  
(15) just said that the person who filed the concern, the  
(16) important thing is to raise the issue, that it's  
(17) better that he raise it that way than not at all,  
(18) obviously, but he was concerned, you say, that  
(19) because the bargaining unit people may be angry.  
(20) MR. BEARD: Yes.  
(21) MR. LIEBERMAN: Is that a normal concern,  
(22) that, when a manager raises an issue that may be  
(23) relevant to safety or relevant to how the plant's  
(24) operating, that workers respond by becoming angry?  
(25) MR. BEARD: No. I think that is not an

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(1) expected response, and if anyone feels free to talk  
(2) about.  
(3) MR. BOLDT: Let me add one other thing.  
(4) Brian at that time, Mr. Suven, was actually manager  
(5) of system engineering, was he not, manager of  
(6) primary systems?  
(7) MR. GUTHERMAN: He was the supervisor of  
(8) system engineering, primary plant.  
(9) MR. BOLDT: At the time of the test he  
(10) was the supervisor of the mechanical primary  
(11) systems, so system engineering reported to him. At  
(12) the time of the July discovery he had been  
(13) transferred for development purposes to manager of  
(14) the mechanical maintenance shops. He was shop  
(15) manager.  
(16) This was his first experience with  
(17) bargaining unit personnel, his very first, to my  
(18) knowledge, and I think he knew that his performance,  
(19) his personal performance depended on his ability to  
(20) get good performance from his people, and I think he  
(21) had a genuine concern and maybe some naivete, but he  
(22) was genuinely concerned that he might lose the  
(23) support of his personnel in the shop, but there was  
(24) no such reaction.  
(25) MR. LIEBERMAN: Have you given counseling

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[1] to other first line supervisors as part of your  
[2] supervisory training program to counsel individuals  
[3] on how to go about raising these types of issues and  
[4] to address these matters?  
[5] **MR. BEARD:** Well, we've provided training,  
[6] and counseling with regard to the employee concerns  
[7] program, how it works, what the intent is,  
[8] encouraging people to come forward. So Jim, I think  
[9] in the broad sense my answer would be yes. I think  
[10] Mr. Boldt put Mr. Suven in the proper frame of  
[11] mind.

[12] Also, realize that management, that we  
[13] had already made an issue with the operators back in  
[14] September. We had the NRC now, and there was a big  
[15] effect around our plant, a lot of concern,  
[16] particularly the operators were edgy, the bargaining  
[17] unit people. Thank God the people came forward.  
[18] Mr. Suven, the engineer that read the report and  
[19] brought it up, we're so very happy that it came  
[20] forward, that it did come forward, and in that way  
[21] I'd say our system worked.

[22] **MR. LIEBERMAN:** Have you given any  
[23] counseling to the engineers that didn't bring it  
[24] up?

[25] **MR. BEARD:** I personally haven't.

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[1] They've been talked to by you guys. Do you want to  
[2] answer that now or later? Who has talked with  
[3] Hinman and Salzman about this?

[4] **MR. BOLDT:** Jerry Campbell would have  
[5] done that, but he's not here for me to verify that  
[6] with.

[7] **MR. BEARD:** Take that down, and we'll get  
[8] back to you.

[9] As a result of learning this, we launched  
[10] into our investigation which was headed by, again, a  
[11] member of our on-site safety review committee. We  
[12] had a member of our security group on it. We had  
[13] our safety concerns rep and a technical rep. We did  
[14] an extensive investigation. We talked to many  
[15] people. And the conclusion of the report was yes,  
[16] an unauthorized test was conducted on the 4th, and  
[17] there was no other unauthorized test conducted on  
[18] the make-up tank that they could find in 1994.

[19] There was evidence that the shift  
[20] supervisor and assistant shift supervisor had  
[21] withheld information. There were something like  
[22] twelve occasions where they had opportunity to come  
[23] forward with that. There was evidence that the  
[24] bargaining unit operators were not entirely  
[25] forthcoming but some evidence that they thought they

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[1] had told somebody. That's where we found out that  
[2] there were three engineers who knew of the test.  
[3] There's no evidence that management knew of the  
[4] test.

[5] Then there were some other issues about  
[6] we should have done a full root cause, which we  
[7] agree with, and that the shift supervisor's  
[8] authority as to what he could or couldn't do was  
[9] adequately defined in September, and we provided  
[10] that investigation to OI.

[11] **MR. GIBSON:** Could you clarify that last  
[12] statement? I didn't understand. You said that  
[13] there was evidence that the shift supervisor's  
[14] authority was not adequately defined.

[15] **MR. BEARD:** No. The conclusion was that  
[16] it was adequately defined. It's in our report.

[17] We took additional corrective action as a  
[18] result of that investigation, some of which was  
[19] discipline. We terminated the shift supervisor and  
[20] assistant shift supervisor, we revoked the license  
[21] of the chief nuclear operator, gave a reprimand to  
[22] one of the operators, and verbal counseling for one  
[23] of the others who was not involved in September the  
[24] 4th.

[25] And you might say, "Well, gee, why did

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[1] you do this now and not back in September", and the  
[2] answer is very simple. It's a matter of integrity,  
[3] not coming forward when you knew you should have.  
[4] It's an entirely different issue. Now, had we known  
[5] about both in the same time in September would we  
[6] have done differently with the operators then?  
[7] That's hypothetical. Maybe not much more than with  
[8] respect to the counseling and the things we did do.  
[9] The issue here is the time lapse and that people  
[10] who, through their training, experience, and in fact  
[11] the basis for their license, should have known  
[12] better and should have told us, and they didn't.

[13] **MR. LIEBERMAN:** Pat, are you going to  
[14] further discuss this investigation later on today?

[15] **MR. BEARD:** In what sense?

[16] **MR. LIEBERMAN:** There was an issue called  
[17] developed issue number three involving corrective  
[18] action which the investigators didn't have time to  
[19] pursue. I was wondering if that issue was ever  
[20] pursued.

[21] **MR. BEARD:** Yes, it was. I think as we  
[22] go through some of the details that you'll see that,  
[23] and we can come back to that if you have further  
[24] questions.

[25] In addition to the discipline, we took



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(1) six additional corrective actions such that we now  
 (2) call our corrective action plan the 49 plus six,  
 (3) including such things as broadening the focus of  
 (4) what situations could be defined as infrequently  
 (5) performed tests, more guidance to our shifts a  
 (6) checklist requiring plant manager approval, log  
 (7) keeping practices. We expanded the management  
 (8) review committee. We now call it the review  
 (9) management panel process, and that's now documented  
 (10) in a directive and how it's conducted and a number  
 (11) of other things.

(12) Now, in August through December the  
 (13) second OI investigation was conducted, and a number  
 (14) of other people were interviewed that were not  
 (15) interviewed the first time, including management.  
 (16) In December of 1995 we became aware that there were  
 (17) additional make-up tank alarm events, and we were  
 (18) provided through a third step grievance some data  
 (19) from the computer that indicated that on other  
 (20) occasions in July through September during our  
 (21) normal evolutions of five a day to keep the pressure  
 (22) up that it appeared that alarms had been exceeded  
 (23) and maybe for some period of time.

(24) Now, you could say, "Well, see, why  
 (25) didn't you know about that sooner", and what can you

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(1) say other than, "Well, yes, we should have." I wish  
 (2) we had. Well, why didn't we? The investigation of  
 (3) August '94 went back and looked at the strip chart  
 (4) recorders which the operators used to manipulate the  
 (5) plant. They talked to the operators. They did  
 (6) everything but one thing that was subsequently done  
 (7) by one of the operators we terminated, and that's to  
 (8) go back and pull off all the computer data, which  
 (9) the computer generates the alarm, and see what that  
 (10) says.

(11) We investigated this information, and Mr.  
 (12) Halnon conducted that investigation, and we  
 (13) confirmed that in fact in nine instances between  
 (14) July '94 and September the 9th that the alarm was  
 (15) received and was not dealt with in a timely manner,  
 (16) and we reported that to you in our letter of  
 (17) December the 27th. As a result of that  
 (18) investigation, we've taken some additional  
 (19) corrective actions with regard to alarm response  
 (20) training, further strengthening the procedures and  
 (21) things like that, really a reinforcement of the  
 (22) things we already had under way. Then of course we  
 (23) received the March 8th report, and that brings us to  
 (24) today.

(25) So that's what happened, and we will

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(1) further talk about some of these things as we get  
 (2) around to answering the key questions and your other  
 (3) questions. This is just sort of a summary of what  
 (4) are some of the key things I've said. Certainly the  
 (5) issues involved are complex. We've learned a lot  
 (6) about how this system interacts with something like  
 (7) nine competing operation requirements. Our  
 (8) corrective actions have been ongoing since  
 (9) September '94, including our management corrective  
 (10) action plan, which does address the underlying  
 (11) factors.

(12) We've had interactions ongoing with you  
 (13) since November, and we feel that we've kept you  
 (14) informed with the exception that I didn't call Mr.  
 (15) Ebneter after September 5th. Again, not dwelling on  
 (16) the safety consequences, what's important, as you've  
 (17) said, and we recognize, is the human performance  
 (18) issues, including management.

(19) I'd like Greg now to just very briefly  
 (20) talk about the system, and then we'll go to the  
 (21) plant manager.

(22) Mr. Ebneter, you brought up the fact that  
 (23) you'd like to after each violation then have  
 (24) questions, and we appreciate that.

(25) MR. EBNETER: I recognize that it may not

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(1) fit your agenda.

(2) MR. BEARD: It may not fit exactly, but  
 (3) we'll work with it. We planned to have Mr. Hickie  
 (4) talk about the first two violations and then talk to  
 (5) the management oversight that relates to those.

(6) Now, I would assume that probably, say,  
 (7) if we stopped after A that your questions would  
 (8) probably focus on management oversight, which he's  
 (9) going to talk about. We'll stop after A and then  
 (10) see how it goes.

(11) MR. GIBSON: Let's try it.

(12) MR. EBNETER: I'll let Al sort of control  
 (13) us.

(14) MR. GIBSON: After each violation let's  
 (15) stop, and if you're going to cover our question  
 (16) later, tell us so and we'll relate it after.

(17) I'd like to maybe ask a question or two  
 (18) about your presentation at this point, if I may.

(19) You at the outset described your  
 (20) expectation that the operators should stay below  
 (21) Curve 8, but that's a little different than the  
 (22) understanding we had. We understooped that your  
 (23) expectation was that they stay on Curve 8, as close  
 (24) to or on Curve 8 as possible.

(25) MR. BEARD: Al, I believe that's



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(1) incorrect, but I would let Mr. Hickie and Mr. -  
(2) **MR. GIBSON:** What we understood from  
(3) interviews with operators and discussions with  
(4) others is that Pat Beard's expectation was for them  
(5) to stay on Curve 8.

(6) **MR. BEARD:** That's totally incorrect. My  
(7) expectation was from the beginning and has remained  
(8) to strive to maintain hydrogen concentration within  
(9) the recommended chemistry guidelines. That's the  
(10) only expectation that I've ever expressed.

(11) **MR. BOLDT:** I would go on the record and  
(12) say, too, Al, having been in many meetings with Mr.  
(13) Beard, that the only conversation I recall him  
(14) having dealt with cc's per kg, which is not an  
(15) element of the curve at all. Only pressure and  
(16) level are. He was strictly talking about the  
(17) maintenance of the dissolved hydrogen level.

(18) **MR. GIBSON:** So you expected them to meet  
(19) the objective of 25 cc's per kg. That was your  
(20) expectation.

(21) **MR. BEARD:** Yes. I expected our  
(22) organization to operate the plant such that the  
(23) hydrogen chemistry was maintained in the band.

(24) **MR. GIBSON:** In the time frame that we're  
(25) discussing, the fall of '94, did you have an

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(1) understanding and appreciation of the burden that  
(2) was on the operators for maintaining this hydrogen  
(3) concentration?

(4) **MR. BEARD:** I didn't have as detailed an  
(5) understanding as I have today. I recognized that it  
(6) placed an additional burden, that they were having  
(7) to manipulate the tank more often, that increased  
(8) operator attention was required, and that we were  
(9) looking for ways to further alleviate this burden.  
(10) We talked about things from relocating the make-up  
(11) tank to give it a different elevation, which really  
(12) wasn't very feasible, to how to use the hydrogen  
(13) regulator, setting it higher and letting it be  
(14) automatic, and what kept us from that was Appendix  
(15) R, one of those competing requirements. I was aware  
(16) that there was additional operator burden, and we  
(17) were taking steps to address it.

(18) **MR. LIEBERMAN:** Were you aware that the  
(19) operators had a concern that this curve was  
(20) non-conservative?

(21) **MR. BEARD:** I'd say yes. I didn't  
(22) appreciate the depth of the concern of one chief  
(23) operator who was the one that really pushed this,  
(24) although I had talked with him personally. I will  
(25) say in all candor that I didn't have a full

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(1) appreciation before September. I did after that  
(2) because I talked personally with him after  
(3) September. I was aware of the fact that there was  
(4) additional operator burden, that they were pushed in  
(5) a narrow box. I was not aware before September that  
(6) there was an issue about the curve being wrong. I  
(7) think that was being discussed with Mr. Van Sicklen  
(8) and a few other people.

(9) **MR. LIEBERMAN:** Is it unusual for  
(10) operators to have the view that various operators'  
(11) limits or administrative limits are  
(12) non-conservative? Is that a common occurrence.

(13) **MR. BEARD:** No, it's not common.

(14) **MR. LIEBERMAN:** Are you disappointed or  
(15) do you feel that your managers met your expectations  
(16) in not bringing it forward to you or should they  
(17) have brought it forward to you, or is that something  
(18) that they should handle themselves.

(19) **MR. BEARD:** That's a very difficult  
(20) question to answer at this point in time. To give  
(21) you a candid answer, I would almost have to go back  
(22) and hypothesize. Let me say that I'm quite  
(23) confident, and I was quite confident in September of  
(24) '94 with regard to the fact that we had a very  
(25) effective, in my view then and now, an effective

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(1) employee concerns program. I can give you many  
(2) examples where it worked, where people felt free to  
(3) bring things forward. They weren't blocked and,  
(4) they were promptly dealt with. I personally read  
(5) every employee concern.

(6) My managers and myself in September, and  
(7) since, I think, are involved in the plant. I  
(8) frequently go to the plant. I walk around the  
(9) plant, I'm in the control room. People know they  
(10) can talk to me. I think it was, first of all,  
(11) unusual for operators to have, you know, concerns  
(12) with real safety concerns with things that they were  
(13) trying to operate. I feel that in this case, and I  
(14) would say that you can ask Mr. Van Sicklen whenever  
(15) he's up here, but in hindsight, if you were that  
(16) concerned, why didn't you use the employee concerns  
(17) program? And I think in hindsight I'm not sure he  
(18) could answer that, in all candor.

(19) **MR. GIBSON:** Pat, we've talked about nine  
(20) occasions where Curve 8 was violated. I'm sure that  
(21) now you're aware and in fact the alarm for exceeding  
(22) Curve 8 occurred on many more occasions than that.  
(23) We selected the nine occasions that were the most  
(24) significant.

(25) **MR. BEARD:** Yes.

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[1] **MR. GIBSON:** Were you personally aware  
[2] that that curve was frequently violated?  
[3] **MR. BEARD:** No.  
[4] **MR. GIBSON:** Were you, Gary?  
[5] **MR. BOLDT:** No.  
[6] **MR. GIBSON:** Were you, Bruce?  
[7] **MR. HICKLE:** No.  
[8] **MR. GIBSON:** That doesn't seem consistent  
[9] with management's presence in the control room, the  
[10] tours that you say you took and that you addressed  
[11] earlier, Pat, the fact that yes, the investigation  
[12] that we did, the internal investigation failed to  
[13] pick up on it. But of more significance to me is  
[14] why didn't management know that these numerous  
[15] alarms were occurring during normal plant operation.  
[16] **MR. BEARD:** I will answer that. Bruce is  
[17] going to cover this. That's a question that we ask  
[18] ourselves. First of all, there were 669 make-up  
[19] tank evolutions during the period of the  
[20] investigation, two of which were the 4th and 5th.  
[21] And - let me get might mach right, - on 49 of those  
[22] an alarm was received.  
[23] **MR. HALNON:** 21 of the evolutions had an  
[24] alarm. Some of them were multiple alarms.  
[25] **MR. LIEBERMAN:** We can accept it was a

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[1] small percentage, but for that small percentage a  
[2] number of them were for a substantial time period.  
[3] **MR. BEARD:** I'll get to that. I  
[4] understand. Let me finish - for a period of how  
[5] many months are we talking about?  
[6] **MR. HALNON:** About three months.  
[7] **MR. BEARD:** July, August, September.  
[8] There were 21 alarms.  
[9] **MR. HALNON:** 21 situations the alarm came  
[10] in, some multiple times.  
[11] **MR. BEARD:** 21 times the alarm was  
[12] received, and nine times it was clearly too long.  
[13] Let's just first of all look at the total time that  
[14] the nine alarms were in for a substantial period of  
[15] time over the total time period of three months, and  
[16] it's like one percent. Now, we've got to talk about  
[17] where does this alarm come up, and it's a computer  
[18] generated alarm. First there's a scrolling - let  
[19] me make sure I'm right. There's a scrolling -  
[20] first there's alarm annunciators around the plant,  
[21] you get a horn, and the thing comes in. In this  
[22] case, though, there are other alarms that are  
[23] computer generated that show up on a scrolling CRT,  
[24] and if one comes up it's orange or red.  
[25] **MR. HALNON:** Let me stop you there.

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[1] You're getting mixed up with what we have today and  
[2] back then. Back then we had an annunciator alarm.  
[3] On occasion I knew that the tank was coming alarm.  
[4] Mark had talked about when we get up near the curve  
[5] the alarm comes in. We never talked duration. We  
[6] never talked about that this was violating the  
[7] curve. What we talked about was that the alarm came  
[8] in, it added concern, and my expectations was the  
[9] alarm was being dealt with.  
[10] Now, in hindsight should I have gone up  
[11] and reviewed the annunciator printouts? I didn't  
[12] think of it at the time. My expectation was the  
[13] alarms were being dealt with like they normally  
[14] would be dealt with. When the alarm comes in, the  
[15] horn sounds and you get an annunciator window that  
[16] says make-up tank high or low pressure and you look  
[17] up on a screen. At that point the operators are  
[18] expected to take the LER out. I'm not sure where  
[19] you were leading.  
[20] **MR. BEARD:** Well, my point is if you go  
[21] in a control room at any time, say I go in there and  
[22] I maybe spend 15 minutes and I would say you spend  
[23] more time, and Bruce will talk about this more than  
[24] I do, and Gary. At any time there may be a number  
[25] of alarms in, and we can talk about them. I don't

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[1] want to go over every one. So the point is, you  
[2] know, in this one percent of the time somebody other  
[3] than a shift supervisor noted that, "Gee, there's  
[4] been one that's in alarm for 55 minutes."  
[5] You can say that, but it comes down to if  
[6] there's an issue here the person who is in the  
[7] control room all the time, he's not there all the  
[8] time, he shouldn't be, and I'm not. We depend on  
[9] that person, the shift supervisor, to say or tell us  
[10] we've got a problem here, we can't clear this alarm  
[11] in a timely manner. Should we have known? Yes.  
[12] They should have told us.  
[13] **MR. LANDIS:** Was that ever raised, Pat,  
[14] that question, that we have alarms in for a long  
[15] period of time and it's getting difficult to keep it  
[16] out of alarm? Was that issue ever raised?  
[17] **MR. BEARD:** It wasn't raised to me. Was  
[18] it raised to you, Greg?  
[19] **MR. HALNON:** No, not the period of time,  
[20] just the fact that it happened.  
[21] **MR. BEARD:** We're sort of getting ahead  
[22] of ourselves. We were searching our souls, again,  
[23] asking ourselves if we should have known. How can  
[24] you say otherwise in hindsight? Could we have  
[25] reasonably expected it to be known? That does lead

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[1] to one thing we're going to talk about, maybe one of  
[2] those sort of underlying things.

[3] As we've gone through this we've realized  
[4] that our plant operations manager, the way we were  
[5] organized at that time, had a tremendous load that  
[6] he was trying to cope with and he needed help. We  
[7] now have two people. We have an operations manager  
[8] and an operations superintendent who the shift  
[9] supervisors report to directly. The operations  
[10] manager, he's licensed, he has to go through  
[11] training, he has to go through the simulator and  
[12] watch everybody else. He's always the focal point  
[13] of licensing issues with operations.

[14] So as part of our broad corrective  
[15] action, in fact one of the specific ones after  
[16] December, when we looked at this, was to create this  
[17] additional position of an operations superintendent,  
[18] this is one of our broader corrective actions, who  
[19] has the time to spend more time in the control room  
[20] to ask these types of questions.

[21] **MR. HICKLE:** It's an operations manager  
[22] position.

[23] **MR. BEARD:** Well, I didn't get the titles  
[24] right, but we now have two people. If you want to  
[25] talk about a broad

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[1] where we ought to be held responsible, yes, we  
[2] should have realized sooner that Mr. Halnon needed  
[3] more help.

[4] **MR. LIEBERMAN:** If I could go back to the  
[5] issue we were talking about just before Al raised  
[6] the question that we're on now -

[7] **MR. MERSCHOFF:** Before we leave this,  
[8] would you expect an alarming condition like this to  
[9] be logged with the alarm coming in for an extended  
[10] period of time?

[11] **MR. HALNON:** No. If it's an abnormal  
[12] event, yes. I mean, if the operators perceived it.

[13] **MR. MERSCHOFF:** For the multiple  
[14] conditions where the alarm came in, would that be  
[15] something you'd expect to show up in the operator's  
[16] log?

[17] **MR. HALNON:** Typically it does not. Do  
[18] we expect it? I would say no.

[19] **MR. HICKLE:** All of the alarms are logged  
[20] on an alarm printer, so we have a paper record.

[21] **MR. MERSCHOFF:** Is that reviewed by  
[22] management?

[23] **MR. HICKLE:** It's reviewed by the OTA in  
[24] certain circumstances. It's not routinely reviewed  
[25] by management.

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[1] **MR. BEARD:** You might further discuss,  
[2] though -

[3] **MR. BOLDT:** It would be the type of log,  
[4] though, that would be reviewed by shift supervision,  
[5] especially internal, if there were some concerns.

[6] **MR. BEARD:** Log keeping is one of the  
[7] corrective action plans in our 49 plus six that  
[8] we're looking at.

[9] **MR. HALNON:** Keep in mind we're dealing  
[10] with two errors here, what we expected back then,  
[11] and what we expect now is a much higher standard.  
[12] If it was an abnormal and unusual thing that met the  
[13] threshold of loggable things back then, I think  
[14] we've seen that it had been inconsistent back in the  
[15] early '90s and mid '90s. The same thing with the  
[16] spent fuel allegation we had one time where we had  
[17] an inconsistent logging issue. It was still an  
[18] issue.

[19] **MR. MERSCHOFF:** So you view this, the log  
[20] keeping, as an opportunity for management to become  
[21] aware of this alarm that was missed?

[22] **MR. BEARD:** Well, certainly, Ellis, it  
[23] would have been an opportunity. But I think, again,  
[24] if you look in the control room, in any control room  
[25] in this country on a day-to-day basis, in 24 hours

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[1] how many alarms do you get? No one logs all those  
[2] things in their log that they personally keep. It's  
[3] easy to say that, and we certainly are strengthening  
[4] our log keeping practices, and you'll see that as  
[5] one of our corrective actions. Certainly, in  
[6] hindsight, you can say if they'd logged every alarm  
[7] and all that maybe we would have seen it.

[8] **MR. GIBSON:** Let me see if I can  
[9] summarize what I see as a concern. What I see here,  
[10] and I'm going to say some things that maybe haven't  
[11] been said yet, but based upon the interviews of the  
[12] operators that have taken place and all the various  
[13] correspondence on this subject, it appears that the  
[14] operators in the control room had the clear message  
[15] that you and the other FPC managers expected them to  
[16] operate on or near Curve 8 in order to maintain the  
[17] hydrogen concentration to meet the objective on  
[18] hydrogen concentration.

[19] In fact, there was even one occasion  
[20] where operators were reluctant to do that and  
[21] someone picked up the phone and threatened to dial  
[22] Pat Beard's number and hand the phone to the  
[23] operator in order to get it up to the curve. Faced  
[24] with that, operators were having some difficulty  
[25] maintaining the plant on or near that curve without



[1] violating the procedure, and yet management of the  
 [2] station wasn't aware apparently of this difficulty.  
 [3] You were not aware of the frequency of alarms and  
 [4] the difficulty that operators were having meeting  
 [5] your objective.  
 [6] It would appear that you should have been  
 [7] aware, particularly in view of an earlier statement  
 [8] you made, that managers were in the plant and in the  
 [9] control room frequently monitoring what was going  
 [10] on. It would seem to me that you should have been  
 [11] aware.  
 [12] **MR. BEARD:** Al, I can understand why you  
 [13] would, just reading all the material that's been  
 [14] unearthed, why you would ask that question. And let  
 [15] me just say, again, that I don't think it's  
 [16] reasonable to assume, first of all, that management  
 [17] should have known. You really have to go up and go  
 [18] in the control room environment and look at  
 [19] everything that's going on, look at all the things  
 [20] that happen on any given day, all the alarms that  
 [21] come in and out, and I've been there and asked  
 [22] questions, particularly ones that are showing red on  
 [23] the annunciator panel, and in fact I've always  
 [24] gotten a good answer on what it was in. I just don't  
 [25] think in hindsight in our view it's reasonable to

[1] make that assumption.  
 [2] Now, again, I want to get back to this  
 [3] issue, and it's something I said earlier that's  
 [4] complicating this whole thing for you as the NRC and  
 [5] for us, and that is that we have an adversarial  
 [6] position now with two operators. In fact, when I  
 [7] read the enforcement policy, it's very clear, and I  
 [8] don't know what they're going to do but I think I  
 [9] know, and that is that if you read the enforcement  
 [10] policy against the individuals their main line of  
 [11] defense would appear to be "management made us do  
 [12] it", and I'm convinced that they're totally focused  
 [13] on making a case after the fact with all the  
 [14] rationalization that they can, short of lying, and  
 [15] I'm not even sure that's not occurred, with two  
 [16] attorneys to make that case, and I realize that  
 [17] makes your position difficult.  
 [18] I'll just say right here, and I'll go on  
 [19] the record that I totally reject anything that says  
 [20] that I personally was trying to take action against  
 [21] individuals, in fact that we were tracking  
 [22] individuals who didn't or anything of that sort.  
 [23] That is not true, and I don't know how to make it  
 [24] any clearer. Now, if they want to rationalize that  
 [25] after the fact, fine, but I think they're going to

[1] find themselves trapped in falsehoods.  
 [2] **MR. LIEBERMAN:** Does your management  
 [3] staff agree that operating crews were not being  
 [4] tracked on how well they met the curve or came close  
 [5] to the curve?  
 [6] **MR. HALNON:** I agree, and I'm probably  
 [7] the closest one to it. We tracked chemistry  
 [8] parameters on the whole. If we saw chemistry  
 [9] parameters trending the wrong way we took  
 [10] appropriate action to get them trending back.  
 [11] You'll never find anything I wrote down or anything  
 [12] that said Crew A, B, C or D was not doing a good job  
 [13] meeting chemistry parameters. They rotated on a  
 [14] weird schedule during the week, and any one week you  
 [15] could have had four or five crews affecting it.  
 [16] **MR. BEARD:** At our 8:30 management  
 [17] meeting, which is something that we instituted in  
 [18] probably '83 again where we wanted to focus on  
 [19] maintaining proper chemistry, we instituted, and I  
 [20] think it's every Thursday because I'm there every  
 [21] Thursday morning, a graph of various chemistry  
 [22] levels, reactor coolant pH, steam generator oxygen  
 [23] chlorides, that sort of thing, and one of them is  
 [24] hydrogen pressure in the make-up tank, and that's  
 [25] all we look at. That's all I've looked at. I mean,

[1] even to suggest that there's a report of which  
 [2] operating crew didn't maintain - ridiculous. Not  
 [3] so.  
 [4] **MR. LANDIS:** Let me back up just for a  
 [5] minute. Was one of the graphs hydrogen pressure in  
 [6] the make-up tank?  
 [7] **MR. GUTHERMAN:** It was concentration of  
 [8] hydrogen in the RCS.  
 [9] **MR. GIBSON:** We're going to have to move  
 [10] on. Jim, did you have a question?  
 [11] **MR. LIEBERMAN:** I just have one point and  
 [12] then we can go to the violations because I think  
 [13] this is important. The issue has to do with your  
 [14] saying that it's somewhat unusual for licensed  
 [15] operators to raise concerns about curves not being  
 [16] conservative. It was being addressed by various  
 [17] engineering and operations staff with the company.  
 [18] You weren't aware of that issue.  
 [19] **MR. BEARD:** Of what, Jim?  
 [20] **MR. LIEBERMAN:** That the licensed  
 [21] operator had a concern that the curve was not  
 [22] conservative.  
 [23] **MR. BEARD:** Not before September. I was  
 [24] not aware of that particular. What I was aware of  
 [25] was that there was concern with having to operate

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(1) the tank, that it was an additional burden and so  
(2) forth.  
(3) **MR. LIEBERMAN:** But your staff was aware  
(4) that the licensed operators were concerned that the  
(5) curve was not conservative.

(6) **MR. BEARD:** I think Mr. Halnon was aware  
(7) that Mr. Van Sicklen was.

(8) **MR. HALNON:** I took over operations in  
(9) the January of '93 time frame after coming through  
(10) license class and had a series of shift meetings. I  
(11) came in usually at four o'clock Sunday mornings to  
(12) talk to the crews when it was quiet, and that's when  
(13) it was first brought up that they had a concern with  
(14) the curve the way it was.

(15) **MR. EBNETER:** His question is were you  
(16) aware of the non-conservatism of the curve.

(17) **MR. HALNON:** I knew of the curve, and I  
(18) don't know if this answers your question, Stu. I  
(19) knew of the concern that they were feeling that the  
(20) curve slope did not match the curve or tank  
(21) response.

(22) **MR. LIEBERMAN:** Were you concerned from a  
(23) safety point of view at the potential of gas binding  
(24) the pump?

(25) **MR. HALNON:** Excuse me?

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(1) **MR. LIEBERMAN:** Were you concerned the  
(2) hydrogen -

(3) **MR. HALNON:** I knew the curve was there  
(4) to prevent the gas binding of the pumps and I knew  
(5) that they were trying to get cc's per lb on that.

(6) **MR. LIEBERMAN:** My question for Pat is:  
(7) Are you concerned that this issue did not get up to  
(8) your attention?

(9) **MR. BEARD:** Sooner?

(10) **MR. LIEBERMAN:** That's my question. What  
(11) have you done to make sure your expectation is now  
(12) known to your management staff so we won't have an  
(13) event like this happening tomorrow? That's the  
(14) issue.

(15) **MR. BEARD:** I'll address that. Let me  
(16) first get back to Greg. Your question that Greg  
(17) tried to answer was did the operator or operators  
(18) prior to September the 4th have a safety concern.  
(19) Now, that's different from we noticed that as the  
(20) tank level comes down that pressure doesn't seem to  
(21) follow this curve. I've already said it doesn't  
(22) necessarily and shouldn't. Did they have just that  
(23) concern or did they have a safety concern?

(24) **MR. HALNON:** I don't recall exactly how  
(25) they couched the concern. I just recall that there

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(1) was a concern with the way the curve was.

(2) **MR. BEARD:** Now, clearly on September  
(3) 4th, when they ran the test and Mr. Van Sicklen was  
(4) part of that crew, when they noted what they thought  
(5) was possible cavitation and again the system  
(6) response didn't track, I think my feeling is at that  
(7) time, really because of the cavitation thing, that  
(8) it now really was a safety concern. I'm not trying  
(9) to gild the lily because I'm going to answer the  
(10) question. I'll wait until he finishes talking.

(11) **MR. HALNON:** It wasn't a hot issue. I  
(12) may have talked to them once.

(13) **MR. BEARD:** I think it became a hot issue  
(14) when they ran the flow test. We noticed possible  
(15) cavitation, and then again, you know, this thing  
(16) about the pressure doesn't seem to follow this  
(17) curve, which it shouldn't necessarily have. I think  
(18) that's when it became a real safety concern. In  
(19) fact, I can recall talking to Mr. Van Sicklen  
(20) sometime after the problem report and all of that,  
(21) and I remember what sticks in my mind is the  
(22) cavitation thing. That's my view.

(23) Let me answer your question. To the  
(24) extent that it was a safety concern prior to  
(25) September '94, to the extent that it was and say it

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(1) didn't come to me, am I concerned? Yes. I'm  
(2) concerned. I don't like that.

(3) **MR. HALNON:** Can I correct the record for  
(4) a minute? My time frames are getting mixed up. The  
(5) concern in January was the higher pressure in the  
(6) make-up tank versus the potential, not the potential  
(7) but the emergency boration issue of getting water  
(8) from the BWST into the RCS quick enough. That was  
(9) the concern in January. We didn't know the curve  
(10) issue with the slope until after the test SP-630,  
(11) and that was the one issue that I believe - and  
(12) again, it's so far along the way.

(13) **QUESTION FROM THE FLOOR:** Could you go  
(14) over again when the SP-630 test was?

(15) **MR. BEARD:** May of '94.

(16) **QUESTION FROM THE FLOOR:** So that was  
(17) well before September. I believe Mr. Lieberman's  
(18) question was what about between May of '94 and the  
(19) September time frame and was the issue raised to  
(20) your attention during that time frame.

(21) **MR. BEARD:** Yes. Jim, is that your  
(22) question, between May and September?

(23) **MR. LIEBERMAN:** Yes. That's the time  
(24) period.

(25) **MR. BEARD:** Well, first of all, yes, I



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[1] was aware of it. I read every problem report. For  
 [2] example, I read 149. Yes, I was aware of it. I  
 [3] read the corrective action for 149, which was a good  
 [4] corrective action plan, reading the words. At that  
 [5] point I had no reason to feel that safety concerns  
 [6] were not being elevated to my attention or being  
 [7] dealt with. I mean, we now know that we didn't deal  
 [8] with it very effectively. I mean, certainly there's  
 [9] no doubt about that. But it was brought to my  
 [10] attention, as was Problem Report 267 and the LER,  
 [11] and I think I signed that LER.

[12] But what I have done since then? I've  
 [13] talked to the shift supervisors on at least two  
 [14] occasions, and I think they're documented, about the  
 [15] lessons learned from the make-up tank event, what  
 [16] our expectations are. In fact, you know, it's  
 [17] ironic that back in September they gave an attaboy  
 [18] for a questioning attitude, and we've maintained  
 [19] that.

[20] In fact, one of the things, as we  
 [21] consider the MRC recommendations and our reaction to  
 [22] that, and I think it's reflected in some of his  
 [23] memos, is we wanted to strike the right balance. We  
 [24] didn't want to turn off the information and create a  
 [25] chilling effect by overreaction, so there was that

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[1] balance to encourage them to come forward. But with  
 [2] respect to the event, "Guys, you did it the wrong  
 [3] way." That was always the issue. The end doesn't  
 [4] justify the means. And since September - well, let  
 [5] me tell you, I mean, this event has been in  
 [6] everybody's mind every day, every conversation, in  
 [7] meetings with management, one on one with my team,  
 [8] soul-searching further as we prepared for this. Let  
 [9] me tell you. This isn't ever going to happen again  
 [10] at our plant.

[11] **MR. LIEBERMAN:** I hope so.

[12] **MR. GIBSON:** I think that unless we're  
 [13] prepared to spend the night we'd better move on.

[14] **MR. BEARD:** I could just go to the end  
 [15] and answer the key questions and summarize, but  
 [16] since you put so much work into it, Bruce and Paul,  
 [17] we'll let you talk.

[18] (A recess was taken.)

[19] **MR. BEARD:** Before I turn it back over to  
 [20] Greg, I'd like to come back to two points in  
 [21] response to your questions.

[22] First of all, to Mr. Lieberman's  
 [23] question, I think there were two parts. One was  
 [24] were your system engineers or was your system  
 [25] engineer involved in writing the LER, and then, if

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[1] he was, why didn't he bring out September the 4th  
 [2] since he knew about it. Sort of as a follow-on to  
 [3] that, as I recall, you made a statement or question  
 [4] along the line that said has anybody counseled the  
 [5] system engineers, and we didn't give you a very good  
 [6] answer. I saw you shake your head. So I'm going to  
 [7] address those two things.

[8] First of all, let me get back to the fact  
 [9] that yes, we know that the system engineers, there  
 [10] was a Mr. Hinman and Mr. Salzman who were involved  
 [11] in addressing the problem report which of course was  
 [12] the basis for the LER, and in fact he was aware that  
 [13] the September 4th thing happened. However, they're  
 [14] engineers, and I am not saying this in a disparaging  
 [15] way, but engineers particularly don't necessarily  
 [16] think in terms of human performance, operator  
 [17] performance. We hadn't even had the management  
 [18] review committee meeting at that time. In caucusing  
 [19] with my people, we did ask the question in our  
 [20] investigation and ourselves many times, "Why didn't  
 [21] you say something in September", and the answer is  
 [22] we were focused, I was focused, I, the system  
 [23] engineer, on the technical issues.

[24] September 4th and 5th, it was all one  
 [25] thing, there was data, there was a technical issue,

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[1] and we focused on that. I think why that holds  
 [2] water is when they read the inspection report and at  
 [3] that time, you know, in July '95, everybody was very  
 [4] sensitive to the issue as an operations/human  
 [5] performance/management issue. That's what's  
 [6] important now. They were sensitized to that, they  
 [7] read the report, and they saw it wasn't there and  
 [8] came forward, to their credit.

[9] Nevertheless, your question was has  
 [10] anybody counseled them. I guess we thought about  
 [11] that, and counsel them about what? What did they do  
 [12] wrong as engineers back in the September time  
 [13] frame? I mean, they came -

[14] **MR. LIEBERMAN:** Do you want me to answer  
 [15] that?

[16] **MR. EBNETER:** The question is not why you  
 [17] should counsel them, it's did you or didn't you.

[18] **MR. LIEBERMAN:** In November when the LER  
 [19] was issued there's an event description. On  
 [20] September 5, '94, control room license operators  
 [21] suspected the curve to be inaccurate, they did  
 [22] whatever they did, and I presume the various  
 [23] engineers reviewed this LER in November, not  
 [24] September, and this is after the management review  
 [25] meeting. They wouldn't have recognized that that's

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[1] not how the event happened. It was September 4th,  
[2] suspecting it was inaccurate, that they started.  
[3] **MR. BEARD:** But Jim, the LER  
[4] constructively was focused on we had a curve that  
[5] was design basis and we violated the design basis.  
[6] The LER was not written on the event and the  
[7] operators did wrong on the 4th and 5th, and that's  
[8] the answer. I mean, after the LER what would we  
[9] have counseled on? Would they say, "Man, I wish  
[10] we'd told everybody sooner"? Sure, they're going to  
[11] say that.  
[12] Let me get to another point, though.  
[13] What about what have we done in engineering which  
[14] includes these guys? As part of event-free  
[15] operations, which is the cornerstone of our  
[16] management corrective action plan, we've made a  
[17] clear case that mistakes, whether they be  
[18] calculational or human performance or whatever,  
[19] apply to engineers as well as operators. Nuclear  
[20] plants in the past traditionally, and in our place,  
[21] if the operators screw up we make a big deal about  
[22] it. What about if the engineer makes the wrong  
[23] calculation? What do you do about them? Well, let  
[24] me tell you what. We're doing a lot of things now,  
[25] and we've had cases where we've counseled and

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[1] disciplined engineers since then. So in a broad  
[2] sense and through our heightened  
[3] operation/engineering interface I think in a broad  
[4] sense, Jim, they have been counseled or made more  
[5] aware.  
[6] **MR. LIEBERMAN:** I don't want to be  
[7] argumentative. I think engineers should be aware of  
[8] the rule of completeness, they should be aware of  
[9] the rule of misconduct, and I think in the LER,  
[10] focusing on the design basis obviously, but it  
[11] describes the evolution and what happened. And  
[12] frankly, I don't think this met the standards of  
[13] completeness and accuracy that we should expect in  
[14] understanding an issue. Not only on this issue, but  
[15] later on when it says each time the operating point  
[16] was on or near the curve the plant could have been  
[17] operating outside the design basis, from one point  
[18] that's a true statement, but when it was on the  
[19] curve it's my understanding it was operating outside  
[20] the design basis. And to someone in our office  
[21] who's reviewing this LER who didn't have all the  
[22] information, they would really not have recognized  
[23] the situation, and I think that should be a  
[24] concern.  
[25] **MR. BEARD:** Was the LER a great LER? No,

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[1] you're darn right, and we're say not saying it was.  
[2] Would we have rewritten it differently?  
[3] **MR. EBNETER:** Do we want an answer to the  
[4] counseling?  
[5] **MR. LIEBERMAN:** The answer is they  
[6] haven't counseled and they didn't see a need to do  
[7] so.  
[8] **MR. BEARD:** I didn't say that last one,  
[9] Jim. I said at this point we were trying to think  
[10] what we should have counseled them on.  
[11] **MR. LIEBERMAN:** Up to now.  
[12] **MR. EBNETER:** Someone may have counseled  
[13] them, though, that you're not aware of.  
[14] **MR. BOLDT:** I want to ask Jerry Campbell  
[15] that question.  
[16] **MR. EBNETER:** Let me put it this way.  
[17] You send them a letter telling us that you checked  
[18] with them and you either did or did not counsel  
[19] them, just to make sure we're not missing anything.  
[20] **MR. BEARD:** Let me say this, and Paul,  
[21] you can disagree, but since September, with our  
[22] focus on the calculation process, our 50.59 process,  
[23] our operability process, have we all been counseled  
[24] on what you said? You bet, including me.  
[25] The second thing I wanted to come back

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[1] to, and I think this was Mr. Gibson's question, was  
[2] why didn't management know that these alarms were  
[3] current. I want to come back to that one more time  
[4] with the caveat that management, including myself,  
[5] we're responsible for everything. That's not an  
[6] issue. But two things. When you say management, I  
[7] think what you mean is above the shift supervisors,  
[8] right? Am I correct?  
[9] **MR. GIBSON:** Yes.  
[10] **MR. BEARD:** Because as you also said, and  
[11] we agree, the shift supervisors are also  
[12] management. They're exempt people. So why didn't  
[13] we know? And we will say that at one point, to be  
[14] defensive, that 99 percent of the time this  
[15] particular alarm wasn't in what had been reasonable  
[16] to expect, nor did we log it. Would it be  
[17] reasonable to expect that management above the shift  
[18] supervisor should note that through personal  
[19] observation? Our answer is no. That answer is no.  
[20] So how should we have known it? Bruce is going to  
[21] talk about that when we address management  
[22] oversight.  
[23] We should have known it had we been  
[24] entirely successful at that point in viewing our  
[25] management below us, including shift supervisors,

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[1] with the importance and insistence on rigid and  
 [2] strict adherence to procedures, the event-free  
 [3] operations program and precursors. When something  
 [4] isn't right you write it down and tell us, and we  
 [5] review every precursor card the next morning at the  
 [6] management level, including Mr. Hickie. I'd say  
 [7] that we were remiss in not achieving that awareness  
 [8] and use of the precursor program sooner or at that  
 [9] time. So in that sense, yes, because, had we done  
 [10] that, they would have reported it or should have  
 [11] said, "Hey, we're having difficulty, we're getting  
 [12] an alarm, we can't clear it sooner", and we would  
 [13] have known and should have known.

[14] Greg, do your thing and then we'll get to  
 [15] Bruce.

[16] **MR. HALNON:** Like I said, I want to  
 [17] really drop mine down to just about a minute. First  
 [18] of all, I want to correct something I said earlier.  
 [19] I took over in January of '94, not '93, so I was a  
 [20] year off. I was talking to Bob and all these dates  
 [21] are starting to run together. I'd like to just  
 [22] spend a few seconds describing the control room and  
 [23] alarms. Is there anything physically with the plant  
 [24] you need to have described that you feel you're not  
 [25] clear on, the three pumps, the make-up tanks or the

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[1] BWST levels?

[2] **MR. RICHARDS:** If you get a safety  
 [3] injection do all three pumps start or is one of them  
 [4] locked out?

[5] **MR. HALNON:** At any one time the third  
 [6] pump is always spared and it takes manual operation  
 [7] to get that started, so at any one time two pumps  
 [8] will start, and one of the normal running pumps,  
 [9] since this is a multi-function system, one of the  
 [10] normal running pumps is always one of those two  
 [11] pumps that will be running on HPI injection.

[12] **MR. GIBSON:** Were all three pumps  
 [13] operable during the test?

[14] **MR. HALNON:** No. During the evolutions  
 [15] during the 4th and 5th we had the spare pump, which  
 [16] at this time we had the B pump spared, and it was in  
 [17] maintenance. It was just about ready to come back  
 [18] into service. The A pump and the C pump were our ES  
 [19] pumps. The A pump was the normal running pump.

[20] **MR. RICHARDS:** Do tech specs allow you to  
 [21] take one pump out?

[22] **MR. HALNON:** The tech spec only mentions  
 [23] two pumps. The third pump is a swing pump in case  
 [24] you have to do maintenance.

[25] Just a couple of key points to keep in

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[1] mind. Everyone knows that there are competing  
 [2] operational requirements going on, the high pressure  
 [3] in the make-up tank, the swap-over point.

[4] There are a lot of different competing  
 [5] requirements going on, so the operators were dealing  
 [6] with those things. Also, the standard ES pump, and  
 [7] what I mean by that is the pump, the ES selected  
 [8] pump, the HPI pump that is not running, and we show  
 [9] this one as the C pump on this diagram and you'll  
 [10] get a copy of this in your handout when you get  
 [11] them, but this valve right here maintains separation  
 [12] from the make-up tank at all times, so one train of  
 [13] the HPI system is always independent of the make-up  
 [14] tank issue. It's not an issue, and that adds into  
 [15] the safety consequences.

[16] The spare pump, your question, is it  
 [17] available if it's operable, not in maintenance, but  
 [18] under normal circumstances we treat this pump, if we  
 [19] get into maintenance on that, we treat that like an  
 [20] action statement. We work it as quick as possible,  
 [21] and we have a high level of attention on those  
 [22] pumps, so when we get into maintenance on those  
 [23] pumps we put a lot of attention on it and work it  
 [24] two shifts, sometimes three shifts.

[25] One last point that I'd make before I sit

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[1] down is that as you're drawing down these tanks and  
 [2] putting water into the RCS which is going into the  
 [3] reactor building sump because of the LOCA, you get  
 [4] over to where you swap over the long term  
 [5] recirculation cooler, take the LPI pumps, take  
 [6] suction from the reactor building sump and,  
 [7] depending on the size break you might have, if you  
 [8] still have your HPI pumps running, the discharge of  
 [9] the LPI pumps feeds to suction of the make-up pumps  
 [10] or HPI pumps. At that point, when you provide that  
 [11] what we term piggyback operation, this check valve  
 [12] in the make-up valve ceases, and that isolates the  
 [13] make-up tank from the picture. From that point on  
 [14] there's no concern with hydrogen training. So this  
 [15] discharge pressure, when you're feeding this, when  
 [16] you're feeding the one that's normally running, you  
 [17] back up and seat that check point, so that again  
 [18] adds into the safety consequences.

[19] These technical issues won't be covered  
 [20] any further. I just want to make sure we're clear  
 [21] on those types of things. If there's no other  
 [22] questions about the physical plant, I'll go ahead  
 [23] and turn it over to Bruce.

[24] **MR. HICKIE:** Good morning. As Pat told  
 [25] you, I'm going to cover the two violations that had



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[1] to do with our operators and operating practices.  
[2] I'm also going to discuss the management issues  
[3] associated with those. I'm going to discuss the  
[4] second violation first, which is the tests that our  
[5] operators performed. Then I'll talk about the other  
[6] nine evolutions that were the subject of the first  
[7] violation and inspection report, and then finally  
[8] there were three management issues or concerns that  
[9] were identified in the inspection report that I'll  
[10] talk about after those two violations because there  
[11] is some overlap, and I think there is some  
[12] relationship between the management issues.

[13] Now, Mr. Beard has already covered some  
[14] of the information that I had to review and some of  
[15] your questions have already addressed some of those  
[16] subjects, so if you find that I'm getting into an  
[17] area where you feel like you have sufficient  
[18] information tell me and we'll move on. Some of the  
[19] information I'll move through rather quickly for  
[20] that same reason.

[21] **MR. BEARD:** And we'll leave you a book of  
[22] all the overheads and this other book of the  
[23] chronology that I mentioned.

[24] **MR. HICKLE:** I won't spend a lot of time  
[25] discussing the evolutions. I'll provide just an

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[1] overview for the sake of discussing the root causes  
[2] and the corrective actions.

[3] The first violation I'm discussing are  
[4] the two examples of conducting an unauthorized test  
[5] or experiment without a written safety evaluation  
[6] containing the basis for the determination that an  
[7] unreviewed safety question did not exist. The  
[8] inspection report talks about that there was no  
[9] approved procedure for the test and there was also a  
[10] failure to follow procedure.

[11] Some useful facts in understanding our  
[12] causes and corrective actions. First of all, there  
[13] were two evolutions, one performed on the 4th of  
[14] September and one performed on the 5th, 1994, both  
[15] occurred on the midnight shift, and both were  
[16] conducted with the purpose of testing the validity  
[17] of our make-up tank curve as illustrated here.  
[18] There was no operational reason, and we concur, for  
[19] those two evolutions to be performed. The dissolved  
[20] hydrogen in the reactor coolant system was within  
[21] specification at the time. Both tests were  
[22] performed without a test procedure or a 50.59  
[23] evaluation.

[24] Some key points regarding the scenario,  
[25] or facts. A pre-job briefing was conducted by the

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[1] operating crew. It outlined precautions,  
[2] responsibilities, expectations, and on September 5th  
[3] designated a dedicated operator to be stationed in  
[4] our auxiliary building. In the event of an  
[5] accident, that dedicated operator was to vent and  
[6] bring the plant back within normal acceptable  
[7] operating parameters as illustrated by our make-up  
[8] tank curve. The hydrogen pressure was raised to  
[9] above the alarm set point, the make-up tank level  
[10] raised to the high level limit, 86 inches, and then  
[11] a bleed from our make-up system was established  
[12] which allowed the level in the make-up tank to drop  
[13] to about our low level limit, and data was taken  
[14] during this evolution.

[15] After about 35 minutes on September 5th  
[16] the plant was returned to the acceptable region of  
[17] our operating curve. A problem report was written  
[18] on September 7th by the operating crew that  
[19] conducted the test, and during that time the make-up  
[20] tank pressure exceeded the curve by approximately  
[21] 1.7 pounds at the low level limit, so right about  
[22] here.

[23] Let me show you a trace very quickly, a  
[24] computer trace. This is downloaded computer  
[25] information, so you can see over time how this

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[1] evolution was conducted. First, the make-up tank  
[2] hydrogen pressure was increased with a hydrogen  
[3] add. That brought the tank above the alarm curve.  
[4] This is the alarm curve which emulates the make-up  
[5] tank curve that we had in our plant curve book,  
[6] which is OP-103B. The alarm was received in the  
[7] control room. At that point level inventory was  
[8] added to the make-up system and the level went up  
[9] until such time as the alarm cleared and the  
[10] function, which is the combination of pressure and  
[11] level, was right on the curve.

[12] At that point our operators established a  
[13] bleed from our make-up system allowing level to  
[14] drop, and over a 35 minute period plotted data and  
[15] reproduced this curve as part of the problem report  
[16] that they wrote, and then later recovered by  
[17] increasing inventory to the tank.

[18] The September 4th evolution was similar  
[19] but not identical. In this instance hydrogen was  
[20] added, the alarm was received at near the high level  
[21] limit in the tank, and then while the alarm was in  
[22] the bleed was initiated and data was gathered. The  
[23] difference between the two evolutions, in this  
[24] instance it lasted a little longer, about 45 minutes  
[25] roughly, and the alarm was not cleared prior to the

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(1) start of the evolution. I'll come back to that  
(2) point in a few minutes.

(3) We've spent a lot of time looking at this  
(4) event or these events, and we believe that there are  
(5) several root causes, as follows. First of all, we  
(6) believe that we had a deficiency with shift  
(7) supervisor leadership. What do we mean by that? We  
(8) think the strongest personality that was on that  
(9) shift that night, the person that was really running  
(10) the test and organizing it and planning it, was our  
(11) chief nuclear operator. Our shift supervisor  
(12) allowed our chief nuclear operator to take that  
(13) control. Furthermore, we have evidence, and I'll  
(14) talk about the management relationship to this in a  
(15) few minutes, but we have evidence that our shift  
(16) supervisor had some problems with strength and  
(17) leadership, and I'll discuss specifically what I  
(18) mean in a few minutes.

(19) The existing procedures that existed at  
(20) the time in 1994 were either not consulted or they  
(21) were not used correctly. We think that the crew  
(22) made some cognitive errors, that they used some poor  
(23) judgment, that there was some rationalization that  
(24) occurred and probably some group-think, group-think  
(25) as much as they all reached as a group the wrong

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(1) conclusion that this evolution could be performed  
(2) within the scope of our existing procedures, and  
(3) management was not successful finally in achieving  
(4) consistent adherence to procedures by operators. We  
(5) believe that that is also a root cause.

(6) We've done a lot of things to address  
(7) that which I'm going to talk about under the  
(8) management issue, but at that time procedure use was  
(9) inconsistent from shift to shift, and the  
(10) expectations were also not clearly understood by all  
(11) of our operators. There were some contributing  
(12) factors.

(13) First, there was no doubt the crew was  
(14) strongly motivated to prove that the make-up tank  
(15) curve was wrong, and they mistakenly felt that the  
(16) issue was going to be closed. We referred to that  
(17) earlier. There was a letter, a memo that I received  
(18) on September 2nd which that crew reviewed prior to  
(19) conducting the evolutions, and the letter states -  
(20) this is an excerpt - that engineering believes that  
(21) this curve is accurate and reasonably conservative  
(22) to protect the high pressure injection pumps from  
(23) hydrogen gas intrusion in the worst case large break  
(24) LOCA. In addition, corrective action number eight  
(25) of Problem Report 149, which Mr. Beard referred to,

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(1) is currently in progress to provide technical basis  
(2) for the BWST swap-over point. During this analysis  
(3) make-up tank overpressure per curve number eight  
(4) will be reevaluated. This action is scheduled to be  
(5) completed by September 30, 1994.

(6) This memo clearly told me and our  
(7) operators that it wasn't a closed issue. There was  
(8) still technical information that had to be evaluated  
(9) that would have a bearing or potential bearing on  
(10) the final outcome of this technical issue.

(11) When I received this memo I conferred  
(12) with Greg, our operations manager, and asked him to  
(13) take that back through his organization to our  
(14) operators and find out if there were any other  
(15) concerns related to the make-up tank issue, any  
(16) other concerns that they cared to articulate that we  
(17) may need to address, so that we were sure that by  
(18) this date we had everything addressed we needed to.

(19) A final contributing factor is that  
(20) management's efforts to strengthen shift supervisor  
(21) leadership were not timely. The first personnel  
(22) change that we made back in the early part of 1994  
(23) with a specific objective of trying to strengthen  
(24) on-shift leadership was replacing our operations  
(25) manager, who had been in the job a long time, with a

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(1) new operations manager, Greg Halnon. That was the  
(2) beginning of an overall plan that we expected to  
(3) create improved leadership on shift and in  
(4) management positions of operations with the express  
(5) intent of trying to improve human performance in the  
(6) organization to try to move up to what we viewed as  
(7) the need to increase standards in the organization.

(8) However, we didn't move fast enough on  
(9) our shift supervisors. There were a few and also  
(10) some assistant shift supervisors that eventually we  
(11) had plans to rotate into the organization in other  
(12) areas into support functions so that we could bring  
(13) new talent in. Our operations organization was  
(14) primarily staffed by supervision that had been there  
(15) a long time, and we felt a change was necessary, a  
(16) change so that we could promote new ideas and  
(17) improve our operations. But we were somewhat  
(18) constrained inasmuch as we didn't have a surplus of  
(19) extra operating licenses. We didn't have younger  
(20) people - when I say younger, meaning new talent -  
(21) in the mill trained and ready to step in, so this  
(22) process took time. In hindsight, we didn't move  
(23) fast enough.

(24) I'm going to discuss corrective actions,  
(25) but I'm going to separate these. First I'll talk



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[1] about what we did after this learning about the  
[2] September 5th event, the September 5th evolution,  
[3] recalling that, looking at our chronology, we didn't  
[4] know the evolution that occurred on the 4th at that  
[5] time. So I'll separate the corrective actions.

[6] First these are the ones that we took  
[7] over September 5th. When I became aware of the way  
[8] that the data was gathered on this evolution, I  
[9] immediately notified Pat Beard and also the same day  
[10] notified the NRC resident and our branch chief, NRC  
[11] branch chief. At that time we had not conducted an  
[12] investigation. We only became aware that we had a  
[13] potential problem and we had enough information to  
[14] suspect that the right controls were not applied  
[15] that evening to conduct that test.

[16] We formed a management review committee.  
[17] That was my idea. We have had no history of  
[18] management review committees. That wasn't a part of  
[19] our formal corrective action process, but I felt  
[20] that it needed elevated management attention.

[21] Furthermore, I was very upset about what  
[22] had occurred, and I wanted people that maybe were a  
[23] little cooler that could provide some advice to  
[24] myself and also to Greg so that we could evaluate  
[25] the circumstances and act reasonably based upon the

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[1] facts. I'll talk about the management review  
[2] committee after I discuss the rest of these  
[3] corrective actions. I'll talk specifically about  
[4] what we looked at, what we did and what we  
[5] recommended.

[6] Crew discipline resulted. The crew  
[7] discipline resulted after the management corrective  
[8] action committee. I'll go back to that and describe  
[9] it more fully because I know there is a concern  
[10] about it. First we counseled the crew. The  
[11] counseling of the shift supervisor and assistant  
[12] shift supervisor was done by me personally and Greg  
[13] attended that counseling session. Later, the rest  
[14] of the members of the shift were talked to by our  
[15] operations manager. Our operators that were  
[16] involved with this evolution received operator  
[17] retraining on the lessons learned, and I'll  
[18] specifically tell you what those lessons were that  
[19] were learned when I talk about the MRC.

[20] We also required the crew, specifically  
[21] the shift supervisor and assistant shift supervisor,  
[22] to go back and write a test procedure with a 50.59  
[23] evaluation to reinforce the expectation that we felt  
[24] was not fulfilled that evening, and they did that.  
[25] We reinforced management expectations and we

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[1] strengthened program barriers to prevent similar  
[2] judgmental errors. We conducted shift meetings, and  
[3] Pat's already talked about that. We had multiple  
[4] shift meetings to discuss what we had learned and to  
[5] reinforce our operating standards.

[6] MR. LIEBERMAN: I know I'm not supposed  
[7] to interrupt, but could you give me a time frame  
[8] when those shift meetings were conducted?

[9] MR. HALNON: It was throughout the fall.

[10] MR. HICKLE: I'd like to give that  
[11] exactly if we can.

[12] MR. HALNON: I don't know if we have  
[13] exact dates. They happened throughout the fall.

[14] MR. BEARD: All of '94.

[15] MR. HALNON: I think that some of them  
[16] may have had follow-up in '95 also.

[17] MR. HICKLE: It came in phases. Of  
[18] course we initially met with our operating crews and  
[19] tried to reinforce the things we felt we needed to  
[20] do right away, but the reinforcement came through  
[21] the requalification cycle.

[22] MR. LIEBERMAN: The initial meetings,  
[23] would that have been in September?

[24] MR. HICKLE: I can't give you a date. I  
[25] believe it was, yes.

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[1] MR. EBNETER: Could you reconstruct that  
[2] and send it to us, or would you just be guessing?

[3] MR. HALNON: It would be a guess.

[4] MR. HICKLE: I think we can get pretty  
[5] close. These were immediate corrective actions.

[6] QUESTION FROM THE FLOOR: According to a  
[7] memo on October 4th of '94 which was written with  
[8] regard to this process, Bruce had already provided  
[9] counseling for the shift and talked to Fields and  
[10] Weiss, and there was already counseling for the  
[11] reactor operators on the shift by Mr. Halnon, so  
[12] that according to this memo all of the shifts had  
[13] already been talked to in the October time frame.

[14] MR. HALNON: The next phase came when OI  
[15] came. We knew it was a traumatic experience to have  
[16] OI come to the site, and Pat wanted to have  
[17] communication going with the shift so they knew what  
[18] was going on.

[19] MR. HICKLE: And Pat and myself attended  
[20] those meetings and met with each shift when that  
[21] occurred, so it occurred over a several months'  
[22] period of time.

[23] MR. GUTHERMAN: Is your question related  
[24] to when that specific crew was counseled or all of  
[25] the crews?

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(1) MR. LIEBERMAN: The other crews.  
(2) MR. GUTHERMAN: Thank you.  
(3) MR. BEARD: Just for the record, and this  
(4) is in this thing that I will leave you, the  
(5) chronology of stuff, but there was a memo to file  
(6) from Mr. Hickie that he counseled the shift  
(7) supervisor and assistant shift supervisor on  
(8) September 15th. Let me see if I can find it real  
(9) quick. I'm not sure that I can. We'll look into  
(10) that for you.  
(11) Would somebody capture that as a  
(12) follow-up item?  
(13) MR. GUTHERMAN: I've got it.  
(14) MR. HICKIE: So we conducted shift  
(15) meetings. We also, in these meetings and  
(16) separately, reinforced our procedure use  
(17) expectations, and that was done through event-free  
(18) operations, through our event-free operations  
(19) seminars that Greg conducted himself at our training  
(20) centers for all of our operating shifts. Procedures  
(21) for procedure use were strengthened, and what I mean  
(22) there is we developed a standard which specifically  
(23) tells our operators under what circumstances they  
(24) need a procedure, that they need a procedure in hand  
(25) and they need to specifically sign off the steps or,

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(1) depending on the category assigned, there are some  
(2) occasions where they're allowed to provide simple  
(3) manipulations without a procedure.  
(4) We then took that standard and went back  
(5) to every single operating procedure we have and  
(6) specifically delineated the steps in those by  
(7) category so there would no longer be inconsistency  
(8) from shift to shift as to how these procedures were  
(9) being used, when these evolutions and manipulations  
(10) were being conducted.  
(11) MR. GIBSON: You did this even though  
(12) your internal investigation later showed the  
(13) procedural guidance was adequate?  
(14) MR. HICKIE: That's correct. And the  
(15) reason for that is this: Human performance/operator  
(16) action is a combination of expected behaviors and  
(17) are always going to be a combination of training,  
(18) experience and the tools that are in place such as  
(19) procedures. While we feel the tools were adequate,  
(20) if they had been consulted for these two tests that  
(21) were performed, one of the logical things to do to  
(22) prevent recurrence is to provide more defensive  
(23) depth, and that was the intention with respect to  
(24) developing this procedure.  
(25) I want to also add that I said earlier

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(1) that we didn't feel that our procedure use from  
(2) shift to shift was consistent. If you recall, I  
(3) called that a contributing factor, so I'm trying to  
(4) separate for you what we viewed as a generic  
(5) weakness from events that directly or conditions  
(6) that directly caused the evolutions to occur. There  
(7) was sufficient guidance for the conduct of these  
(8) evolutions, and I'll show you that later when I talk  
(9) about management concerns. I'll put you on that  
(10) shift that night, and we'll go through the logic  
(11) that should have occurred, that I would have  
(12) expected to have occurred, and I'll show you the  
(13) barriers that were in place at the time that would  
(14) have prevented these evolutions from occurring.  
(15) MR. BEARD: Existing procedural  
(16) guidance.  
(17) MR. HICKIE: Existing procedural  
(18) guidance. I'll come back to that and make that  
(19) clearer.  
(20) We've made improvements in our training.  
(21) That's one of the things that you can do to  
(22) reinforce expectations and correct human performance  
(23) problems. Lessons learned were also incorporated  
(24) into our event-free operations program. Since the  
(25) time of these events we've developed a very

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(1) comprehensive tool to use that's a program to  
(2) improve human performance at the station, and I  
(3) think most of you that have participated in our  
(4) meetings to discuss our management corrective action  
(5) plan are very familiar with our event-free  
(6) operations program. Its main objectives are to  
(7) improve safety culture in the plant, to improve a  
(8) questioning attitude, to cause people by these  
(9) things to do the right thing the first time, and we  
(10) provide tools and we stress the importance of  
(11) procedure use as one of those tools.  
(12) Also, we're strengthening on-shift  
(13) leadership. We've been able to take our plans  
(14) further. Remembering that it started with Mr.  
(15) Holnon, since that time we've replaced two of our  
(16) shift supervisors. We had identified a few that we  
(17) felt eventually we'd like to see rotate. We've  
(18) changed our shift crew compositions to try to make  
(19) sure that the team dynamics are right for  
(20) communications to occur, and we've established a  
(21) long term plan and recruited and done some  
(22) recruiting to allow us to take and train experienced  
(23) engineers to eventually come up through operations,  
(24) receive the senior director operating license and  
(25) become assistant and shift supervisors. We've

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[1] recruited three so far.  
[2] The criteria for recruitment, they've had  
[3] to have naval nuclear experience and they have to be  
[4] degreed engineers from an accredited university, and  
[5] we're finding that there are quite a few people out  
[6] there we're able to recruit that meet those  
[7] criteria. We also screen them for what we view as  
[8] very strong leadership capability, because that is  
[9] probably one of the more critical criteria for a  
[10] shift supervisor.

[11] **MR. BEARD:** Bruce, you might also mention  
[12] that we've recruited internally. An excellent  
[13] example is sitting right here. We've taken  
[14] engineers such as Gary Becker, and Gary has stood  
[15] watch with the assistant shift supervisor. Two more  
[16] have gone through that and we have two in the  
[17] pipeline right now internally.

[18] **MR. HICKLE:** I mentioned that I'd discuss  
[19] the management review committee a little further.  
[20] The purpose, the stated purpose when we convened,  
[21] was to conduct an overview of open issues relative  
[22] to the problem report that our operators wrote about  
[23] the September 5th evolution and review the test  
[24] performed by the operating crew. The committee  
[25] members are listed. They're fairly high level

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[1] management, and our intention was to try to bring  
[2] senior level engineering and operational expertise  
[3] to bear in assessing the issue or assessing the  
[4] facts relative to the evolution.

[5] Our director of quality programs is our  
[6] former plant manager. Our director of nuclear  
[7] operations engineering and projects was in charge of  
[8] all of our design engineering, and our manager of  
[9] nuclear plant maintenance was there because he was a  
[10] former shift supervisor. In fact, he was one of our  
[11] best shift supervisors.

[12] These are the general conclusions that  
[13] the management review committee arrived at. The  
[14] evolution clearly did not meet documented operating  
[15] standards and expectations reinforced in training,  
[16] specifically those that refer to questioning  
[17] attitude, procedure compliance, use of approved  
[18] procedures and infrequently performed tests and  
[19] evolutions. The committee believed that a test  
[20] procedure with a 50.59 evaluation should have been  
[21] used to perform the evolution.

[22] We did not characterize operator actions  
[23] as an intentional violation of procedures, and if  
[24] you recall the root cause, and we still wouldn't  
[25] characterize it that way, but we think some wrong

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[1] judgments were made, we think some rationalization  
[2] occurred, we think there were some strong  
[3] motivations which may have clouded judgment, but we  
[4] never felt that the operating crew, based on the  
[5] information that we had, intended to violate our  
[6] procedures. And that was a mitigating  
[7] circumstance.

[8] The crew provided professional,  
[9] believable responses to everything that we asked.  
[10] The crew generated a problem report that documented  
[11] the evolution that they conducted on the 5th. Now,  
[12] that was the only one that we were aware of at the  
[13] time. There didn't appear to be any coverup on the  
[14] part of that crew. At the time we didn't recognize  
[15] that curve as a design basis limit, and the crew  
[16] didn't, either, so there was no need to believe that  
[17] they intentionally violated the design basis curve,  
[18] but we realize that now after the fact.

[19] **MR. LIEBERMAN:** Just to clarify that  
[20] point to make sure it comes out on the record the  
[21] right way, I think you just said that now you feel  
[22] they intentionally violated the design basis curve.

[23] **MR. HICKLE:** No, that's not what I  
[24] intended to say

[25] **MR. EBNETER:** I think you said at the

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[1] time you never felt the crew intended to violate the  
[2] procedure, that at the time there didn't appear to  
[3] be any coverup, and at the time you didn't  
[4] understand that the curve was a design basis. All  
[5] of it was precluded by "at the time."

[6] **MR. BEARD:** That's what I heard.

[7] **MR. HICKLE:** Remember, this is a snapshot  
[8] in history.

[9] **MR. EBNETER:** But I know where Jim's  
[10] going, I think. I just wanted to clarify.

[11] **MR. BEARD:** I thought that's what he  
[12] said.

[13] **MR. HICKLE:** I don't want to infer that  
[14] now we think to the contrary.

[15] **MR. LIEBERMAN:** It's important to make  
[16] sure that's clear.

[17] **MR. HICKLE:** We determined that we needed  
[18] to discuss the importance of adherence to operating  
[19] curves and other limits and expected response to  
[20] alarm conditions with all operating shifts, that we  
[21] should review all operating curves and OP-103, our  
[22] plant curve book, to identify other instances where  
[23] operating crews may be required to operate too close  
[24] to the limit, i.e. where too little margin exists  
[25] between the normal administrative limit and the



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(1) operating limit, and that we should provide  
 (2) counseling for the shift that performed the test,  
 (3) stressing the importance of avenues for resolving  
 (4) issues, the importance of maintaining operating  
 (5) limits, correct methods for performance of  
 (6) evolutions, abnormal evolutions, and the  
 (7) consequences of repeat performance.

(8) Now, all of these recommendations are  
 (9) completed, and one question you may have is why -

(10) **MR. BEARD:** Would you pause for a  
 (11) minute?

(12) **MR. HICKLE:** Yes.

(13) **MR. BEARD:** Go ahead. I just wanted to  
 (14) make sure that Mr. Lieberman heard everything you  
 (15) were saying.

(16) **MR. LIEBERMAN:** I heard him.

(17) **MR. BEARD:** All of these were completed,  
 (18) is what he said.

(19) **MR. HICKLE:** So why didn't we go  
 (20) further? At that time we felt we had all the  
 (21) information that we needed. Obviously in hindsight  
 (22) that wasn't correct. If we had had any inkling that  
 (23) that crew was trying to hide their actions or if  
 (24) they had come into that meeting with a defensive  
 (25) posture or even if they had not accepted the

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(1) recommendations made by the MRC, we would have had  
 (2) cause to go further.

(3) Another factor, though, is at that time  
 (4) that preceded our event-free operations program, and  
 (5) the root cause evaluations that we were conducting  
 (6) were formal structural root cause evaluations and  
 (7) were not very many in terms of what we do now,  
 (8) today, and they addressed primarily mechanical and  
 (9) technical or equipment performance problems and, in  
 (10) some instances, some instances, regulatory issues.  
 (11) We had not developed our root cause program and  
 (12) integrated that into our human performance  
 (13) initiative so that the root causes were very rarely  
 (14) done to look at deep root causes of human  
 (15) performance problems.

(16) We didn't conduct a formal investigation  
 (17) in the sense of an OI investigation complete with  
 (18) transcripts and impartial panels and such because we  
 (19) detected absolutely nothing in our exchange with our  
 (20) shift supervisor and assistant that would cause us  
 (21) to question the validity of the information that we  
 (22) received.

(23) **MR. LIEBERMAN:** Even today, after you  
 (24) know so much more than you knew in September, just  
 (25) focusing on the September 5th event, do you feel,

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(1) looking back in hindsight, that the operators were  
 (2) candid about the September 5th event or what they  
 (3) did on September 5th?

(4) **MR. HICKLE:** That's a good question. No  
 (5) is the answer. We asked the operators, and I say  
 (6) the operators, but the assistant and shift  
 (7) supervisor were the only two operators that were  
 (8) interviewed by the MRC. We did not interview the  
 (9) engineers, we did not interview the other shift  
 (10) members as a committee.

(11) Getting back to your question, I said no  
 (12) because we asked them if there was anything else  
 (13) that they had to tell us that had a bearing on the  
 (14) issue, and I felt like that meeting was conducted  
 (15) professionally in a non-adversarial manner, and I  
 (16) felt like they looked like they were comfortable  
 (17) enough to bring that kind of information forward.

(18) **MR. LIEBERMAN:** But other than the 4th,  
 (19) other than the 4th, as to the 5th, what happened on  
 (20) the 5th, were they candid as to what happened on the  
 (21) 5th?

(22) **MR. HICKLE:** We felt they were, yes.

(23) **MR. LIEBERMAN:** And even today, in  
 (24) hindsight, when you know that much more  
 (25) information?

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(1) **MR. HICKLE:** The information that they  
 (2) provided to us appears candid today.

(3) **MR. LIEBERMAN:** On your second bullet or  
 (4) arrow there, it says, Review all operating curves to  
 (5) identify other instances where operating crews may  
 (6) be required to operate too close to the limit. Does  
 (7) that suggest that in this instance with Curve 8 they  
 (8) were required to operate too close to the limit?

(9) **MR. HICKLE:** They operated too close to  
 (10) the limit. This is the window that they had to  
 (11) operate within. Provided they would keep the  
 (12) function, the level-pressure relationship in this  
 (13) area for a long enough period of time, they could  
 (14) achieve 25 cc's per kg in the system. That window  
 (15) is not large relative to the entire curve, although  
 (16) we felt, I felt, that it was achievable. At no time  
 (17) did I, or anyone else, to my knowledge, tell any of  
 (18) our operators to operate on the curve or even near  
 (19) the curve. What we asked them to do was operate the  
 (20) make-up tank so that the objective of meeting 25  
 (21) cc's per kg or greater in the reactor coolant system  
 (22) was achieved or tell us why they couldn't, why they  
 (23) have a problem doing that. Now, at the same time,  
 (24) and I was going to talk about this in the first  
 (25) violation -



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[1] **MR. GIBSON:** Bruce, let me raise a couple  
[2] of points. I have an e-mail from D. Jones to D.  
[3] Fields dated June 27th, '94 that says, Hot Topic.  
[4] **It says:** To maximize RCS hydrogen concentration  
[5] ensure that make-up tank level and pressure are  
[6] being maintained at the top of allowable bands,  
[7] double exclamation point.  
[8] I have a memo from Halnon to Fields which  
[9] goes through an explanation of how to meet the  
[10] objective on hydrogen concentration. It says, in  
[11] effect, to raise the hydrogen pressure once a day to  
[12] the top of the band and then pressure will decay  
[13] below 20 pounds.  
[14] **MR. EBNETER:** Are you familiar with  
[15] these?  
[16] **MR. HICKLE:** I've seen the  
[17] correspondence.  
[18] **MR. BEARD:** Yes.  
[19] **MR. HICKLE:** I saw the correspondence  
[20] recently. "At the top of the band" should mean in  
[21] this area. I don't think that means, at least the  
[22] way I interpret it when I read it, it doesn't mean  
[23] on the curve, it means at the top of the band.  
[24] **MR. GIBSON:** What does "at the top of the  
[25] allowable bands", double exclamation point, mean to

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[1] you as an operator?  
[2] **MR. HICKLE:** I think these are the  
[3] allowable bands right here.  
[4] **MR. GIBSON:** So on the top is on the  
[5] curve?  
[6] **MR. HICKLE:** I didn't point to the  
[7] curve. I'm pointing to the area under the curve.  
[8] **MR. BEARD:** Maybe we should have Mr.  
[9] Halnon now - let's understand who is -  
[10] **MR. HALNON:** May I see the e-mails?  
[11] **MR. BOLDT:** You got two or three.  
[12] **MR. GIBSON:** We only have two.  
[13] **MR. BEARD:** At this point on the record,  
[14] if I'm correct, our plant manager said that he did  
[15] not tell the crews to operate on the curve, and that  
[16] is a true statement. Now, let's talk about what did  
[17] the crews to do what. That's where we're going, and  
[18] one of them is right here, and we'll let him speak  
[19] for himself.  
[20] **MR. LANDIS:** While Mr. Halnon is getting  
[21] ready to do that, can I clarify one thing?  
[22] Maintaining yourself in the box that Bruce had just  
[23] shown on the far right-hand lower corner of it well  
[24] away from the curve for an extended period of time  
[25] would have produced greater than 25 cc's per kg of

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[1] hydrogen.  
[2] **MR. BEARD:** Yes.  
[3] **MR. LANDIS:** Was that information  
[4] understood by the crews?  
[5] **MR. BOLDT:** I believe so by those  
[6] e-mails, yes.  
[7] **MR. HICKLE:** I think Greg should answer  
[8] that.  
[9] **MR. BEARD:** As long as you could keep  
[10] above 20 pounds. The key was how much hydrogen  
[11] overpressure would result in 25 cc's per kg, and our  
[12] experience indicated it was 20, and that's that  
[13] green line.  
[14] **MR. HALNON:** Let's walk through this.  
[15] How do we communicate to the operators what they  
[16] needed done, I think that's the question, and what  
[17] did he mean by this. One thing is we have three  
[18] e-mails. I think that's all the communication we  
[19] had, but that's wrong. I was in the control room  
[20] daily when I was on site to talk about this. We've  
[21] talked about what we mean by keeping pressures up,  
[22] by keeping cc's per kg up, and discussion ensued  
[23] from these e-mails. Operators knew they had to keep  
[24] the pressure above 20 pounds consistently to get  
[25] there.

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[1] We have allowable bands all over the  
[2] place. You have an allowable band down here, a load  
[3] level one. You have an allowable band on the high  
[4] level, and you have an allowable band on the  
[5] pressure. You put those together and you have a  
[6] preferred region, and that's where we wanted them to  
[7] keep it. That's where they knew they had to keep  
[8] it. Different operators had different confidence in  
[9] their ability to keep it there; different operators  
[10] were more versed to keep it there. The burden that  
[11] we talked about was the increased operator attention  
[12] required to keep it there.  
[13] The actual adding water, the actual  
[14] adding hydrogen is not a complex situation, and it  
[15] really wasn't a burden. It's the attention that  
[16] they had to do to keep it there.  
[17] **MR. GIBSON:** But Curve 8 didn't have, if  
[18] I remember correctly, it didn't have the horizontal  
[19] line at 20 psi. The operator had one single curve  
[20] drawn on an axis and was told to keep it at the top  
[21] of the allowable band. I would have thought that he  
[22] might have thought keep it as close to the curve as  
[23] possible.  
[24] **MR. HALNON:** And the e-mails say, While  
[25] maintaining in compliance with the curve.

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(1) **MR. RICHARDS:** You just pointed out that  
(2) the upper and lower levels were defined in the  
(3) procedure, so those numbers are available to the  
(4) operators. In defining the band, did you ever put  
(5) down in an e-mail or writing that the band is  
(6) consistent with the curve in the upper and lower  
(7) limits, stay above 20 pounds?  
(8) **MR. HALNON:** The 7-25 e-mail, it's from  
(9) me, and it's actually forwarded from Dave Jones.  
(10) That was from the experience that we knew that if we  
(11) kept pressure above the 20 pounds. Did we ever draw  
(12) it on the curve for them? No. They had a laminated  
(13) curve in front of them and they knew approximately  
(14) where they had to keep it, what their job was,  
(15) because we had normal RCS leakage, which causes the  
(16) tank to drop in level until they add level again,  
(17) and that was several evolutions to add level during  
(18) the day, and they knew that depends on where they  
(19) put it here, that if they put it down here it was  
(20) going to take increased attention because it very  
(21) quickly was going to go below 20, half a shift, just  
(22) from normal leakage.  
(23) If the operators put it way up in here  
(24) they wouldn't have to give it as much attention for  
(25) a period of time because it was going to take longer

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(1) to get down here. They knew that if they put it up  
(2) in here they could keep it. Again, you're hedging  
(3) up against two limits, and that was a burden.  
(4) **MR. RICHARDS:** In the interest of making  
(5) sure what you expected was clear to the operators,  
(6) was there a standing night order or standing  
(7) expectation written in a book that said the goal is  
(8) to stay above 20 pounds?  
(9) **MR. HALNON:** Just the e-mail and the  
(10) discussions we were having. It was an emerging  
(11) issue that we were having to do this. There was  
(12) ongoing discussion. Different operators came up  
(13) with different ideas on different ways to maintain  
(14) it, and we had an emphasis on RCS leakage on our  
(15) make-up system to try to not keep that happening as  
(16) quickly.  
(17) **MR. BEARD:** Let me jump ahead and address  
(18) what I think sort of - let me go straight to the  
(19) point from our side. Bruce is going to get to  
(20) this. In hindsight, did we give the operators, we,  
(21) management above the shift supervisors, clear and  
(22) consistent guidance and expectations on the balance  
(23) between maintaining hydrogen pressure in the reactor  
(24) coolant versus don't get alarms? The answer is no.  
(25) And that's reflected in one of our own inspection

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(1) reports that we shared with you. In fact, in our  
(2) letter of December 27 we made that very clear.  
(3) Looking back, I wish we had said, "Look,  
(4) we realize that this is an additional burden for now  
(5) until we can figure out how to alleviate it forever,  
(6) we want you to maintain hydrogen, we know it can be  
(7) done." And of course you still have an alarm, and  
(8) of course we didn't know it was design basis then.  
(9) And we didn't clearly say that, not to get the  
(10) alarm. We're not going to say that we did.  
(11) So what have we done about that? Now,  
(12) you'll also recall somewhere around about this time  
(13) we had the Salem event in the industry. Salem shut  
(14) down and all this stuff and they found out that the  
(15) operators were living with what we call operator  
(16) workarounds. One of the corrective actions we  
(17) talked about, and I think again it gets to this  
(18) point, when I think the early plants said, hey, and  
(19) certainly in this region, maybe we've got operator  
(20) workarounds so let's go focus on that. This is  
(21) one. We have an operator, a senior reactor operator  
(22) in charge now of bird-dogging that list. We have  
(23) frequent management meetings to review it, just like  
(24) about every other plant does, too.  
(25) So yes, this was an operator workaround.

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(1) We realized we were having difficulties. We never  
(2) said, though, that it's okay and we never said it's  
(3) okay to get the alarm anyway to keep the hydrogen  
(4) up. Management, to my knowledge, being Halnon and  
(5) above, never said that.  
(6) Now, we probably should have said it's  
(7) not okay and don't do that, but we never said keep  
(8) hydrogen up there and get the alarms we have to and  
(9) it's okay. We did not say that.  
(10) **MR. HALNON:** There's one other. The  
(11) reason I wanted to read the e-mail is because  
(12) there's one on 7-27.  
(13) **MR. GIBSON:** I've got 6-27 and 7-25.  
(14) **MR. BOLDT:** Let me add a bit of  
(15) characterization here because I've been looking at  
(16) these very cautiously, too. There was an evolving  
(17) understanding which are characterized in time  
(18) sequence of those two e-mails plus the third one  
(19) that Greg's about to talk about. There was  
(20) instruction to stay inside the curve limits, the  
(21) limitations of the curve. They'd established that  
(22) the 20 pounds for 24 hours would be well above the  
(23) 25 cc's per kg, and in a number of cases it tells  
(24) them to raise a level, and I would say in the latter  
(25) case in particular, the 7-27 memo talks about

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(1) raising the level to the upper end of the band, as  
(2) Kerry pointed out. But those e-mails were being  
(3) developed again largely by their peer group, and the  
(4) instructions we had given was to stay about 25 cc's  
(5) per kg, and they established the methodology which  
(6) typically is how operators do that, how do go about  
(7) doing that acceptably, and this is basically the  
(8) methodology by which they had established that.

(9) **MR. HALNON:** This is an e-mail from Jones  
(10) to Fields. Jones was essentially working as my  
(11) assistant, Dave Jones. 7-27 -

(12) **MR. BOLDT:** By the way, I think maybe one  
(13) other point. Bruce, I don't recall if you made it  
(14) in your presentation, but we'll talk about the  
(15) interpretation contact for procedures. For example,  
(16) the OP, at that time it was Dave Jones. He was the  
(17) interpretation contact for the make-up system  
(18) procedure.

(19) **MR. HALNON:** This is an e-mail provided  
(20) to the operating shifts talking about that where we  
(21) found that maintaining hydrogen pressure above 20  
(22) pounds for 24 hours will be maintained in cc's per  
(23) kg in the desired band which is above 25 cc's per  
(24) kg. It goes on to say that without performing the  
(25) evolutions that we're familiar with on the nine

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(1) additional evolutions that we talked about, and it  
(2) goes on to say down at the bottom that the day shift  
(3) supervisor should daily add H2 via the regulator and  
(4) then make an equilibrium addition to the make-up  
(5) tank, which is squeezing the bubble, to raise  
(6) level. This is, quote unquote, to raise level to  
(7) the upper level of the level band, the level band,  
(8) this way on the curve, to maintain a higher average  
(9) make-up tank overpressure while complying with the  
(10) make-up tank curve limits.

(11) He's saying get over here because you've  
(12) got more room and get up here because that's going  
(13) to put you above 20 pounds. The key was to maintain  
(14) above 20 pounds average make-up tank pressure, so  
(15) we're clearly talking about this window right here.  
(16) And that was the add-on, probably the e-mail to the  
(17) two that you have, Al. I think they were in the  
(18) same group.

(19) **MR. GIBSON:** I'd like to clarify just one  
(20) point. I guess, based upon what you have said, that  
(21) it's clear that you expected Curve 8 to be met. It  
(22) was not your intent that Curve 8 be violated.

(23) **MR. BEARD:** That's correct.

(24) **MR. GIBSON:** The operators interpreted  
(25) your direction, I think it's reasonable to say, to

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(1) maintain the pressure as high as they could without  
(2) violating Curve 8.

(3) **MR. HALNON:** I think that's probably  
(4) fair.

(5) **MR. GIBSON:** Now, several times today you  
(6) have mentioned, "We did not know that Curve 8 was a  
(7) design basis limit." Bruce, you were the last  
(8) person to say that, and the operators of course have  
(9) said this many times also. But I've also heard you  
(10) say that you expect procedures to be followed  
(11) whether they are design basis limits or not.

(12) **MR. BEARD:** Yes.

(13) **MR. GIBSON:** I wanted to clarify that  
(14) point.

(15) **MR. HICKLE:** May I clarify?

(16) **MR. GIBSON:** Please.

(17) **MR. HICKLE:** It's true that we expect our  
(18) operating curves and limits to be followed  
(19) irrespective of the technical basis for these.  
(20) That's true. So why did I make a point about the  
(21) design basis for the make-up tank curve? I think  
(22) that if our operators had known the technical basis  
(23) for that curve they would have had a greater  
(24) questioning attitude about the alarm condition. I  
(25) think they would have recognized the curve as more

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(1) important to safety than other curves that they  
(2) have.

(3) **MR. GIBSON:** So you understand that your  
(4) operators considered some curve, some procedures  
(5) more important than others, but you seem to accept  
(6) that if they can judge it not to be too important  
(7) then they don't always comply with it.

(8) **MR. HICKLE:** No. The reason that's  
(9) important is this. If they had recognized that this  
(10) was a design basis curve and that it was sometimes  
(11) challenged during hydrogen additions to the make-up  
(12) tank they would have questioned that more. They  
(13) would have questioned whether or not that should  
(14) have been a valid operating curve at all. In fact,  
(15) when you look at our corrective actions, you'll see  
(16) that what we have provided is an operating curve  
(17) that has quite a bit of margin to the design basis  
(18) limit.

(19) It's certainly true that all of the  
(20) limits that we establish for our operators to follow  
(21) have different technical bases. Some, such as  
(22) safety limits and tech specs, have dire consequences  
(23) and safety significance, and some may not. They may  
(24) be equipment protection curves. We expect our  
(25) operators to follow all of these and, when they



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[1] receive an alarm, to promptly address the alarm  
[2] condition, to follow the AR and to return the plant  
[3] to a configuration out of the alarm condition.  
[4] The only point is that if they had  
[5] recognized the design basis limit I think they would  
[6] have come forward. I think the management oversight  
[7] issue that we've been discussing may not even have  
[8] been there, because I think our operators would have  
[9] told us. They would have said, "Hey, I'm worried  
[10] about this, do you know what the basis for this  
[11] curve is and do you know I get these alarms  
[12] sometimes and sometimes they're in for a long period  
[13] of time."

[14] **MR. GIBSON:** I think your operators, at  
[15] least this particular crew, understood this curve  
[16] quite well.

[17] **MR. HICKLE:** To the best of our  
[18] knowledge, at some point they understood the  
[19] technical basis, but it was never communicated to  
[20] the other shifts. It was never communicated in that  
[21] way to us.

[22] **MR. LANDIS:** May I make a distinction  
[23] here? They knew the basis for the curve, correct me  
[24] if I'm wrong, but they did not understand that that  
[25] curve was a design basis curve.

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[1] **MR. HICKLE:** What's your impression,  
[2] Greg?

[3] **MR. HALNON:** I think we all knew it was a  
[4] curve to prevent hydrogen binding.

[5] **MR. BEARD:** We actually have progressed  
[6] into what we were going to talk about in the next  
[7] violation and where we're going to get to exactly  
[8] this, but I'd just like to make a comment.

[9] First of all, no one, including the  
[10] operators on the 4th and 5th, knew that this was a  
[11] design basis limit curve. They understood the  
[12] intent of the curve. What they didn't know was that  
[13] if we got on it or went across it we violated the  
[14] design basis, which is a one hour report LER and all  
[15] of that. And I think you said, and rightly so, that  
[16] regardless of what the curve is, is it okay to  
[17] violate curving the alarms, and the answer's no, but  
[18] with a caveat. I guess if the operators had what  
[19] they now have - and again, what we really did wrong  
[20] with the operators is to give them a design basis  
[21] curve as an administrative operating curve. That's  
[22] what we did wrong. What they now have is an  
[23] administrative curve here. Above that is a curve  
[24] where they get the first alarm, a computer alarm,  
[25] above that they get the annunciator alarm, and above

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[1] that is the design basis limit. That's what they  
[2] should have had all along.  
[3] And what they thought, at least at the  
[4] time, what they thought this one curve was and we  
[5] thought was an administrative limit curve. So the  
[6] question is is it okay to violate an administrative  
[7] limit curve. Is it okay to get an alarm for an  
[8] administrative limit. The answer is no, it's not  
[9] okay, but sometimes it happens. I'm thinking about  
[10] other times in the plant. Well, if it does, then  
[11] you're supposed to take immediate response. I use  
[12] the word immediate, and I don't know how that's  
[13] defined, but you're to take response to clear the  
[14] alarm, as distinguished from if you go across the  
[15] design basis curve. That's totally unacceptable any  
[16] time. That's an LER.

[17] **MR. EBNETER:** I don't disagree with  
[18] that. If you're going to discuss it on the next  
[19] violation, let's finish that one up.

[20] **MR. TANGUAY:** I'd like to clarify that  
[21] Pat didn't know there was a design basis curve.  
[22] That should be clarified. No one within operations  
[23] knew it was a design basis curve; engineering knew.

[24] **MR. LIEBERMAN:** All the time?

[25] **MR. TANGUAY:** Yes.

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[1] **MR. LIEBERMAN:** So when the problem  
[2] report was written, did they understand it was a  
[3] design basis curve that had been violated?

[4] **MR. TANGUAY:** The engineer knew.

[5] **MR. LIEBERMAN:** Was he one of the persons  
[6] who knew about the issue of September 5th?

[7] **MR. TANGUAY:** No. September 4th, you  
[8] mean?

[9] **MR. LIEBERMAN:** No, the 5th.

[10] **MR. TANGUAY:** Once the problem report  
[11] came out, then just about everybody would have known  
[12] that.

[13] **MR. LIEBERMAN:** So engineering knew, I  
[14] guess, on September 7th that the design basis curve  
[15] had been violated.

[16] **MR. TANGUAY:** It was a design limit  
[17] curve. They knew that.

[18] **MR. LIEBERMAN:** And that it had been  
[19] violated.

[20] **MR. TANGUAY:** Yes.

[21] **MR. LIEBERMAN:** Why was the LER written  
[22] in November?

[23] **MR. GUTHERMAN:** I can explain that. I  
[24] was responsible for determining whether it was a  
[25] design basis issue, whether it was operation outside



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(1) design basis. That was a single curve for a large  
(2) break LOCA which bounds all the LOCA sizes. When  
(3) the event happened and I was assigned to describe  
(4) that, I knew intuitively that high pressure  
(5) injection was not credited for large break LOCA  
(6) mitigation. I also knew that the curve protected  
(7) the high pressure injection pumps. As I went  
(8) through it, I needed to find out whether in this  
(9) specific case for that specific accident whether we  
(10) would have destroyed equipment necessary to mitigate  
(11) a specific design basis event.

(12) Knowing that HPI was not credited in a  
(13) large break LOCA, I thought that perhaps it was  
(14) simply a procedure violation but not operation  
(15) outside design basis. Going through the review  
(16) cycle with my peers, having put that memo together  
(17) several times, we came up with that one scenario of  
(18) a core flood line break that's described in the  
(19) memo, which put us outside design basis of the  
(20) plant. That took two months to get done.

(21) **MR. EBNETER:** And who were your peers?

(22) **MR. GUTHERMAN:** There was an individual  
(23) - I was in design engineering at the time. There  
(24) was an individual in licensing, Paul Fleming. He  
(25) was my primary counterpart in giving me a critical

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(1) review of what I was doing and helping me find the  
(2) B&W information which talked about the core flood  
(3) line break event.

(4) **MR. LANDIS:** Going back to clarify, on  
(5) September 7th, then, you were suspect that it was a  
(6) design basis curve, and then you were doing some  
(7) evaluation.

(8) **MR. GUTHERMAN:** Yes.

(9) **MR. LANDIS:** And what time did you make  
(10) the conclusion that indeed you were outside design  
(11) basis?

(12) **MR. GUTHERMAN:** The day of the memo,  
(13) which was November 16th, I believe.

(14) **MR. BEARD:** November 16th.

(15) **MR. LANDIS:** Who made that decision?

(16) **MR. GUTHERMAN:** I was the author of the  
(17) memo incorporating input from a number of my peers.

(18) **MR. LIEBERMAN:** When you suspected it  
(19) might have been a design basis, did you raise that  
(20) to operations or did you want to wait until you were  
(21) sure?

(22) **MR. HALNON:** I believe the problem report  
(23) actually checked the box, suspected design basis  
(24) issue on it, which tells you that that's what caused  
(25) the design basis review to start happening.

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(1) **MR. BEARD:** I'm looking at the problem  
(2) report in question, 267, which was dated 9-7-94.  
(3) It's checked as a suspected design basis issue, and  
(4) then you can go through and see what the corrective  
(5) actions were which culminated on November the 16th  
(6) and we confirmed that it was. I was in a meeting  
(7) where this was presented by Mr. Gutherman. We said  
(8) engineering knew it was a design basis curve on  
(9) September the 7th. Have we fully clarified what  
(10) that means?

(11) **MR. GUTHERMAN:** That means that in the  
(12) absence of any other curves which are LOCA break  
(13) site specific it's a bounding curve, and it must be  
(14) adhered to for the entire spectrum of break sizes.  
(15) That's why it's a design basis curve in the broad  
(16) sense.

(17) **MR. BEARD:** And we confirmed that on the  
(18) 16th.

(19) **MR. GUTHERMAN:** And we confirmed on the  
(20) 16th that there was a specific size LOCA, location  
(21) LOCA and a number of other failure mechanisms where  
(22) equipment necessary to mitigate the accident would  
(23) have been damaged by violating that curve.

(24) **MR. LANDIS:** And that was on the 16th of  
(25) November?

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(1) **MR. GUTHERMAN:** That's correct.

(2) **MR. EBNETER:** Could I ask you, and it's  
(3) just informational, but what took you two months? I  
(4) understood you had to go to B&W to get this data; is  
(5) that correct?

(6) **MR. GUTHERMAN:** I received the assignment  
(7) as one of the corrective actions on the problem  
(8) report in roughly mid September. I was supervising  
(9) the design group at the time in St. Petersburg.  
(10) There were a number of other priorities that I had  
(11) to attend to. I was not dedicated to this effort.  
(12) In retrospect, I perhaps should have delegated that  
(13) to one of my engineers but chose not to do it, and  
(14) it just took me two months to get the various  
(15) revisions of this memo through a review cycle and  
(16) incorporate comments.

(17) **MR. EBNETER:** I'm interested  
(18) fundamentally, which is just a little bit outside of  
(19) the enforcement type thing, but if you had a  
(20) situation today where this occurred, would it take  
(21) you two months again to get this information from  
(22) B&W? Do you not have this design basis information  
(23) within the engineering department?

(24) **MR. TANGUAY:** We have the bulk of the  
(25) information in-house, but bringing this information

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[1] in-house and having a thorough understanding of the  
[2] what the content is and what it means, we don't have  
[3] all that knowledge in-house.  
[4] **MR. BEARD:** Let's talk about what would  
[5] happen today, because we haven't gotten to that.  
[6] Today someone would write a precursor card. It  
[7] would be reviewed the next morning and someone would  
[8] take it from there in our operability process. What  
[9] would happen then?

[10] **MR. GUTHERMAN:** In all likelihood -

[11] **MR. BEARD:** What would happen?

[12] **MR. GUTHERMAN:** It would be called a  
[13] suspected design basis issue, and then there are  
[14] some subjective -

[15] **MR. BEARD:** We would enter CP what?

[16] **MR. HALNON:** 150, but we report suspected  
[17] design basis issues as design basis issues.

[18] **MR. BEARD:** It would be assigned a  
[19] certain level of timeliness for corrective action,  
[20] and then what?

[21] **MR. HICKLE:** And a problem report would  
[22] be generated. We would also do a formal structured  
[23] operability assessment per CP-150 which would  
[24] establish timelines for resolution of the technical  
[25] issue, and that entire CP-150, until closed out,

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[1] becomes the custody of our shift manager, who  
[2] reports to me to ensure timely closure and to  
[3] coordinate resources if necessary to make that  
[4] happen.

[5] **MR. LANDIS:** Do you have timeliness  
[6] guidelines in that?

[7] **MR. HICKLE:** Yes.

[8] **MR. LANDIS:** How long would that have  
[9] been?

[10] **MR. GUTHERMAN:** The shift supervisor and  
[11] shift manager make a decision on the subjectiveness  
[12] of the issue and safety significance of the issue.

[13] **MR. GIBSON:** The point that I want to get  
[14] clarification on before we leave this is your  
[15] expectations regarding procedural compliance.  
[16] Whether this was a design basis issue or not, I  
[17] think it's fair to say that most of the parties  
[18] involved understood it was an important curve.

[19] **MR. BEARD:** Yes.

[20] **MR. GIBSON:** That being on the wrong side  
[21] of it could result in cavitation and loss of safety  
[22] injection. Several times in the presentation there  
[23] have been remarks to the effect that you believe if  
[24] the operators had known it was a design basis curve  
[25] they might have acted differently, we made a mistake

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[1] by not telling them it was a design basis curve.  
[2] I'm trying to understand. You seem to acknowledge  
[3] that operators treat design basis curves differently  
[4] from administrative curves. Is that your  
[5] expectation and to what extent does that occur?

[6] **MR. BEARD:** No. You're right. The  
[7] problem is we get so involved in these things and we  
[8] keep asking what if, what if, what if. We got into  
[9] a mode of thinking, it's really hypothetical, and  
[10] you're right. It's not worth talking about. Our  
[11] expectations are if you have a curve, if you have a  
[12] limit, you're supposed to adhere to it. If you get  
[13] an alarm, you're supposed to do something about it.  
[14] That was our expectation then and it's our  
[15] expectation now, no ifs, ands or buts.

[16] **MR. BOLDT:** I've stated on the record  
[17] that it didn't matter to me whether it was an  
[18] operating basis curve or any other basis curve, it  
[19] was a curve to be followed, and our AR procedure in  
[20] fact said that when the alarm comes in you're in an  
[21] unacceptable region of the curve. Unacceptable  
[22] means get out of it.

[23] **MR. EBNETER:** If you said otherwise, I  
[24] would be very surprised, but do you have on the  
[25] record any audits, oversights or anything that would

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[1] show that these types of things were regular  
[2] occurrences within the Crystal River operations over  
[3] the past two or three years?

[4] **MR. BEARD:** Our investigation of August  
[5] of '95 explored that quite thoroughly, so yes, the  
[6] answer is yes. We've had an audit, and that is not  
[7] expectation, and it never was. Really, we're into  
[8] the next violation.

[9] **MR. EBNETER:** Then let's move on.  
[10] Gibson, you're in charge. Let's keep this thing  
[11] moving.

[12] **MR. HICKLE:** Let me clarify one thing I  
[13] thought I heard you say, at least the way I  
[14] interpreted it. Mr. Ebneter's question, the way I  
[15] understood it, was are these regular occurrences  
[16] that operators are violating limits, and if that was  
[17] the question, the answer is no. There were no  
[18] assessment reports or results of any kind, including  
[19] management assessments in the simulator and in the  
[20] control room, which are done routinely, to tell us  
[21] that there was a blatant disregard or even a casual  
[22] disregard for operating limits or curves.

[23] **MR. BEARD:** I think what you just said,  
[24] Bruce, I think what you meant to say is all of the  
[25] audits, surveillances and personal observations by

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[1] you and others did not reveal other instances of  
[2] deliberate or inadvertent or whatever violations.  
[3] **MR. HICKLE:** Or casual disregard for  
[4] operating limits.  
[5] **MR. BEARD:** You took him to say we didn't  
[6] have any audits to show that. I think what you said  
[7] was that all of the oversight audit surveillances  
[8] found other occasions where this was the case.  
[9] **MR. HICKLE:** That's true. There's  
[10] routine management self-assessments that are done in  
[11] the simulator and also in the control room, and one  
[12] specific criteria that is assessed, it's part of a  
[13] checklist, is alarm response, and deficiencies have  
[14] to be identified. And we specifically look for  
[15] promptness, use of AR procedures and thoroughness  
[16] when those procedures are invoked, and there is not  
[17] a record that we have in conducting those  
[18] assessments or from any of our QA audits that we  
[19] have a casual disregard for these limits.  
[20] **MR. LIEBERMAN:** That has to raise one  
[21] more question, and that is, given that with this  
[22] particular curve there were a number of instances  
[23] where action wasn't taken in what I'll call a  
[24] reasonable time to get back to the curve -  
[25] **MR. HICKLE:** I want to show that to you

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[1] and explore that. I think you have to understand  
[2] how the operators were interpreting their  
[3] information and the options that they had to  
[4] exercise for system control. I was specifically  
[5] going to talk about that when we get to the first  
[6] violation.  
[7] **MR. GIBSON:** I think we really need for  
[8] you to proceed through your presentation and then  
[9] we'll stop and ask our questions at the end.  
[10] **MR. HICKLE:** Continuing, then, with the  
[11] MRC recommendations that we generate a procedure or  
[12] work instructions as appropriate after the fact for  
[13] the make-up tank overpressure test, counseling for  
[14] the operators on shift, validate the make-up tank  
[15] hydrogen overpressure curve and reissue it if  
[16] necessary, review plant modifications to ensure that  
[17] operator burden is minimized and revisit the  
[18] technical justification for the 25 cc's per kg limit  
[19] in the reactor coolant system. All of these  
[20] recommendations we established a schedule for, they  
[21] were tracked by our quality programs, and they were  
[22] all completed by December of 1994.  
[23] Some additional corrective actions were  
[24] taken after we learned about the evolution that was  
[25] conducted the night prior, September 4th of '94.

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[1] Pat talked about a formal investigation that we  
[2] conducted. I won't get into that any further. Some  
[3] further crew discipline was taken based upon what we  
[4] viewed as an integrity issue. Pat also discussed  
[5] that. We also further revised our procedures to do  
[6] just these things, expand the scope of infrequently  
[7] performed tests or evolutions, a checklist, and  
[8] that's the screening criteria that the operator uses  
[9] to determine whether or not he's performing a test  
[10] or an experiment, and to require director approval  
[11] of the checklist. When that screening is completed  
[12] it requires my signature or my signature authority  
[13] to review it.  
[14] **MR. LIEBERMAN:** Bruce, are you satisfied  
[15] that there's adequate guidance as to what defines a  
[16] test?  
[17] **MR. HICKLE:** I believe that there was  
[18] adequate guidance in place, and I was going to talk  
[19] about it in management issues, but I believe there  
[20] was adequate guidance back then. We also  
[21] incorporated a CAPS approach in the criteria for  
[22] determining procedure adequacy and shift  
[23] supervision. It provides guidelines for  
[24] communication, approval, planning and scheduling  
[25] when the shift supervisor has a question about the

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[1] intent of a procedure on shift, and that's in our  
[2] conduct of operation procedure A-I-500 now.  
[3] We also recognize that the MRC process,  
[4] although not bad, didn't go far enough, so we've  
[5] expanded that application and we've formalized it as  
[6] part of our normal way of doing business to handle  
[7] corrective actions. At the level where we have a  
[8] potential NRC violation or another significant issue  
[9] related to safety documented in a problem report,  
[10] the MRC is required to meet and to review the root  
[11] cause evaluation and the corrective actions that are  
[12] taken, to meet with all of the people that are  
[13] involved with the problem and determine the adequacy  
[14] of those and provide recommendations where we need  
[15] to go further.  
[16] **MR. LIEBERMAN:** How is that going to  
[17] relate to your human factors performance review  
[18] procedures?  
[19] **MR. HICKLE:** In this way. The MRP  
[20] reviews the root cause, the structured root cause  
[21] evaluation attendant with these problems and, in  
[22] doing that, that structured root cause now is  
[23] required to address the roots of human performance  
[24] issues.  
[25] **MR. LIEBERMAN:** But prior to the MRP



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(1) process?

(2) **MR. HICKLE:** Prior to the MRP process

(3) they have to bring all that information to the MRP.

(4) Now, the MRP is chaired usually by myself, but if

(5) I'm not available another director chairs it. We

(6) have at least three directors present on the MRP.

(7) The intention is not to apply pressure to our

(8) people, and we've communicated this, but it's to

(9) require and structure management involvement in the

(10) corrective action process.

(11) We've reinforced our log keeping

(12) practices, I think we discussed that earlier, and

(13) we've provided additional training using examples

(14) describing shift supervisor authority. And that

(15) training, we provided examples for the shift

(16) supervisors to diagnose whether or not they had the

(17) authority to authorize certain hypothetical

(18) evolutions to occur, and then we critiqued their

(19) answers.

(20) So what are the results that we've

(21) achieved on this with respect to the second

(22) violation? There's absolutely no doubt that there's

(23) an increased sensitivity throughout operations as to

(24) procedure use standards. I mentioned earlier we

(25) developed a procedure to talk about how to use

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(1) procedures. That was developed by a team of our

(2) operators representing operations. We're using them

(3) and we are developing experience with it. We're not

(4) using it perfectly, I won't tell you that, but right

(5) now we're seeing a lot more consistency on procedure

(6) usage from shift to shift. That's a positive

(7) result, in my opinion.

(8) The initial procedure barriers we think

(9) are going to help ensure that similar judgmental

(10) errors are avoided. Again, defense in depth. I can

(11) tell you we haven't had any more unauthorized tests

(12) or experiments and we don't believe we will based on

(13) the training and procedures we've got in place. But

(14) we don't think that our job is over by any means at

(15) all. The lessons learned are going to have to be

(16) continued to be reinforced to ensure that these

(17) operating principles are firmly ingrained not only

(18) in the operators we have now but in the operators

(19) we're bringing up through the ranks. To that end

(20) these things have been incorporated into our

(21) training program.

(22) Shift supervisor leadership has been

(23) improved by some of the changes we've made. We

(24) don't think we're done yet, and we've got plans in

(25) place. In fact, we believe that we'll have SRO

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(1) trained personnel capable of assuming leadership

(2) positions in operations very shortly after the

(3) examinations that are currently being conducted.

(4) The significance. I'll be more specific

(5) on the first point in the next violation. The

(6) safety consequence of the test was very, very low,

(7) but the human performance significance and the

(8) regulatory significance was extremely high. It was

(9) very high to us. Fundamental operating principles

(10) were violated, and similar judgmental errors, if

(11) they occurred under different situations, could have

(12) serious impact, serious safety consequences, we

(13) recognize that, and for that reason we tried very

(14) hard to be extremely thorough and comprehensive in

(15) the actions we took to address this.

(16) Now, the next thing I wanted to discuss

(17) was the first violation.

(18) **QUESTION FROM THE FLOOR:** I have a couple

(19) of questions. I just want to go back to the design

(20) basis curve. Did operations know? By operations, I

(21) mean the operations management, not the operators.

(22) When did they know that it was a design basis

(23) curve?

(24) **MR. HICKLE:** Around November of '94.

(25) Well, the problem report probably preceded the LER.

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(1) **MR. HALNON:** That was the memo that Brian

(2) wrote.

(3) **MR. HICKLE:** It was in November, well

(4) after the evolution.

(5) **QUESTION FROM THE FLOOR:** How do we

(6) ensure that there are so many other design bases

(7) that they may not know the operation?

(8) **MR. HICKLE:** That's a very good

(9) question. The first thing we did was we went back

(10) to our plant curve book, OP-103, and we did an

(11) operational review of every single curve there to

(12) see if there were any other situations where we

(13) might be challenging a curve, where there might be

(14) an issue of sufficient operating margin, and we

(15) didn't find any that gave us concern. That was the

(16) first layer of corrective action, to address your

(17) point.

(18) Now, the next level's not completed. The

(19) next level is to go back and do a systematic

(20) engineering design review of all of our operating

(21) curves and develop or bring forward the technical

(22) basis for those curves to see if there are any

(23) others that are design basis. On the surface it

(24) doesn't look like we have that, but until that

(25) systematic review is completed - Paul, do you want



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[1] to say anything about this?

[2] **MR. TANGUAY:** We have talked about doing  
[3] that. I don't have an integrated plan at this point  
[4] in time to complete that activity, but we do intend  
[5] to look at it.

[6] **QUESTION FROM THE FLOOR:** The order of  
[7] design basis, what's your reporting ability?

[8] **MR. HICKLE:** We report suspected design  
[9] basis issues right away. We don't wait to confirm  
[10] that they are in fact design basis. If we think  
[11] they might be, we make an immediate report.

[12] **MR. LIEBERMAN:** Is that a new policy?

[13] **MR. HICKLE:** That's our policy now.

[14] **MR. LIEBERMAN:** So since September?

[15] **MR. HICKLE:** Yes.

[16] **QUESTION FROM THE FLOOR:** The operability  
[17] examination was CP-150?

[18] **MR. HALNON:** Right now it's CP-150.

[19] **QUESTION FROM THE FLOOR:** Before that  
[20] point in time you make the operability examination  
[21] you may have some big conditions and you may  
[22] continue to operate but then you have to make a  
[23] reportability examination.

[24] **MR. HICKLE:** That's done separately.

[25] **QUESTION FROM THE FLOOR:** In September

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[1] 1994, when you suspected this to be outside the  
[2] design basis, did you make a reportability call?

[3] **MR. GUTHERMAN:** It was determined to be  
[4] not reportable pending the evaluation that was  
[5] ongoing to determine whether it was outside design  
[6] basis or not.

[7] **QUESTION FROM THE FLOOR:** So at that  
[8] point in time a suspected design basis would not  
[9] have been a reportable thing?

[10] **MR. GUTHERMAN:** That's correct. There  
[11] was subjectivity involved between the shift  
[12] supervisor and the shift manager based on the safety  
[13] significance of the issue.

[14] **QUESTION FROM THE FLOOR:** But engineering  
[15] made the decision in September of '94, September 7th  
[16] of 1994, that it was suspected to be outside the  
[17] design basis, but then you did the analysis and came  
[18] to the conclusion that it was outside the design  
[19] basis and came out with an LER in November.

[20] **MR. GUTHERMAN:** That's correct.

[21] **QUESTION FROM THE FLOOR:** But then it was  
[22] not reported at that time.

[23] **MR. GUTHERMAN:** That's correct.

[24] **QUESTION FROM THE FLOOR:** Why?

[25] **MR. GUTHERMAN:** Because it was only

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[1] suspected at that time.

[2] **QUESTION FROM THE FLOOR:** So coming back  
[3] to the question I asked, should a certain thing be  
[4] reportable at that time because it's suspected to be  
[5] design basis or only when the evaluation is  
[6] completed, then it becomes reportable?

[7] **MR. HICKLE:** Licensing does not determine  
[8] what's reportable in the plant. That's a line  
[9] function. That's operations' responsibility.  
[10] That's my responsibility today. The way it would  
[11] work today, all of our engineers, all of our  
[12] technical support people have been instructed that  
[13] at the time they suspect an issue may be related to  
[14] design basis, do not wait. They're to notify me  
[15] personally and, in my absence, one of our assistant  
[16] plant managers. At that point we review the issue,  
[17] and if it's a suspected but not confirmed design  
[18] basis issue we report it right away.

[19] **MR. EBNETER:** Let me make it clear that  
[20] suspected design basis is not reportable. If you  
[21] choose to do that to give you margin to avoid these  
[22] types of things, that's up to you, because if you  
[23] make an error you get into the type of situation  
[24] we're talking about right here.

[25] **MR. BEARD:** Our whole process, as I've

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[1] said before, and I think the region certainly  
[2] understands that, is that with your input we've  
[3] greatly strengthened our whole process for  
[4] operability calls, including reportables, which  
[5] currently culminates in a CP-150 which I think is  
[6] quite thorough. It addresses both the design basis  
[7] operability and the reportable with that, and we're  
[8] much more sensitive and we're much more likely today  
[9] to report something is suspected if we think it's  
[10] likely or to agree on the safety significance of  
[11] it.

[12] **MR. EBNETER:** But that's your choice;  
[13] that's not by regulation.

[14] **MR. BEARD:** Yes, sir.

[15] **MR. LANDIS:** Larry Kelley, how many times  
[16] have you reported potential outside design basis  
[17] since September of 1994?

[18] **MR. KELLEY:** I can't give you a number,  
[19] but we've reported several.

[20] **MR. LANDIS:** Do you have any feel for  
[21] that?

[22] **MR. GUTHERMAN:** The number of LERs for  
[23] calendar year 1994 were 28, and my judgment is that  
[24] 25 of them perhaps were outside design basis.

[25] **MR. BEARD:** You said for '94. You meant

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[1] 1995.  
[2] **MR. GUTHERMAN:** I beg your pardon. '95.  
[3] **MR. KELLEY:** He said suspected design  
[4] basis issues.  
[5] **MR. GUTHERMAN:** I'd say a large majority  
[6] of those were suspected rather than known design  
[7] basis issues.  
[8] **MR. HICKLE:** We just feel that it's  
[9] better to communicate the issue at the onset and, if  
[10] we need to, once we're finished with our assessment  
[11] to clarify it.  
[12] **MR. EBNETER:** That's enough on that.  
[13] **MR. GIBSON:** We have a number of  
[14] questions on this violation that I would like to  
[15] review with you briefly. We don't need a long  
[16] explanation unless it's warranted, but these are  
[17] questions that are based upon -  
[18] **MR. IMBRO:** I just want to make one point  
[19] before we get into that. I'm trying to reconcile  
[20] the fact that you don't take credit for HPI for  
[21] large break LOCA, and I'm not sure how that connects  
[22] to whether those curves were design basis and  
[23] whether Curve 8 was a design basis curve. Clearly  
[24] the system wasn't designed to do this HPI on large  
[25] break LOCA whether you needed it or not. It seems

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[1] like a real straightforward question.  
[2] **MR. GIBSON:** I think we're mixing  
[3] licensing basis and design basis. I understand your  
[4] conclusion was that HPI was not part of the  
[5] licensing basis for most accidents, but HPI was  
[6] clearly part of the design basis for the plant. It  
[7] was designed to inject at high pressure and, if  
[8] lost, if the make-up pumps were lost you did not  
[9] have high pressure injection as designed.  
[10] **MR. BEARD:** At some point I think we're  
[11] going to take a break and recaucus. I think we need  
[12] to clearly think about what your questions were. I  
[13] know that everybody here is anxious to give you an  
[14] answer, but I think right now I'm a little  
[15] confused.  
[16] **MR. EBNETER:** And I agree with you. We  
[17] need to keep this within the scope of the regulation  
[18] and the enforcement conference here and what the  
[19] issues are and not get into redesigning the plant at  
[20] this point. We all agree that this curve today is a  
[21] design basis curve.  
[22] **MR. BEARD:** Yes.  
[23] **MR. EBNETER:** And we agree that it was  
[24] violated by the operator.  
[25] **MR. BEARD:** Yes.

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[1] **MR. EBNETER:** That's fine. If we need to  
[2] explore why you think this is now and why it wasn't  
[3] ten years ago, we need to do that in a different  
[4] forum.  
[5] **MR. BEARD:** And we can do that.  
[6] **MR. EBNETER:** But we need to keep this on  
[7] the enforcement basis here and not all the other  
[8] things. And I'm not trying to stifle the staff. If  
[9] you insist on doing it, you can do it, but I'm  
[10] telling you you're not going to get through this  
[11] meeting. If we need to have a meeting to discuss  
[12] some of these other issues, then we can do it, but  
[13] we can do that later.  
[14] **MR. IMBRO:** My point was the timeliness  
[15] of the LER.  
[16] **MR. BEARD:** I think what people are  
[17] really trying to say here, Stu, is that somebody in  
[18] design engineering in St. Pete, where they were at  
[19] the time, somebody must have known that this curve  
[20] was based on a design basis and there was no margin  
[21] for operator action, and we agree. At some point  
[22] this curve was given to operations, and why didn't  
[23] they, operations, realize, "Gee, okay, therefore  
[24] we've got to give the operator something over here."  
[25] If that's the issue we can address that.

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[1] **MR. EBNETER:** But separate from this  
[2] meeting we need to have another meeting. There are  
[3] numerous questions raised about the availability of  
[4] the design information and how you're doing things,  
[5] and there have been a lot of revisions to the  
[6] process, so we probably should schedule, and I'll  
[7] leave that up to Kerry to schedule another meeting  
[8] to discuss all these other issues. Maybe it should  
[9] be held at NRR. We'll talk about that.  
[10] **MR. BEARD:** Could I suggest that we do  
[11] the questions that relate to this violation? I  
[12] think that a lot of the questions we had earlier may  
[13] really relate to the alarms and all that. Once we  
[14] do that, maybe we ought to take a break.  
[15] **MR. GIBSON:** I think we should take a  
[16] break for lunch, but I would like to get through  
[17] this violation before that.  
[18] We have read of course the August  
[19] internal investigation that you conducted, August of  
[20] '95, and in there you identified other tests that  
[21] had been conducted. There was a test, for example,  
[22] turning off the fuel cooling and monitoring the  
[23] temperature rise. Have you investigated further to  
[24] establish whether or not those occurred and to  
[25] determine how pervasive conducting tests without

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(1) procedures and 50.59 evaluations has been to the  
(2) station.

(3) **MR. BEARD:** Yes, and I'll let Greg and  
(4) Bruce talk further about that. Realizing in that  
(5) report the time frame in which again the team was  
(6) trying to be very thorough, talking to a lot of  
(7) people, and the time frame in which some of these  
(8) things were done or were not done probably goes back  
(9) to 1978. Go ahead, Greg and Bruce. You can talk  
(10) further about that.

(11) **MR. HICKLE:** Let me start out and then  
(12) I'll turn it over to Greg. We did go back and  
(13) inspect that instance that you talked about to take  
(14) a look at it. We didn't do that exhaustively  
(15) because we didn't have really enough information as  
(16) far as exactly when that occurred and under what  
(17) conditions and who did it. It was more like  
(18) hearsay, but we went back and looked at it.

(19) I'll let Greg address the investigation,  
(20) although it really wasn't a structured  
(21) investigation. There's no question that in the past  
(22) we used our procedures without as much careful  
(23) thought to the intent of those procedures as we do  
(24) today. And let me just take that evolution that  
(25) you're talking about and explain to you how our

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(1) procedures were probably used.

(2) Our operating procedure for the spent  
(3) fuel system provides specific guidance for starting  
(4) a spent fuel cooling train, for securing a train,  
(5) for bypassing filtration systems, et cetera, and all  
(6) of those are sectionalized in the operating  
(7) procedure. In this instance our operators or our  
(8) shift followed the section of the procedure which  
(9) talked about the normal equipment shutdown, allowed  
(10) the spent fuel pool temperature to increase, but  
(11) within the limits of their procedure to determine  
(12) what the heat-up rate was. Now, we believe that  
(13) occurred.

(14) What's different about it is they then  
(15) restarted the spent fuel train with that section of  
(16) the procedure. First, let me tell you how it's  
(17) different than these tests and then let me tell you  
(18) what we expect. It's different than these tests  
(19) inasmuch as we know of no other instances where  
(20) decisions were made to use procedures outside the  
(21) intent where that led to violation of operating  
(22) limits or intentional violation of operating  
(23) limits. That's what's different about these make-up  
(24) tank tests. Nevertheless, that's a latitude that we  
(25) became concerned with when we went back and looked

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(1) for these things, and it was specifically addressed  
(2) in our procedure use standards.

(3) In fact, when I talked about the CAPS  
(4) philosophy earlier, that's exactly the kinds of  
(5) issues we used as examples, and we even have  
(6) examples in our operating standard.

(7) Now what do we expect? We expect our  
(8) operating crews to use their procedures consistent  
(9) with the intent that they were designed for or  
(10) written for. Every procedure has a purpose  
(11) statement. That procedure I referred to, that OP,  
(12) the intent is to swap trains, to take trains out of  
(13) service for maintenance, to bypass filtration  
(14) systems for changing filters but not to isolate all  
(15) cooling to determine a heat-up rate, because that  
(16) would be outside the safety analysis of that OP.  
(17) The 50.59 evaluation uncovered that OP.

(18) What I'm saying to you is yes, there was,  
(19) and that's one of the management issues, but yes  
(20) there were things that went on on the shift that  
(21) were on the ragged edge of the intent that the  
(22) procedure was written for, and we believe that we've  
(23) addressed that. That's one of the things that we  
(24) tightened up. That's one of the lessons that we  
(25) learned.

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(1) **MR. LIEBERMAN:** So you're satisfied that  
(2) you've pursued these other potential unauthorized  
(3) evolutions that were described in your report to a  
(4) great enough extent that your corrective actions  
(5) encompass those issues so they won't happen again?

(6) **MR. HICKLE:** That's exactly right.

(7) **MR. HALNON:** Let me give you another  
(8) reason why, Mr. Lieberman. We're really talking  
(9) about only one other shift supervisor. There was  
(10) only one other shift supervisor who'd been a shift  
(11) supervisor since just about day one that the plant  
(12) was operated, and I'm convinced that there's nobody  
(13) in this world that knows more about this plant than  
(14) this guy, and he knows more about the plant because  
(15) he did these types of things.

(16) Another problem with this shift  
(17) supervisor, and I was one of the ones that we  
(18) identified early on that we needed to rotate off,  
(19) was his address of human performance issues. During  
(20) the week that these tests happened, the 4th and 5th,  
(21) IMPO was in doing a test on the simulator, and I was  
(22) full-time with them at the training center. The  
(23) shift supervisor was one of the shift supervisors I  
(24) had counseled before about addressing human  
(25) performance problems. We had a significant human



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[1] performance problem with IMPO there, I addressed it  
[2] to him again, and he essentially refused to address  
[3] it to IMPO standards, so he was pulled off the shift  
[4] the week after.

[5] When we went back and looked at the  
[6] August investigation and saw that he was involved  
[7] with most of them, it all connected up, and that was  
[8] the main corrective action. Now, going right head  
[9] to head with him, I asked him, "Would you have ever  
[10] violated a procedure to get the data you need", he  
[11] said no. No disrespect meant, but he's looking at  
[12] the procedure and staying in the bounds of it but,  
[13] like Bruce said, he's on the ragged edge of it, and  
[14] that's why we considered that corrective action. We  
[15] talked to other shift supervisors in that time  
[16] period, and I don't have all the details, but I  
[17] wouldn't have done that. He was already pulled off  
[18] shift for another reason.

[19] MR. GIBSON: Is he still off shift?

[20] MR. HALNOR: Yes.

[21] MR. RICHARDS: I think he was asked if he  
[22] would perform the kind of tests that happened on the  
[23] 4th and 5th. I can't remember from your report  
[24] whether he said yes or no.

[25] MR. HALNOR: As a matter of fact, he was

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[1] the shift supervisor that came up to depress the  
[2] squeeze. He told me he never would have gone over  
[3] the curve, that that was one thing he never would  
[4] have done as far as violating a limit. He was  
[5] pretty adamant about that. I'm not sure what he  
[6] came up with in the report, but that was a personal  
[7] conversation I had with him.

[8] MR. GIBSON: One of the issues that we  
[9] must assess is the environment that existed in  
[10] September of 1994. We have evidence here that other  
[11] unauthorized tests were conducted without 50.59  
[12] reviews. Albeit limits may not have been exceeded,  
[13] tests were conducted that would have seemed to have  
[14] required a 50.59 review. There's some indication  
[15] that management had some level of awareness of these  
[16] tests.

[17] Putting yourselves back in the time frame  
[18] of the violations in 1994, were such tests within  
[19] the expectations of management? Was management  
[20] aware? Did management tolerate it, or were the  
[21] tests going on and management didn't know it?

[22] MR. BEARD: Before we answer that,  
[23] there's one thing I think in answering Al's question  
[24] that has to be put in context. I think Al was  
[25] referring to page nine of our investigation report

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[1] that we shared with you, and this is one of the  
[2] things that we charged the team to look into.

[3] Quote: What are the generic implications or extent  
[4] of the condition, e.g., did the crew perform other  
[5] unauthorized evolutions and were unauthorized  
[6] evolutions performed by other crews.

[7] That was one of their charges, and here  
[8] are some facts. Interviews with other operations  
[9] personnel indicated that several plant evolutions  
[10] which primarily gathered data and which did not  
[11] exceed limits had been performed at various times in  
[12] the past, including the spent fuel pool thing which  
[13] we've talked about. Two, securing reactor cavity  
[14] cooling to determine reactor cavity.

[15] Now, except for the spent fuel cooling  
[16] thing, as I recall, as I review this data and ask  
[17] questions, the last three examples are things that  
[18] [REDACTED] did probably before I was a senior VP  
[19] ops. Is that correct?

[20] MR. HALNOR: Since I can't recall the  
[21] time frame, Pat, I can't characterize that.

[22] MR. BEARD: I can't speak to what  
[23] management's expectations were in '88 or '89  
[24] or '87.

[25] MR. GIBSON: What were expectations in

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[1] '94? The environment in '94 of course is based  
[2] upon events that have transpired and communications  
[3] that preceded '94. As an operator in '94, might I  
[4] reasonably have concluded that conducting a test  
[5] such as was conducted on September 4th and 5th would  
[6] be okay with my management?

[7] MR. LIEBERMAN: This gentleman that we  
[8] were just talking about said he did not see anything  
[9] wrong with the evolution conducted on September  
[10] 5th. He was under the impression that the standard  
[11] operating procedure allowed operations to prove a  
[12] curve. He is now, I gather, manager of operation  
[13] support.

[14] MR. KELLEY: This is [REDACTED] response.

[15] MR. RICHARDS: This is in your August  
[16] investigation. He didn't say, "I'd go ahead and do  
[17] it", but he didn't say -

[18] MR. KELLEY: That's a summary. That's  
[19] not his exact words but a summary.

[20] MR. BEARD: Let's go back and answer the  
[21] question. In September of '94 that would not be  
[22] acceptable, the make-up tank evolution was not  
[23] acceptable, and that was not my standard. The fact  
[24] that [REDACTED] had done things in the past,  
[25] going back to I think 1980 or before, and the fact



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[1] that we had already recognized, as Mr. Hickie has  
[2] said, particularly when Greg Halnon became ops  
[3] manager, that we had work to do with regard to the  
[4] operations manager with regard to the leadership  
[5] procedures and all that, I think it's reflected that  
[6] no, that that did not meet our standards and was not  
[7] acceptable.

[8] The fact that it had occurred in the  
[9] past, that we had at least two shift supervisors who  
[10] were not meeting expectations in '94, that's true,  
[11] and we certainly ought to be held accountable for  
[12] that, and we're taking them off shift soon.

[13] MR. GIBSON: Earlier you said a few. How  
[14] many are still on shift that should be off?

[15] MR. BEARD: That should be right now off,  
[16] I don't think there are any that should be off right  
[17] now. There's one that's going to be replaced.  
[18] probably in terms of upgrading leadership, but not  
[19] - this person is not a Dave Fields and not a [REDACTED]

[20] [REDACTED]  
[21] MR. HICKIE: Let me answer that more  
[22] specifically. If we felt right now that we had an  
[23] immediate need we would have taken those actions,  
[24] even if it meant working a five shift rotation.  
[25] Please believe that. But that's not to infer that

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[1] we're satisfied with our shifts the way that the  
[2] leadership on our shifts is now. There are other  
[3] changes that we want to make that are going to go  
[4] into the future, some near term within the next few  
[5] months and some within the next few years.

[6] MR. RICHARDS: I think the reason it's  
[7] important to bring it up is you've got - I don't  
[8] know what Mr. Fields's reputation was with the rest  
[9] of the crews, but you mentioned [REDACTED] had been  
[10] there since day one, had been respected for having  
[11] the most knowledge of the plant, your words, and he  
[12] said some things summarized in your internal report  
[13] that I got pretty anxious about. It seems to me  
[14] that if he's been there 15 years as a shift  
[15] supervisor he's had a big impact on the attitude and  
[16] philosophy on operating that plant for the rest of  
[17] your operators.

[18] You've stated some corrective actions to  
[19] further express your positions of the operators and  
[20] how to carry out procedures and things. I guess  
[21] after reading your internal report and some of his  
[22] statements, just sitting here listening to your  
[23] corrective actions, I hope you've got a good handle  
[24] on the impact that [REDACTED] and Mr. Fields may have  
[25] had on the way your operators look at operating your

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[1] plant.

[2] MR. HALNON: Mr. Richards, let me add  
[3] something. I don't know if I can ever express to  
[4] you the difficulty I went through in pulling [REDACTED]  
[5] [REDACTED] off shift. Besides this test that happened on  
[6] the 4th and 5th and everything that happened since  
[7] then, that was probably one of the most traumatic  
[8] things that happened in operations. He was  
[9] respected, but he was pulled off for not meeting our  
[10] standards, and if that's not a message to the rest  
[11] of the operators - he's in the position he's in now  
[12] because of his technical knowledge, and that  
[13] technical knowledge is a great benefit to our  
[14] plant. But the message, and the message when he was  
[15] pulled off shift, is that human performance and  
[16] procedures are key. It was a very traumatic thing,  
[17] and we've soul-searched on why that happened.

[18] MR. RICHARDS: I think you're right to a  
[19] certain degree. It's your decision whether to take  
[20] him off shift or not, but how do you know. I guess  
[21] with the four operators that were on Fields' group,  
[22] as far as I can tell, nobody talked to them until  
[23] August of the following year. Nine or ten months go  
[24] by and nobody has talked to these people about how  
[25] they viewed the events.

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[1] MR. BEARD: That's not true.

[2] MR. HALNON: I talked to them regularly.  
[3] Mark van Sicklen was the union steward. He was in  
[4] my face daily on union issues and just about daily  
[5] on what was happening with the make-up thing.

[6] MR. RICHARDS: So you're saying that  
[7] sometime shortly after the event you sat down with  
[8] each of the operators and talked to them about this  
[9] event and addressed your expectations to them?

[10] MR. HALNON: The letter said I counseled  
[11] the operators, and that is like a bone of contention  
[12] because some of the operators didn't realize they  
[13] were being counseled. I couched it more as a  
[14] coaching. When I talked with the operators we  
[15] talked about the reasons the test was done, the fact  
[16] that the procedures weren't adhering to our  
[17] standards and stuff. There was a coaching aspect  
[18] about getting them to understand why that was the  
[19] case. That was ongoing.

[20] I taught a two hour class every week, two  
[21] operators at the training center, and usually an  
[22] hour of that concerns the procedural standards and  
[23] human performance standards.

[24] MR. HICKIE: Let me also add one point to  
[25] thoroughly answer the question. Greg did that on

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[1] his level. I did that personally. I did that at  
[2] all-hands meetings with everyone in the plant. Pat  
[3] has done the same, and Gary. What we've done is to  
[4] tell them and tell them again and tell them again  
[5] and then build it into the training programs, so  
[6] there's no question in my mind that the lessons  
[7] learned have been communicated and that they're very  
[8] well understood.

[9] I just wanted to answer Mr. Lieberman's  
[10] question, because I don't think it got completely  
[11] answered. I think it was your question, or maybe it  
[12] was yours, Al. Back in 1994 what were management's  
[13] expectations? Those expectations were in writing.  
[14] They were in our procedures, and they specifically  
[15] covered unusual evolutions, requirements for 50.59  
[16] evaluations, requirements for soliciting help off  
[17] shift. It was all there. I could show that to you  
[18] if you really want me to.

[19] **MR. LIEBERMAN:** That's fine.

[20] **MR. HICKLE:** I'm saying those  
[21] expectations were there. Would that have been okay  
[22] back then if we got wind of it? No, but I don't  
[23] think it's the same thing that occurred with the two  
[24] tests that were performed. That was the other point  
[25] I was trying to make.

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[1] **MR. LIEBERMAN:** I see lots of violations,  
[2] and it's so common to get an explanation that  
[3] management expectations - and we have the same  
[4] problem in the NRC too. Management expectations  
[5] weren't carried down to the people who have to do  
[6] the work. In this case it looks like a third of the  
[7] shift supervisors did not appreciate expectations  
[8] concerning unauthorized evolutions. We might have  
[9] had the procedures in place and to be run in  
[10] facilities, and I don't have to tell you how to run  
[11] the facilities, you know a heck of a lot more about  
[12] this than I, but it's more than just having things  
[13] written on a piece of paper.

[14] **MR. BEARD:** Of course it is. I have to  
[15] speak out again. Based on your comments, which I  
[16] appreciate, and yours, John, let me just go back in  
[17] time. I've been in the nuclear operations business  
[18] since 1966. I know a lot of you have, too, both in  
[19] the Navy and IMPO and here. I can see since 1966  
[20] that operating standards have continued to rise both  
[21] in the nuclear navy and the commercial nuclear power  
[22] plants. I came to IMPO in 1982, and then I came to  
[23] this job in 1990. How navy ships were operated in  
[24] 1970 and how commercial nuclear power plants were  
[25] operated in 1970 and up until 1990 is entirely

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[1] different from the way they operate today in terms  
[2] of management expectations, both from the NRC and  
[3] from utility management.

[4] For example, in 1990, when I first came  
[5] on the job, IMPO sent me a proposed good practice  
[6] procedure on how to use procedures, like which ones  
[7] have to be in hand to be followed verbatim, which  
[8] ones have to be looked at and so on, because no one  
[9] had any. Very few plants at that time had that. I  
[10] took that and said, "Gee, let's give that a try."  
[11] We gave it to operators, and I was dealing with a  
[12] lot of other things and learning the ropes, and we  
[13] said yes, it would be a good idea, but we don't need  
[14] that, and I'm not even sure IMPO was interested in  
[15] good practice at that time. They are now. And then  
[16] things went on.

[17] I may also add, and Stu will get mad at  
[18] me for saying this, that in 1990 we were a one in  
[19] operations at Alaska South. We probably shouldn't  
[20] have been, and then we were dealing with a lot of  
[21] things. Standards continued to improve. The first  
[22] time I went down and watched the crews in the  
[23] simulator, our communications were terrible. There  
[24] was no repeat backs.

[25] What I'm saying is that yes, we had a

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[1] Dave Fields on shift, we had a [REDACTED] and the  
[2] fact that [REDACTED] had done some of these things  
[3] back in 1987 I sure as hell didn't know about. But  
[4] as time went on, as our standards improved, as our  
[5] eyes got open and we looked harder and we recognized  
[6] we needed to relieve Bill Marshall with Greg Halnon,  
[7] that's another step, that we need new eyes, we  
[8] needed to have higher standards, and since we put  
[9] Greg in the job we've finally been focused. We had  
[10] two people in there that did not meet today's  
[11] standards, nor did we think they could change, and  
[12] that happens with people. They'd been there a long  
[13] time, and sometimes you can't teach an old dog new  
[14] tricks, and we realized that. We were late in  
[15] realizing that, but we realized it.

[16] Yes, it's true that [REDACTED] has this  
[17] title. And by the way, [REDACTED]  
[18] [REDACTED] Today, if you could get him in  
[19] a room and sit him down and say, "Tell us honestly  
[20] the way you operated back then, was that right", I  
[21] think he would say no. And if we didn't think that  
[22] he was contributing a positive influence today in  
[23] that position he wouldn't be there.

[24] I wanted to try to put things in  
[25] context. We're continuing to get better. We now

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[1] have a Mr. Dave deMontford backing up our operations  
[2] manager. We've got Gary Becker with an SRO who's  
[3] been in the control room. We've got three other  
[4] engineers getting SROs. We've brought two other  
[5] people into the pipeline, and all of these are going  
[6] to be in our control room at some point, but you  
[7] can't do it instantaneously.

[8] (A recess was taken.)

[9] **MR. GIBSON:** Let's resume the meeting.

[10] **MR. BEARD:** Are you ready for Bruce to  
[11] discuss the next violation?

[12] **MR. GIBSON:** We've discussed the  
[13] presentation thus far. We have no more questions on  
[14] violation B at this time. What I would propose we  
[15] do, in an effort to make this more efficient, is to  
[16] allow you to go completely through your presentation  
[17] on the violations, and we will use restraint.  
[18] Right, Jim?

[19] **MR. LIEBERMAN:** But you had one  
[20] misstatement. We only have one question left on  
[21] violation B.

[22] **MR. GIBSON:** I said at this time.

[23] **MR. LIEBERMAN:** On violation B, one quick  
[24] question. On October 13th, '94 there was a  
[25] re-evaluation of the procedure and a 50.59 review

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[1] was performed for the September 5th evolution, and I  
[2] believe that concluded that was not an unreviewed  
[3] safety question. Am I correct in that?

[4] **MR. HICKLE:** That was the procedure that  
[5] we asked the shift supervisor and assistant to write  
[6] as part of their disciplinary action. The intention  
[7] was to reinforce our expectation that a procedure be  
[8] written. The way they wrote that procedure was  
[9] along the lines of what they had actually - it was  
[10] almost a chronology of what they did that night on  
[11] the 5th. That's correct.

[12] **MR. LIEBERMAN:** Were you satisfied with  
[13] the evaluation as to whether or not there was an  
[14] unreviewed safety question with it?

[15] **MR. HICKLE:** In hindsight, no. I had not  
[16] even intended that procedure to go to the PRC, but  
[17] after it was written it went to PRC. Greg was on  
[18] the PRC, he can talk firsthand about it, but the PRC  
[19] didn't know what to do with it because it obviously  
[20] wasn't the kind of procedure they would routinely  
[21] approve. But because it was taken as part of a  
[22] disciplinary action and the test had already been  
[23] performed, they went ahead and approved it. But if  
[24] it had been a procedure that had come into the PRC  
[25] for an evolution about to be performed, I don't

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[1] believe it would have been performed.

[2] **MR. HALNON:** It was presented as a one  
[3] time only, it's going to die right here. Frankly,  
[4] we didn't know how to get it through our process to  
[5] let it die. In hindsight, we looked back and said,  
[6] "Well, we probably would not have approved it the  
[7] way it was written, the safety evaluation, knowing  
[8] what we know now as far as design basis and that  
[9] type of issue."

[10] **MR. LIEBERMAN:** I don't want to dwell on  
[11] this. Is engineering involved in looking at the  
[12] unreviewed safety question issue?

[13] **MR. HALNON:** They're in the qualified  
[14] review process for the procedures, yes.

[15] **MR. LIEBERMAN:** Since at the time that  
[16] was reviewed on October 13th there were some  
[17] questions as to whether this was design basis or  
[18] not, and that was still being evaluated, were there  
[19] any weaknesses in that engineering review for that  
[20] particular 50.59 issue?

[21] **MR. HICKLE:** I'm not sure at what point  
[22] in time.

[23] **MR. BEARD:** I think Greg said it went to  
[24] the PRC and this was sort of okay, but we're not  
[25] going to do it, it was just a disciplinary follow-up

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[1] thing. I think he said our full process weighed  
[2] in. I don't think it was intended. It was our  
[3] process then.

[4] **MR. HALNON:** We went through the motions  
[5] basically to get it to the ten point.

[6] **MR. LIEBERMAN:** The motions did not  
[7] include engineering?

[8] **MR. HALNON:** It had technical supports,  
[9] the system engineers, not the design group.  
[10] Frankly, in hindsight, looking at it with what we  
[11] know now, it doesn't meet our standards now.

[12] **MR. LIEBERMAN:** And your corrective  
[13] actions for this issue, does it encompass this type  
[14] matter?

[15] **MR. HALNON:** The communication in the  
[16] design review, yes.

[17] **MR. LIEBERMAN:** Between engineering and  
[18] operations?

[19] **MR. HALNON:** Yes.

[20] **MR. BEARD:** And we'll get to that as we  
[21] talk about the other violations since one of the key  
[22] things is corrective actions and how does this  
[23] design basis get translated in the plant. It's the  
[24] interaction between operations and design.

[25] **MR. GIBSON:** I'd like for you to go



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[1] through the remainder of the violations, and I'd  
[2] like to ask the staff to use restraint and hold your  
[3] questions until the end. Perhaps by that time some  
[4] of our questions will have been answered.  
[5] **MR. HICKLE:** Let's move on to apparent  
[6] violation number one in the report, the inspection  
[7] report, nine examples of operation of the make-up  
[8] tank outside the acceptable operating region while  
[9] adding hydrogen. The report speaks to untimely  
[10] alarm response in connection with that violation.  
[11] Information important in understanding  
[12] the violation. Violations occurred during  
[13] operational evolutions conducted to establish  
[14] optimum hydrogen pressure. The intent of these  
[15] evolutions as differentiated from the two tests was  
[16] to restore the plant to chemistry specifications, to  
[17] within chemistry specifications. From June 1  
[18] through September 30th there were 669 manipulations  
[19] of the tank level or pressure. 21 alarm conditions  
[20] resulted from those, and nine are characterized in  
[21] the violation as untimely alarm response. Now,  
[22] untimely means the alarm was in for greater than 30  
[23] minutes, and in the examples it was as long as 190  
[24] minutes and greater than a half a pound over our  
[25] alarm curve.

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[1] Now, I'm telling you this not to minimize  
[2] the importance of the violations by saying that  
[3] there were just a few of them I'm telling you this  
[4] because these manipulations were conducted most of  
[5] the time correctly, and it wasn't a normal operating  
[6] expectation of any of our operating crews to get  
[7] this alarm. They couldn't have performed this many  
[8] manipulations successfully without an alarm, this  
[9] minus this.

[10] Another important fact is our operators  
[11] controlled the evolutions using a make-up tank strip  
[12] chart recorder. The make-up tank chart strip  
[13] recorder on our control board tells the operators  
[14] what the pressure is and what the level is in the  
[15] make-up tank real time. It's the only real time  
[16] indication that they have that they can use to  
[17] verify their alarm condition.

[18] One of the nine apparent violations, only  
[19] one, exceeded the make-up tank curve limit as  
[20] indicated by the strip chart recorder, and that was  
[21] for a short time right after they added hydrogen,  
[22] and that was for a period of fifteen minutes.  
[23] During the rest of the evolutions the strip chart  
[24] recorder told the operators that they were within  
[25] the operating curve.

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[1] Now, why is this point important, that  
[2] one of nine apparent violations exceeded the make-up  
[3] tank curve? There was no intentional disregard for  
[4] the operating curve when these violations occurred.  
[5] Let me explain what our expectation was, what we  
[6] would have expected to happen, and then I'll show  
[7] you what really happened.

[8] The system would normally lose inventory  
[9] due to normal leakage. That's the make-up system or  
[10] reactor cooling system. They're interconnected. At  
[11] some point the operators would add hydrogen. Now,  
[12] the intention was, their intention was to add  
[13] hydrogen to some point that would not put them in  
[14] the alarm condition and then to add inventory to the  
[15] make-up system and raise the level in the tank,  
[16] which had the effect of moving the function to the  
[17] right and down and return them to the optimum  
[18] operating window. Now, that's what they tried to  
[19] do. They tried to add hydrogen but stay off the  
[20] alarm and then add inventory. On most occasions  
[21] they were able to do this without putting the plant  
[22] into alarm. And we were satisfied, we being  
[23] management, that 25 cc's per kg in the reactor  
[24] coolant system was an achievable limit and could be  
[25] done operationally, safely and within legal limits.

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[1] **MR. GUTHERMAN:** When they raised the  
[2] level it would move it to the right and up rather  
[3] than to the right and down. Just let me correct  
[4] that.

[5] **MR. HICKLE:** Well, it's obvious from the  
[6] diagram.

[7] Let me show you what typical evolution  
[8] occurred in the case of the violations, what it  
[9] looked like. Now, this is the one that occurred on  
[10] July 27th. In this case they were between 71 and 72  
[11] inches in the make-up tank. They added hydrogen.  
[12] They went into alarm. Again, this is the alarm  
[13] curve. They went into alarm. At that point they  
[14] began to increase inventory and level in the make-up  
[15] tank, which caused the function to migrate toward  
[16] the acceptable region of the curve.

[17] **MR. GIBSON:** It appears they continued to  
[18] add hydrogen after the alarm occurred; is that  
[19] correct?

[20] **MR. HICKLE:** No. This is 21 pounds and  
[21] this is 23. This is less than a half a pound. I'll  
[22] explain how that happened in a few minutes.

[23] **MR. BEARD:** As the gas is compressed the  
[24] pressure does go up, too.

[25] **MR. HICKLE:** When you raise level the



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[1] function actually migrates inside the acceptable  
[2] region of the curve. That's the way that they could  
[3] clear the alarm. The point drifts this way.  
[4] Now, in this case they stopped their  
[5] addition or their level increase at about 77.5  
[6] inches. They allowed the system to stabilize, and  
[7] that's what's happening here. Hydrogen was going  
[8] into solution and cooling down, and the function  
[9] returned to the acceptable region of the curve.  
[10] So what went wrong? What's the root  
[11] cause? What we would have expected our operators to  
[12] do is to question the discrepancy between the alarm  
[13] and their recorder. They looked at the recorder and  
[14] they verified from the best that they could read  
[15] that recorder that they were within the acceptable  
[16] region of the operating curve. When an alarm is  
[17] received we ask our operators to respond promptly to  
[18] the alarm, verify your alarm condition, and the only  
[19] way that they could do that was using the strip  
[20] chart recorder, there was no other real time  
[21] indication, and then to follow their annunciator  
[22] procedure.  
[23] MR. EBNETER: The alarm comes off the  
[24] computer?  
[25] MR. HICKLE: The alarm comes off of a

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[1] computer point, and the computer point has no real  
[2] time display in the computer room.  
[3] MR. HICKLE: Any time you're making a  
[4] hydrogen add the only thing you have to monitor to  
[5] make sure that you stay away from the alarm limit is  
[6] the strip chart recorder. That's the only  
[7] instrument they have for real time indication.  
[8] As far as what went wrong, we felt like  
[9] our crews should have questioned that discrepancy  
[10] and caused that to be evaluated to see which was the  
[11] most conservative, the alarm or the recorder, and  
[12] given the uncertainty to respond to the alarm and  
[13] follow the AR, which was our annunciator procedure  
[14] and return the plant promptly to the acceptable  
[15] region of the curve. That was our expectation.  
[16] They didn't question that. We think that our  
[17] supervisors became a little complacent and failed to  
[18] address the alarm condition.  
[19] MR. GIBSON: Bruce, I'm sorry to  
[20] interrupt and break our own rules, but we did have  
[21] an e-mail that you may have seen where this  
[22] discrepancy was addressed. At least it was sent to  
[23] one operator or one crew where engineering advised  
[24] the operator that the computer was more conservative  
[25] and they should rely on the computer indication as

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[1] opposed to the strip chart.  
[2] MR. HICKLE: Greg, would you address  
[3] that, please?  
[4] MR. HALNON: That was between, I think,  
[5] two operators, Gary Hebb and Mark van Sicklen, in an  
[6] answer from Pat saying it would be good to use the  
[7] computer because it's more accurate and the alarm  
[8] curve is off of that. That pretty much died with  
[9] those two. Some of the operators talked about it,  
[10] but I didn't see that, I didn't know about that. It  
[11] certainly didn't get put out as an operations  
[12] directive in any way, so it was not consistently  
[13] thought through the operations department that  
[14] that's what we needed to do.  
[15] Gary did not want to operate the plant  
[16] for the computer for the reasons we just told you.  
[17] It was not real time and it was not easy for the  
[18] operators to use and there was no curve display you  
[19] could see anywhere, the function that Bruce talked  
[20] to you about, so they continued to operator with the  
[21] strip chart recorder.  
[22] MR. HICKLE: There was insufficient  
[23] day-to-day management presence in the control room.  
[24] We think that was part of the root cause. At this  
[25] time, at this particular time, Greg was our

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[1] operations manager. He was spending quite a bit of  
[2] his time down at the simulator doing simulator  
[3] instruction, working with the crews in trying to  
[4] reinforce some of the human performance improvement  
[5] standard that we were emphasizing at the time, and  
[6] he was not spending a great deal of time in the  
[7] control room.  
[8] Additionally, Greg was the only level  
[9] that we had of operations management above the shift  
[10] supervisor. Greg reported directly to me, and we  
[11] believe that because of the demands on Greg at the  
[12] time, and he was new in his position, and because we  
[13] were trying to change our operating practices and  
[14] bring the bar up, that he was spread too thin. If  
[15] we had had additional management presence in the  
[16] control rooms more often there may have been an  
[17] opportunity not necessarily to identify this  
[18] firsthand, but there may have been an opportunity  
[19] for more dialogue and maybe a little more exchange  
[20] between management and our operating shifts, which  
[21] could have led to addressing this issue before we  
[22] discovered it.  
[23] There were some contributing factors.  
[24] First, system design was not intended for fine-tuned  
[25] control. The control board indications didn't

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(1) emulate this make-up tank curve, and what the  
 (2) operators had to do was take their strip chart  
 (3) readings and put those on to the operating curve to  
 (4) try to determine whether or not they were  
 (5) approaching their limit, and the strip chart  
 (6) recorder was too inaccurate for its intended use.  
 (7) There was only resolution at best to plus or minus  
 (8) half a pound, and in most instances, where we  
 (9) overshot our operating curve, it was by about a half  
 (10) a pound, so it wouldn't have been picked up on the  
 (11) strip chart recorder.

(12) Also, these hydrogen additions were done  
 (13) manually. There was no automatic system control,  
 (14) which made overshoot more likely. After hydrogen  
 (15) was added the operator would have to determine when  
 (16) to stop so that he didn't challenge that curve. But  
 (17) once the hydrogen went into the make-up tank, often  
 (18) it heated up, there was thermal expansion, and that  
 (19) caused additional pressure to build up even after  
 (20) the point that the hydrogen addition was stopped.  
 (21) All of this had to be factored in, and the control  
 (22) just was not fine-tuned.

(23) Another contributing factor was that  
 (24) management guidance regarding hydrogen concentration  
 (25) versus the alarm limit could have been clearer. I

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(1) think that, if we had done a better job of  
 (2) explaining the basis for the 25 cc's per kg in the  
 (3) reactor coolant system to our operating crews, at  
 (4) least they may have recognized or better recognized  
 (5) the relative importance of the chemistry limit  
 (6) versus the limit of the operating curve. As we  
 (7) said, we put a lot of emphasis on meeting the 25  
 (8) cc's per kg, and I think sometimes they may have  
 (9) viewed that as a higher priority, at least to the  
 (10) point that maybe they didn't question that  
 (11) discrepancy between the strip chart and their alarm  
 (12) set point.

(13) **MR. EBNETER:** Mr. Lieberman asked me a  
 (14) question. Was the strip chart in the control room  
 (15) sensitive and accurate enough that the operators  
 (16) could clearly discern that there was overshoot?

(17) **MR. HICKLE:** No. In the instance of the  
 (18) nine violations or nine instances of the violation,  
 (19) when they looked at their strip chart recorder they  
 (20) would get the alarm, they would look at the strip  
 (21) chart recorder and they would see on that strip  
 (22) chart recorder that they were within their operating  
 (23) limits except for one instance, and that was the  
 (24) case I talked about. For a short period after a  
 (25) hydrogen addition one day they were over about

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(1) fifteen minutes, but they cleared that on their  
 (2) strip chart report.

(3) **MR. GIBSON:** On the other hand, I would  
 (4) like to point out that you mentioned earlier that  
 (5) Mr. Hebb was involved in many of these overshoots,  
 (6) and he had personally received a memorandum from  
 (7) engineering advising him to use the computer and not  
 (8) the strip chart because the computer was more  
 (9) conservative, and apparently he chose to ignore the  
 (10) advice.

(11) **MR. HALNON:** Gary was more involved in  
 (12) the ones that came out - Gary was primarily  
 (13) involved in the ones in the late July time frame,  
 (14) and that memo came out the first part of the second  
 (15) week in August, so after that I can look and see how  
 (16) many times Gary was involved, but in effect, yes, he  
 (17) did not want to operate the plant by computer.

(18) **MR. LIEBERMAN:** Are there other  
 (19) situations like that with strip chart versus the  
 (20) computer on other curves?

(21) **MR. HALNON:** This is the only curve we  
 (22) have that has an alarm generated by the computer to  
 (23) where the computer would be more accurate as far as  
 (24) the alarm limit.

(25) **MR. HICKLE:** We've strengthened our alarm

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(1) response procedures, though, recognizing that we  
 (2) don't have a crystal ball and what we get into in  
 (3) the future in terms of modifications and what alarms  
 (4) off of what switches, what we want our operators to  
 (5) do is when they receive the alarm to verify it and  
 (6) without any doubt at all follow the alarm response  
 (7) procedure immediately.

(8) **MR. LIEBERMAN:** How have you modified  
 (9) your procedure for alarm response? I gather that  
 (10) previous procedure addressed expected alarms versus  
 (11) unexpected alarms and this was viewed as an expected  
 (12) alarm so that complicated the operator's response.

(13) **MR. HICKLE:** I think it may have, but I  
 (14) think that's more of an excuse. The reason I think  
 (15) that is because our operators are trained to respond  
 (16) to alarms promptly, and that's reinforced by the  
 (17) assessment of their performance in the control room  
 (18) and in the simulator. We specifically critique  
 (19) that, and it's hard for me to believe that that  
 (20) expectation isn't crystal clear. I really think  
 (21) that this contributing factor maybe had more to do  
 (22) with that decision-making, the fact that we weren't  
 (23) clear enough as to the reasons for maintaining the  
 (24) chemistry limit, and that may have created a  
 (25) priority in our operator's mind that caused them

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[1] maybe not to question the alarm as hard. I think  
[2] this is an exceptional circumstance.  
[3] **MR. HALNON:** I think the statement you  
[4] made about expected alarms, there was in that bottom  
[5] bullet the weak procedure guidance. There was  
[6] weakness as far as expected alarms because it gave  
[7] the operators quite a loophole in responding to  
[8] alarms, and the procedures didn't go beyond that,  
[9] and that was a weakness in it.

[10] **MR. BEARD:** We've already talked about  
[11] the last bullet.

[12] **MR. HICKLE:** That's right. So we  
[13] recognized we could strengthen our procedures, and  
[14] we did that. What corrective actions did we put in  
[15] place? Some of these corrective actions will have  
[16] an asterisk, and those are the ones that we did  
[17] directly in response to this apparent violation,  
[18] remembering that we didn't discover this violation  
[19] until sometime well after the time that the two  
[20] tests were performed.

[21] **MR. BEARD:** Like December '95.

[22] **MR. HICKLE:** But the corrective actions  
[23] that we put in place as a result of the tests served  
[24] to correct this problem, too.

[25] On September 9th we placed an offset on

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[1] the make-up tank operating curve, and since that  
[2] time we're not aware of any instances where we've  
[3] had an alarm condition. And when I say an offset, I  
[4] mean we established an operating limit which is  
[5] below the design basis limit. We revised the  
[6] administrative procedures for alarm response. Now,  
[7] that we did specifically, and we already talked  
[8] about that, directly in response to this violation  
[9] after discovering it. We reinforced expectations on  
[10] alarm response through training. I think we've  
[11] discussed that quite a bit this morning.

[12] We created an additional management  
[13] position to focus on shift operations. That  
[14] position is called our manager nuclear plant  
[15] operations with sole responsibility for management,  
[16] providing management assistance and oversight and  
[17] assessment of our shifts that are on duty, our  
[18] on-duty shifts, with no responsibilities, routine  
[19] responsibilities for operations support,  
[20] administration. It's strictly a management  
[21] function. That position now reports to an assistant  
[22] plant manager of operations and chemistry. So we've  
[23] got another layer of management with the intention  
[24] of being able to provide a lot more oversight in the  
[25] control room.

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[1] We implemented our event-free operations  
[2] program. I talked about that earlier. We're  
[3] getting extremely good results from that. We  
[4] implemented changes to reduce operator burden.  
[5] Specifically, the make-up tank high level limit was  
[6] increased to a hundred inches, so that moves the  
[7] window that makes the area larger that's acceptable  
[8] for operation to maintain the chemistry limit that  
[9] we desire in the reactor coolant system. Back in  
[10] '94 it required about five manipulations a day to  
[11] maintain our chemistry limit, and now it's less than  
[12] two.

[13] **MR. HALNON:** It's gone way down.

[14] **MR. HICKLE:** To less than two. We  
[15] installed -

[16] **MR. EBNETER:** How did you get that down  
[17] from five to two?

[18] **MR. HALNON:** It's based on -

[19] **MR. HICKLE:** Previously we had this  
[20] window to operate within. Now we've got this window  
[21] to operate within to maintain acceptable hydrogen in  
[22] the reactor coolant system. This is a larger  
[23] window. So by raising the level and pressure -

[24] **MR. EBNETER:** I understand. I'm just  
[25] curious. Is this still within all the chemistry

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[1] guidelines, though, I take it, by moving it off to  
[2] the right further?

[3] **MR. BEARD:** Yes. We did an analysis to  
[4] show that raising that with all the competing  
[5] operational requirements wouldn't violate something  
[6] else.

[7] **MR. HICKLE:** We installed a pre-alarm as  
[8] an operator aid to give warning to the operator that  
[9] he's approaching the operating curve.

[10] This is our computer alarm, which did not  
[11] exist back in '94. We had no computer alarm. This  
[12] is our annunciator alarm, and this is our design  
[13] basis limit. When operators add hydrogen they'll  
[14] get the computer alarm to tell them that they're  
[15] approaching the annunciator alarm limit, which is  
[16] our operating curve, so there's plenty of margin now  
[17] to the design basis limit.

[18] **MR. BEARD:** And that's what we should  
[19] have done from day one.

[20] **MR. HICKLE:** We provided a conservative  
[21] operating curve. I just showed you that. We added  
[22] a chain wheel on MUC 64, or are adding. These next  
[23] three are being accomplished. MUC 64 is the shutoff  
[24] valve that isolates the make-up pump from the  
[25] make-up tank. We restored the position indication



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[1] for that same valve on the control board so the  
[2] operator can see its position, and we've added a  
[3] manual isolation valve for hydrogen addition in the  
[4] turbine building.

[5] These last three things were requested by  
[6] our operators to help them in emergency operations  
[7] in the event that we have an accident. We don't  
[8] anticipate they'll be used for routine operations.

[9] So what results have we achieved? By the  
[10] end of refueling, all of our corrective actions, the  
[11] last of which are the last three modifications I  
[12] discussed, will have been completed. I mentioned  
[13] we've had no high pressure alarms identified since  
[14] September 9th of '94. We think the questioning  
[15] attitude regarding expected alarms has greatly  
[16] improved. Now, that's a hard thing to measure.  
[17] That's why I said we think. But that's our  
[18] observation. We're getting a lot more questions  
[19] being asked and we've had a lot more opportunity for  
[20] alarms to exist with the refueling outage and our  
[21] shutdown that we're presently under, and we're  
[22] seeing a very good, healthy response in that area.

[23] We have also increased management  
[24] presence in the control room. We believe that our  
[25] shifts, and my personal observation is that our

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[1] shift supervisor is much better informed of our  
[2] plant activities, of our plant priorities. Our  
[3] operations manager position is providing a lot of  
[4] help to our on-duty shifts and very good assessment  
[5] and oversight.

[6] **MR. LIEBERMAN:** What's the role of the  
[7] shift manager with the operations manager? Is that  
[8] the same position or a different position?

[9] **MR. HICKLE:** That's a different  
[10] position. The shift manager is not an operations  
[11] position. The shift manager reports to me and is  
[12] responsible for our integrated plant schedule. What  
[13] does he do specifically? First he's a schedule  
[14] enforcer, but he pulls together resources for  
[15] accomplishing the scheduled items that are on our  
[16] daily work schedule and also during refuelings the  
[17] same thing. He's there to be notified of evolutions  
[18] or any other activity that the shift supervisor is  
[19] required by procedure to communicate outside the  
[20] control room, and in those cases he has some  
[21] approval authority.

[22] He also serves as our emergency  
[23] coordinator and would man our technical support  
[24] center in the event that we have an alert. And he's  
[25] not expected - this is a good time to clarify this

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[1] point. He's not the management position that I  
[2] expect to be cognizant of all of our alarms on the  
[3] control board. The first responsibility is with our  
[4] shift supervisor, and the oversight responsibility  
[5] for that now rests with our operations manager  
[6] position.

[7] Does that sufficiently answer your  
[8] question?

[9] **MR. LIEBERMAN:** Yes. In other places the  
[10] shift manager has more operations responsibility, so  
[11] you've clarified that point.

[12] **MR. HICKLE:** And I gathered that was the  
[13] conclusion from the inspection report comments.

[14] **MR. BOLDT:** One of the chief reasons he  
[15] exists is to provide assistance to the shift  
[16] supervisor if he needs assistance, if he has  
[17] questions to pursue with the system engineer or he's  
[18] running on a timeline and he has to get some  
[19] questions answered. He would be expected to turn to  
[20] the shift manager to assemble the resources so that  
[21] the shift supervisor may focus on the control center  
[22] activities.

[23] **MR. LIEBERMAN:** By the time of September  
[24] 5th should the shift manager have been consulted?

[25] **MR. BOLDT:** In our opinion the shift

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[1] manager should have been consulted, and actually in  
[2] our opinion this shift that was on duty should have  
[3] known better than any other that that was the reason  
[4] he was there.

[5] **MR. LIEBERMAN:** Did the shift manager  
[6] periodically go in the control room?

[7] **MR. HICKLE:** Yes.

[8] **MR. LIEBERMAN:** Should the shift manager  
[9] have known about what was going on on the 5th or the  
[10] 4th?

[11] **MR. BOLDT:** They should have been  
[12] informed by shift supervision of what was occurring.

[13] **MR. BEARD:** They should have consulted  
[14] with them in advance.

[15] **MR. LIEBERMAN:** But from the other  
[16] direction, should the shift manager have been in the  
[17] control room enough to have recognized this was  
[18] going on?

[19] **MR. HICKLE:** Not in my view. They spend  
[20] time in the plant, but not solely in the control  
[21] room. They're expected to evaluate work in progress  
[22] in the field.

[23] **MR. BEARD:** During an outage, many plants  
[24] have typically what they call an outage shift  
[25] manager around the clock. And we said, "Gee, that



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(1) works pretty good in an outage, why don't we use  
(2) that concept all the time."  
(3) **MR. BOLDT:** As it relates to this  
(4) specific shift, we had three reactor trips in late  
(5) 1991, one of which was the subject of enforcement.  
(6) Two of those reactor trips occurred on a midnight  
(7) shift which was supervised by this same shift  
(8) supervisor involved in the 4th and 5th incidents.  
(9) The third reactor trip, we happened to have in place  
(10) an operations superintendent who was rotating. He  
(11) stepped in and was able to assist that shift in  
(12) properly mitigating that particular reactor trip and  
(13) the consequences.

(14) As a result, Pat had assigned me the task  
(15) of looking at the generic implications of those  
(16) three reactor trips. We looked at all of them in  
(17) general, and we have a document that made  
(18) recommendations, one of which was to consider the  
(19) creation of a nuclear shift manager as a resource to  
(20) the shift supervisor for collecting data. One of  
(21) the other trips that occurred dealt with a power  
(22) range detector that was out of service. The shift  
(23) supervisor in question was approaching a limitation  
(24) whereby he was going to have to bypass another  
(25) channel, and he consulted only the local resources

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(1) on his midnight shift, consulted two of our NC  
(2) technicians and some other data available to him,  
(3) but he never stepped outside that for example to  
(4) call the system engineer at home or call in some  
(5) additional help.

(6) They constrained themselves to on-shift  
(7) available resources, made inappropriate decisions,  
(8) and now we tend to apply cockpit isolation to that.  
(9) Even in a cockpit you've got a radio to call to the  
(10) ground to get additional assistance. That's why the  
(11) shift manager exists, so the shift supervisor can  
(12) focus on the control activities and say, "We need  
(13) help from the system engineer, you take the lead on  
(14) this and help me get an answer."

(15) **MR. BEARD:** Although I mentioned this  
(16) earlier today, Bruce did not mention another  
(17) corrective action that we've undertaken that also  
(18) addresses the root causes here and will be  
(19) additional effort, and that is our structured  
(20) operator work around the identification and  
(21) resolution process. Clearly, this in a sense was an  
(22) operator workaround, and today we have a process  
(23) that identifies those, keeping them current and  
(24) tracking the resolution of them, and that process is  
(25) achieving results.

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(1) Secondly, in terms of results, Bruce did  
(2) mention in a corrective action our event-free  
(3) operations program. I'd like to stress again that a  
(4) key part that applies to the whole plant is enhanced  
(5) use of what we call our precursor system, which is  
(6) that if anybody sees anything wrong or they're  
(7) worried about it, write it down and tell us. In  
(8) 1994 we had the program in place, but it was not  
(9) well implemented, as pointed out to us by IMPO.

(10) A case in point. In all of '94 we only  
(11) had 400 precursor cards. In 1995 we had over  
(12) 3,000. We now have implemented that. I think the  
(13) operators, the shift supervisors would have written  
(14) a precursor card that they're having difficulty, and  
(15) the way the precursor program works, there's a  
(16) little green card that anybody can fill out.  
(17) They're provided to the shift manager immediately,  
(18) the nuclear shift manager, around the clock. All  
(19) the ones that came in in the previous 24 hours are  
(20) discussed at 8:30 with the plant manager and other  
(21) managers and are immediately sent out for  
(22) disposition, and those that are significant are  
(23) turned in as quality reports. That's another result  
(24) I'd like to point out.

(25) **MR. HICKLE:** This last slide just shows

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(1) the safety significance of these nine evolutions. I  
(2) mentioned earlier, with respect to the first  
(3) violation, that the safety consequence was low.  
(4) These are the reasons we believe this. Only one  
(5) train of HPI would be affected, and our tech specs  
(6) allow an outage time of 72 hours per each train.  
(7) The time in violation of curve was short relative to  
(8) the allowed outage time. No other technical  
(9) specification actions were in effect at the time,  
(10) and the curve was a design basis limit only for a  
(11) single accident scenario that had a core damage  
(12) frequency of 3.5 times ten to the minus eight per  
(13) year.

(14) The last thing I want to discuss, and I  
(15) think we've picked up quite a few of the points that  
(16) I wanted to make, so I'll go over those briefly, are  
(17) the three management concerns expressed in the  
(18) inspection report.

(19) **MR. BEARD:** Actually, in the March 8  
(20) letter which followed the inspection report which  
(21) set up this conference.

(22) **MR. HICKLE:** So we know what those are.  
(23) The first one was that inadequate management  
(24) oversight allowed recurrent challenges to and  
(25) violations of operating curves that were intended to

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[1] ensure that design basis limits were not exceeded.  
[2] Well, we agree. However, we do think that when we  
[3] discuss management oversight that there's many  
[4] elements of that, and all of those we don't believe  
[5] were inadequate, but we do feel that some were  
[6] deficient, and let me show you what those are.  
[7] First, providing written guidance  
[8] establishes management expectations and standards.  
[9] While we did make some changes for added defense in  
[10] depth, overall we feel that this area of oversight  
[11] was adequate. Communicating operating standards,  
[12] including training on these, is a management  
[13] oversight function, and that area we think we were  
[14] deficient in some areas, especially with respect to  
[15] the way that we communicated our expectations for  
[16] procedure use.  
[17] Now, since that time I mentioned we've  
[18] got a new procedure use procedure which we're using  
[19] as a tool to communicate these standards, but also  
[20] our event-free operations program has gone a long  
[21] way to put procedure compliance into the context of  
[22] our need to improve overall human performance at the  
[23] plant, and we know that that expectation is clearly  
[24] communicated and understood by our personnel,  
[25] including our operators.

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[1] Establishing processes to identify  
[2] deviations from standards. In this case we think we  
[3] were deficient. Pat just talked about our precursor  
[4] system. Right now during our outage we're receiving  
[5] around 50 precursor cards a day, and quite a few of  
[6] these have been identified by operators and by shift  
[7] supervisors. We're getting extremely good usage,  
[8] and we're learning a lot about problems at a very,  
[9] very low level, and from this information we're able  
[10] to do trending and develop understandings of areas  
[11] that need additional management oversight.  
[12] Observing and self-assessing to ensure  
[13] that standards are met. In that area I already said  
[14] I think we were somewhat deficient, and I mentioned  
[15] that we've established a new management position to  
[16] help assure that there's a greater degree of  
[17] oversight of control room activities. Also, I  
[18] mentioned that we've got a precursor system, and we  
[19] also have established a formal self-assessment  
[20] process, which is done by management and by senior  
[21] management which looks not only at our precursor  
[22] information but at all of the feedback that we get  
[23] from QA reports, from inspection reports and any  
[24] other source to try to understand what areas need  
[25] additional management attention, what areas may be

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[1] emerging as potential problems. Following up on  
[2] deviations from standards, including intervention,  
[3] was necessary. That is a management oversight  
[4] function, and we think we've done an adequate job in  
[5] that area. In summary, we think two, three and four  
[6] were deficient. We think one and five was  
[7] adequate.  
[8] The next concern was that management did  
[9] not provide adequate guidance on the use of routine  
[10] procedures for non-routine evolutions, a focused  
[11] issue, and we disagree. We think that the  
[12] procedures that were in place were adequate for the  
[13] training and experience of our operators. Now we  
[14] have strengthened our procedures to provide defense  
[15] in depth. This is the point where I want to explain  
[16] to you how the decision should have been made on  
[17] September 4th and 5th, 1994 on the midnight shift.  
[18] First of all, an operating crew  
[19] determines a desire to perform an evolution of some  
[20] kind. They get the idea. The next step is to  
[21] decide how they're going to go about that, to find  
[22] the nature of the evolution, how are we going to do  
[23] it. They did that. They then determine the  
[24] procedural adequacy, and this is back in 1994 using  
[25] AI-500, which is our conduct of operations

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[1] procedure.  
[2] If that procedure had been consulted, it  
[3] would have referred our crew to AI-400S, description  
[4] and general administration of plant procedures. In  
[5] consulting that procedure, they would have gone  
[6] through a logic matrix and they would have  
[7] determined that a written procedure was required for  
[8] the test. The next step, now that they know they  
[9] need a written procedure, is to determine whether or  
[10] not they need a new procedure or if the existing  
[11] operating procedure provides sufficient coverage.  
[12] Now, in answer to that question, they had  
[13] five opportunities with our existing procedure  
[14] guidance to come to the correct conclusion. First,  
[15] they could have reviewed Operating Procedure 402,  
[16] the operation of the make-up and purification  
[17] system, and they would have determined that the OP  
[18] does not allow operation in the unacceptable region  
[19] of the curve. Remember, in both evolutions the  
[20] first step was to add hydrogen, to pressurize the  
[21] make-up tank, and that put them in alarm condition  
[22] for both evolutions. That specific step in the  
[23] operating procedure refers operators to Curve  
[24] OP-103B.  
[25] They also could have consulted AI-400B,

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(1) which is originating new procedures, and determine  
(2) that a new procedure was required for a test or an  
(3) unusual evolution. They would have gone through a  
(4) matrix and they would have determined this was a  
(5) test or an unusual evolution. If they didn't  
(6) consult either of these, they could have consulted  
(7) AI-400A and determined that the interpretation  
(8) contact must resolve questions regarding intent,  
(9) content and clarifications.

(10) They had a discussion about the intent of  
(11) the operating procedure, they deliberated and made  
(12) the conclusion, an incorrect conclusion, that their  
(13) OP covered their test. The authority when intent  
(14) questions are asked rests with the interpretation  
(15) contact, who was really functioning as Greg's  
(16) backup, as our assistant operations manager. They  
(17) could have consult the NCD-11, which is a nuclear  
(18) operations directive. Those are the highest tiered  
(19) procedures that we have in nuclear operations,  
(20) preparation of safety, regulatory, environmental and  
(21) compliance reviews, and from that they would have  
(22) determined that a 50.59 evaluation was required.

(23) They also could have simply exhibited a  
(24) questioning attitude which was discussed in AI-500,  
(25) and AI-500 would have directed them to get some help

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(1) to make the decision. So that's why we disagree.  
(2) There were at least five opportunities that night to  
(3) make the correct decision.

(4) **MR. BEARD:** The details of that flow path  
(5) are in the back which we will give you with each  
(6) element outlined so you can clearly see the flow  
(7) path. He was determined to go through every single  
(8) step, and we said no, we can make our point.

(9) **MR. EBNETER:** Were these operators and  
(10) shift supervisors trained in all these procedures?

(11) **MR. HICKLE:** Yes, they were trained to  
(12) use the procedures, the AI-500 and AI-400  
(13) procedures.

(14) **MR. LIEBERMAN:** Nevertheless, at least  
(15) two shift supervisors thought this would be okay to  
(16) do it that way.

(17) **MR. BEARD:** I think we said as a root  
(18) cause management was not successful in reviewing the  
(19) adherence to procedures and questioning attitude.  
(20) Our point is the procedures were adequate. We've  
(21) already said that as a management oversight our  
(22) ability to have them use those consistently was  
(23) inadequate. That's not an issue with us.

(24) **MR. HICKLE:** The next concern, other  
(25) procedure guidance was lacking, such as guidelines

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(1) for operator response to alarms, procedural  
(2) precautions regarding adherence to operating  
(3) parameters contained in administrative curves, and  
(4) the responsibilities and limitations of the shift  
(5) supervisors.

(6) For each of these, guidelines for  
(7) operator response to alarms, we agree. Although  
(8) operators are expected to address alarms promptly,  
(9) and that's routinely reinforced in the simulator,  
(10) the procedure guidance needed to be strengthened.  
(11) Our procedures didn't specifically address prompt  
(12) thinking in responding to alarms, and AI-500 has  
(13) been revised to address that. Also, we revised the  
(14) annunciator response procedure to require immediate  
(15) response to a make-up tank alarm.

(16) Procedural precautions regarding  
(17) adherence to operating parameters contained in  
(18) administrative curves, we disagree. We believe that  
(19) OP-402 provided adequate guidance regarding  
(20) adherence to the make-up tank curve. Remembering  
(21) when you challenge the curve is when you add  
(22) hydrogen, and that step specifically called out  
(23) OP-103B, Curve 8. The make-up tank, I mentioned  
(24) that. Additional reference to the make-up tank  
(25) curve was added to the limit of precaution to OP-402

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(1) for defense in depth.

(2) The responsibilities and limitations of  
(3) shift supervisors, we don't agree that that's a  
(4) weakness. The responsibilities, we feel, were  
(5) clearly defined in AI-500 at the time, and in your  
(6) package you've got those highlighted so you can look  
(7) at that if you're interested. Again, though, we  
(8) have added additional guidance. I talked about that  
(9) earlier, and it has to do with the CAPS philosophy.

(10) I want to remark on the responsibilities  
(11) and limitations of shift supervisors. After the two  
(12) tests were performed on the 4th and 5th and before  
(13) our other crews knew about them, I specifically  
(14) talked to, that I recall, at least two shift  
(15) supervisors and presented a similar scenario to them  
(16) and asked them what their decision would be with  
(17) respect to use of procedures. I was assured in both  
(18) instances that that evolution would not be performed  
(19) without a test procedure, and they considered it to  
(20) be an unusual evolution.

(21) Now, subsequently we've talked to other  
(22) shifts, and other shifts have given us feedback that  
(23) they would not have violated our operating curve,  
(24) but that's after the fact. That's after the  
(25) information about the evolution was disclosed.



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[1] **MR. GIBSON:** Meaning they would have  
[2] conducted the test so long as it did not violate the  
[3] curve?  
[4] **MR. HICKLE:** That isn't what they said.  
[5] **MR. BEARD:** I don't know if we asked them  
[6] that question. You just said in two cases where you  
[7] talked to shift supervisors they said they would not  
[8] have conducted the test.  
[9] **MR. HICKLE:** I only talked to two  
[10] personally.  
[11] **MR. GIBSON:** I was only trying to  
[12] understand what you said. I wasn't trying to expand  
[13] on it.  
[14] **MR. BEARD:** Are we ready for Paul to talk  
[15] about the next violation? I want to get back to one  
[16] point as we're waiting for Mr. Tanguay.  
[17] There was management oversight. That's a  
[18] term that we use ourselves often. The NRC uses that  
[19] term, and when we received your March 8 letter,  
[20] although we had already been thinking of that from  
[21] the earlier inspection reports, I guess this is a  
[22] case where the regulatory process works, contrary to  
[23] what the Time Magazine article may say, that caused  
[24] us to really say what is management oversight, what  
[25] does it consist of.

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[1] We've determined that there were five  
[2] elements starting with the top, and that's  
[3] management expressing the standards and expectations  
[4] through written guidance. That was very helpful to  
[5] our understanding of what it was, and that's  
[6] something that we're going to carry forward with us  
[7] in the future. It really clarified our thinking on  
[8] what elements were deficient and which weren't, and  
[9] I think that's something that will be of  
[10] considerable benefit to us going forward.  
[11] **MR. GIBSON:** That's good. I'd like to  
[12] share with you some of the thought that went into  
[13] that phrase in that letter, and that was that we  
[14] felt you should have known about the problems that  
[15] were occurring on shift. The fact that your  
[16] objective for meeting the chemistry standard was  
[17] causing a real hardship on the crews and was  
[18] resulting in some cases in a procedure being  
[19] violated and that this continued over some period of  
[20] time without your knowledge, that was one of the  
[21] reasons that we felt that there was a management  
[22] oversight condition.  
[23] **MR. BEARD:** That stimulus to further our  
[24] examination of what management oversight is and what  
[25] we did or didn't do was very helpful.

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[1] **MR. TANGUAY:** As Pat indicated earlier,  
[2] I'll be talking about the third and fourth apparent  
[3] violations as well as the management issue as  
[4] identified in the March 8 letter.  
[5] The third apparent violation is three  
[6] examples where we had inadequate corrective actions,  
[7] specifically that corrective actions for engineering  
[8] calculations were not completed in a timely manner.  
[9] The first two examples related directly to the  
[10] calculation of the make-up tank curve, and that will  
[11] be the focus of my discussion here this afternoon.  
[12] I'd like to dispose of the third example,  
[13] if you would, and that was specific to corrective  
[14] actions for safety-related tanks were not completed  
[15] in a timely manner. I was personally involved in  
[16] the decisions associated with delaying the  
[17] corrective action associated with the tanks. At the  
[18] time that that issue came up I made conscious  
[19] decisions based upon the other competing factors I  
[20] had for workload within my organization, recognizing  
[21] the safety and significance of those issues, and  
[22] what we had seen in the few tanks that we had  
[23] evaluated we had other higher priority, more safety  
[24] significant issues, and I made a conscious decision  
[25] to push those out.

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[1] We did, however, list the tanks,  
[2] prioritize those tanks, and we have incorporated  
[3] that corrective action into the action plan that was  
[4] presented to NRC back in November as part of our set  
[5] point program, so it is ongoing on an integral part  
[6] of that.  
[7] One piece of that that was completed in  
[8] the past when we got into that effort, we hadn't  
[9] identified there was an issue involving  
[10] instrumentation accuracy that had to be  
[11] incorporated, and we had to go in and make sure we  
[12] had correct, for lack of a better term, mechanical  
[13] calculations which directly related to the  
[14] relationship of volume within the tank to the actual  
[15] level. Once we had that physical level, we would go  
[16] back and superimpose on it the instrumentation  
[17] piece. The mechanical-physical relationship has  
[18] been completed for all the tanks and now we're back  
[19] fitting in the instrumentation aspect of that.  
[20] In hindsight, we should have done a more  
[21] effective job in prioritizing getting on with those  
[22] activities. However, at that time we were also  
[23] looking to bring more work in-house. A lot of the  
[24] AEs were downsizing, and we previously had relied on  
[25] them quite heavily. The other conscious part of the



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[1] decision was to keep that knowledge base and insight  
[2] in-house and significantly enhance our working  
[3] knowledge of the plant going forward.  
[4] Root causes, there are several, as you  
[5] would imagine. The first root cause, the engineers  
[6] that were involved in developing the calculation did  
[7] not get the needed input from operations. They  
[8] weren't licensed, they weren't trained in the  
[9] physical operation of the plant and were neglectful  
[10] in going out and getting the required information  
[11] that they needed. Specific areas where they should  
[12] have obtained some additional information were in  
[13] the area of validating assumptions right up front in  
[14] the calculation and making sure that the assumptions  
[15] they were using in the development of the curve were  
[16] in fact consistent with the procedures and the way  
[17] the plant was operated. They did not do that.  
[18] They also did not go to operations and  
[19] ascertain the input that they would need to assure  
[20] that they did in fact represent a curve that the  
[21] operators could physically use and that we could put  
[22] out, as we already talked about, a design curve that  
[23] did not have an operating offset. Had they had that  
[24] interaction they would have identified that as a  
[25] need.

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[1] The second root cause in the area of  
[2] inadequate management is that we did not assure  
[3] operations input was in fact obtained. And  
[4] exacerbating that is that once we realized that that  
[5] was occurring we didn't step in and correct the  
[6] situation in a timely manner. I should have gotten  
[7] more personally involved, recognized that wasn't  
[8] occurring, and taken corrective actions to make sure  
[9] that that interaction was happening. In addition,  
[10] we did not address at that point in time the human  
[11] performance issues that were associated with the  
[12] specific individuals associated with developing the  
[13] calculation.  
[14] The third root cause was in the area of  
[15] the calculation process. There were weaknesses  
[16] within the body or within the process that existed  
[17] at the time. Specifically, verification of  
[18] assumptions and design inputs was not effective. We  
[19] did not go and actually verify that the inputs that  
[20] we were using for the calculation were appropriate.  
[21] Secondly, the method of verification was  
[22] inadequate. If you're familiar with the ANSI  
[23] standard, it indicates that there's essentially  
[24] three methods of verifying work, a review, an  
[25] alternate calculation, or by test. And in

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[1] hindsight, going back and doing a review, what I've  
[2] determined is that the bulk of our verifications are  
[3] accomplished by a cursory review, and therefore what  
[4] I've concluded is that the level of rigor applied to  
[5] the verification process is not where it needs to  
[6] be.  
[7] In this particular case the verification  
[8] was not commensurate with the safety and  
[9] significance of a given calculation. Contributing  
[10] to this, there was ineffective communication and  
[11] calculation between the design and system  
[12] engineers. Specifically, up front through the bulk  
[13] of the exchange and interaction with operations, say  
[14] from the June to September time frame, the bulk of  
[15] that interaction was between the system engineers  
[16] and operations, design engineering wasn't that  
[17] involved, and that was again exacerbated by the  
[18] physical separation, the design engineer working on  
[19] a calculation being located at St. Pete and the  
[20] system engineer being at the site and not really  
[21] being familiar with the design calculation itself.  
[22] A contributing factor on this third one  
[23] is the complexity of the make-up tank curve, which  
[24] was not well understood by anyone. There were a lot  
[25] of competing issues, as we've already talked about.

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[1] I don't want to dwell on this, but on the next slide  
[2] I just listed the issues just to show you that there  
[3] were many, many competing issues here. Every one of  
[4] them ultimately forced us into the situation where  
[5] we had this, and we had Appendix R and design  
[6] limitations on the tank and the balance of the  
[7] issues that unfolded unfortunately as we were  
[8] continuing to develop the calculations.  
[9] What did we do to address these issues?  
[10] The corrective actions we put in place. First, we  
[11] counseled the engineers, both the design engineer as  
[12] well as the individual performing the verification  
[13] process.  
[14] MR. BEARD: Paul, you pointed out that in  
[15] this case many of these were directly as a result of  
[16] this violation, but some were broader and already in  
[17] place that do reflect corrective action to address  
[18] the issue.  
[19] MR. EBNETER: Are these the engineers  
[20] that Lieberman asked about before?  
[21] MR. TANGUAY: These are design and  
[22] verification. He had asked about the system  
[23] engineers. We did counsel the design and  
[24] verification engineer, and the course of the  
[25] counseling was done by the supervisor and their

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(1) manager. The things covered within that counseling  
(2) session were the importance of interdepartmental  
(3) interaction and communication, making sure you've  
(4) got a quality product, the importance of the  
(5) verification process and reiteration of an  
(6) expectation letter that I had put out months before  
(7) talking about the importance of verification and the  
(8) fact that the verification engineer was as  
(9) responsible for the accuracy and adequacy of design  
(10) as was the design engineer. They shared that; it  
(11) wasn't something that was passed along.

(12) **MR. LIEBERMAN:** Paul, in your system what  
(13) does counseling mean?

(14) **MR. TANGUAY:** It was a form of discipline  
(15) where the supervisor and manager and I also talked  
(16) to them, sat down and talked through these issues.  
(17) There is a document within our departmental files,  
(18) not in the performance, because this was the first  
(19) step of a progressive discipline activity where you  
(20) talk to the individuals. Also, if you go back to  
(21) the two individuals' performance appraisal that was  
(22) just completed you will see that reflected in there  
(23) in the performance appraisal.

(24) The calculation process now includes  
(25) operations and system engineer sign-off of design

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(1) engineering calculations. Back when the initial  
(2) calculations were done that wasn't there. It was  
(3) left to the discretion of the individual design  
(4) engineer whether or not he went out and solicited  
(5) input from the other organizations, and in direct  
(6) response to this specific issue we have incorporated  
(7) that as an in-line function.

(8) When a calculation is being done, the  
(9) design engineer's required to sit down with the  
(10) system engineer and a representative from operations  
(11) and determine what the design inputs would be and  
(12) what the appropriate assumptions are. Then there is  
(13) a physical signature within the body of the  
(14) calculations. Then, at the tail end, once the  
(15) calculation is done prior to being finally issued,  
(16) again they sit down with the operations  
(17) representative and the system engineer and review  
(18) the results of the calculation, the product of it,  
(19) what it means, and the intent here is to make sure  
(20) that operations clearly understands what the bases  
(21) of the calculation is and whether or not it has any  
(22) impact on anything in the operations organization,  
(23) i.e. procedure revisions required, human factors,  
(24) those types of things.

(25) We relocated the design engineering

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(1) organization entirely to the site. That includes  
(2) myself. I was previously with the balance of the  
(3) design organization located in St. Pete. We're now  
(4) physically at the site and have been since June of  
(5) last year. The design engineering review board was  
(6) formed, and what this is is one of our senior staff  
(7) engineers leads a multi-disciplined technical review  
(8) of all calculations before they're issued. They  
(9) challenge the design engineer on the issues within  
(10) the body of the calculation, again trying to ensure  
(11) technical accuracy and adequacy. We also use  
(12) feedback into this, lessons learned.

(13) As we go through the process and collect  
(14) precursor cards to identify issues, deficiencies or  
(15) problems that we see within the engineering  
(16) organization, we feed them back to the chair person  
(17) of the design and engineering review board and say,  
(18) "These are problems or issues we've seen in the  
(19) past, you need to add to your repertoire of  
(20) questions as you go forward and begin the challenge  
(21) as you look through the issues to make sure we don't  
(22) repeat them."

(23) As Pat indicated earlier, we've also now  
(24) assigned important issues as management focused  
(25) items, which results in the identification of an

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(1) issue manager, and we did that in this specific case  
(2) once we got into the overall issue and realized how  
(3) complex it is. We recognized Gary Becker, the  
(4) former design engineer of the organization who  
(5) received his license and was now the issue manager  
(6) in this activity. Based upon his involvement, the  
(7) scope and the complexity was further clarified, and  
(8) we made sure we had a lot of the issues identified  
(9) right up front and addressed from both perspectives,  
(10) and he was able to bring both perspectives to the  
(11) table.

(12) We also implemented a third party review  
(13) of calculations. In this particular case, we had  
(14) both Gilbert and MPR perform a review on those  
(15) calculations. In both cases they did actual  
(16) independent calculations. They didn't just take  
(17) ours and review it. We gave them all the inputs and  
(18) assumptions and the scenario. MPR did a manual  
(19) calculation, as we did, Gilbert did a computer based  
(20) calculation, which is also modeled via computer, so  
(21) the level of rigor was there, and in both cases the  
(22) results of their efforts pretty much paralleled  
(23) ours. In fact, I believe in both cases, from what  
(24) we can see, our curves were conservative by  
(25) approximately half a pound. When I say our curve,

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(1) that's the curve we're currently operating to, the  
(2) last curve.

(3) We also have implemented the event-free  
(4) operation program to assist us in identifying issues  
(5) affecting our engineering performance in our area so  
(6) we can track and trend them. Engineering management  
(7) now attends operations turnover meetings on a daily  
(8) basis. We implemented this a few months ago in an  
(9) effort to improve interaction between the operations  
(10) organization. It gives them an opportunity to  
(11) identify issues to us so we can get more prompt  
(12) response and turnaround on those issues, and it's a  
(13) rotating basis, one week at a time, and I will be on  
(14) it next week. It includes myself, my managers and  
(15) all my supervisors on a rotating basis.

(16) **MR. MERSCHOFF:** Paul, before you leave  
(17) that, engineering in this case failed to prevent  
(18) this from occurring. They had an opportunity in May  
(19) that wasn't acted on. If this happened again today  
(20) and you had that May of '94 PR from the cavitation  
(21) incident, what would have stopped or resulted in  
(22) early resolution?

(23) **MR. TANGUAY:** The fact that we physically  
(24) have the design organization right on site working  
(25) more closely with the system engineering

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(1) organization. When we receive Problem Report  
(2) 94-149, that was predominantly reviewed by the  
(3) system engineer. That was their primary  
(4) interaction. The design engineer, although they had  
(5) a piece of that, it wasn't a significant piece. In  
(6) today's environment, with everybody on site, I  
(7) believe you would see closer interaction. In  
(8) addition to that, at that point in time the system  
(9) engineering organization and design engineering  
(10) organization were split. The system engineers and  
(11) design engineers did not report to the same person.  
(12) Today they both report to me.

(13) **MR. MERSCHOFF:** So the September letter  
(14) that said the curve was conservative had no input  
(15) from design engineers?

(16) **MR. TANGUAY:** They had some, but the bulk  
(17) was design engineering.

(18) **MR. GIBSON:** Were the calculations  
(19) reviewed by system engineering or design engineering  
(20) as a basis for the September letter?

(21) **MR. TANGUAY:** Yes.

(22) **MR. GIBSON:** Because, as I understand it,  
(23) the calculations had a statement in there that in  
(24) effect they had expired and were no longer  
(25) effective, that they were good only through

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(1) refueling number eight. It wasn't clear to me that  
(2) engineering had even looked at them.

(3) **MR. TANGUAY:** You said were the curves  
(4) reviewed?

(5) **MR. GIBSON:** The curves and calculations  
(6) that support the curves.

(7) **MR. TANGUAY:** The calculations were  
(8) reviewed, and that was clearly in the letter.

(9) **MR. GIBSON:** I knew the letter said it,  
(10) but I just wanted to confirm that the engineer had  
(11) reviewed the calculation.

(12) **MR. TANGUAY:** Yes.

(13) I believe on the results, I've already  
(14) covered several of these as part of going over the  
(15) corrective actions. One of the things we have seen  
(16) is that the in-line reviews of the calculations have  
(17) identified discrepancies prior to calculations being  
(18) issued. As an ongoing process and based upon the  
(19) precursor cards that we see looking at the design  
(20) review board, we are collecting data that  
(21) demonstrates we are catching issues before the  
(22) calculations are being issued, so that's a clear  
(23) indication to me that the processes appear to be  
(24) working. As I indicated, we're tracking and  
(25) trending that information as a part of the operation

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(1) program precursors and using that as input, and  
(2) we'll continue to make changes as we continue to  
(3) find them to be appropriate.

(4) The fourth apparent violation, there were  
(5) four examples of our failure to implement effective  
(6) controls to assure that the design basis is  
(7) correctly translated into operating procedures. The  
(8) first three examples that are noted are directly  
(9) related to the development of the make-up tank  
(10) curve, and again, that will be the focus of my  
(11) discussion here this afternoon. The last is the  
(12) fire service tank volume which we have talked about  
(13) earlier. I'd rather not dwell on that at this  
(14) point.

(15) Root causes. These will be addressed, as  
(16) I indicated, with respect to the make-up tank issue,  
(17) and even though they're specific to the make-up  
(18) tank, they do in fact have a much broader  
(19) application. Essentially they apply to just about  
(20) everything we do within our organization. At the  
(21) time there was a generic lack of operation's  
(22) involvement in the calculation development process.  
(23) As I indicated before, it was left up to the  
(24) individual, the design engineer, whether or not she  
(25) or he solicited the appropriate input. In concert



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[1] with that, there was inadequate engineering  
[2] involvement in operating procedure revisions.  
[3] At the point in time the operations  
[4] organization would make a procedure revision, it  
[5] would go to the system engineer, and they would do  
[6] the review. The design engineers were left out of  
[7] that process, they were not in line. One of the  
[8] things we do now is an in-line review for both  
[9] system and design. By doing this process where  
[10] operations is now involved with the calculation,  
[11] engineers are now involved with procedures, and we  
[12] now look forward to having consistency between the  
[13] way the plant is operated and the way it's designed,  
[14] alleviating that issue.  
[15] There was ineffective communication  
[16] between engineers and operations. We did not  
[17] communicate to them adequately that the curve in  
[18] fact was a design limit. The engineer, as we  
[19] indicated, knew that at that point in time. Also,  
[20] we did not communicate to them that it was not a  
[21] dynamic response and what we would expect to see in  
[22] the tank itself, and the ineffective communication  
[23] was once again exacerbated by the physical  
[24] difference in location of the respective  
[25] organizations.

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[1] In addition, management did not assure  
[2] that the calculation and operating procedure  
[3] processes included interdepartmental reviews. I  
[4] indicated there were deficiencies in both areas. We  
[5] were remiss in making sure that they did in fact  
[6] include that and catch that.  
[7] (A recess was taken.)  
[8] MR. GIBSON: Pat, where are we?  
[9] MR. BEARD: Mr. Tanguay is about to -  
[10] MR. TANGUAY: The corrective actions.  
[11] MR. BEARD: We've gone through the root  
[12] cause for the fourth apparent violation and we're in  
[13] corrective actions.  
[14] I'd like to make sure on the record that  
[15] we're clear with regard to one of Mr. Lieberman's  
[16] last questions of Mr. Tanguay because we're worried  
[17] about that and we want to be entirely correct. I  
[18] believe the question that we want to make clear was  
[19] that you asked Paul, and this is my synopsis of your  
[20] question, if between May the 5th, SP-630 and  
[21] September 4th did engineering review the  
[22] calculation. I think that was your question.  
[23] MR. GIBSON: I think I asked that  
[24] question.  
[25] MR. BEARD: Was that your question?

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[1] MR. GIBSON: Well, my question was that  
[2] the September 2nd memorandum said in effect that the  
[3] curve in the calculations had been reviewed and was  
[4] correct.  
[5] MR. BEARD: Yes.  
[6] MR. GIBSON: And my question was were the  
[7] calculations actually reviewed by an engineer as a  
[8] basis for that response.  
[9] MR. BEARD: Because there's a difference  
[10] between did engineering review the calculations and  
[11] did engineering do a rigorous look at the bases for  
[12] it and all that sort of thing. Mr. Tanguay answered  
[13] yes.  
[14] Now, what we thought your question was,  
[15] and let me clarify it, is was the calculation  
[16] reviewed in a broad sense. And the answer is yes,  
[17] we went back and looked at Problem Report 149 and  
[18] Mr. Hinman's attachment to that, attachment two,  
[19] where that specific corrective action was closed out  
[20] on June 14th, 1994. In that sense, yes, he reviewed  
[21] it. Did design engineering and/or Mr. Hinman do a  
[22] rigorous review of the bases for the calculation,  
[23] the assumptions and all of that? The answer is no.  
[24] That's an example of the weakness in our process  
[25] that we recognize, in the process for not only doing

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[1] the calculations initially, the detailed  
[2] calculations, but a review of it.  
[3] MR. GIBSON: Okay.  
[4] MR. BEARD: I don't want there to be any  
[5] misunderstanding about what we said.  
[6] MR. TANGUAY: What did we do to address  
[7] the root causes that were just identified. Several  
[8] of these I've already talked about as a result of  
[9] the previous violations so I won't go back and  
[10] reiterate those. But with respect to the specific  
[11] item that indicates both design and system  
[12] engineering review operating procedure revisions,  
[13] again, the intent there was to assure that the  
[14] operators understood the design basis of the plant  
[15] in that the procedures did in fact reflect the  
[16] calculation.  
[17] To enhance that understanding,  
[18] engineering personnel provided training to the  
[19] operators as part of their last requal cycle, I  
[20] believe, on the design basis of the plant. We  
[21] physically developed a one and a half to two hour  
[22] session, took our design basis documents in and  
[23] explained to them what the content was, how to use  
[24] them and what they meant, so we attempted at that  
[25] point in time to enhance their understanding of the



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(1) design bases of the plant.

(2) We established an operations contact for  
(3) technical issues. Bruce had talked about that in  
(4) his presentation. That was Gary Hebb, a former  
(5) shift supervisor. He has been interacting with us  
(6) on numerous technical issues and providing some  
(7) excellent input so that we can get some consistency  
(8) in the operations organization on issues that we  
(9) need to address.

(10) Management structure and interfaces were  
(11) strengthened, and I'd mentioned this before, that  
(12) now both design and system engineering organizations  
(13) are under myself and that we're all physically  
(14) located at the site, and those activities go  
(15) directly to support and enhance improved support of  
(16) the operating organization.

(17) Results that we've achieved. The new  
(18) processes are in place and are working. Operations  
(19) is directly involved in the calculation process and,  
(20) as a result of this, there is an enhanced  
(21) understanding on their part of the design bases, and  
(22) the calculations that we issue are consistent with  
(23) the way the plant is operated. We have the design  
(24) and the system engineers directly involved in the  
(25) operating procedure preparation, and I'd like to

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(1) clarify here under operating procedure.

(2) We don't directly get involved in a  
(3) day-to-day operating procedure review. What we're  
(4) focusing on here, because of the significance of it,  
(5) are the EOPs and the APs. Those are the critical  
(6) ones where we've seen some issues. We have made  
(7) changes to the calculation and operating review  
(8) process, and they have resulted in additional issues  
(9) and discrepancies being identified.

(10) Any corrective action program that you  
(11) take, particularly in this area, you're looking for  
(12) a couple of things. One is to preclude continuation  
(13) of the problems that you've seen to date, and then  
(14) also there's a need to have a system that enables  
(15) you to identify issues that exist as sins of the  
(16) past, if you will.

(17) The second item I have here is  
(18) essentially a mechanism where we're going back and  
(19) identifying sins of the past as a result of the  
(20) implementation of the processes. And particularly  
(21) in those two areas, the set point and EOP review  
(22) program, we are identifying issues as a result of  
(23) the intercommunication or interaction between the  
(24) operations and engineering organization, and those  
(25) you're very well familiar with by the number of LERs

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(1) and design basis issues that we have in fact been  
(2) identifying.

(3) **MR. MERSCHOFF:** While you're on sins of  
(4) the past, you told us earlier that you didn't have  
(5) an integrated plan to assure that design basis  
(6) curves are not being used currently to operate the  
(7) plant. That's a sin of the past.

(8) **MR. TANGUAY:** Correct.

(9) **MR. MERSCHOFF:** When will you have such a  
(10) plan, or is that part of the corrective action for  
(11) the violation?

(12) **MR. TANGUAY:** I don't have that  
(13) specifically identified here. Again, we were going  
(14) back to what Bruce had indicated where ops had gone  
(15) back, reviewed what they had in the 103-B procedure,  
(16) and they did not have any where we appeared to be  
(17) operating right up against there. What we're trying  
(18) to do now is focus on the EOPs and set point  
(19) programs, which are of a higher level of importance  
(20) and safety significance, and then my intent is to  
(21) develop a program to go back in a more structured  
(22) manner and look at the others.

(23) **MR. EBNETER:** And that was my  
(24) understanding of the previous comments, that all of  
(25) the curves are in 103-B and that you had reviewed

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(1) that and were satisfied that there were no design  
(2) basis curves being inappropriately used at this  
(3) point.

(4) **MR. HICKLE:** What I intended to say is I  
(5) was satisfied that there were no occasions where we  
(6) were challenging curves.

(7) **MR. EBNETER:** Maybe that's what you did  
(8) say.

(9) **MR. HICKLE:** It didn't appear that the  
(10) curves were design basis, but we really needed  
(11) engineering to tell us that for sure.

(12) **MR. BEARD:** I think you're well aware of  
(13) what we're into with our enhanced awareness of  
(14) design basis translation into EOPs. And yes, Al,  
(15) when I told you whenever it was that the EOP's okay,  
(16) well, I was wrong. We didn't do that properly and  
(17) we're doing that properly now. We've also got the  
(18) set points. We're doing everything we can right  
(19) now. You cannot address every particular design  
(20) basis issue at once, as we found out, and I think  
(21) you well know that on more than one occasion we've  
(22) bitten off more than we can chew in the time frame  
(23) we told you.

(24) Paul said our process is to get around to  
(25) doing all the curves to find out if they're design

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[1] basis. It's our plan to do that, not just his, and  
[2] we can't do everything at once and we haven't.  
[3] Right now we're focusing on set points, EOPs, tank  
[4] calculations, as well as a number of other things.  
[5] We've assured ourselves that none of the other  
[6] operating curves are even close to being challenged,  
[7] whether they're design basis or not, and they won't  
[8] be. When we can fit it into our resources and  
[9] priorities, we will look at all of those curves from  
[10] the part of the design curve and what is the basis  
[11] for the curve.

[12] **MR. TANGUAY:** Continuing on the results,  
[13] We're continuing to use, as I indicated earlier,  
[14] performance indicators, particularly precursors, to  
[15] monitor our improvements and the effectiveness of  
[16] our corrective actions, and we'll continue to do  
[17] so. As a result of the implementation of the  
[18] focused item issue manager concept, the progress  
[19] that we see in addressing these issues are reviewed  
[20] on a periodic basis and are statused monthly for  
[21] Pat's senior staff.

[22] As an additional item here, last week we  
[23] had an inspection, and to show that we feel some of  
[24] these activities are in fact taking hold, we were  
[25] looking at the set point program as a follow-up

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[1] inspection, and he gave us some excellent accolades  
[2] about the quality of the product we're putting out  
[3] in that arena. When we came back the previous time  
[4] he said he saw two typos in a 140 or 150 page  
[5] calculation and this time he couldn't find typos,  
[6] and we feel that's a direct result of the rigor  
[7] we're putting in these calculations and the process  
[8] going forward.

[9] All of these things we're talking about  
[10] today are playing a role in the development of  
[11] those. We feel that if these activities and actions  
[12] were in fact in place at the time these other events  
[13] were unfolding we would have identified those issues  
[14] and we wouldn't be here today talking about these  
[15] things.

[16] Next I'd like to talk about the fourth  
[17] item from your NRC March 8th letter, and this one  
[18] specifically addressed the fact that management did  
[19] not work effectively with the engineering and  
[20] operations staff to resolve a longstanding operator  
[21] concern. As we've indicated before, we agree with  
[22] that statement, and throughout the discussions here  
[23] today we've been presenting information that  
[24] supports those. Within that statement I've taken  
[25] the liberty to underline "effectively", because I

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[1] think that's the critical element here. We have  
[2] been working with the operations organization.  
[3] There was significant management  
[4] involvement during the months prior to the September  
[5] 5th test, specifically in response to Problem Report  
[6] 149 addressing the HPI flow test and operations  
[7] management. Specifically, Bruce Hickie, Greg Halnon  
[8] and other members of the engineering organization  
[9] got together on numerous occasions to assure that  
[10] there was interaction between the engineering and  
[11] operations organization on these issues.

[12] Engineering promptly addressed the issues  
[13] and concerns that were identified by the problem  
[14] report, specifically the cavitation that was  
[15] recognized or realized during the test. We were  
[16] able to prove at that point in time, based upon our  
[17] evaluation, prove and demonstrate that it was not  
[18] hydrogen entrainment, that it was in fact air  
[19] entrainment in the line because we had previously  
[20] performed maintenance and had not adequately vented  
[21] the piping out.

[22] As soon as we recognized that we vented  
[23] the system off, reran the test and did not see a  
[24] repeat, so we felt that we were very prompt in  
[25] addressing that at that point in time. There were

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[1] also follow-up meetings to specifically address the  
[2] adequacy of the corrective action plan developed as  
[3] a result of that specific problem report.

[4] Management involvement continued. There  
[5] were again interdepartmental meetings, and they had  
[6] several objectives, one of which was to review  
[7] options to reduce operator burden. We were focused  
[8] on trying to reduce the operator burden we've talked  
[9] about here today. We were looking at and had  
[10] implemented several changes for the operators to  
[11] enhance their ability to maintain hydrogen  
[12] concentration where it needed to be.

[13] Another objective here also was to obtain  
[14] comments on the concerns regarding Curve 8. The  
[15] operators were specifically asked for any comments  
[16] relating to the September 2nd letter and the issues  
[17] as they unfolded as a result of PR 149.

[18] **MR. LANDIS:** Paul, did you say you did  
[19] implement something to reduce the operator burden?

[20] **MR. TANGUAY:** Throughout this evolution,  
[21] as we realized there was a burden, we had taken some  
[22] actions. We had gone in and we had raised the set  
[23] point on the hydrogen regulator. If you give them a  
[24] higher pressure they can get the hydrogen in and  
[25] maintain a higher pressure and make it easier. We

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(1) modified the valves within the hydrogen upstream of  
(2) the regulator again trying to reduce the pressure  
(3) drop within that line which enabled them to get  
(4) hydrogen in quicker. We were trying to do what we  
(5) could on-line in a relatively short period of time  
(6) to address those issues. We weren't insensitive to  
(7) it, but there were some things that Bruce had talked  
(8) to earlier which were longer term and needed to be  
(9) addressed at that scope.

(10) **MR. LIEBERMAN:** You just mentioned the  
(11) September 2nd letter. Maybe you should repeat what  
(12) you said concerning the -

(13) **MR. TANGUAY:** Management was looking to  
(14) find out what additional concerns the operators had,  
(15) so they asked them, "What other concerns do you have  
(16) regarding Curve 8." And my understanding is, in  
(17) response to that, that there was one item  
(18) identified, and that was a request to rerun SP-630,  
(19) which is the full flow HPI flow test, and based upon  
(20) that we agreed we would in fact do that, and it was  
(21) a commitment to do it that we're in right now, and  
(22) it will be run this outage.

(23) **MR. BEARD:** I'd like to read this into  
(24) the record. This is documented evidence of  
(25) management involvement. It's from Mr. Halnon to the

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(1) operators. I think this is in the material.

(2) **MR. HALNON:** This is not in response to  
(3) the September 2nd memo, which was your question.  
(4) The September 2nd memo came out after what Pat's  
(5) about to read to you. Paul had got his timeline  
(6) messed up a little bit.

(7) **MR. BEARD:** This is in the material I'm  
(8) going to leave you. This is dated August 9, 1994.  
(9) There is an ongoing discussion on the issue of  
(10) hydrogen pressure in the make-up tank. I have  
(11) talked with Mark van Sicklen and understand the  
(12) concerns. I discussed this with Bruce and Jerry  
(13) Campbell, and will be working on resolving the  
(14) questions. It is important and Bruce has asked if  
(15) anyone has a concern to please write it down and  
(16) send it to me. Even if it is not new I need to get  
(17) all perspectives of this issue so we can address the  
(18) right areas. It appears what has been addressed has  
(19) not satisfied the concerns to date, and I need to be  
(20) absolutely clear on the questions.

(21) **MR. LIEBERMAN:** Was there any response to  
(22) that?

(23) **MR. BEARD:** There was one.

(24) **MR. HALNON:** I got one response that said  
(25) running SP-630 would be an inappropriate thing to

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(1) close it out. That was from Gary.

(2) **MR. LIEBERMAN:** So when the September 2nd  
(3) letter was provided, what was the communication  
(4) associated with the September 2nd letter to the  
(5) operators?

(6) **MR. HALNON:** I had just promoted another  
(7) assistant to myself and gave him the memo, and he  
(8) wrote on it on the top of the memo "draft  
(9) recommendation" and a note on it saying, "Write  
(10) comments to G. Halnon", and he placed that into the  
(11) shift supervisor's in box. Then that crew came in  
(12) that night that he did that and saw that. That's  
(13) the only correspondence we can find.

(14) **MR. GIBSON:** He did not personally hand  
(15) it to that crew and did not have any personal  
(16) discussion with them?

(17) **MR. HALNON:** To the best of our  
(18) knowledge, no, because the crew was on midnights,  
(19) and Carl was the one we're talking about. He didn't  
(20) stay there until eleven o'clock when this crew came  
(21) on, I'm almost certain of that, and he doesn't  
(22) recall talking to the crew.

(23) **MR. BEARD:** Where were you, Greg, between  
(24) September 2nd and September 5th? Were you in  
(25) training?

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(1) **MR. HALNON:** I had the IMPO E&A visit  
(2) going on during that time frame.

(3) **MR. GIBSON:** Mr. Bergstrom did not urge  
(4) operators to take action on that memorandum?

(5) **MR. HALNON:** The only thing we have right  
(6) now is what he wrote on that letter, and I think  
(7) that's included as part of one of the exhibits.

(8) **MR. GIBSON:** Did you ask him if he did?

(9) **MR. HALNON:** I didn't personally ask  
(10) him.

(11) **MR. BEARD:** I asked him again yesterday,  
(12) Al, and he answered unequivocally no. I know in the  
(13) letter, the DO alert, and I'm sure again on the  
(14) enforcement with the shift supervisor you're going  
(15) to hear this: Management made us do it. That's  
(16) totally false. Mr. Bergstrom assured me that, Pat,  
(17) I was new in the job, I was getting up to speed on  
(18) the issues, I annotated this memo to be just what it  
(19) was. I did not in any way say, infer or otherwise  
(20) say words to the effect that someone would lead you  
(21) to believe here's your last chance, you better do  
(22) something or it's going to be closed. I'd even use  
(23) a stronger word, but I'm not going to do that in  
(24) this forum. That is totally false.

(25) **MR. LIEBERMAN:** Did he have any



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[1] communication with him verbally? Based on your  
[2] conversation did he -

[3] **MR. BEARD:** No. I don't know if I asked  
[4] him that specific question, but from what I did ask  
[5] him it was clear to me that he did not. I did not  
[6] ask him that question. I think that's also what you  
[7] just stated.

[8] **MR. HALNON:** Yes. Again, I haven't asked  
[9] him that specific question the way you worded it,  
[10] but I have been under the impression that they  
[11] didn't have any words with them before the test.

[12] **QUESTION FROM THE FLOOR:** It was not just  
[13] a midnight shift, it was a Labor Day weekend, so  
[14] there were even fewer people around.

[15] **MR. BEARD:** Again, the memo itself has  
[16] come back. It pointed out that corrective action  
[17] item, whatever it was, that there was an ongoing  
[18] corrective action item ongoing. The memo stood for  
[19] itself. There was no close-out.

[20] **MR. TANGUAY:** As you've indicated, there  
[21] was management involvement. We were attempting to  
[22] address the issues, and unfortunately the events  
[23] that unfolded on September 5 ultimately preempted  
[24] any other activities that were going on. We feel  
[25] that had that test not been run that the corrective

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[1] actions that we were in fact pursuing would have  
[2] surfaced a lot of these issues and, once again, we  
[3] wouldn't be here today.

[4] The corrective actions that we've talked  
[5] about throughout this presentation have been  
[6] implemented to address strengthening management  
[7] involvement, and we feel that through the precursors  
[8] and the focus items program that management is more  
[9] in tune with the issues and will give them more  
[10] prompt attention consistent with their relative  
[11] priority.

[12] The last item, number five -

[13] **MR. LIEBERMAN:** If I could just ask one  
[14] more question. If it wasn't for the September Labor  
[15] Day evolution, you said the corrective actions were  
[16] preempted. When do you think the company would have  
[17] recognize the problem with the curve.

[18] **MR. BEARD:** That's a very hypothetical  
[19] question, and I don't think it's fair for us to try  
[20] to answer that. I mean, I could say whatever I felt  
[21] I'm prejudiced to say and it would be difficult to  
[22] refute it. I don't think that's a fair question.  
[23] We feel that our process which is in place today and  
[24] which we'd embarked on during that time frame would  
[25] have precluded something like that from happening.

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[1] When would we have found this design  
[2] basis curve? I could argue that we could have found  
[3] it by September 30th if Problem Report 149 had been  
[4] allowed to complete. I mean, I could sit here and  
[5] make that statement, but it wouldn't be appropriate  
[6] for me to do so.

[7] **MR. TANGUAY:** The fifth item from March  
[8] 8th is that a series of engineering reviews of the  
[9] adequacy of the make-up tank operating curve and  
[10] other design basis parameters were in error,  
[11] reflecting inadequate verification of design  
[12] parameters by management. I was struggling with  
[13] this, and in my addressing this this afternoon I  
[14] focused on the first four or five lines of that,  
[15] indicating that the reviews were in error. I wasn't  
[16] sure how to deal with the last portion of that,  
[17] where that verification wasn't done by management.  
[18] In my process management doesn't get directly  
[19] involved in the verification process of individual  
[20] assumptions and inputs through calculations.

[21] **MR. GIBSON:** I believe you previously  
[22] acknowledged that the verification process was  
[23] deficient and that more independent review was  
[24] needed, and that's a management control that would  
[25] be put in place without requiring personal

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[1] management review.

[2] **MR. TANGUAY:** That's what I felt, because  
[3] management has the responsibility to assure that the  
[4] processes and procedures are in place to make sure  
[5] that the product is in fact correct, and that's  
[6] where we had focused our energies on here today. We  
[7] agree with that statement, and the corrective  
[8] actions that we have put in place as a result of the  
[9] discussions we've had on the other violations should  
[10] address those concerns going forward.

[11] **MR. BEARD:** Al, at this point I can make  
[12] my conclusion or we can answer questions and then I  
[13] can conclude.

[14] **MR. GIBSON:** I'm not sure what your  
[15] remarks are. You may want to hold your comments.

[16] **MR. BEARD:** Then let's answer the  
[17] questions.

[18] **MR. GIBSON:** I would like, going back to  
[19] the violation on failure to follow procedure, I  
[20] would like to explore that for a minute. What  
[21] latitude or authority were operators given in  
[22] September of 1994 to change procedures for  
[23] departmental procedures? Your internal  
[24] investigation showed that two operators, as I  
[25] recall, thought the shift supervisor had the



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[1] authority to make on the spot changes. Is that  
[2] correct? I'd like to understand what authority the  
[3] shift supervisor has.

[4] **MR. BEARD:** This is with regard to the  
[5] second violation, the one we caught first?

[6] **MR. GIBSON:** The failure to follow  
[7] procedures.

[8] **MR. BEARD:** Do you understand the  
[9] question?

[10] **MR. HICKLE:** Not completely.

[11] **MR. BEARD:** Well, let's understand the  
[12] question.

[13] **MR. GIBSON:** Let me try again. In  
[14] September of 1994 did shift supervisors have the  
[15] authority to make on the spot changes to operating  
[16] procedures.

[17] **MR. HICKLE:** Meaning did they have the  
[18] authority to deviate from instructions and operating  
[19] procedures, or are you asking did they have the  
[20] authority to initiate a procedure change process?

[21] **MR. EBNETER:** More appropriately, I think  
[22] you already put on the record or somebody did, and  
[23] I'm not sure who it was, that you did not give the  
[24] operators enough guidance in what to do on how to or  
[25] when to deviate from the procedures. Somebody said

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[1] that. Al's asking you what authority did they have,  
[2] so why don't you tell us that, that they could  
[3] deviate procedure without going to get some -

[4] **MR. HALNON:** I can answer that.

[5] **MR. EBNETER:** That's what we want to  
[6] know.

[7] **MR. HICKLE:** Let me show you two  
[8] viewgraphs that I think will address this  
[9] specifically, and if these don't answer it, this  
[10] will focus it a little more.

[11] It's the duty of every member of the CR 3  
[12] nuclear plant work force to strictly adhere to  
[13] written policies and to comply with procedures  
[14] written for the CR 3 nuclear plant. If a procedure  
[15] directs them to take any action or perform steps  
[16] they know to be wrong or may be wrong, then they  
[17] stop, restore and bring the discrepancy to the  
[18] attention of the supervisor. This is an AI-500.  
[19] We're telling all the operations people they have to  
[20] follow the procedures.

[21] Now let's talk about deviations. There's  
[22] a few sections in our procedure entitled  
[23] responsibility of operations personnel, nuclear  
[24] shift supervisor. This also came out of AI-500 at  
[25] the time. Certain operating decisions and actions

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[1] require the review and approval of the DMPO, which  
[2] is the plant manager, nuclear shift manager, or  
[3] manager on call as defined in applicable plant  
[4] procedures.

[5] Processes concerning review and approval  
[6] by these individuals remain the same. This is  
[7] talking about those activities that would be  
[8] classified as unusual tests or evolutions. Finally,  
[9] ensure that shift operations - and this is the  
[10] duties of the shift supervisor - are conducted in  
[11] accordance with plant procedures, the operating  
[12] license and other requirements. This is the only  
[13] deviation authorization they have. Authorized  
[14] deviation from license conditions or tech specs as  
[15] allowed by 50.54X. Implicit in this is an  
[16] obligation to deviate from license deviations or  
[17] technical specifications only when this action is  
[18] immediately needed to protect the public health and  
[19] safety.

[20] Now, our operating procedures are  
[21] conditions of our license. That is the only  
[22] authorization to deviate that they have.

[23] **MR. GIBSON:** Let me ask just one  
[24] follow-up question. If I'm the shift supervisor and  
[25] the procedure doesn't provide the instructions or

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[1] direction that I need to accomplish what I want to  
[2] accomplish, can I make a pen and ink change to that  
[3] procedure without independent review?

[4] **MR. HICKLE:** You can't change the  
[5] procedure without going through the procedure change  
[6] process.

[7] **MR. GIBSON:** So some review other than my  
[8] own would be required for approving that procedure  
[9] change?

[10] **MR. HICKLE:** In the instance that you  
[11] just said, yes. Greg, do you have anything you want  
[12] to add?

[13] **MR. HALNON:** I wanted to bring up, and  
[14] this could be the root of where this question came  
[15] from, even though you may not know it, Al, that one  
[16] of the things I found that was in our AI-500 was  
[17] that there's a statement in there or step that says  
[18] if the procedure that you're doing and the operating  
[19] procedure you're doing has some steps that don't  
[20] apply, in other words, it may be the fact that the  
[21] procedure's written so that it's doing a release on  
[22] both tanks and you're only doing one tank, so  
[23] therefore you go through and when you get to the  
[24] other tank you'd N/A it and write a note while  
[25] you're N/A'ing it.

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[1] AI-500 made the statement that if you  
[2] came to one of those steps and it doesn't apply to  
[3] the task at hand and doesn't affect the overall  
[4] evolution, N/A it and get a note from the  
[5] supervisor.

[6] I found that some shift supervisors or  
[7] shifts kind of took that too far sometimes, and the  
[8] notes that they made, some of them I think we found  
[9] should have been procedure changes, and that was  
[10] back in the early '90s and the things that we have  
[11] found in the records. And we hit that head on. I  
[12] put a paper out, and I can't remember when, I don't  
[13] know if it was before or after this task but it was  
[14] probably after, I would think, and it said that the  
[15] only time you can N/A a step is, and I restated the  
[16] guidance in the AI-500, and you had to write that  
[17] note. It caused a little furor, but they figured it  
[18] out pretty quickly. That could have been some of  
[19] the misunderstanding where they thought they could  
[20] N/A operating procedures.

[21] **MR. EBNETER:** My comment was based on  
[22] when you discussed management oversight. You said  
[23] that was not adequate. Written guidance was okay  
[24] and communication was not okay. The process for  
[25] deviating from our standards was not okay, which is

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[1] what we're talking about here. Your standard is  
[2] that you will follow procedures, right?

[3] **MR. BEARD:** Right.

[4] **MR. HICKLE:** That's right.

[5] **MR. EBNETER:** And in this case they did  
[6] an evolution that was outside of the procedures.  
[7] You said that was not okay. What was that based  
[8] on? You said your guidance was not adequate or the  
[9] process for deviating from standards was not  
[10] adequate.

[11] **MR. BEARD:** Let me go back -

[12] **MR. MERSCHOFF:** It was the fourth item of  
[13] the first management concern.

[14] **MR. BEARD:** That's right. Give me a  
[15] chance to think.

[16] **MR. HICKLE:** I can clarify that.

[17] **MR. BEARD:** Go back and show that slide  
[18] again. This is where we went through the five  
[19] elements of management oversight and where we  
[20] thought we were adequate and where we thought we  
[21] were deficient, and I also want to get to another  
[22] thing that we've said.

[23] **MR. HICKLE:** One of the elements of  
[24] management oversight is establishing processes to  
[25] identify deviations from standards, problem

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[1] reporting. Precursor reporting is what I had in  
[2] mind there, not deviations from procedures.

[3] **MR. BEARD:** You meant in a broad sense -

[4] **MR. HICKLE:** So that when they've got a  
[5] gripe or a problem complying with a management  
[6] standard of some kind there's a feedback mechanism.  
[7] That's what I was trying to address. I said that we  
[8] were somewhat deficient in that area because we had  
[9] not developed our event-free operations program and  
[10] we did not have very wide use of our precursor  
[11] program, so some of the ways that we could have  
[12] found out about low level complaints or problems or  
[13] workarounds, the mechanisms and processes weren't  
[14] completely in place at that time back in '94.

[15] **MR. BEARD:** And then you said this. Use  
[16] that one. I think this is driving at what we were  
[17] just talking about.

[18] **MR. HICKLE:** And then management did not  
[19] provide adequate guidance on the use of routine  
[20] procedures for non-routine evolutions, and that's  
[21] where we said we disagree, that the procedures were  
[22] adequate for trained operators. I didn't mean those  
[23] two to conflict.

[24] **MR. EBNETER:** I just wanted to let you  
[25] know I've been listening.

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[1] **MR. LIEBERMAN:** There's a conclusion in  
[2] your August review, AI. On page 12 it says AI-500  
[3] and AI-400A do not provide the nuclear shift  
[4] supervisor a clear level of authority to perform  
[5] plant manipulations that are not directly covered by  
[6] procedures such as raising or lowering the level  
[7] within limits, cooling for temperature trending, et  
[8] cetera.

[9] Does that mean you really disagree with  
[10] that particular conclusion?

[11] **MR. HALNOR:** I can address that. I've  
[12] never read that particular statement but I know  
[13] where it's coming from. Here the operators operated  
[14] this make-up tank within the limits. On the 4th and  
[15] 5th they went over, but they started asking  
[16] questions. Well, what is okay, can I operate between  
[17] this level and this level and not get an alarm, can  
[18] I move the pressurizer up and down to see if an  
[19] instrument is tracking correctly. That was the  
[20] issue there that came out saying, "Well, give us  
[21] some guidance, what is a test, what isn't a test,  
[22] what's troubleshooting and what's not." That was  
[23] all included in our corrective action data.

[24] **MR. BEARD:** Let me go back, because I  
[25] think I understand your comment. Could you give me

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(1) the page?

(2) **MR. LIEBERMAN:** Page 12, Item C at the  
(3) top.

(4) **MR. BEARD:** My interpretation of that  
(5) when I read this and it's the basis for our  
(6) statement is that as these operators may say that  
(7) the current guidance allows us to do this, it did  
(8) not, and that's what this is saying. I mean, you  
(9) could take it another way, but that's what it meant,  
(10) because that's one of the questions that we asked  
(11) them to look into. They did not provide them the  
(12) authority to do it. Clearly it was just an  
(13) objective to make the point - not that it was  
(14) confused. It's that they didn't have the authority  
(15) to do it. That was the investigative team's  
(16) conclusion, that they didn't have authority to do  
(17) it, which coincided with our view.

(18) Back in September when we had the  
(19) management review committee the investigation  
(20) confirmed that. That's what that means. I can see  
(21) how you might think it means otherwise, but it  
(22) doesn't.

(23) **QUESTION FROM THE FLOOR:** Going back to  
(24) page 11, if you look under opinions, under A, it  
(25) states that the operating crew needs to have some

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(1) latitude for plant manipulations within operating  
(2) limits performing evolutions not specifically  
(3) required for megawatt production or compliance with  
(4) regulatory requirements.

(5) **MR. BEARD:** Yes.

(6) **QUESTION FROM THE FLOOR:** Doesn't that  
(7) seem to indicate that they would have the  
(8) authority?

(9) **MR. BEARD:** No. That is a statement,  
(10) that is an opinion. That's just a statement.  
(11) Remember, the head of this was Dan Poole, who had  
(12) been a plant manager, and this is just a statement  
(13) that in real life, when you're operating a plant,  
(14) ultimately you depend on the judgment and experience  
(15) and the training of the shift supervisors. They  
(16) have to have some latitude, and that's why the NRC  
(17) recognizes in 54F that if in your best judgment you  
(18) have to deviate, do so. Admiral Rickover told me  
(19) many times, if you want to operate a nuclear plant  
(20) with trained monkeys, fine, write it down. Instead,  
(21) we're going to train you and we've got this book of  
(22) procedures and you have to have some latitude.

(23) In this case they didn't have that  
(24) latitude, however. If you go back to 54F, it was in  
(25) our procedures. Was there an emergency here to the

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(1) public health and safety? Hell, no. Was  
(2) concentration within limits? Yes. There was no  
(3) reason to exercise latitude.

(4) **MR. GIBSON:** I'd like to move on to the  
(5) next question. There's a document that I'll refer  
(6) to as Pat and Gary's expectations which was put out  
(7) in 1993. If you read one of the bullets on those  
(8) expectations, it states it is okay to question any  
(9) requirement, and requirement is underlined,  
(10) including regulations in company policy that don't  
(11) make sense. Rigid and blind obedience is not in the  
(12) best interest of nuclear safety.

(13) **MR. BOLDT:** What's your understanding of  
(14) the entirety of that document? Do you have a copy  
(15) of that document?

(16) **MR. GIBSON:** I have the list of bullets.

(17) **MR. BOLDT:** The reason I ask is in the  
(18) DOL letter which I understand you received a copy of  
(19) there was one page. It was a one page document.

(20) **MR. GIBSON:** That's all I have.

(21) **MR. BOLDT:** That's the problem. It is  
(22) not a one page document.

(23) **MR. GIBSON:** The reason I brought it up  
(24) was to give you an opportunity to discuss it.

(25) **MR. BOLDT:** That's why I asked. This is

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(1) the document.

(2) **MR. GIBSON:** I brought it up, and let me  
(3) just add a couple of other comments before you  
(4) discuss it. After discovery of the September 5th  
(5) test, Greg wrote an e-mail to Mr. Fields commending  
(6) him for a questioning attitude, and I think, Bruce,  
(7) you had similar dialogue with Mr. Van Sicklen, I  
(8) believe, saying at least purportedly that he had a  
(9) questioning attitude and he should be commended for  
(10) pursuing something that he thought was a safety  
(11) issue.

(12) Is it reasonable in your judgment for  
(13) operators to interpret your expectation that if the  
(14) procedure doesn't make sense they don't have to  
(15) follow it?

(16) **MR. BEARD:** Certainly not. That's  
(17) another case where these two operators after the  
(18) fact are trying to use that as a rationalization,  
(19) which they obviously are, and that's BS.

(20) Let me start from the beginning. As Gary  
(21) said, we spent a whole week with all of our  
(22) supervisors working on leadership and expectations.  
(23) You have to go through the whole week to fully  
(24) understand it, and you also have to understand all  
(25) of our expectations. What you have is part of it.



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[1] Throughout that course, and since we've worked very  
[2] hard on saying whereas it's okay and we want you to  
[3] question and they did, we gave them an attaboy for  
[4] that. On the other hand, there's procedures and  
[5] processes we have in place and insist you go through  
[6] particularly in a nuclear power plant to resolve  
[7] those questions. So on the one hand yes, but  
[8] there's a way to do it. And these gentlemen were  
[9] mature individuals. One had been a former navy  
[10] nuclear trained officer.

[11] **MR. EBNETER:** Is this document in the  
[12] notebook?

[13] **MR. BEARD:** No, but we'll add it. You  
[14] asked one specific question, and the answer is  
[15] unequivocally no.

[16] **MR. EBNETER:** And you will provide that  
[17] document?

[18] **MR. BEARD:** Sure. We can send you the  
[19] whole course, if that helps.

[20] **MR. EBNETER:** Don't get defensive, Pat.

[21] **MR. BOLDT:** Let me make one comment about  
[22] it, though. The empowerment course is a circle of  
[23] activities, it's not just one. It starts with  
[24] challenging the process. Enabling others to act is  
[25] another piece, and that is a key piece. What

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[1] happened in our view in this particular instance is  
[2] the process was challenged, but the crew by  
[3] ineffective communication as well as some of our  
[4] process didn't enable the others to act that needed  
[5] to act.

[6] On the very top of that second page under  
[7] enabling others to act, change was implemented and  
[8] we did not communicate at an increased rate. One  
[9] other piece during this particular course, and  
[10] because I was involved in the 1991 reactor trips,  
[11] and this was another one, an example of how the  
[12] reactor trip was a failure to communicate outside  
[13] the crew of what the problems were and how we should  
[14] have focused on it differently.

[15] I have a little card that I generated,  
[16] and I talked to the folks. Stu, I think you may  
[17] have been at the same dinner, at one of the  
[18] operating license dinners. We talked about what a  
[19] questioning attitude is, what it means, and I came  
[20] up with a six step plan and we handed out the  
[21] cards. Every time I would bring this up I would  
[22] refer back to the reactor trip. That trip was  
[23] covered in Mr. Fields's shift. What we were trying  
[24] to get to is that open communications was crucial.  
[25] I'd used it and I'd not mentioned which crew or

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[1] which people were involved, but I'd used it so many  
[2] times that during his session of empowerment  
[3] training he came up to me and he said, "I'm getting  
[4] a little sensitive to you using this specific  
[5] example about communications."

[6] So when Bruce told me that this test had  
[7] occurred - again, I was in Rochester, New York, I'd  
[8] called back to the plant - he related to me what  
[9] was happening. My first reaction was the same as  
[10] Pat's. I said it's a precursor, you realize that's  
[11] a precursor to the Chernobyl incident. He related  
[12] to me he was setting up a special committee.

[13] And second to the fact that the event  
[14] occurred, which was obviously paramount in our  
[15] concerns, my second most concern was having been  
[16] through empowerment training, using that reactor  
[17] trip, having talked about communications, explaining  
[18] over and over again that's why we set up nuclear  
[19] shift managers, and my first question to Bruce was  
[20] why didn't they use the shift manager. I was most  
[21] disappointed in the crew when I found out which crew  
[22] leader was on that crew that did not use a shift  
[23] manager.

[24] **MR. EBNETER:** The dinner he's talking  
[25] about was probably an operator certificate

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[1] presentation, and I don't recall that. That might  
[2] have been Ellis. For the record, that does happen  
[3] in some of these certificate presentations where we  
[4] make our presentation on duties.

[5] **MR. BOLDT:** I think this is important  
[6] also. These are the six steps that were in how I  
[7] defined what a questioning attitude meant. Define  
[8] the problem. Well, first of all, I believe saying  
[9] that there were two flags to when you really need to  
[10] question something. The first flag is having never  
[11] done this before. That's a red flag. The second  
[12] red flag is I do this a lot. What does that mean?  
[13] It means that I'm so comfortable I'm really likely  
[14] to make mistakes. Those were the two flags for  
[15] entry. The first point was to define the problem  
[16] clearly, accurately and thoroughly. We often try to  
[17] solve a problem that's not well defined.

[18] The second step was to consult the  
[19] resources, information and data, the man on call,  
[20] the shift operations technical adviser, system  
[21] engineer, licensing, emergency plan, et cetera. The  
[22] third step was to decide on the course of action, to  
[23] get permission was what that step said, the man on  
[24] call, SRO, et cetera, if needed. The fourth step,  
[25] which was crucial, was before acting to consider the



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[1] consequences of being wrong in step three. What if  
[2] I just made the wrong decision? And the fifth step  
[3] was to mitigate or eliminate the consequences of  
[4] being wrong. And step six was finally to act.

[5] Those were issues that we had gone over and again  
[6] largely which came out of an event which evolved -

[7] **MR. EBNETER:** So let me ask you  
[8] something. Do you have one of those cards with  
[9] you?

[10] **MR. HICKLE:** No.

[11] **MR. EBNETER:** Do you have one of those  
[12] cards?

[13] **MR. HALNON:** No.

[14] **MR. EBNETER:** Do you have one of those  
[15] cards?

[16] **MR. BEARD:** Not on me, but I have one on  
[17] my desk in Crystal River. And that's also embodied  
[18] in our current event-free operations program.

[19] **MR. BOLDT:** I'll be the first to admit  
[20] that we're ineffective in following through with  
[21] that document.

[22] **MR. EBNETER:** And that's that point.

[23] **MR. BEARD:** We were ineffective as of  
[24] September '94, and we've already said that. But  
[25] STAR is a key element of event-free ops, and I think

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[1] that's emblazoned on my door at Crystal River. We  
[2] didn't invent STAR but we've certainly embraced it.

[3] **MR. GIBSON:** Moving along, I don't have  
[4] many more here. One comment I did want to make,  
[5] Paul, is that in your presentation you discussed  
[6] your corrective actions, and I noted that they're  
[7] focused on improving the process and improving  
[8] future performance. Unless I just didn't hear it,  
[9] they did not focus on engineering evaluations and  
[10] decisions that had been made in the past, and you  
[11] talked about things like a generic lack of  
[12] operations involvement, too much reliance on cursory  
[13] reviews, and a lack of independent reviews, which of  
[14] course existed prior to your corrective actions.

[15] Now, mindful of Pat's comment that you  
[16] can't solve all the problems in the world at the  
[17] same time, I just wanted to make sure I didn't  
[18] overlook something. My assessment of your  
[19] presentation was that you focused your corrective  
[20] action on future activities and have not made an  
[21] effort to go back to the past and correct errors  
[22] that might exist in previous engineering work.

[23] **MR. TANGUAY:** I had talked specifically  
[24] to the set point and EOP program. Those are  
[25] programs where we're going back and trying to look

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[1] at those. We did that in the past in the electrical  
[2] calculation program, the set point and the EOP  
[3] program. Again, you can only manage so much.

[4] **MR. BEARD:** And the tank calculations.

[5] That's all looking in the past.

[6] **MR. BOLDT:** The next point is to go back  
[7] and look at the FSAR and ERs.

[8] **MR. GIBSON:** I think at this point I  
[9] would like to ask for questions from others. What I  
[10] would propose we do is we give others here an  
[11] opportunity to ask questions and then maybe we need  
[12] a brief caucus among ourselves to make sure that  
[13] there are not any other issues that need to be  
[14] addressed.

[15] **MR. BEARD:** But I still need to make my  
[16] conclusions.

[17] **MR. GIBSON:** Do you want to do that now?  
[18] You can do that whenever you wish.

[19] **MR. LIEBERMAN:** Wouldn't it be more  
[20] appropriate after all the questions?

[21] **MR. IMBRO:** I have no questions.

[22] **MR. RICHARDS:** I have a couple. I think  
[23] a couple of times today you mentioned that a curve  
[24] is not a dynamic draw-down curve. It appears the  
[25] operators thought it was.

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[1] **MR. GUTHERMAN:** That's correct.

[2] **MR. RICHARDS:** That was a fact that was  
[3] never intended to demonstrate how the tank would  
[4] draw down in the design basis event for which it was  
[5] drawn.

[6] **MR. BEARD:** Yes. And that's another  
[7] example of us not understanding and explaining to  
[8] them what it was. We agree with your statement.

[9] **MR. RICHARDS:** I've heard two versions of  
[10] that, too. You had two numbers today on the  
[11] significance of the event. I think the LER says ten  
[12] to the minus eleventh. You mentioned that earlier.  
[13] Someone else said ten to the minus eighth.

[14] **MR. BEARD:** Let me answer that because I  
[15] asked the same question. The three times ten to the  
[16] minus eight is the frequency per year. The three  
[17] times ten to the minus eleventh in the LER reflects  
[18] the actual period of time that the curve was out of  
[19] design. So the actual safety consequences of the  
[20] time that the LER was three times ten to the minus  
[21] eleventh but per year it's three times ten to the  
[22] minus eighth.

[23] **MR. GUTHERMAN:** I want to clarify your  
[24] first remark.

[25] **MR. BEARD:** Why do you want to do that?

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[1] We've settled the issue.

[2] **MR. GUTHERMAN:** Okay.

[3] **MR. URYC:** I was curious, Mr. Halnon,  
[4] about a comment you made earlier, that, quote, Hebb  
[5] does not want to operate the plant by computer.  
[6] What did you mean by that?

[7] **MR. HALNON:** The computer is history from  
[8] the standpoint of when you look at a computer point  
[9] you're looking at it up to a minute old, and it's  
[10] not operator friendly. It's not meant to be  
[11] operator friendly. You have a CRT above the control  
[12] board or you have it over here in a small CRT on the  
[13] right-hand side of the control board, and Gary  
[14] didn't think it was appropriate to ask the operators  
[15] to take away their normal indication that they  
[16] monitored the tank with and have to monitor the data  
[17] that was either old or out of place.

[18] Our control board's set up in a mimic  
[19] standpoint, and on that mimic is the level and  
[20] pressure indicator, and if the operators are  
[21] affecting a change in pressure they'd have to go  
[22] somewhere else to see how that pressure's changing,  
[23] that would be a minute old, and he didn't feel that  
[24] was appropriate.

[25] **MR. HICKLE:** And it wouldn't be practical

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[1] to try to control the evolution with old data,  
[2] especially when you're adding hydrogen to the  
[3] approaching curve. You have to be able to tell that  
[4] time, and the strip chart recorder was all they had  
[5] available.

[6] **MR. GIBSON:** Jim, do you have anything at  
[7] this time?

[8] **MR. LIEBERMAN:** I'd be interested in  
[9] hearing Mr. Gutherman's clarification.

[10] **MR. BEARD:** Go ahead, Brian. That's all  
[11] right. It's fine. You can say whatever you want.

[12] **MR. GUTHERMAN:** While we did not expect  
[13] that tank to draw down exactly on that curve, we do  
[14] expect it will draw down within some reasonable band  
[15] on either side of that curve based on the conditions  
[16] present at the particular time with the fluctuations  
[17] in temperature and instrument accuracy. That's all  
[18] I wanted to say.

[19] **MR. BEARD:** Did that clarify?

[20] **MR. RICHARDS:** That means it's not a  
[21] perfect curve. It's representative of what a tank  
[22] ought to do within the accuracies of what you can  
[23] measure.

[24] **MR. HALNON:** It's not a dynamic model.

[25] **MR. GIBSON:** I'm not sure I understand.

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[1] My simpleminded understanding was that if plant  
[2] conditions were on the unacceptable side of the  
[3] curve and a LOCA occurred, calculations showed the  
[4] make-up pumps might cavitate.

[5] **MR. BEARD:** Yes, sir.

[6] **MR. HALNON:** Pump, singular.

[7] **MR. GIBSON:** Whichever pump was aligned.

[8] **MR. GUTHERMAN:** That's correct.

[9] **MR. EBNETER:** Let me tell you my view.

[10] If you're moving that curve, that's a dynamic curve  
[11] to me. I don't give a damn how else you define it,  
[12] but it's a dynamic situation because you're varying  
[13] it at the point. Are you happy with the curve?

[14] **MR. RICHARDS:** I can't answer that  
[15] question.

[16] **MR. EBNETER:** Are you happy with the  
[17] answer?

[18] **MR. RICHARDS:** I understand the  
[19] explanation.

[20] **MR. BEARD:** You've made me do it. See  
[21] what you got us into? You're going to hear it again  
[22] from me.

[23] **MR. GUTHERMAN:** I'm sure I will.

[24] **MR. BEARD:** We can spend the rest of the  
[25] day here. You know, I'm an engineer, too. In fact,

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[1] I have - no, I won't say it. This curve is a locus  
[2] of generated calculated points with respect to a  
[3] design basis LOCA. Whoever generated this curve in  
[4] the past and in the future says if a LOCA occurs and  
[5] you're at this level when it occurs, what's the most  
[6] pressure you should have in there so you wouldn't  
[7] gas bind the pumps, or probably wouldn't, and you  
[8] calculate that. That's under a LOCA. That means  
[9] water's pouring out somewhere in the plant. It  
[10] means that this is coming down, this is coming down  
[11] all at the same time, and that's different from what  
[12] happens when we normally operate the plant where  
[13] only this one's coming down. This isn't coming  
[14] down, it's not water pouring out of some hole.

[15] So this curve is not a dynamic curve,  
[16] it's a locus of calculated points.

[17] **MR. EBNETER:** Curve is static, but the  
[18] conditions are dynamic.

[19] **MR. BEARD:** Yes, sir. The conditions  
[20] which the curve is designed to prevent is a LOCA,  
[21] and that's dynamic. Now, my point is and what we  
[22] were trying to say earlier is that however we  
[23] operate the plant, we have leakage in the plant and  
[24] the level goes down or we may draw it down for some  
[25] valid operation, as we do in SP-630, and the

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[1] operators noted that under that condition normal or  
[2] assimilated HPI fluid test, that as the level was  
[3] going down pressure didn't seem to follow exactly  
[4] like this, it tended to come over some. There's  
[5] nothing wrong with that. You would expect it  
[6] probably to do that because it did it. And you know  
[7] what? When we run 630 tomorrow we are going to see  
[8] the same thing, and there's nothing wrong with that  
[9] except that you want to give the operators an  
[10] operating curve that they stay below so that when a  
[11] system does that you don't challenge the design  
[12] curve. It's as simple as that.

[13] **MR. EBNETER:** I understand that we're  
[14] just arguing about a couple of terms.

[15] **MR. BEARD:** We were sort of fuzzy, and I  
[16] think we've got ourselves clear on that. And when  
[17] we run 630 tomorrow it ain't going to follow the  
[18] current calculations and it never will.

[19] **MR. EBNETER:** Are there any other  
[20] questions on the curve?

[21] **MR. LIEBERMAN:** In all honesty, I think  
[22] having that explanation just now was helpful.

[23] **MR. EBNETER:** It was good, Pat, but it  
[24] was the same explanation that somebody else gave.  
[25] It's a good thing they were both the same.

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[1] **MR. MERSCHOFF:** I have no questions.

[2] **MR. LANDIS:** I have one question. The  
[3] evaluation that was going to be done by engineering  
[4] to close out this issue by September 30th, was that  
[5] going to be a rigorous review of the calculation?  
[6] What was intended or what was planned?

[7] **MR. BEARD:** Remember Stu's admonition.  
[8] If we don't know, we'll come back and tell you.

[9] **MR. GUTHERMAN:** That item was assigned to  
[10] my group, design engineering, and it would have been  
[11] a rigorous review of the calculation. One of the  
[12] problems was that the calculation at that time was  
[13] owned by an engineer in another discipline of  
[14] engineering, not in mechanical, so we would have had  
[15] to work together with them, but that was not a  
[16] problem. We would have done so.

[17] **MR. LANDIS:** Would that have included  
[18] review of all the assumptions and inputs that go  
[19] into that calculation?

[20] **MR. GUTHERMAN:** Yes.

[21] **MR. LANDIS:** Would that have differed in  
[22] any way from what you ultimately did do with the  
[23] make-up tank calculation, except that your  
[24] methodology today is probably more rigorous?

[25] **MR. GUTHERMAN:** You're asking me to

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[1] speculate on what might have happened?

[2] **MR. LANDIS:** What I'm asking you is you  
[3] were going to do a rigorous review of the  
[4] calculation that was going to involve the  
[5] methodology evidently that you had back at that  
[6] time. You did not have the set point corrective  
[7] action program in place. You did not have the new  
[8] set point methodology in place at that time. Is  
[9] that correct?

[10] **MR. TANGUAY:** That's correct.

[11] **MR. LANDIS:** That's all I have.

[12] **MR. BUTCHER:** I have one clarification,  
[13] and that's on Problem Report 94-149. This test  
[14] you're going to perform, as I understand it, it's  
[15] going to be a more severe test than what you  
[16] experienced as cavitation that the operators were  
[17] concerned about.

[18] **MR. HALNON:** That's correct. That's  
[19] what's planned right now.

[20] **MR. BUTCHER:** That's what I wanted to  
[21] clarify.

[22] **QUESTION FROM THE FLOOR:** As of the day  
[23] before they were going to run the spray pump, the  
[24] decay heat pump and the make-up pump, whereas on the  
[25] previous they only had the decay pump and HPI pump.

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[1] **MR. BUTCHER:** This will close out the  
[2] test that was going to answer - well, it was part  
[3] of the September 30th calculation, and the test this  
[4] outage was going to answer the questions on the  
[5] concerns.

[6] **MR. BEARD:** It will be the last action  
[7] step I think originally from 149. But I'll say  
[8] again what we're going to see in a dynamic system  
[9] response is it's going to be the exact shape of the  
[10] curve, and that's okay.

[11] **MR. HALNON:** It's more into the  
[12] cavitation issue.

[13] **MR. BEARD:** It will address the  
[14] cavitation issue. I think that's really the real  
[15] issue. We think we addressed it back then and we're  
[16] going to prove it then.

[17] **MR. LANDIS:** Following up on Ross's  
[18] question, are there any operator concerns now with  
[19] the test that is going to be performed, that it's  
[20] not going to be complete, that it won't solve this  
[21] issue?

[22] **MR. HICKLE:** We've established a test  
[23] director, Carl Bergstrom, and Carl has coordinated  
[24] all of the operations issues. He's also responsible  
[25] for the conduct of the test to make sure that it's

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[1] done with the right procedure and safety concerns,  
[2] so I'm confident doing that that we're addressing  
[3] the concerns that existed and that may exist today.

[4] **MR. TANGUAY:** An additional thing we're  
[5] doing, when we went to NRR a while back and  
[6] presented information regarding the calculation and  
[7] its development, we agreed at that point that when  
[8] we ran this test this outage we would go in and  
[9] we're going to add additional instrumentation to the  
[10] key points to get as much information as we can  
[11] about flows and pressures at various locations so  
[12] that we can take that and from it infer the data we  
[13] need to get a better handle on the system, and the  
[14] loss go coefficients as a means of verifying and  
[15] validating what is there. So when they refer to a  
[16] PT, that PT is intended to go get that additional  
[17] data which is beyond the normal SP-630 we would  
[18] run.

[19] **QUESTION FROM THE FLOOR:** Brian, I'm  
[20] still trying to understand this description of your  
[21] new and better Curve 8. Let me ask you one  
[22] question. On your new replacement curve that's in  
[23] effect today, if you raised and lowered the level in  
[24] the make-up tank and drew a trace, would it more  
[25] closely mirror the slope of the current curve than

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[1] it did back in 1994?

[2] **MR. GUTHERMAN:** I would expect so because  
[3] the methods have been more finely tuned.

[4] **QUESTION FROM THE FLOOR:** And I had one  
[5] question for Greg. Back during, let's say, July  
[6] through September of 1994, when there were a number  
[7] of cases when the Curve 8 alarm was in and at the  
[8] time if you were outside Curve 8, according to your  
[9] calculation, you could have cavitated one of the  
[10] make-up pumps, the one that was in service. When  
[11] the alarm was in, should the operators have declared  
[12] the make-up pump inoperable and entered a tech spec  
[13] action statement?

[14] **MR. HALNON:** In hindsight you could  
[15] probably make an argument for that, yes. That's why  
[16] I went back to check if there were any in effect.

[17] **QUESTION FROM THE FLOOR:** And why didn't  
[18] the operators do that during that time?

[19] **MR. HALNON:** They didn't realize it made  
[20] the pump inoperable.

[21] **QUESTION FROM THE FLOOR:** So no one in  
[22] operations was aware, then, including yourself, that  
[23] when you were outside Curve 8 it made the pump  
[24] inoperable?

[25] **MR. HALNON:** Probably to that detail.

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[1] no. And also when the alarm is in, unless you went  
[2] and took the computer point and did a plot like  
[3] we've shown on those graphs you have, we didn't know  
[4] how much over the curve you were. If you were over  
[5] the curve a certain amount, you'd have to go back  
[6] and take the data, and obviously we didn't do that.  
[7] We plotted it on a piece of paper from the strip  
[8] chart, and never more than one or so was shown under  
[9] the curve, so there was no feeling to go back and  
[10] check the computer data

[11] **MR. GIBSON:** I'd like to follow up  
[12] because I have a different view. I believe that  
[13] operators well understood that operating to the left  
[14] of Curve 8 was operating in a region where  
[15] engineering calculations showed the pump would  
[16] cavitate in the event of a LOCA.

[17] **MR. HALNON:** I don't disagree with you  
[18] there. My point is that when the alarm came in,  
[19] unless you went back and realized the overshoot and  
[20] how far the overshoot was, by checking the computer  
[21] data, if you check just on your plot, on the graph,  
[22] and translated the point from the strip chart to the  
[23] piece of paper, that wouldn't show you that you were  
[24] a lot over the curve or even on in most cases.  
[25] So it was conflicting, and Bruce addressed that with

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[1] the poor questioning attitude they had as far as  
[2] rectifying those two concerns.

[3] **MR. GIBSON:** Okay.

[4] **QUESTION FROM THE FLOOR:** Following up  
[5] Mr. Gibson's question with regard to the latitude  
[6] that the operators have, very recently out at a  
[7] plant in which the operator knew the temperature  
[8] cooldown issue, knowing that event, do you still  
[9] believe that your procedure's very effective and  
[10] management expectations have been communicated to  
[11] the operators?

[12] **MR. HICKLE:** Yes, we believe so. We  
[13] supplemented the LER, as a matter of fact, to  
[14] clarify the decision-making and the human  
[15] performance of the shift supervisor and control  
[16] board operator that were responsible for the conduct  
[17] of the cooldown. But to make a long story short,  
[18] the shift supervisor was involved with the procedure  
[19] change.

[20] **MR. BEARD:** Let me pause for a second.  
[21] Stu, you were talking for a minute. Did you hear  
[22] what Rag's asking and what we're talking about right  
[23] now?

[24] **MR. EBNETER:** I heard him. You're  
[25] answering him.



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[1] MR. BEARD: He's brought up the fact  
[2] that - when was it, in February?  
[3] MR. HALNON: January.  
[4] MR. BEARD: That's when we were cooling  
[5] down and a condenser tube ruptured and we exceeded  
[6] the pressurizer cooldown.  
[7] MR. HALNON: It was the RCS cooldown  
[8] rate.  
[9] MR. BEARD: And Rag, you said therefore  
[10] because that happened do we still have confidence  
[11] that our corrective action is effective. I think  
[12] that's the essence of what you're asking.  
[13] MR. EBNETER: And what is the answer, yes  
[14] or no?  
[15] MR. HICKLE: Yes.  
[16] MR. BEARD: Yes. Are we perfect? Are we  
[17] ever going to be perfect? No. And I think we had a  
[18] good conversation on that issue with staff, with Mr.  
[19] Jones personally talking.  
[20] MR. EBNETER: Rag, are you satisfied?  
[21] QUESTION FROM THE FLOOR: Yes.  
[22] QUESTION FROM THE FLOOR: Two years have  
[23] passed. This was in September of '94 when these  
[24] things happened, and you say that since  
[25] September '94 in fact the expectations program was

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[1] there in 1993. That's the time that you gave the  
[2] seminar, and three years from that day we still saw  
[3] some procedures not being followed under the  
[4] operators' actions which are outside the  
[5] procedures. I just wanted to know how does one  
[6] conclude that your program is effective in  
[7] communicating the expectations.  
[8] MR. HICKLE: The way that we conclude  
[9] that is we have to go back and do a very thorough  
[10] root cause evaluation on these kinds of errors that  
[11] in the case of the cooldown rate that was exceeded,  
[12] the shift supervisor had made the decision, which by  
[13] the way is our best supervisor, he has no history of  
[14] procedure compliance problems at all, and he was  
[15] involved with a procedure change where we clarified  
[16] that procedure to talk about what temperature we use  
[17] to monitor the reactor coolant system cooldown  
[18] rate. Being involved with the procedure change that  
[19] was made several years ago, he felt he understood  
[20] the basis for the requirement and felt that that  
[21] requirement did not apply to the transition  
[22] temperature when the cooldown rate changes, steps  
[23] down. He never had cause to question any further.  
[24] It was one of those cases where he was involved with  
[25] the procedure change and thought he knew, and he

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[1] gave instructions to the nuclear control board  
[2] operator.  
[3] He was questioned by one of our other  
[4] SROs that was reviewing the data, and in questioning  
[5] him we had to go back ourselves and go back to our  
[6] supplier and get clarification to make sure we  
[7] understand what temperature to use for a  
[8] transition. And in doing so, we found out that he  
[9] took the wrong actions. But it wasn't a case where  
[10] he felt he was stretching a limit in procedure or  
[11] taking latitude. It was strictly that he thought he  
[12] knew what the answer was and he acted accordingly.  
[13] So yes. I think that the expectations  
[14] that were put in place with our event-free program  
[15] were applied. I don't think that we can altogether  
[16] eliminate honest mistakes. What we can do is when  
[17] those occur is to make sure we fully understand them  
[18] and that we're doing the things that we can to  
[19] correct them.  
[20] QUESTION FROM THE FLOOR: Going back to  
[21] what you said earlier, Bruce, concerning some of the  
[22] issues on the barriers that were available to the  
[23] operators on the 4th and the 5th. Relative to that  
[24] time frame, what was the conduct of operations  
[25] guidance for a long response?

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[1] MR. HICKLE: Do we have a copy of it,  
[2] Greg?  
[3] MR. HALNON: In general or for that  
[4] make-up time?  
[5] QUESTION FROM THE FLOOR: The AR-500  
[6] guidance alarm response procedures.  
[7] MR. HALNON: There were a couple of  
[8] steps. I don't have it right here with me, but  
[9] there was no reference to promptness or time frame.  
[10] There was a step that talked about if the alarm came  
[11] in due to the expected, you expected the alarm to  
[12] come in and there's parentheses, part of the  
[13] evolution's your doing or something to that effect,  
[14] it had some caveat in there about how to deal with  
[15] that. And I think that's what the operators kind of  
[16] relied on, that step in itself. They were doing an  
[17] evolution, the alarm came in, they knew why it was  
[18] in, they knew it was going to clear when they  
[19] changed their actions, and that step kind of, I  
[20] won't say permitted them to do that, but it kind of  
[21] addressed how they were treating the alarm in that  
[22] case.  
[23] QUESTION FROM THE FLOOR: Was that just  
[24] peculiar to Crystal River or is that somewhat  
[25] standard in the industry?

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[1] **MR. HALNON:** I don't know if it's  
[2] standard for the industry. It was what was in our  
[3] procedures for many years.  
[4] **MR. BEARD:** I think a key point, Curt,  
[5] and a contributing factor to this question of the  
[6] alarms, we said procedures were weak with regard to  
[7] timeliness and normal response. We fully  
[8] acknowledge that and they've been made better. Now,  
[9] in September of '94 was that the industry standard?  
[10] I don't know what the industry standard was, but it  
[11] sure wasn't good enough and we increased our  
[12] standard.

[13] **QUESTION FROM THE FLOOR:** There was also  
[14] some discussion about the make-up tank level  
[15] pressure recorder versus the alarm indication or  
[16] computer indication, and you said the make-up tank  
[17] recorder was the only instrument they had to make  
[18] the determination to whether an alarm was valid or  
[19] not.

[20] **MR. HICKLE:** It provided real time  
[21] information.

[22] **QUESTION FROM THE FLOOR:** My question is  
[23] that the expectation was to use that recorder to  
[24] validate the computer alarm.

[25] **MR. HICKLE:** That's what they were doing.

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[1] **QUESTION FROM THE FLOOR:** Are you aware  
[2] of the e-mail that came out from engineering that  
[3] said use the computer point to add hydrogen and use  
[4] the make-up tank recorder to monitor operations,  
[5] that the alarm takes precedence?

[6] **MR. HICKLE:** I think we discussed that.  
[7] That was the e-mail that went to Mark van Sickle.

[8] **MR. BEARD:** What I heard and what I  
[9] believe is the case is the memo went from the system  
[10] engineer to Gary Hinman and Mark van Sickle. Gary  
[11] Hebb didn't like the computer and that was the end  
[12] of it, so management wasn't aware of it at that time  
[13] until we were doing our investigation.

[14] **MR. LIEBERMAN:** So the system engineers  
[15] know that when they wanted to give guidance like  
[16] that it should be going through operations?

[17] **MR. BEARD:** Yes, sir. That's one of the  
[18] symptoms we told you was weak and we've recognized  
[19] that. We've taken steps to address that.

[20] **QUESTION FROM THE FLOOR:** When you  
[21] pointed out on the 4th and the 5th and you said that  
[22] they violated OP-402 by going over Curve 8 when they  
[23] did the hydrogen addition, would that hydrogen  
[24] addition, the amount over Curve 8, would that have  
[25] shown up on the strip chart recorder?

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[1] **MR. HICKLE:** I think it did.

[2] **QUESTION FROM THE FLOOR:** That was the  
[3] read out station.

[4] **QUESTION FROM THE FLOOR:** When you  
[5] plotted it on the recorder it's over.

[6] **MR. HALNON:** At the worst point or some  
[7] point going after.

[8] **MR. HICKLE:** Maybe not initially.

[9] **MR. HALNON:** The one on the 4th, using  
[10] the same criteria that we used to talk about the  
[11] other nine, I'd say probably no, they wouldn't have  
[12] seen it. But towards the end when they were at the  
[13] worst case they would have seen it, and on the 5th I  
[14] think that's the same thing that would have  
[15] happened. It was probably less than half a pound.  
[16] I'd have to say that for sure.

[17] **MR. HICKLE:** We said that the worst case  
[18] was 55 inches over one and a half pounds, and we had  
[19] that good a resolution on the strip chart recorder.  
[20] During the evolution they would have been able to  
[21] verify by the strip chart recorder that they were in  
[22] an unacceptable region of the curve without a doubt,  
[23] but probably not initially when they first got the  
[24] alarm. They would have had the same resolution  
[25] problem.

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[1] **MR. HALNON:** On the 5th they were .5  
[2] pounds over the curve and on the 4th they were a  
[3] little less than a pound, over a half.

[4] **MR. MERSCHOFF:** In the worst case on both  
[5] the 4th and the 5th would you have seen using the  
[6] strip chart recorders that you were in the  
[7] unacceptable region?

[8] **MR. HALNON:** Yes.

[9] **QUESTION FROM THE FLOOR:** And on the 4th  
[10] they were two pounds over as opposed to 1.7 on the  
[11] 5th.

[12] **QUESTION FROM THE FLOOR:** Going back to  
[13] what Brian clarified on the curve here. He said  
[14] that there's a band on either side of the curve.

[15] **MR. GUTHERMAN:** It's not an explicit  
[16] band, it's an implicit band.

[17] **QUESTION FROM THE FLOOR:** My question is  
[18] that if the band is actually below the curve, if the  
[19] actual system response is below the curve, then  
[20] operating near or at the curve would put you outside  
[21] the design basis, right?

[22] **MR. GUTHERMAN:** The curve is offset for  
[23] all those uncertainties in the worst case  
[24] direction.

[25] **MR. BEARD:** It is now.

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[1] QUESTION FROM THE FLOOR: But what about  
[2] September 4th and 5th?

[3] MR. GUTHERMAN: Knowing what we knew at  
[4] the time, that was the attempt.

[5] MR. EBNETER: But it wasn't.

[6] MR. GUTHERMAN: But it was incorrect at  
[7] the time.

[8] MR. EBNETER: The present curve has this  
[9] margin built in; is that right?

[10] MR. GUTHERMAN: Yes.

[11] MR. BEARD: When the system responds in a  
[12] normal revolution and it doesn't match the  
[13] calculated theoretical locus of points it's no big  
[14] deal. It's not going to come close to the design  
[15] basis.

[16] QUESTION FROM THE FLOOR: Thank you.

[17] MR. LIEBERMAN: I hate to do this, but  
[18] just to go over the last question that Curt raised  
[19] that Brian has answered. Each time the operating  
[20] point was on or near the curve could it have been  
[21] operating outside the design basis or it was  
[22] operating outside the design basis?

[23] MR. GUTHERMAN: Knowing that the curve  
[24] was incorrect?

[25] MR. LIEBERMAN: This is November of '94.

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[1] MR. LANDIS: September, you mean.

[2] MR. GUTHERMAN: My November memo is what  
[3] you're referring to. The answer is it would have,  
[4] because we knew the curve was non-conservative.

[5] MR. MERSCHOFF: Near is an imprecise  
[6] term. Some nears would have been okay and some  
[7] nears would have not been okay.

[8] MR. GUTHERMAN: I didn't get to that  
[9] level of analysis.

[10] MR. LIEBERMAN: I'm talking about the  
[11] LER, not your memo, and these are your words, not  
[12] mine, and so I'm asking the company, when they use  
[13] the phrase was on or near the curve could have been  
[14] operating, what did you mean? What were you trying  
[15] to communicate to us? That's my question.

[16] MR. GUTHERMAN: What we were trying to  
[17] communicate, in my opinion, was the fact that the  
[18] curve had not been redone by the time the LER was  
[19] issued so we didn't know where the correct curve was  
[20] going to end up.

[21] MR. BEARD: I attended the 11-16 meeting  
[22] where you explained why it was a design basis and in  
[23] particular while we were on the evolution on  
[24] September the 5th we had done a sufficient  
[25] calculation to prove we were outside the design

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[1] basis and therefore reportable, and I think that was  
[2] exactly the intent of the other words.

[3] MR. GIBSON: So it might have been more  
[4] accurate to say we may have been on, near or over.

[5] MR. KELLEY: Are you referring to the LER  
[6] statement under cause?

[7] MR. LIEBERMAN: Yes.

[8] MR. KELLEY: It says each time the  
[9] operating point was on or near the curve as  
[10] indicated by the main control board instrument,  
[11] referring to the chart recorder, the make-up tank  
[12] could have been operated outside the design basis.  
[13] That appears to me to be in relation to the  
[14] difference in the computer point and the control  
[15] board recorder.

[16] MR. LIEBERMAN: Okay.

[17] MR. RICHARDS: I want to make sure I  
[18] understand what you just said, though, and I think I  
[19] understood before, but maybe I'm getting confused  
[20] because the curve was offset non-conservatively, it  
[21] was incorrectly drawn, and you had people operating  
[22] in the acceptable region of the curve as it was  
[23] defined at that time for who knows what period  
[24] because they were moving around in there and they  
[25] were in violation of the design basis because the

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[1] curve was incorrect. You haven't gone back and  
[2] counted all those times, but now that you've figured  
[3] out where the real curve should be I guess you can  
[4] append that there were lots of periods of time where  
[5] they were operating in violation of the true curve  
[6] and not knowing it.

[7] MR. GUTHERMAN: That's correct.

[8] MR. RICHARDS: That's what I heard you  
[9] say before.

[10] MR. BEARD: I'm not sure what the point  
[11] of the question is, Jim. Is there some inference  
[12] that we should have done something else? I'm not  
[13] sure what you're trying to get to, and that would be  
[14] useful to us. I think the statement means just what  
[15] Brian said, and I think that's what it meant to me  
[16] when I signed it. We were acknowledging right up  
[17] front that with regard to operating by the main  
[18] board control instrument, which was the strip chart  
[19] recorder, we could have been outside. We didn't  
[20] know. Are you inferring that we should have now  
[21] done something else, gone searching for other times,  
[22] done more calculations, seen how many times and  
[23] wrote another LER or what? Our corrective action  
[24] would have been the same no matter what.

[25] MR. LIEBERMAN: In reading this, I would

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[1] have expected this would have said each time the  
[2] operating point was on the curve it was operating  
[3] outside the design basis. Near the curve may have  
[4] been outside the design basis. It could suggest to  
[5] me that there's a possibility. But I thought at  
[6] this time there was a greater appreciation that if  
[7] it was on the curve it was outside the basis and if  
[8] it was near the curve it may have been outside the  
[9] design basis.

[10] **MR. GUTHERMAN:** I don't understand. Is  
[11] there a question there? I'd like to answer it.

[12] **MR. GIBSON:** Let me try it. He's  
[13] questioning the accuracy of the LER. The question  
[14] is you said if operated on the curve it could be  
[15] outside the design basis. The fact of the matter is  
[16] at the time did you not know that operating on the  
[17] curve was outside the design basis?

[18] **MR. GUTHERMAN:** We knew that the curve  
[19] was non-conservative. Therefore operating on it  
[20] would have been outside design basis.

[21] **MR. GIBSON:** No, could have been but was  
[22] outside. I believe that was the question.

[23] **MR. BEARD:** Yes, but I think somebody's  
[24] hit the key point now that it comes back to me. At  
[25] this point the information that we had was what? At

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[1] least the information that we explored and also that  
[2] we explored subsequently was the strip chart  
[3] recorder. And I think it's already been said here  
[4] that in fact in our subsequent August evaluation the  
[5] strip chart recorder indicated that they were okay.  
[6] So looking at the strip chart recorder data - isn't  
[7] this right? Somebody's already pointed this out.  
[8] You couldn't tell on that because it was offset from  
[9] the computer alarm. I'm not sure what's the intent  
[10] here.

[11] **MR. LIEBERMAN:** That's fine. I think  
[12] what you've just said may have cleared it up,  
[13] meaning the main control board instrument. If this  
[14] had said the computer, the digital, maybe my concern  
[15] would have been more valid.

[16] **MR. BEARD:** I think that's correct.

[17] **MR. GIBSON:** Could we have a review?  
[18] You've agreed to provide us a couple of things in  
[19] writing. Maybe we should review that.

[20] **MR. GUTHERMAN:** The items I have, Pat,  
[21] are we were to confirm whether Salzman and Hinman  
[22] were counseled with regard to how they reviewed LERs  
[23] and specifically the description of the event.

[24] **MR. EBNETER:** And you still want that. I  
[25] think you're the one that requested that.

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[1] **MR. BEARD:** There was one before that and  
[2] I said somebody note that. What was the first one,  
[3] Larry?

[4] **MR. GUTHERMAN:** You wanted to know when  
[5] specifically each shift was counseled regarding the  
[6] event.

[7] **MR. MERSCHOFF:** The first one I wrote  
[8] down was why didn't engineering review the LER for  
[9] September 4th.

[10] **MR. EBNETER:** Who kept track of these on  
[11] your staff?

[12] **MR. MERSCHOFF:** I wrote down four of  
[13] them, yes. The first one that was asked was why  
[14] didn't or did engineering formally review the LER  
[15] and note that the September 4th event was not  
[16] mentioned. The second one was were Mr. Hinman and  
[17] Salzman counseled for not bringing up the '94  
[18] issue. The third one was when were the crews  
[19] trained or counseled on the 9-4 and 9-5 test. The  
[20] fourth was to provide a copy of Pat and Gary's  
[21] expectations.

[22] **MR. BEARD:** We're agreed.

[23] **MR. MERSCHOFF:** Did I miss any more?

[24] **QUESTION FROM THE FLOOR:** I had one  
[25] more. Specific dates when the shift meetings were

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[1] conducted as close as you could come.

[2] **MR. BEARD:** That was his number four.

[3] **QUESTION FROM THE FLOOR:** I'm sorry. I  
[4] guess I didn't hear him.

[5] **MR. BEARD:** It was actually number  
[6] three.

[7] **MR. EBNETER:** Let's stop and go back over  
[8] those four.

[9] **MR. BEARD:** Do we need to write those  
[10] down?

[11] **MR. EBNETER:** I just want to make sure.  
[12] Go over the four, and whoever asked for them, do you  
[13] want it? If you want it, we'll get it in writing.  
[14] Go over the four.

[15] **MR. MERSCHOFF:** Number one is why didn't  
[16] engineering or did engineering review the LER and  
[17] notice that 9-4 wasn't mentioned.

[18] **MR. EBNETER:** Who needs that response?

[19] **MR. LIEBERMAN:** I would like that.

[20] **MR. EBNETER:** You'll give us a written  
[21] response on that.

[22] **MR. MERSCHOFF:** Number two was were Mr.  
[23] Hinman and Salzman counseled for not bringing up the  
[24] 9-4 event.

[25] **MR. LIEBERMAN:** I would like that.



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[1] MR. EBNETER: You need that written  
[2] response.  
[3] MR. MERSCHOFF: The third is the specific  
[4] dates when crews were trained on the 9-4 and 9-5  
[5] tests.  
[6] MR. LIEBERMAN: I might have wanted it.  
[7] I would like that now.  
[8] MR. HALNON: And we said we'd do the best  
[9] we could with that.  
[10] MR. BEARD: We're going to write all  
[11] these to NRC.  
[12] MR. MERSCHOFF: And the fourth was the  
[13] expectations.  
[14] MR. EBNETER: Are there any others that  
[15] you want a written response to now?  
[16] MR. LIEBERMAN: Will you have a copy of  
[17] the expectations that you could leave?  
[18] MR. BEARD: Yes.  
[19] MR. BOLDT: This has got notes on it.  
[20] MR. LIEBERMAN: Is it possible that you  
[21] could fax us a copy?  
[22] MR. BEARD: Sure.  
[23] MR. EBNETER: We need to get these  
[24] responses in a very short period of time.  
[25] MR. LIEBERMAN: I'm only referring to a

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[1] copy of the document. If you could fax it to us  
[2] tomorrow morning, I would appreciate it.  
[3] MR. BEARD: We'll let you Xerox that,  
[4] Jim.  
[5] MR. EBNETER: You can white it out if you  
[6] want, but I would advise you not to.  
[7] MR. KELLEY: It's just Conklin's notes he  
[8] used in teaching the course.  
[9] MR. EBNETER: So that's one of them  
[10] that's off the list, then.  
[11] MR. MERSCHOFF: Yes, sir, number four.  
[12] MR. EBNETER: So you still owe us three.  
[13] And I asked a question and I didn't hear anybody.  
[14] Are there any others that the staff wants a written  
[15] response to? There are no other questions we want a  
[16] written response to. The next question is when can  
[17] you give us those responses? The staff will have to  
[18] consider them as part of their deliberation.  
[19] MR. BOLDT: I'll confer with these guys,  
[20] but I don't see any reason why they can't be faxed  
[21] before the close of work tomorrow.  
[22] MR. BEARD: Don't overcommit. We've  
[23] learned that lesson. We've got an outage and 25  
[24] million things going on.  
[25] MR. BOLDT: When do you need them, Stu?

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[1] Do you have a deadline you need them by?  
[2] MR. EBNETER: When do you need them, Mr.  
[3] Lieberman?  
[4] MR. LIEBERMAN: We're not going to have  
[5] this action out tomorrow. That's for sure. Say a  
[6] week.  
[7] MR. BEARD: One week. If you can't do  
[8] those simple questions in one week -  
[9] MR. GUTHERMAN: Give us until the 5th of  
[10] April, the end of next week.  
[11] MR. EBNETER: That's fine.  
[12] MR. BEARD: May I conclude?  
[13] MR. GIBSON: You may. But I'm going to  
[14] ask the NRC staff to step next door and make sure we  
[15] have no other issues to raise.  
[16] MR. LIEBERMAN: Five minutes.  
[17] (A recess was taken.)  
[18] MR. GIBSON: I think we can go back on  
[19] the record. The NRC staff has met to determine if  
[20] there were additional questions or issues that  
[21] should be discussed during the meeting. We really  
[22] have no additional questions. We did note that  
[23] you've agreed to supplement your last LER, and at  
[24] some point in the future we'd like to discuss the  
[25] schedule for doing that with you.

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[1] MR. BEARD: This is the LER for what?  
[2] Which LER?  
[3] MR. RICHARDS: I believe it was the  
[4] curve.  
[5] QUESTION FROM THE FLOOR: Following the  
[6] September 5th event, the one in November.  
[7] MR. BEARD: Bruce, are you listening?  
[8] Was that the LER you were talking about we were  
[9] going to supplement?  
[10] MR. RICHARDS: The LER says you're going  
[11] to supplement the LER.  
[12] MR. KELLEY: Which one are you looking  
[13] at?  
[14] MR. RICHARDS: 9400901, March 1st, '95.  
[15] MR. KELLEY: It was originally written in  
[16] December and it was supplemented in March.  
[17] MR. GUTHERMAN: And we said again we're  
[18] going to supplement.  
[19] MR. RICHARDS: In the supplement it says  
[20] it will be supplemented.  
[21] MR. MERSCHOFF: The first page, the last  
[22] sentence, this report will be supplemented with  
[23] additional information. Page one of nine.  
[24] MR. BEARD: I want to make sure that we  
[25] understand what we're agreeing to do, and we'll

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[1] agree to do whatever's right.  
 [2] **MR. EBNETER:** Well, let me put it this  
 [3] way. I don't want to debate this this afternoon.  
 [4] There's a need for another meeting with you on some  
 [5] of the engineering issues, I think that's clear,  
 [6] that are outside this enforcement hearing. NRR and  
 [7] the region will get back with you on that meeting,  
 [8] and at that meeting we will discuss with you what  
 [9] has to be done with that LER.  
 [10] **MR. BEARD:** That clarifies it, because  
 [11] I'm thinking what are we going to supplement it  
 [12] with? What's the information?  
 [13] **MR. LIEBERMAN:** You may want to just  
 [14] change it and say there's nothing more to  
 [15] supplement, but we just have something on the record  
 [16] we want to clear up.  
 [17] **MR. BEARD:** Do you understand, Larry?  
 [18] **MR. EBNETER:** That's fine. It's clear  
 [19] that you said the statement and we need to get it  
 [20] covered, and we can do that in a subsequent  
 [21] meeting.  
 [22] **MR. GIBSON:** Jim, did you want to say  
 [23] something?  
 [24] **MR. LIEBERMAN:** My comment's just on the  
 [25] end.

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[1] **MR. GIBSON:** Pat?  
 [2] **MR. LIEBERMAN:** I'll just -  
 [3] **MR. BEARD:** I thought I had the last  
 [4] word, Al.  
 [5] **MR. LIEBERMAN:** This has been a long  
 [6] conference. I want to thank you for your patience  
 [7] and the information you've provided us. You've  
 [8] discussed a number of corrective actions that are  
 [9] going to involve management of both engineering and  
 [10] operations to pull off. The test of your success  
 [11] will be obviously in the results, and neither you  
 [12] nor us can afford to have to have a similar visit  
 [13] like this in the future.  
 [14] **MR. BEARD:** Totally agreed.  
 [15] May I conclude?  
 [16] **MR. GIBSON:** Yes.  
 [17] **MR. BEARD:** Now I have a chance to put  
 [18] one more thing on the record, and forgive me for  
 [19] doing this. I want to talk about that LER again,  
 [20] 009. The point I'd like to make is there's been  
 [21] questions raised about if engineering review it, why  
 [22] didn't the 4th come out. I'd like to point out that  
 [23] the one person who surely reviewed it and wrote a  
 [24] memo of which we have a copy, and so do you, was Mr.  
 [25] Fields, and that memo discusses at great length the

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[1] LER. And the one person that we know for damn sure  
 [2] knew about the September the 4th didn't say anything  
 [3] in his review of the LER. I want that on the  
 [4] record.  
 [5] **Conclusions.** The first statement is not  
 [6] a conclusion. I think it's apparent to everybody.  
 [7] We accept responsibility for the violations. We  
 [8] couldn't do anything else, could we? There were  
 [9] deficiencies in some elements of management  
 [10] oversight in September of '94. And the reason I put  
 [11] that up there is because it relates to the  
 [12] difficulty that we've had and I think you've had in  
 [13] having an enforcement in March of '96. In one way  
 [14] it would have been easier to have an enforcement in  
 [15] December '94. This is March of '96. There were  
 [16] oversight deficiencies in September '94, we think  
 [17] that we've addressed them, and of course that's what  
 [18] the next bullet says. We feel they have been  
 [19] addressed. They've been addressed, they were  
 [20] addressed initially, parts of it or parts of the  
 [21] corrective action of the violations, in our  
 [22] management review committee meetings.  
 [23] I went back and read it, and they were  
 [24] pretty good with respect to what we knew about  
 [25] September the 5th, the principles involved and the

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[1] human performance issues. They've been further  
 [2] addressed starting in February of '95 with our  
 [3] management corrective action plan, which includes  
 [4] the precursor program, which includes all the things  
 [5] that we've talked about. It's also reflected, and  
 [6] this is something that's not a record here, but I  
 [7] previously provided it to the NRC.  
 [8] Every year we go back and revise what we  
 [9] call our long range plan for excellence and  
 [10] operations, a five year look-ahead, and as a result  
 [11] of that we then develop our business plan for the  
 [12] coming year. When you read our current version of  
 [13] our long range plan and our 1996 plan, all of the  
 [14] focus, the intent, the increased focus on safety and  
 [15] human performance that we've talked about that are  
 [16] embodied starting with the management review  
 [17] committee actions, carrying through the management  
 [18] corrective action plan and subsequent actions are  
 [19] embodied in those documents as a reflection of the  
 [20] first element of management oversight, which is to  
 [21] have written guidance on what our standards and  
 [22] expectations are.  
 [23] As another example of our corrective  
 [24] action I mentioned that we now have issue managers  
 [25] of key issues. Here's the latest, and this is in

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[1] this book that I will leave with Stu. These are the  
[2] latest issue manager updates for the management  
[3] corrective action plan, and it will be in your  
[4] book. 51 of 55 items have been completed. That's  
[5] 92 percent. Our make-up tank action plan is 82  
[6] percent complete, and it's very clear relating back  
[7] to the problem report reference. This is where we  
[8] capture all of this.

[9] I also would like to stress again that,  
[10] and this again is embodied in our event pre-ops in  
[11] our '96 business plan and our long range plan, and  
[12] it's the back end of the oversight process, which is  
[13] self-assessment. There are three things I'd like to  
[14] stress again. Senior management, that's me, Gary,  
[15] and the directors have embarked on a periodic take a  
[16] day or two sit-down and self-assess how are things  
[17] going, get away from the forest and the trees and  
[18] take a look. This is something Virginia Power does  
[19] very well. We've picked up that.

[20] An adjunct to that is at the department  
[21] manager level we do quarterly the same thing. We  
[22] look at NRC inspection reports, the precursor  
[23] trends, IMP(), whatever it is, kick up our feet and  
[24] take a day off. We do it off site. As part of  
[25] that, and again, we picked this up from Virginia

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[1] Power, we take the elements of a good plant  
[2] performer that's the NRC's own criteria and our QA  
[3] department, and going down all those attributes  
[4] gives us an assessment of how we're doing.  
[5] Basically we grade ourselves south level one, two or  
[6] three.

[7] We also have in place now a nuclear  
[8] assessment team headed by the former assistant plant  
[9] manager at North Anna. It's staffed with a number  
[10] of top quality people, an organization that has  
[11] taken the lead on root cause analysis when needed.  
[12] They operate our precursor and problem report  
[13] program. It's going to give us an added element  
[14] that we've not had and that other top performing  
[15] plants do have.

[16] Now, I said that I would come back and  
[17] answer the three key questions in our mind and I  
[18] think in yours as you've expressed, why did the  
[19] make-up tank test happen, why didn't you know about  
[20] September the 4th sooner and therefore tell us, and  
[21] why didn't you fix the curve sooner. I'll give you  
[22] the answer. I think we have collectively, but I  
[23] just want to make sure.

[24] To answer the first question, why did it  
[25] happen. I could have started off like this. It

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[1] wouldn't have happened if our design hadn't been so  
[2] complex. Other plants don't have dual systems. So  
[3] we could say, "Hey, if our system hadn't been  
[4] complex on this issue and we didn't have all these  
[5] competing things it wouldn't have happened." It  
[6] wouldn't have happened if we had not decided let's  
[7] meet the chemistry guidelines. We could say that it  
[8] wouldn't have happened if we'd given them an  
[9] operating curve to start with instead of design  
[10] basis, and you would say rightly so. So what? So  
[11] we're not going to take that approach.

[12] So why did it happen? It happened  
[13] because, one, coordination and communication among  
[14] design engineering, system engineering and  
[15] operations was deficient. In addition, it happened  
[16] because our process for managing complex changes was  
[17] deficient. It also happened because some elements  
[18] of management oversight that we've talked about very  
[19] clearly were deficient. Even with all that, it  
[20] happened because the shift supervision of that crew  
[21] exercised poor judgment and didn't meet their  
[22] responsibility. That's why it happened. And our  
[23] corrective actions have addressed all of that.

[24] Why didn't we tell you sooner? Why  
[25] didn't we know sooner? The reason that we didn't

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[1] know sooner is that we didn't do an extensive root  
[2] cause investigation in September beyond the  
[3] management review committee. But that's somewhat  
[4] hypothetical and hindsight because the sub-question  
[5] is well, why didn't you do that, and I think we  
[6] addressed that. We believed the operators, what  
[7] they told us at the management review committee.  
[8] They wrote Problem Report 267. Mr. Fields reviewed  
[9] it, wrote a memo, didn't mention it. The technical  
[10] issues were being addressed through Problem Report  
[11] 149 and 267. We already knew that. There was no  
[12] reason to suspect otherwise.

[13] We didn't know sooner because the three  
[14] engineers who did know, system engineers, felt no  
[15] reason - they didn't see that as an issue. Now, we  
[16] can say they should have, but they didn't until one  
[17] of them read the July investigation report and  
[18] noted, Gee, it's not in there, and thank goodness he  
[19] came forth. We didn't know because the shift  
[20] supervisors, the shift supervision withheld  
[21] information, and the rest of the crew could have  
[22] been more forthcoming. So that's why we didn't  
[23] know. If we had, we would have told you. We told  
[24] you as soon as we knew, we being management.

[25] The third question is why didn't you fix

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[1] it sooner, why didn't you fix it between May and  
 [2] September, the curve, and I think we've already  
 [3] covered that. We had deficient coordination and  
 [4] communication among design, system engineering and  
 [5] operations. The calculation development process was  
 [6] deficient and management involvement was  
 [7] ineffective. That's why we didn't fix it. Our  
 [8] corrective actions addressed that.

[9] You know, the hardest way to learn is  
 [10] from self-experience. Now, we all talk about we've  
 [11] got to make use of industry experience and we try to  
 [12] do that and all that sort of thing, and  
 [13] self-experience is the hardest way. We can verify  
 [14] that. But you know, perhaps also it's the most  
 [15] effective way from the standpoint of lasting. We're  
 [16] not going to forget this one. We've already paid a  
 [17] high price for this self-experience. Two people  
 [18] have lost their jobs. Four others have had their  
 [19] careers adversely affected. There's been a  
 [20] significant impact on our reputation and our  
 [21] morale. There have been significant management  
 [22] hours involved, and that's an understatement.  
 [23] There's been negative press, we have four apparent  
 [24] violations, and we're here. But we have learned.  
 [25] Corrective actions are in place, and I will say on

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[1] the record that it won't happen again.

[2] The last thing I'll say is a saying that  
 [3] I've used with our people. They've heard me say it  
 [4] before, but I think it applies. There's a saying  
 [5] that goes, In the moment of darkest defeat is the  
 [6] greatest opportunity, and we'd like to think we've  
 [7] taken advantage of that opportunity.

[8] Thank you.

[9] **MR. EBNETER:** Thank you, Mr. Beard. With  
 [10] regard to experience and learning, experience is a  
 [11] difficult learning situation, that's for sure. It  
 [12] gives you the test first and then the lesson later,  
 [13] and I think we all understand that.

[14] In closing, we need to remind you of two  
 [15] things. One, the apparent violations as written are  
 [16] subject to change, further review, and particularly  
 [17] in light of the information you'll supply to us.  
 [18] Secondly, the statements, views, expressions of the  
 [19] staff or lack thereof are not intended to represent  
 [20] the final agency determination. As Mr. Lieberman  
 [21] has indicated, this is an agency process. I don't  
 [22] know what prediction -

[23] **MR. LIEBERMAN:** Hopefully sooner than  
 [24] later. That's about as good as I can say.

[25] **MR. BEARD:** We're in favor of that.

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[1] **MR. EBNETER:** We do appreciate your  
 [2] coming in, and your information I thought was well  
 [3] presented, and we appreciate that. It does take a  
 [4] lot of time. It took a lot of time by our staff. I  
 [5] would expect your commitment is to get us that other  
 [6] information by the 5th.

[7] **MR. GUTHERMAN:** Correct.

[8] **MR. EBNETER:** So we'll be looking forward  
 [9] to that. And we'll get back in touch with you with  
 [10] regard to the follow-up meeting on the engineering.  
 [11] So with that, I'll just close the conference.

[12] **MR. BEARD:** I do have one question. I  
 [13] think the fifth item to your four is to whether we  
 [14] supplement LER 09 or not. Also, we'd like to ask  
 [15] about the transcript. When will it be available and  
 [16] will we get a chance to review it for corrections?

[17] **MR. LIEBERMAN:** Our past policy and  
 [18] practice has been that we do not disclose the  
 [19] transcript of a closed conference until after we  
 [20] make the decision on the enforcement action, and  
 [21] then we only disclose it if we get an FIA because it  
 [22] was a closed conference.

[23] **MR. BEARD:** But it wasn't closed to us.

[24] **MR. LIEBERMAN:** But if we give it to the  
 [25] licensee we give it to the world. If you'd like to

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[1] have it, we'd be happy to give it, but only under  
 [2] those circumstances.

[3] **MR. BEARD:** Thank you. We do appreciate  
 [4] your forbearance in listening to us.

[5] **MR. EBNETER:** I should ask you one more  
 [6] question before we close. Normally the material  
 [7] you're going to give us, is there anything that's  
 [8] private information or proprietary information that  
 [9] should not be disclosed?

[10] **MR. BEARD:** No. This is for you, and we  
 [11] have copies of our handouts for anybody that wants  
 [12] it.

[13] **MR. MERSCHOFF:** That book will go in the  
 [14] PDR?

[15] **MR. BEARD:** Both can.

[16] **MR. EBNETER:** Thank you very much. We  
 [17] appreciate it.

[18] **MR. BEARD:** Thank you.

[19] (Proceedings concluded at 5:40 p.m.)  
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 [23]  
 [24]  
 [25]



CERTIFICATE

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This, the 6th day of April 1996.

Keith A. Wilkerson, CCR-B-1381

My commission expires on the  
30th day of May, 1999.