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NUCLEAR REGULATORY COMMISSION

ORIGINAL

In the Matter of: ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
SUBCOMMITTEE ON HUMAN FACTORS

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1 UNITED STATES OF AMERICA
2 NUCLEAR REGULATORY COMMISSION

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4 ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
5 SUBCOMMITTEE ON HUMAN FACTORS

6 - - -

7 Room 1157
8 1717 H Street, N.W.
9 Washington, D.C.

10 Thursday, October 28, 1982

11 The Subcommittee met, pursuant to notice, at
12 8:30 a.m., DAVID WARD, Chairman of the Subcommittee,
13 presiding.

14 PRESENT FOR THE ACRS:

15 MEMBERS:

- 16 DAVID WARD, Subcommittee Chairman
- 17 JEREMIAH RAY
- 18 FORREST REHICK
- 19 HAROLD LEWIS

20 CONSULTANTS:

- 21 I. CATTON
- 22 A. DEBONS
- 23 M. RENTNEY

24 ACRS STAFF:

- 25 Mr. MCKINLEY

DESIGNATED FEDERAL EMPLOYEE:

- DAVID FISHER

P R O C E E D I N G S

1 MR. WARD: The meeting will come to order.

2 This is a meeting of the Advisory Committee on
3 Nuclear Safety Subcommittee on Human Factors.

4 I am David Ward, the chairman of the
5 subcommittee. The other ACRS members present today
6 are: Mr. Ray, and Remick. We have consultants Mr.
7 Catton, Mr. Debons, and Mr. Nertney.

8 The purpose of the meeting is twofold. First,
9 the subcommittee will discuss the proposed rule on
10 licensed operator staffing at nuclear power plants. In
11 the process of doing this, several other issues related
12 to staffing will be addressed, for example, the number
13 of crew on shift, limits on overtime, and the
14 requirements for shift technical advisor.

15 As a result of these discussions, we would
16 like for the subcommittee to develop a recommendation
17 for the full committee on advice that it might choose to
18 give to the Commissioners regarding the proposed rule.

19 I think you have read Mr. Fisher's write-up on
20 the proposed rule, and I see that there has been
21 considerable comment from the industry and the public on
22 the rule. What we want to get today from the staff is a
23 better explanation of their background and the rationale
24 for requiring the new rule at this time.

1 The second major topic of the meeting will be
2 our second discussion of the staff's agreed human
3 factors planning. Back in September, we discussed the
4 plan at some length. We had the benefit of
5 presentations by the staff, and an advance copy of the
6 draft.

7 As you recall, the subcommittee was very
8 strongly critical of the plan, particularly of the
9 written plan. As a result of that meeting, we furnished
10 the staff with a considerable number of comments, both
11 general and specific comments that each of the
12 consultants had furnished, together with other input the
13 staff had received in the meantime.

14 They have redrafted the plan. You have
15 received copies of that within the past week or so. We
16 don't plan to have any presentation from the staff
17 regarding the plan, but rather we would like to have
18 your reaction to the redraft of the plan, and have a
19 general discussion. The staff interested in the plan
20 will be present during that discussion to answer
21 questions or make comments that they might want to
22 make.

23 We will ask for two presentations from the
24 staff at the full committee meeting next. The first
25 regarding the proposed new rule for licensed operator

1 staffing on Friday, November 5th at 10:30 in the
 2 morning. We have an hour allotted for a summary
 3 presentation to the full committee. We can talk a
 4 little bit more about that later, but we would like to
 5 have the staff provide a summary of the presentation
 6 they are going to give at that time.

7 Regarding the program plan, on the same day,
 8 the same morning, Friday morning, November 5th, we have,
 9 I think it is, two hours blocked out beginning at 8:30
 10 for presentations from the staff and a discussion from
 11 the full committee on the integrated human factors
 12 program plan. At that time, I will carry to the
 13 committee a summary of the comments that we get here
 14 today from the consultants and subcommittee members.

15 The agenda for today indicates that we will be
 16 finished fairly early in the afternoon, by one o'clock,
 17 so we will not have a lunch break. We will go right
 18 through to one, and I don't see why we shouldn't be able
 19 to make that. So if your travel plans are appropriate,
 20 I guess you can leave it that way. I don't think that
 21 we will run much later than early afternoon.

22 The staff has asked us for one slight
 23 modification of the order of the agenda. Rather than
 24 starting off with a description of the proposed staffing
 25 rule by Mr. Merschhoff, we will go with D, B, C, in that

1 order, and then revert to the original order of the
2 agenda.

3 With that, let's go ahead with the first item
4 on the agenda which, I guess, is D, and this is Larry
5 Crocker.

6 MR. CROCKER: Good morning. My name is Larry
7 Crocker, and with the Licensee Qualifications Branch,
8 Division of Human Factors Safety of NRR. With have with
9 us today several other NRR members, my Branch Chief and
10 two other members of the branch. There are also some
11 people from Research, Mr. Goller, Mr. Overbee, and Mr.
12 Merschoff, who will also be on the agenda.

13 We are with you today to discuss the staffing
14 rules regarding the number of licensed operators on
15 shift, specifically, the SROs. I should point out, I
16 think probably I am a walking example of the absence of
17 an SRO. About two months ago, whoever was supposed to
18 be in charge of my motor control center shut down, so I
19 am having some difficulty speaking. If you do have
20 trouble understanding me, please let me know and I will
21 back up and try it again. Sometimes the tongue and the
22 cheek do not work the way they are supposed to.

23 Mr. Merschoff will be providing you the
24 details regarding the background, content, the intent,
25 and the current status of the rule. However, before we

1 get into the specifics of the rule itself, we thought
2 that it was important to briefly discuss the predecessor
3 and related actions the staff has taken which have some
4 impact on the rule, to set the stage, so to speak. I
5 would like to take a little time to review that stage
6 setting.

7 Our overall objective within the human factors
8 area of NRR, I believe, can be simply stated as shown on
9 this slide. We are attempting to upgrade the
10 capabilities of the operating personnel to cope with
11 both normal and off-normal conditions at the nuclear
12 plant. In support of this objective, there really are
13 four primary areas of activity which are being pursued
14 simultaneously.

15 First, our Procedures and Test Review Branch
16 at NRR is working on establishing clear, coherent,
17 understandable symptom based emergency procedures which
18 will provide the operators with unambiguous guidance on
19 actions to take in off-normal situations.

20 At the same time, our Human Factors
21 Engineering Branch is working on improvements in the
22 control room that result in more usable information
23 available to the operators with a concurrent decrease in
24 the chance for human error. The safety parameter
25 display system makes sure that the operators have

1 information readily available to better cope with
2 effects of an accident.

3 I do not propose to discuss here the emergency
4 procedures or the control room improvement programs any
5 further, except to say that they are valuable in helping
6 make human operators plan. The committee is already
7 aware of the details of those programs.

8 A third effort, now largely concluded, had to
9 do with an upgrade of administrative controls. This
10 effort has been the responsibility of the Licensee
11 Qualifications Branch. The individual actions that have
12 been taken stem from the lessons learned from the TMI-2
13 accident, and are noted on this slide.

14 Briefly, the changes have been made in the
15 administrative controls area. They include
16 establishment of shift relief and turnover procedures to
17 ensure that each member of an on-going shift is aware of
18 the plant status, and particular matters pertinent to
19 the station or the plant.

20 Procedures have been established at each plant
21 to assure that that only essential personnel are allowed
22 in the control room, and to establish a clear line of
23 authority for the control room.

24 Procedures have also been established in this
25 plan to assure that the operating experience originating

1 both at that plant and elsewhere in the industry is
2 identified and evaluated for applicability to that
3 plant, and is made known to those persons within the
4 utility who need such information.

5 At the same time, the procedures include
6 provisions which should preclude swamping these
7 individuals with non-essential matters. The staff feels
8 that the INPO-CN program is an important part of this
9 information experience feedback effort, and we endorse
10 the INPO-CN program by the industry.

11 Procedures also have been implemented at each
12 plant which require that important operating activities
13 are verified to be correct. This independent
14 verification may be accomplished by another qualified
15 individual or by automatic systems status verification,
16 or by some combination of the two.

17 MR. RAY: Could I have a question, please?

18 MR. CROCKER: Yes.

19 MR. RAY: That verification of the correct
20 performance of operating activities, is that on-going on
21 a 24-hour basis, or is it a shift change activity?

22 MR. CROCKER: This is as the activities are
23 completed.

24 MR. RAY: So it is on-going.

25 MR. CROCKER: It is on-going.

1 Finally, procedures have been established at
2 each plant which assure that the duties,
3 responsibilities, and authority of the shift supervisor
4 are clearly defined. As a corollary, shift supervisors
5 have been relieved of unnecessary administrative
6 duties. These procedures emphasize the responsibility
7 of the shift supervisor for management of the plant, and
8 they set forth a clear line of command authority at the
9 plant.

10 MR. REMICK: Larry, the references that you
11 have there, are those from 0660?

12 MR. CROCKER: Yes, 0660, the TMI Action Plan.
13 I am sorry, I should have mentioned that.

14 All of this then brings us to the four program
15 areas which support our objective of upgrading the
16 capability of the operating personnel. In addition to
17 providing improved emergency procedures, and improved
18 control boards and systems, and upgraded administrative
19 controls, we also have a major emphasis on upgrading the
20 staffing, qualification and training of on-shift
21 personnel.

22 As a result of the TMI-2 lessons learned,
23 several immediate steps were taken in the upgrading of
24 qualifications of operations. In accordance with item
25 1.A.2.1, the experience levels for operators was

1 increased.

2 For SROs, the pre-TMI requirements called for
3 a high school graduate, who had had four years of
4 responsible power plant experience, including one year
5 of nuclear power plant experience with a one for one
6 credit allowed for each year of academic or related
7 training.

8 Since TMI, the required experience for SROs
9 has been expanded to include also one year as a licensed
10 operator, six months of experience at the plant for
11 which the license is being sought, and three months of
12 training on-shift as an extra person.

13 For ROs, the pre-TMI requirements were a high
14 school graduate, two years of power plant experience,
15 including one year of nuclear experience. This now has
16 been expanded to also require three months of training
17 as an extra person on shift in the control room.

18 TMI Action item I.A.2.3 specified instructors
19 must be trained and qualified at the SRO level, and it
20 also called for NRR to develop criteria and procedures
21 to be used for auditing training programs. Our branch
22 now has training specialists on staff. Procedures and
23 criteria for training are being written, and we are
24 beginning to conduct audits of licensee and vendor
25 training programs.

1 In accordance with item I.A.3.1 of the Action
2 Plan, the scope and criteria for licensing examinations
3 were upgraded. Required training was added in the area
4 of heat transfer, fluid flow, and thermal dynamics.

5 Training for mitigating core damage was
6 covered specifically by Task Action Item II.B.4.
7 Training emphasis was placed on proper response to
8 reactor and plant transients.

9 The passing grade for operating examinations
10 was increased. Before TMI, the passing grade was 70
11 percent overall. Since TMI, it has been upgraded to 80
12 percent overall, with a minimum of 70 percent in any
13 category.

14 MR. CATTON: How many times can they take the
15 exam?

16 MR. CROCKER: Three times, I believe, before
17 they get into real trouble. If they miss the first time
18 in one or two areas, we let them go back again, I
19 believe, after two months.

20 MR. CATTON: Who makes this decision?

21 MR. CROCKER: It is part of the Operator
22 Licensing Branch as far as the examinations are
23 concerned.

24 MR. CATTON: Three before they get into real
25 trouble, which means that it is probably four, If there

1 are extenuating circumstances, is it four?

2 MR. CROCKER: We have the expert with us, and
3 I might call on him.

4 MR. CATTON: Is it three and you are out, or
5 what?

6 MR. CROCKER: I really don't know.

7 Paul, can you help, or Ellis?

8 MR. MERSCHOFF: Ellis Merschhoff, Office of
9 Research.

10 According to the Code of Federal Regulations,
11 there is a time period of two months before they can
12 take it a second time, and a period of three months
13 before you can take it a third time. There is no
14 cut-off. Conceivably, you could take the examination an
15 indefinite number of times, unless the plant management
16 or the NRC decides that it is enough. But the code does
17 not specifically address the maximum number of time.

18 MR. CATTON: Except that after the first it
19 takes six months.

20 MR. MERSCHOFF: I am pretty sure that that is
21 the number and how it is spelled out in the code.

22 MR. CATTON: Thank you.

23 MR. LEWIS: Once they pass it, is that it for
24 life, or is there any schedule for reexamination?

25 MR. CROCKER: Every two years, there is a

1 requalification.

2 MR. LEWIS: But it is not with the same exam.
3 It is not the same intensity of the exam?

4 MR. CROCKER: It is not a full blown exam on
5 the requalification, but they are required to go over
6 specific subjects and be able to pass the
7 requalification exam.

8 MR. CATTON: But that exam is not given by
9 NRC, is it; it is given by the plant, and you just check
10 it.

11 MR. CROCKER: It was at the plant before, but
12 there are efforts underway to make that an NRC exam.

13 MR. CATTON: But at present it is not.

14 MR. CROCKER: At present, I believe it is
15 not.

16 MR. MERSCHOFF: There has been a recent
17 change, within the past few months, and 20 percent of
18 the requalification exams will be administered by the
19 NRC. That is 20 percent of the people who are taking
20 the exam.

21 MR. RAY: Is there any intent to change it to
22 a full-blown exam as compared to the partial that you
23 mentioned a moment ago?

24 MR. CROCKER: I believe not. In fact, we have
25 backed off from what was going to be required for the

1 full NRC exam to the 20 percent. We just do not have
2 the manpower to take care of it.

3 MR. RAY: On the reexam after they fail, is
4 that a complete examination, or is an examination only
5 in the areas that were deficient?

6 MR. CROCKER: It depends on how much they
7 failed. If it was just one area, or maybe two areas,
8 they would take that portion of it over again.

9 MR. RAY: So a judgment is applied.

10 MR. WARD: Larry, do you know if it is the
11 practice of the utilities to, as part of the training,
12 at the end of the training period, to give exams
13 in-house, which are similar, or maybe old exams that
14 have been used?

15 MR. CROCKER: I believe that it is almost
16 universal practice within the utilities, yes.

17 MR. WARD: So, presumably, a utility won't put
18 a license applicant up for the exam unless he or she has
19 already done very well on an in-house exam.

20 MR. CROCKER: I think that is correct.

21 MR. WARD: Does anyone have a rough number on
22 the fraction of failures.

23 MR. CROCKER: I had them at one time.
24 Certainly, after TMI there was a tremendous failure rate
25 on the examinations for the NTOL plants. I think recent

1 data would probably indicate that they are doing
2 considerably better. The training program seems to be
3 taking into account more of the things that we have been
4 putting emphasis on. But I don't have the precise
5 numbers.

6 MR. REMICK: I am probably four or five years
7 out of date, but Paul Collins is in the audience, and if
8 I can quote his figures correctly, historically in the
9 past, 15 percent used to fail. But after TMI,
10 especially when it went up to 80 percent as passing, it
11 is my impression that more than 50 percent failed. What
12 it is now, I am not sure.

13 MR. CROCKER: It is something like that.

14 MR. REMICK: I think historically it was
15 something like 15 percent failed the NRC test.

16 MR. WARD: Is that because the utility
17 training groups took a while to get up to speed? Did
18 the exams change? The passing grade went up, but did
19 the content of the exam change?

20 MR. REMICK: I am certainly not an expert, but
21 the content changed, but also the level for passing, and
22 so forth.

23 Larry, I have a question. I think you said
24 that as part of Action Item I.A.2.3, instructors are now
25 certified at the SRO level. I think you said,

1 certified. Are they not licensed?

2 MR. CROCKER: I think it is an option on the
3 part of the utility to either license or certify them.

4 MR. REMICK: If they are certified, they don't
5 have to go through a requalification program themselves;
6 is that right?

7 MR. CROCKER: I believe they have to go
8 through a recertification. Ellis has another comment on
9 that.

10 MR. MERSCHOFF: They are required to take the
11 written portion of the SRO exam, and that constitutes
12 their certification, which is sort of a funny word.
13 They don't take the simulator exam, and they don't take
14 the oral exam. They are required to participate in the
15 requalification program, the entire two-year cycle
16 program.

17 MS. GOODMAN: I would like to say OLB is
18 preparing a commission paper this month on a lot of
19 these issues, particularly on the failure rates. That
20 commission, I believe, is due at the end of this month.

21 MR. LEWIS: What about the same failure rate
22 question on requalification. Is that a sure thing, or
23 do a number of people have their careers cut-off in
24 mid-stream?

25 MR. CROCKER: There is certainly a possibility

1 that they could have their career cut-off, but I am
2 aware of any that this has happened to. I believe there
3 are some in the last year or so who have had some
4 difficulty with this. I believe they have had to pull
5 them off shift duty and stick them in an intensive
6 training program for a little bit, to get them beefed up
7 so that they can pass the exam.

8 MR. LEWIS: I am just groping for whether the
9 requalification is an effort to force education. That
10 is to say, there are ways of doing this in which a
11 person is assured of passing eventually because he can
12 do it again and again, but it forces him to study a
13 little bit. Then there are other ways in which you use
14 it to weed out the people who have gone downhill. I
15 just wondered what was the philosophy on
16 requalification.

17 MR. CROCKER: I suspect that it is a
18 combination, but I am not sure.

19 MR. MERSCHOFF: The way the requalification
20 exams work now, the industry gives most of them. They
21 have in the past, even the 20 percent that the NRC gives
22 now. If an operator fails, his license is not revoked.
23 He is assigned to a qualification upgrading program to
24 strengthen the weak areas noted by the exam, and then he
25 is given a requalification exam.

1 The catcher is, he is required to
2 satisfactorily complete the requalification program to
3 get his license renewed, so ultimately he has to pass
4 that requalification exam. But failing a
5 requalification exam will not cause him to lose his
6 license.

7 MR. LEWIS: Thank you.

8 MR. REMICK: It will cause him to go into an
9 accelerated requalification program if he is below a
10 certain level.

11 MR. MERSCHOFF: Yes. He is not necessarily
12 pulled off duty, but his training is upgraded.

13 MR. REMICK: Are these requalification exams
14 still given annually?

15 MR. MERSCHOFF: Yes, it is still annually, but
16 the requalification program is two years long.

17 MR. LEWIS: The reason I am groping for one
18 moment on my question, on the pilot requalification,
19 which is a biannual thing, the rule states that it is
20 possible to pass but it is not possible to fail. The
21 intent is to pass everybody, but make them do it often
22 enough, and everybody knows that you cannot lose your
23 license through that sort of thing. That seems to be
24 the understanding here, but perhaps not the rule.

25 MR. DEBONS: Am I assuming correctly that

1 there is a source where all these data concerning the
2 structuring of this test or these tests are available?
3 In other words, I could ask questions about validation
4 of these tests which I begin to question?

5 In other words, is there a source within the
6 staff from which the reliability of the tests and the
7 validation of the tests can be obtained?

8 MS. GOODMAN: The Operator Licensing Branch is
9 that source. They are presently beginning a program to
10 validate the exam, and that program has only just begun
11 this fiscal year. Most of the questions that you are
12 asking can be answered in the remainder of the questions
13 they are working on. With the new program, they have
14 started to both upgrade the examination process, as well
15 as give a reliable, validated examination process.

16 MR. DEBONS: It would seem to me that this
17 activity would be rich for the purpose of developing
18 research on the general question of nuclear safety. Is
19 there an extension of these data to the research
20 community?

21 It seems to me that failure rates are
22 suggestive of some very critical independent variables.
23 Is there an extrapolation between this and that?

24 MR. MERSCHOFF: As far as the research in this
25 area, the format of the examination has recently

1 changed. The number of categories has been changed. A
2 new question bank is being developed by OLB that is
3 computerized, thus leading toward multiple choice type
4 questions, as opposed to the essay answers that were
5 used in the past.

6 The Office of Research is planning validation
7 work in 1984 after experience is gained in the new
8 format of the examination, and that research will
9 support the OLB development work.

10 At this time, there is nothing done. There
11 wasn't a user need received by Research.

12 MR. DEBONS: I think you are addressing the
13 content aspect of the examination. I am asking the
14 question, given that we have these experiences from
15 these examinations, and given that these examinations
16 then can provide some suggestions concerning variables
17 regarding nuclear safety, are these experiences now
18 being translated to the research community?

19 I mean, is there a cross-over between the
20 examination experience and the operational experience?
21 I am not asking the validation question, I asked that
22 before.

23 MR. MERSCHOFF: Right now there is not a
24 conduit to provide the research community with that
25 data. But after we validate the examination, we will

1 certainly publish our work and provide the research
2 community with the data.

3 MR. DEBONS: It seems to me that it is
4 critical, frankly.

5 MR. LEWIS: Isn't there a secondary point,
6 just following up your point, which is a very good one,
7 which is to ask whether the content of the examination
8 is, in turn, related to reactor safety.

9 MR. DEBONS: That is a validation question.

10 MR. RENTNEY: Relevance and role, those are
11 the things that are bothering me. There is nothing
12 worse than an over-qualified operator, I think.

13 MR. LEWIS: I can think of something worse.

14 MR. RENTNEY: Yes, an underqualified
15 operator.

16 MR. REMICK: I have a question. Does the
17 Operator Licensing Branch still audit the annual
18 requalification exam?

19 MR. CROCKER: Yes.

20 MR. REMICK: So they still go and audit those
21 and make sure that they are of comparable quality to NRC
22 type exams.

23 MR. CROCKER: Yes, they do.

24 MR. REMICK: Do you know the frequency with
25 which they audit those?

1 MR. CROCKER: I do not know that. Does anyone
2 have a feel for that? I know we check, but I am not
3 sure how often.

4 MR. WARD: Do you want to get the answer to
5 that, Forrest?

6 MR. REMICK: I would appreciate it, yes.

7 MR. CROCKER: We can certainly get that for
8 you.

9 MR. WARD: Maybe you can call somebody later
10 in the day and find out.

11 MR. RAY: Larry, I think maybe I wasn't
12 listening quite enough. There was a mention earlier of
13 a 20 percent participation by NRC in requal exams.
14 Would someone explain to me what the 20 percent is. Is
15 it complete participation by NRC in approximately 20
16 percent of the number of exams given throughout the
17 industry at a given time, or does the NRC intrude, if I
18 can use the word, on the requal examination of each
19 operator for 20 percent of the scope?

20 MR. CROCKER: My understanding is, it is full
21 participation in about 20 percent of the examinations,
22 rather than a 20 percent intrusion on each one.

23 MR. REMICK: Am I correct, Larry, that this is
24 just starting in this fiscal year, fiscal year 1983,
25 through recent Commission action, I believe.

1 MR. CROCKER: Yes, we are barely getting
2 underway with it.

3 MR. WARD: Why don't you go ahead, Larry.

4 MR. CROCKER: In addition to the experience
5 and training of the reactor operators, there was also a
6 question regarding the number of operators and other
7 staff to operate a plant safely.

8 Various investigations and studies after the
9 TMI-2 accident resulted in various recommendations
10 regarding staffing. Mr. Merschhoff has some data that he
11 will be discussing with you later about these
12 recommendations. For my purpose,, I just want to point
13 out that at this time the regulatory and technical bases
14 for staffing requirements are quite skimpy.

15 We presently have no rules for nuclear plant
16 staffing for other than licensed operators. Operator
17 qualifications, as well as qualifications for other
18 plant personnel are specified in ANSI standard N.18.8,
19 1971, an endorsed by the 1975 version of Regulatory
20 Guide 1.8.

21 There is an 1981 version of the ANSI standard,
22 which I will label ANSI 3.1, that has been adopted by
23 the industry but has not yet been endorsed by a
24 regulatory guide.

25 MR. WARD: Larry, the personnel qualifications

1 in those two documents, are they for just licensed
2 operators, or are they for all other personnel?

3 MR. CROCKER: They are for all personnel on
4 the plant staff.

5 MR. RAY: Excuse me, but sometimes we don't
6 understand what "all" means. Does that include
7 maintenance personnel?

8 MR. CROCKER: It has maintenance people,
9 managers, supervisors.

10 MR. RAY: Thank you.

11 MR. CROCKER: In an attempt to develop a
12 better technical basis for plant staffing guidelines,
13 there are several efforts now underway, but we do not
14 expect usable results to be available before mid-1984.

15 We have a manpower and staffing contract
16 effort now underway at Pacific Northwest Laboratories
17 aimed at developing and recommending guidelines
18 regarding the total manpower and staffing of nuclear
19 plants. It includes consideration of both shift and
20 non-shift personnel, and normal and off-normal
21 operations.

22 The objective of the effort is to develop
23 guidelines regarding the numbers of people, types of
24 jobs, qualifications, and positions, and configuration
25 of staff necessary for safe operation. Consideration

1 also will be given to construction and start-up staffing
2 and qualifications.

3 The results of this effort are not expected
4 until the summer of 1984, although some preliminary data
5 probably will be available by about next March.

6 There are also, either complete or underway, a
7 number of staffing surveys aimed at getting a better
8 handle on the numbers of people needed to staff a
9 nuclear plant.

10 Among these is a survey of foreign reactor
11 operators conducted by our Office of Research. The
12 results were published as NUREG-0863 in May of this
13 year. The report includes a report on foreign staffing
14 practices for 18 foreign countries.

15 MR. REMICK: Was that only operators, or did
16 that include other personnel?

17 MR. CROCKER: It was looking primarily at
18 operators.

19 INPO also has conducted a survey of staffing
20 practices and patterns within the U.S. industry. Our
21 understanding is that they plan to repeat the survey on
22 an annual basis, to include projections for each of the
23 requirements.

24 Our technical assistance contractor, B&L, also
25 is collecting information regarding plant staffing

1 practices in connection with its effort on the various
2 technical assistance tasks.

3 Finally, both the Office of Reseach and INPO
4 are conducting job task analyses in order to gather data
5 necessary to enable us to make the judgment as to how
6 many people and what skills and qualifications are
7 needed for safe plant operation.

8 At this time, it is not precisely clear to me
9 what we are going to do with all this informaton on
10 staffing practices, the necessary skills and
11 qualifications. However, it should enable us to make a
12 rational decision as to the necessity of specifying
13 certain minimum numbers and certain minimum
14 qualifications on the various plant staff positions.

15 In the meantime, not bothered by a lack of
16 technical basis or lack of rules, the staff published
17 NUREG-0737. Among other things, the NUREG provided
18 guidance regarding shift staffing for various plant
19 configurations.

20 MR. REMICK: Larry, before you go into that, I
21 had a question on your previous slide.

22 About a year ago, I believe, DOE, with input
23 from definitely INPO but I believe others, maybe
24 Oakridge, was conducting some kind of a study of supply
25 and demand of operating personnel. What is the status

1 of that; has that been published, or is it still being
2 done?

3 MR. CROCKER: It is underway. Does anyone
4 know whether it has been published or not?

5 MR. MERSCHOFF: That survey was conducted by
6 ORAU, the Oakridge Associated Universities for INPO with
7 DOE money. There was a first version published about
8 six months ago, and a final version is either published
9 or very soon will be published. I saw a draft of it a
10 month ago.

11 MR. RAY: Does it have an identifying
12 designation number?

13 MR. MERSCHOFF: If it does, I will give it to
14 Dave Fisher. I am not sure right now.

15 MR. CROCKER: This slide is a reproduction,
16 really, of the staffing table from NUREG-0737. I have
17 added to the table the emergency preparedness staff, the
18 need for a communicator, a health physics technician,
19 and a rad. chem. technician to be on shift.

20 The STA is, of course, a new requirement
21 stemming from TMI lessons learned. One STA has been
22 required on each site to provide engineering advice to
23 the shift since January of 1980.

24 The only change in requirements for operators
25 from what was in effect at most plants prior to TMI is

1 the additional SRO to be stationed in the control room.
2 The other operators, both licensed and unlicensed, shown
3 in the table, were previously specified in the plant
4 technical specifications.

5 NUREG-0737 called for this new staffing level
6 to be in effect by July 1, 1982. It was an outgrowth of
7 this date that led to the staff briefing in June of this
8 year and subsequently to rulemaking regarding licensed
9 operators, which Mr. Merschoff is now prepared to
10 address.

11 Before I turn the microphone over to Ellis,
12 there is one item, Mr. Ward, that you indicated you were
13 interested in, comparative informatin between the U.S.
14 staffing practices and Canadian practices. I can either
15 talk about that now or later on, if you prefer.

16 MR. DEBONS: Is there a document that I could
17 obtain which specified for each of the positions that
18 you talked about as to competencies which relate to each
19 of these?

20 Do you know what I mean by that?

21 MR. CROCKER: Do you mean the qualifications?

22 MR. DEBONS: Yes, qualifications in a sense,
23 but I mean competencies or the sort of things that these
24 people have to be competent to do.

25 MR. CROCKER: This is one of the things that

1 we have underway right now, the job/task analyses,
2 trying to define specifically what the individuals have
3 to be able to do at the plant in order to have a safe
4 operation.

5 MR. DEBONS: There is a document?

6 MR. CROCKER: There is not one now, but we
7 hope to get that information within the next year and a
8 half or two years.

9 MR. DEBONS: How soon?

10 MR. CROCKER: A year-and-a-half, I guess,
11 before we finally get it.

12 MR. DEBONS: That raises a question in my
13 mind. If the competencies are uncertain, then what is
14 the basis for structuring an examination. I am rather
15 vague about that.

16 MR. CROCKER: I think that same question comes
17 from other folks as well. The examination has been
18 there because it has been there. I don't know that
19 anyone ever developed the exams specifically to make
20 sure that the individuals had all of the specific data
21 or specific skills that were needed to operate a plant
22 safely.

23 MR. WARD: I think practice precedes theory,
24 and this is the case in many practical arts.

25 MR. LEWIS: But this is really an extremely

1 important issue, because the reason for wanting to
2 upgrade operators was the accident at TMI. There were
3 many things that happened at TMI, but the barebones
4 problem was that for a couple of hours the reactor was
5 in trouble and the operators were unable to diagnose it
6 from information that was available to them on the
7 panel. So they let go beyond the point of return.
8 Presumably, an upgrading is not done for someone's
9 sake. It has got to be directed toward resolving that
10 problem.

11 Your question, I think, is exactly
12 well-taken. I find not much evidence that that kind of
13 thinking in accident analysis is at the heart of the
14 upgrading requirements.

15 Particularly, as an aside, I notice in your
16 first slide, you say that you want to upgrade the
17 performance of the operators for both normal and
18 off-normal operating conditions. I wonder if there is
19 evidence that there were difficulties with normal
20 operating conditions, or that one has learned from the
21 TMI accident that there was a problem with normal
22 operation of the plant, or is that just a throw-away?

23 MR. CROCKER: No. I think there was some
24 question, for example, as to whether the operators had a
25 good feel for the natural plant status or that they just

1 followed the internal plant procedures that were laid on
2 them. The question is, if they had really been
3 knowledgeable of the actual plant status, perhaps the
4 accident would not have developed the way it did.

5 MR. LEWIS: In that context, I agree with
6 you.

7 MR. MERSCHOFF: If I could go back to your
8 competency question, sir. We are not exactly groping in
9 the dark. There have been two major efforts since TMI
10 in that area. One is the American Nuclear Society's
11 standard on selection, qualification, and training of
12 power plant operators, which details the short of things
13 that they should be trained in and presumably should
14 know.

15 The second is Harold Denton's letter of March
16 31, 1980, which upgraded the training and qualification
17 program requirements for all licensees, including such
18 things as training in heat transfer, fluid flow,
19 casualty exercises in simulators and that sort of
20 thing.

21 So there are lists of the competencies that
22 these operators should have.

23 MR. DEBONS: Thank you.

24 MR. CATTON: I am not sure that this solves
25 the problem of the examinations yet, though.

1 MR. MERSCHOFF: There is a real effort
2 underway to do that.

3 MR. CATTON: But it still has a ways to go.

4 MR. MERSCHOFF: That is probably true.

5 MR. WARD: Ivan, I am surprised to hear you
6 say that. I thought the examination, the training, as
7 stimulated by the examination changes, had been changed
8 in the last two years to include much more thermal
9 hydraulics.

10 MR. CATTON: It has, and I think we saw here
11 the exam from one of the plants, I don't recall which
12 one, and there is no question that there kinds of
13 problems appearing on them that never did before. But I
14 still feel that they are a little bit too elementary.
15 The exams are still not balanced. They still tend to
16 lean more toward the things that we saw in them earlier
17 with electronics. The thermal hydraulics is just not
18 old enough.

19 I think it is because you have the same people
20 giving the examinations. They are older nuclear
21 engineers, and they don't realize that the plants are
22 run by fluids, and so forth.

23 MR. WARD: All right.

24 MR. CATTON: By way, that is also a comment
25 that has been made by some of the training officers, the

1 ones responsible for training at some of the plants.
2 They are eager to have NRC stiffen up that other end of
3 the exam because it makes life easier for them, and it
4 means a larger amount of money to that guy when he
5 passes it and he is going to learn what he has to to
6 pass it.

7 MR. WARD: So you are saying, Ivan, you think
8 the operator training is directly almost entirely toward
9 passing the exam.

10 MR. CATTON: The guy doing the training maybe
11 is trying to do a nice job, but he has to face up to the
12 fact that when they pass the exam they can run a nuclear
13 power plant, and they get paid a lot more money for
14 that.

15 So the person who is taking the class, his
16 efforts are directed toward passing that exam. He may
17 have a lot of information pass by him, but if he knows
18 he doesn't have to pay a whole lot of attention to it,
19 he is not going to. That is a real problem for them.

20 MR. WARD: Larry, the question about the
21 comparison with staffing required at Canadian plants,
22 maybe you could touch on that now. If you would put up
23 the table you have from 0737, I just thought it might be
24 of interest.

25 As I understand the staffing, and, Larry, you

1 may have more accurate information, if you look at the
2 Ontario Pickering Station, and add another column on
3 there. Do you have it?

4 MR. CROCKER: I just happen to have that.

5 This is a comparison of the Canadian and U.S.
6 staffing. The data basically were taken from
7 NUREG-0863, the foreign survey document I mentioned
8 earlier. I have also discussed the information with an
9 individual from Ontario Hydro.

10 Both the U.S. and Canada have a shift
11 supervisor. Nearly as I can determine, these
12 individuals perform precisely the same functions in
13 either country. Namely, they are the individual in the
14 overall charge of plant operations during their shift.

15 The Canadian equivalent of senior reactor
16 operator is called authorized first operator. There are
17 two of these individuals, one in the control room and
18 one in what they call field areas, which is balance of
19 plant.

20 We have no equivalent requirement for the
21 authorized first operator in the field that would be an
22 SRO in the balance of plant, although one of the prime
23 reasons for us wanting to get an SRO on shift in the
24 control room is to make sure that the shift supervisor
25 is free to get out in the plant and see what is going

1 on.

2 MR. RAY: Could I interrupt you for just a
3 moment?

4 MR. CROCKER: Yes.

5 MR. RAY: The shift supervisor in the Canadian
6 modus apperendi, is he qualified to the same degree as
7 our SRO or their authorized first operator?

8 MR. CROCKER: He is qualified over and above
9 the authorized first operator, yes.

10 MR. RAY: You say, over and above, relatively
11 speaking, is it over and above SRO in our skills?

12 MR. CROCKER: Yes.

13 MR. RAY: Is the equivalent of an STA?

14 MR. CROCKER: I guess it depends on what you
15 think an STA is worth. If you had a good STA, with
16 about 15 years of SRO operating experience, then I would
17 say, yes.

18 MR. RAY: He would be comparable to the
19 Canadiann shift supervisor.

20 MR. CROCKER: Yes.

21 MR. RAY: Maybe we should ask them how they
22 get there.

23 MR. CROCKER: I will tell you, if you will
24 wait just a minute.

25 MR. WARD: Larry, I am not sure that that is

1 really true. I think the difference in the U.S. plant,
2 as far as the NRC is concerned, the shift supervisor is
3 qualified or is licensed as an SRO.

4 MR. CROCKER: That is correct.

5 MR. WARD: As far as the utility is concerned,
6 they have selected a person to be shift supervisor
7 because he has some additional qualifications.

8 MR. CROCKER: Yes, sir.

9 MR. WARD: I think in the Canadian system,
10 they have formalized that somewhat more, so that there
11 is an additional set of training requirements and
12 testing for a man to be qualified as the shift
13 supervisor beyond the mere SRO qualifications.

14 MR. RAY: Qualification testing and
15 experience?

16 MR. WARD: Probably so.

17 MR. CROCKER: There is one exam for the
18 authorized first operators, and another exam for the
19 Canadian shift supervisor. Our shift supervisors do not
20 have take an exam, other than for their SRO license.
21 The utility appoints them as shift supervisor. But the
22 Canadian shift supervisor actually holds a license as
23 shift supervisor.

24 MR. LEWIS: Can I just very briefly address
25 the question of operating experience. You spoke of how

1 important 15 years of operating experience is. I always
2 think of the aviation analogy in which the average pilot
3 goes through his entire professional career without an
4 engine failure, for example, because engines are
5 extremely reliable. Yet, the function of the pilot is
6 to cope with the rare emergency that never comes.

7 The importance of operating experience in
8 preparing to deal with something that doesn't happen in
9 your operating experience is a little fuzzy to me. The
10 more important thing is simulator training on accidents
11 and requalification, and constant upgrading of the
12 ability to deal with things that don't happen in your
13 operating experience.

14 So I am not so sure that operating experience
15 in either case is all that good a guide to the ability
16 to respond to an emergency.

17 MR. CROCKER: I agree with you. I feel that
18 this is one of the biggest things we are going to get
19 from the simulators, just this ability to deal with the
20 outcome of events.

21 The Canadians require no other licensed
22 operator on shift. So they have three, the shift
23 supervisor, and the two authorized first operators.
24 Having said that, I should amend that on multi-unit
25 stations, they also have what they call a shift

1 operations supervisor who amounts to the assistant shift
2 supervisor, if you will. He is also an authorized first
3 operator.

4 There is no Canadian equivalent to our reactor
5 operator. So we have lined up, with our present
6 requirements, to call for two SROs and two ROs on
7 shift. The Canadians would have a shift supervisor and
8 two authorized first operators on shift.

9 The Canadian equivalent of our auxiliary
10 operator is a non-licensed individual. He is called the
11 second operator. Each country has two of these
12 individuals on a shift.

13 The Canadians also have two assistant
14 operators on shift. In effect, the assistant operator
15 is in training for the second operator position. I am
16 told that in practice they also have on each shift
17 several trainee operators who are in training for the
18 assistant operator slot.

19 MR. WARD: Larry, a question or comment. In
20 making that comparison, I guess I would have said that
21 the second operator is equivalent to the RO, and the
22 assistant operator is equivalent to the auxiliary
23 operator. But you make that distinction because the
24 second operator is not licensed in the Canadian system?

25 MR. CROCKER: Yes.

1 MR. WARD: Whereas the RO is licensed.

2 MR. CROCKER: Yes.

3 MR. WARD: I understand.

4 MR. CROCKER: In practice, while the U.S. does
5 not have a required equivalent to the assistant operator
6 or the trainee operator, in the real world we find that
7 most of the U.S. plants do, in fact, have more the
8 auxiliary operators on shift. There are other
9 individuals there.

10 We did a survey several years ago, about two
11 years ago, that would indicate that most of the plants,
12 in fact, carry about four auxiliary operators on shift
13 rather than the two that are required. There is at
14 least one U.S. utility I am aware of that recruits
15 individuals at what they call the utility operator
16 level, and promote them to equipment operator after they
17 have had a couple of years of experience, and then
18 finally to auxiliary operator when they feel they are
19 fully qualified to run the balance of plant equipment.
20 In my view this would correspond directly to the
21 Canadian trainee operator/assistant operator/second
22 operator scheme.

23 MR. WARD: Let me make one more comment. I
24 think the Canadian second operator, insofar as the job
25 he does, is equivalent to the reactor operator, because

1 he sits at the control board, I believe. He is not the
2 balance of plant operator, he is in the control room as
3 a control board operator.

4 MR. CROCKER: But controlling balance of plant
5 equipment, and not reactor activity, I believe is the
6 case.

7 MR. WARD: I got a little different story for
8 the multi-unit plants, but let's not take more time on
9 that.

10 MR. CROCKER: You are probably more familiar
11 with it than I am. I have never been there.

12 The Canadians have mechanical maintenance on
13 shift, so they also have a requirement for two control
14 maintenance technicians and two mechanical maintainers
15 on shift. These would correspond to sort of a
16 combination of instrument control and electrical
17 technician in our country, and a maintenance
18 technician.

19 As noted on the chart, the U.S. does not
20 require individuals in these categories to be on shift,
21 although many utilities in fact do have such individuals
22 on shift. TMI-1, for example, plans to start with
23 something like 16 maintenance people on shift, and they
24 will be part of the shift component.

25 The U.S. staffing, since the TMI-1 accident,

1 has added the health physics technician, the radiation
2 chemistry technician, and the communicator on shift to
3 handle emergency preparedness matters. The Canadians
4 have no requirement for these individuals. My contact
5 at Ontario Hydro informed me that their operators are
6 trained to provide essential health physics coverage if
7 necessary.

8 Finally, of course, we have the STA that we
9 spoke about earlier. The Canadians considered it, but
10 elected instead to assure that the shift supervisor had
11 that capability that is otherwise provided by the STA.

12 The total minimum staffing amounts to 11 on
13 the Canadian side, and 10 on the U.S. side for a
14 single-unit station. The hooker here is that I am not
15 sure there are any single unit stations in Canada.

16 MR. WARD: Yes, there is one.

17 MR. CROCKER: There is a career progression
18 for the Canadian operators. They bring in a high school
19 graduate at the trainee operator level. After two
20 years, he is eligible for promotion to assistant
21 operator. After two more years, he is eligible for
22 promotion to second operator. After two years as second
23 authorized operator, he is eligible to take training to
24 become an authorized first operator.

25 I am not sure of the time requirement as an

1 authorized first operator before he attains ability to
2 take the shift supervisor examination. But they do have
3 a requirement that a shift supervisor have at least 12
4 years of experience outside of high school before he is
5 eligible to become a shift supervisor. I am not sure
6 what that experience is, whether it is all nuclear or a
7 combination.

8 MR. WARD: So they don't require a B.S. degree
9 for the shift supervisor?

10 MR. CROCKER: They do not require a B.S.
11 degree for a shift supervisor. A high school graduate
12 is fine. However, in practice, I am told that more than
13 50 percent of the shift supervisors are graduate
14 engineers, which of course is one reason that they rely
15 on these people for the STA type expertise.

16 I mentioned that the Canadians do their
17 maintenance on shift. I was told that at Pickering, the
18 four-unit station, they are authorized a total of 508
19 people on the staff, operating on a five-shift rotation,
20 which means that they have about 100 people on shift on
21 each of the five shifts.

22 This is about the extent of our knowledge.
23 Are there any questions that I might answer?

24 MR. REMICK: Do you happen to know if they
25 have a requalification requirement?

1 MR. CROCKER: As near as I can tell from our
2 survey document, there is no formal requalification
3 requirement for qualified operators.

4 MR. WARD: I don't know if it is formal or
5 not, but in practice they requalify their operators. At
6 the Pickering station, they have a simulator, and they
7 have an extra shift.

8 MR. CROCKER: There are five shifts, and one
9 training shift.

10 MR. WARD: There is always one shift that is
11 training.

12 MR. LEWIS: Can I ask a quick whimsical
13 question?

14 You mentioned that many of the Canadian shift
15 supervisors are graduate engineers. There has been a
16 fuss in our country about what level of education should
17 be required for the various personnel we are talking
18 about. Why is there a requirement for being a high
19 school graduate?

20 MR. CROCKER: I am not sure I can tell you why
21 there is a requirement for it. Apparently there is a
22 feeling that this is the bare minimum that you might get
23 along with.

24 MR. LEWIS: Peace.

25 MR. CROCKER: I was just thinking that one of

1 the best platoon sergeants I had, had a third grade
2 education, and he was a real crackerjack. Maybe that is
3 what you need rather than a high school graduate.

4 MR. RAY: Can you tell us whether or not high
5 graduates in Canada can read and write?

6 MR. CROCKER: I would certainly hope so.

7 If there are no further questions, I will turn
8 this over to Mr. Merschhoff.

9 MR. MERSCHOFF: Good morning. My name is
10 Ellis Merschhoff. I am with the Office of Research. I
11 am the task leader for this proposed rule that we are
12 discussing on staffing requirements.

13 I thought I would start with the background
14 information and give everyone an understanding of how
15 this rulemaking developed and where we stand now.

16 Originally there was a requirement in the TMI
17 Action Plan, NUREG-0660, for the staff to issue
18 instructions to upgrade control room staffing. Within
19 that TMI Action Plan item there was specific criteria
20 regarding an SRO in the control room and additional
21 operators.

22 Those instructions were accomplished by an
23 Eisenhower letter to all licensees and applicants dated
24 July 31, 1980. That letter required one senior reactor
25 operator in the control room at all times, and required

1 a senior reactor operator to be on site as a shift
2 supervisor, of fuel was loaded in the unit.

3 It required one more senior reactor operator
4 on site than the number of control rooms. If you had
5 two units, and two control rooms, you had three SROs,
6 one shift supervisor and one SRO in each control room.
7 It required a minimum of two ROs for each operating
8 control room, and an SRO to supervise core operations.

9 This letter was sent out to all licensees and
10 applicants in July 1980, and it said that these criteria
11 would be used to issue licenses to all new applicants.
12 Additionally, they would be required for operating
13 licenses by July 1, 1982.

14 Shortly after this, in November of 1980,
15 NUREG-0737 was issued. NUREG-0737 was a compilation to
16 date of the items in the TMI Action Plan that had been
17 implemented. As part of NUREG-0737, the Eisenhut letter
18 was included, and some corrections were made to the
19 original staffing matrix regarding auxiliary operators
20 and reactor operators in multi-unit plants.

21 So in November of 1980, the Eisenhut letter
22 came out again, published in NUREG-0737.

23 MR. RAY: Does NUREG-0737 still apply to near
24 licenses?

25 MR. MERSCHOFF: Yes, sir.

1 MR. RAY: Did it at that time?

2 MR. MERSCHOFF: NUREG-0737 says that these are
3 the criteria. As a matter of fact, in December, one
4 month after that, a Commission Policy Statement was
5 published in the Federal Register which said that the
6 NUREG-0737 criteria would be used for issuing licenses
7 to new applicants.

8 Moving ahead, then, to June of 1982, the staff
9 presented SECY-82-219 to the Commission, which was the
10 status of utilities' ability to provide the additional
11 SRO on shift to meet the requirements of this
12 NUREG-0737.

13 The staff recommended at that time extending
14 the July 1, 1982, date to implement the minimum staffing
15 requirements, and that each facility should be evaluated
16 with respect to the significant effort being made to
17 meet these requirements, rather than one fixed date.

18 At the time the Commission discussed this,
19 consideration was given to writing an immediate
20 effective rule which would require these staffing
21 requirements, but after some discussion the Commission
22 voted to codify the requirement through the proposed
23 rule and final rule route.

24 They said that they wanted an implementation
25 date of January 1, 1983, which was six months later than

1 was required by NUREG-0737 and the Eisenhut letter.

2 They voted four to one --

3 I am sorry, they decided in this June 15th
4 meeting to have the staff develop a proposed rule and
5 bring it back to the Commission within one year. It was
6 extremely important that it be done quickly, since it
7 was already June and this requirement originally was for
8 July, and now they wanted it in January.

9 The staff went back and in two weeks they
10 submitted to the Commission SECY-82-286, which the
11 Commission then looked at on July 29. So now we are
12 actually about six weeks later. This was the proposed
13 rule on staffing requirements that the staff was
14 directed to write. The Commission voted four to one to
15 publish that rule for public comment.

16 There were some changes made to it at that
17 time. Commissioner Asselstine wanted specific words put
18 in the Federal Register notice regarding the
19 implementation date, and whether it was too ambitious or
20 not. That was the proposed rule that the ACRS saw after
21 it was published. That is what we are discussing at
22 this point.

23 The Commission also decided that the rule
24 would only go out for 30 days public comments. Again,
25 they are interested in getting this rule out as quickly

1 as possible.

2 With regard to the rule itself, the current
3 requirements in the Code of Federal Regulations are
4 different than the 0737 requirements. If we go back to
5 the code, the only requirements regarding staffing that
6 are defined are in 50.54(k) which requires an operator
7 or senior reactor operator to be at the controls at all
8 during operations.

9 In 50.54(m) it requires an SRO to be on-site
10 or readily available on call during operation. The SRO
11 shall be on site or shall be present during start-ups,
12 approaches to power, recovery from unscheduled shutdown,
13 significant power reductions, or refueling. At other
14 times, the SRO can be on call.

15 Of course, the practice and the 0737
16 requirements are different from that. Those are the
17 current requirements. The proposed requirements would
18 codify the Eisenhut letter requirements as modified in
19 0737.

20 Basically it says, a senior reactor operator
21 in the control room at all times during operation; a
22 shift supervisor licensed on all fuel units on site; two
23 reactor operators per operating control room, and relief
24 operator; a senior reactor operator to supervisor core
25 operations when you cold shutdown; one senior reactor
operator on site, and one reactor operator for each

1 unit.

2 With regard to the need for the rule, the
3 intent was to provide a senior reactor operator in the
4 control room during operation. But we didn't want to
5 impose this requirement and thereby tie the shift
6 supervisor to the control room.

7 The shift supervisor, being the SRO, requiring
8 him to stay in the control room at all times could be
9 counterproductive. We wanted him to be free to move
10 around the plant as needed, to go around the site
11 without trouble, to supervisor the balance of plant
12 operators. But, yet, there should be coverage in the
13 control room by a senior reactor operator. The reason
14 being that a senior reactor operator is trained
15 differently and has a different type of license than the
16 reactor operator.

17 The differences between SRO and RO training
18 are listed on this slide. These are the things that the
19 SRO is trained and examined on that the RO is not. The
20 conditions and limitations in the license, the design
21 and operating limitations in the technical
22 specifications, certain radiation hazards from
23 experiments, shielding operations, maintenance, and
24 various contamination conditions involving chemistry,
25 procedures and limitations involved in initial core

1 loading, core alterations, control rod programming,
2 determining external and internal effects on core
3 reactivity, fuel handling facilities and procedures,
4 procedures and equipment available for handling disposal
5 of radioactive materials and effluents. This is a
6 different type of person than the RO.

7 Additionally, when the SROs are examined by
8 the license examiners, they are looked at for
9 supervisory and leadership, and ability to perform under
10 stress. These things are hard to quantify, but
11 nonetheless help to make this person a better
12 supervisor, and overall understanding of the plant to a
13 much degree than the RO, specifically with the technical
14 specifications.

15 MR. WARD: Ellis, in the initial hours of the
16 Three Mile Island 2 accident, was there an SRO present
17 in the control room all of the time, some of the time,
18 or what?

19 MR. MERSCHOFF: I don't know. I can find
20 out.

21 MR. CATTON: No. Zewey was the SRO, and he
22 was out in one one of the auxiliary buildings trying to
23 fix the pump, at least that is my recollection.

24 MR. WARD: He was the shift supervisor, and
25 was the only SRO.

1 MR. CATTON: Yes. I think this present
2 staffing rule is in answer to that, to make sure that
3 you have an SRO in the control room at all times, so
4 that you can have a responsible person go out and take
5 care of the problem.

6 MR. LEWIS: How soon did he get back to the
7 control room, do you remember?

8 MR. CATTON: I don't know, but he had to go
9 out and fix that pump, the condensate pump. My
10 recollection is that it took a half-hour or so. I don't
11 remember the details.

12 MR. LEWIS: The damaging decisions -- The
13 discovery that the block valves were shut was made
14 fairly quickly, so that was done without the SRO, you
15 are saying. The damaging decisions, which took about
16 two-and-a-half hours, were after he got back into the
17 control room.

18 MR. CATTON: Everybody had a hand in that
19 one.

20 MR. LEWIS: I understand that. I am just
21 saying that a correlation of the correct decisions and
22 the presence of the SRO is a little bit unclear.

23 MR. CATTON: That is certainly true.

24 MR. WARD: I guess I would have expected,
25 Ellis, since at least, apparently, some of the interest

1 in the staffing rule is to be in the form it is from the
2 experience at Three Mile Island -- it is apparent to me
3 that that is what is wrong, but maybe that is not right
4 -- that the staff would have developed some
5 understanding of exactly what they felt the impact on
6 the Three Mile Island accident was.

7 MR. MERSCHOFF: This issue is a little broader
8 than just Three Mile Island. That is one data point
9 that showed some need for changes. But I think that you
10 can generalize a little more than that by looking at the
11 type of work and the type of supervision, and the type
12 of people available to do it.

13 MR. WARD: You conclude, from the Three Mile
14 Island accident, that you need to have a man with this
15 sort of background in the control room at all times?

16 MR. MERSCHOFF: I would, yes, sir, I think it
17 would help. Additionally, had that SRO been in the
18 control room and been a party to the sequence of events,
19 rather than showing up later, trying to discern what had
20 happened, it might have made a difference. Nonetheless,
21 it is hard to argue against having a person that
22 understands the tech specs and the conditions of
23 limitations of the license be in the control room or
24 operating.

25 MR. LEWIS: I don't think anybody argues

1 against the presence in the control room of somebody who
2 understands the tech specs. I think the disposal of
3 radioactive materials may be another matter, but we
4 don't want to go through the list.

5 The point is, it is more difficult to make a
6 general level, gut-feeling upgrading of the operator
7 performance and qualifications than it would be to try
8 to analyze just which upgrading would be most beneficial
9 to reactor safety.

10 The way I feel, and perhaps others do, is that
11 perhaps this has not been done as carefully as it needs
12 to be done in order to do what we all want to do, which
13 is to make reactors reasonably immune to upset through
14 operator action.

15 MR. MERSCHOFF: I am not too sure that those
16 decisions were not carefully made when these
17 requirements came out in NUREG-0737, or the
18 recommendations of the various study groups. The
19 Commission made the decision, and they told us to codify
20 the Eisenhut letter requirements, which is how we
21 proceeded, rather than starting from ground zero. We
22 felt that the decisions had been made, and it was time
23 to move on.

24 MR. LEWIS: It is never too late to review a
25 decision, even though it is signed by senior

1 management.

2 MR. MERSCHOFF: I agree. I believe in this
3 decision personally. I think that it is a smart thing
4 to do.

5 We can go back in history a little bit
6 regarding the need. The various studies that were done
7 after Three Mile Island came up with some
8 recommendations. These recommendations, as was pointed
9 out in the public comments, did not provide a technical
10 basis for this rule. They were just that,
11 recommendations.

12 But NUREG-0585, which were the recommendations
13 from the TMI-2 lessons learned task force, said that
14 consideration should be given to requiring two reactor
15 operators, and one senior reactor operator in the
16 control room at all times during operation. The ACRS
17 reviewed the TMI-2 lessons learned task force report,
18 and sent a letter to the Chairman on December 13, 1979,
19 which endorsed that recommendation and supported it.

20 The special inquiry group in NUREG-1250, the
21 Rogovin Report, states that consideration should be
22 given to analyses and research performed to determine
23 the operator's responsibilities during normal and
24 off-normal conditions. But until that is done, the NRC
25 should require that all hot operations be manned by a

1 minimum of one senior reactor operator, and two other
2 individuals with diagnostic ability.

3 NUREG-0616, which is the special review group,
4 recommended that two operators be required in the
5 control room at all times, and that is not necessarily
6 including the senior reactor operator. The need for
7 requiring a shift supervisor to be in the control room
8 at all times should be evaluated.

9 I provide this as background, this 1979 report
10 and recommendations.

11 MR. LEWIS: Can I pick up as to what the ACRS
12 said in response to 0585. Did we endorse -- First of
13 all, the recommendation was that consideration be given,
14 and not that you should implement it.

15 MR. MERSCHOFF: That is right.

16 MR. LEWIS: We endorsed that consideration be
17 given, or did we endorse the requirement, and did we
18 specifically mention it?

19 MR. MERSCHOFF: This is the letter, so let me
20 read it to you. It is one sentence.

21 MR. LEWIS: Very good.

22 MR. MERSCHOFF: It is to Chairman Ahearne from
23 Dr. Carbon, the subject was, "Response to TMI-2 Lessons
24 Learned Task Force Final Report." This entitled
25 "Staffing of Control Room." "The ACRS supports this

1 recommendation."

2 MR. LEWIS: I see. That is very detailed.
3 The recommendation was for consideration. Thank you. I
4 think I would be adverse to citing that as support for
5 the rule.

6 MR. MERSCHOFF: That is true, but nonetheless
7 the ACRS reviewed these recommendations and did not
8 disagree with them at that time. This is the timeframe
9 when the Eisenhut letter and 0737 were developed, and
10 the ideas and decisions were being generated.

11 MR. LEWIS: I don't want to be quarrelsome,
12 but the recommendation was for consideration of the
13 recommendation. If I remember, at that time we were all
14 aware, as we still are, of the need to upgrade the
15 ability of operators to deal with upsets. The
16 recommendation of whether the staffing requirements
17 should be changed would be a perfectly reasonable thing
18 to endorse at that time, without prejudice as to the
19 outcome of the consideration.

20 MR. MERSCHOFF: Yes, sir. It was considered,
21 and the Eisenhut letter resulted from that, and 0737
22 resulted from that. That is true. I don't mean to say
23 that the ACRS endorsed those recommendations, but to
24 consider them.

25 MR. REMICK: Do you happen to know, Ellis,

1 what ACRS action was taken with regard to 0737? Did
2 they address 0737, or did they specifically address this
3 in 0737?

4 MR. MERSCHOFF: I don't know.

5 MR. CROCKER: I don't know if the committee
6 specifically addressed 0737.

7 MR. MERSCHOFF: I would like to put a little
8 perspective on this point. NUREG-0863 was mentioned
9 earlier and I noticed that Dave Fisher came out with a
10 copy of it. It is a fairly voluminous document entitled
11 "Survey of Foreign Reactor Operator Practices. It has
12 quite a bit of information in it.

13 The first dozen pages or so of it are matrices
14 that compare the 18 countries surveyed and the United
15 States. But the appendices, Appendix C, specifically,
16 incorporates the detailed responses from each country.
17 There is a lot more information there than just reactor
18 operator and senior reactor operator requirements.
19 Often they did go into supervisory and auxiliary
20 operator type of things.

21 I know that the question came up, and if you
22 want to dig more deeply into any particular country's
23 requirements, Appendix C of that document can be very
24 helpful.

25 With respect to these requirements, the first

1 question on that survey was, what is the minimum number
2 of reactor operators and senior reactor operators
3 required to be in the control room while the reactor is
4 operating. Seventeen of the 18 countries surveyed
5 require either an SRO or a shift supervisor to be in the
6 control room, and the 18th country did not answer the
7 question.

8 With regard to requiring a number of reactor
9 operators in the control room, it gets a little more
10 fuzzy regarding whether they require operators, or one
11 operator and one senior reactor operator, one shift
12 supervisor, and the names change, and quite a few did
13 not answer fully. So it is not quite as conclusive.

14 MR. REMICK: Do you happen to remember
15 off-hand how many of the countries indicated they
16 required a BS?

17 MR. MERSCHOFF: There were only two, Mexico
18 and Korea.

19 With regard to the public comments received on
20 this rule, there are to date 25 letters received
21 containing 70 public comments. By and large, the most
22 prevalent comments dealt with the implementation
23 schedule.

24 Twenty-seven percent of the comments received
25 said that the implementation schedule was too ambitious

1 and recommended either six months to one year slippage
2 in requiring these upgrades. The reasons cited largely
3 were lack of forewarning, the time it takes to select,
4 qualify, and train these senior reactor operators.

5 It is a significant investment of time to
6 bring these people up to speed, to get your staff up to
7 speed. Additional requirements such as the
8 encouragement to go to five or six-shift rotations. The
9 Commission's policy statement on working hours, which
10 limits the amount of overtime. You can use all of these
11 constraints for working against getting more operators
12 on shift.

13 Clearly if you require more SROs, you are
14 going to have to go down to a lesser number of shifts or
15 work overtime, and it was a real problem to these
16 commentators to meet those requirements. As I said, it
17 was 27 percent of the 70 comments.

18 The next most frequent comment received
19 regarded the technical basis for this rule or lack
20 thereof. The comment basically said that if there was a
21 technical basis for this rule, it certainly wasn't
22 apparent from the Federal Register notice.

23 It went on to state that the study cited in
24 support, in fact, provided recommendations, but did not
25 defend a technical basis for these recommendations,

1 which is true.

2 The transition points selected for upgrading
3 the staffing were also commented on, where the
4 suggestion was made that they be made consistent with
5 the changes in mode. That was the third most frequent
6 comment.

7 Moving down in the order, comments were made
8 that the second SRO should be allowed to replace the
9 requirement for an STA. Having two reactor operators, a
10 senior reactor operator, an STA, and a shift supervisor,
11 was getting a little bit ridiculous, and it should allow
12 a multiple role concernig the STA.

13 Comments were made that the tech specs should
14 be used for requiring these staffing changes in lieu of
15 rulemaking, which is the way that it is done now. The
16 staffing requirements are placed in the tech specs, and
17 thi provides an opportunity to make case by case
18 decisions on what each plant really requires, and that a
19 rulemaking was too global and too inflexible for this
20 sort of decision-making.

21 Next was general support of the rule, and that
22 was only three comments, to give you a feel it was four
23 percent. There was a comment that the rule should
24 require even more operators than it currently does.
25 That limited absences from the control room by the

1 senior reactor operator should be permitted, and there
2 were various comments in this area.

3 Some comments said that short absences today
4 to the kitchen should be permitted. Another said that
5 extended absences should be permitted if he is going to
6 check on a problem area. Another suggested that a
7 definition of the control room be deliberately defined
8 so that, if you don't allow short absences, the kitchen
9 should be considered a part of the control room.

10 There were comments on the requirement for
11 relief operators in multiple unit plants, and how they
12 weren't really needed, and you could use the extra
13 operator from one of the plants as a relief for the
14 others, rather than requiring a relief operator.

15 There were comments on pirating, and how that
16 is a very real problem, when you have the implementation
17 and when you have a short turnaround time, to require
18 utilities to have more people on shift and you limit the
19 amount of overtime, and your only alternative is to
20 steal someone else's operator.

21 MR. CATTON: Isn't that helpful? One of the
22 problems in the past was that these people weren't paid
23 enough, and that is why we couldn't get them to do it.
24 My recollection from the aerospace industry is that
25 pirating sure raised the salaries in a hurry.

1 MR. MERSCHOFF: I can't argue with that. One
2 of the comments that we received included a pirating
3 letter that was sent to their people, which claimed that
4 the salaries that were being offered were, I think, 20
5 percent higher than what they were currently being
6 paid.

7 Nonetheless, it contributes to instability in
8 the short-term, when you take an operator who has gone
9 through years of training and qualification on that
10 particular plant, and you remove to another plant where
11 he has to start training all over again. So that the
12 experience that had resided in operating plant A is
13 lost, and he has to gain more experience in plant B, so
14 overall you can find some destabilizing effect.

15 MR. CATTON: It is certainly true that the
16 utilities are not known for paying a living wage without
17 some sort of force.

18 MR. MERSCHOFF: I suppose that that is one of
19 the countervailing aspects.

20 MR. CATTON: I think it may be very helpful.

21 MR. LEWIS: Did you consider the
22 recommendations to permit short absences and rejected
23 them for a reason?

24 MR. MERSCHOFF: Yes, sir.

25 MR. LEWIS: What was the reason?

1 MR. MERSCHOFF: We feel that the requirement
2 for this expertise, the things that the SRO knows,
3 should be in the control room at all times, not out for
4 two minutes, five minutes, or ten minutes, or an
5 arbitrary time. He should be there all the time.

6 If a relief is required, if he wants to go to
7 the head, or if he wants to go to the kitchen and make
8 macaroni, that is fine. The shift supervisor can come
9 in and provide his presence in the control room, so that
10 you have someone with the knowledge and abilities of the
11 senior reactor operator all the time and not part of the
12 time.

13 MR. LEWIS: Your reason was that you wanted it
14 that way.

15 MR. MERSCHOFF: It is needed.

16 MR. LEWIS: That you haven't established for
17 me.

18 MR. MERSCHOFF: It was the feeling of the
19 staff.

20 MR. LEWIS: I understand.

21 MR. MERSCHOFF: There were two comments that
22 the comment period should be extended, that it was put
23 out for 29 days of public comment rather than 30 as
24 required, which was an administrative error. But
25 nonetheless, all the comments that were received after

1 that date have been considered, and that is the bulk of
2 them. In reality, we have been receiving letters of
3 comment for 60 days.

4 The value impact statement was cited as being
5 inadequate. There were comments that staffing should be
6 a function of the plant size and complexity, rather than
7 the fact that it is a plant. You have boiling water
8 reactors that are 50 megawatt electric, and boiling
9 water reactors that are 1100 megawatt. There should be
10 some consideration given to the complexity and the
11 size.

12 That about covers the public comments
13 received.

14 MR. WARD: Let's see, so I understand. Have
15 you considered all of these comments and given them
16 thought or consideration?

17 MR. MERSCHOFF: No, sir, we are still in the
18 process of considering them. We have made some changes,
19 which I will address now, and the rest are under
20 consideration. We have been receiving these comments as
21 recently as two days ago.

22 MR. WARD: But you did say on one of them, the
23 one that Hal just brought up on limited absences, you
24 have considered and rejected that comment. Is that
25 right?

1 MR. MERSCHOFF: That is staff level work. We
2 have not received concurrence on that. The staff level
3 people that have looked them over have decided that it
4 is not acceptable, but it could change. The staff has
5 not reached unanimous opinion on this and is not ready
6 to transfer it to the Commission.

7 MR. RAY: Ellis, before you go on, and I think
8 this is perhaps a difficult question because of the
9 geographic area. Do you have any idea of the order of
10 magnitude of the remuneration of ROs and SROs in the
11 industry?

12 MR. MERSCHOFF: Yes, sir. It varies from,
13 let's say, an experienced SRO can get anywhere from
14 \$35,000 to probably about \$65,000, if you include
15 overtime.

16 MR. RAY: What about ROs?

17 MR. MERSCHOFF: I am not as sure about this,
18 but it is about \$10,000 less at the low end, maybe
19 \$25,000 to \$45,000.

20 MR. RAY: Thank you.

21 MR. CATTON: If a young man goes to work as an
22 RO, how many years is it before he can become an SRO?

23 MR. MERSCHOFF: The minimum requirement
24 regarding experience, I think, if he had a BS degree, is
25 two years of nuclear power plant experience. If he

1 doesn't have a bachelor's degree, I believe it is four
2 years.

3 MR. CATTON: In four or five years, a high
4 school graduate can be making somewhere above \$35,000?

5 MR. MERSCHOFF: And he earns every cent of
6 it. The overtime that they put in demands that type of
7 remuneration.

8 MR. CATTON: It has really changed since TMI.

9 MR. WARD: I have a data point from Ontario
10 Hydro, if you are interested. This is a salary range,
11 but the first operator makes \$42,000 to
12 \$45,000-Canadian, so divide by 1.2.

13 MR. CATTON: The cost of living in Canada is
14 different, too. It is a lot of money.

15 MR. RAY: There is an interesting comparison
16 here. Do you happen to know what the level of
17 remuneration is for the station superintendent is?

18 MR. MERSCHOFF: Not off-hand, sir.

19 MR. RAY: I wonder if it is much higher than
20 this.

21 MR. MERSCHOFF: It might be less, if you look
22 at all the overtime.

23 MR. RAY: So may find some of them applying
24 for jobs as SROs.

25 MR. MERSCHOFF: The overtime is substantial,

1 and I think that you might find that they prefer --
2 There is a lot of responsibility there, but the hours
3 are better, too.

4 MR. CATTON: How much of that large sum is due
5 to the overtime?

6 MR. MERSCHOFF: It can be as much as a third.

7 MR. CATTON: Okay.

8 MR. REMICK: Ellis, you talk about the
9 responses in public comments about the implementation
10 schedule. Wasn't there a caveat in there that one could
11 go beyond the January 1, 1983, date with Commission
12 approval?

13 MR. MERSCHOFF: Yes, sir. January of 1983 is
14 the implementation date. If you required an extension,
15 a six-month extension to that, up through July of 1983,
16 NRR could authorize that. If you required an extension
17 beyond that point, the Commission would decide on a case
18 by case basis. These comments recognized that.

19 MR. REMICK: They did?

20 MR. MERSCHOFF: Yes, sir.

21 MR. REMICK: They still felt that it was
22 unreasonable?

23 MR. MERSCHOFF: Certain of the comments
24 pointed out that we might be making more work for
25 ourselves because if you look at the number of people

1 who will not be able to meet the January of 1983
2 requirement, but can meet the July of 1983, why make
3 them all write letters and the rule on each one, since
4 we have already done that several times.

5 With regard to the 0737 requirements, NRR sent
6 out 50.54(f) letters which basically said, "Tell us you
7 are going to meet these 0737 requirements, or if you do
8 meet them, or if you don't, when you are going to meet
9 them, and what you are doing to get there." Most of the
10 utilities have sent very detailed plans, both optimistic
11 plans and pessimistic plans, to show the range of time
12 that they expected, if everything goes well, that they
13 can meet it, or if it does not go well, they can meet
14 it. So these were done to some extent, and the comment
15 was that they would have to do it again.

16 If I can go on to what we are doing about
17 these comments. Again, it should be pointed out that
18 these comments are still under review at staff level.
19 Due to the timing of the meeting, we have not received
20 office concurrence from either research or NRR, or any
21 of the other offices. To these are staff level
22 decisions that we are talking about right now.

23 The first concerned the transition point, and
24 we agreed with that comment, and we will change the
25 transition points to be consistent with the modes,

1 transition being: cold shutdown, too hot shutdown, less
2 than 200 degrees.

3 With regard to the implementation schedule,
4 the implementation dates in the rule are under
5 consideration by the staff. We have not made a decision
6 at this point. It is interesting to note, though, based
7 on the 50.54(f) responses that we got back, if we went
8 by the January of 1983 requirement, 49 percent of the
9 plants would meet that requirement. They meet it now,
10 as a matter of fact. Forty-nine percent of the plants
11 currently meet these staffing requirements.

12 Thirty-one percent of the plants out there
13 would require extensions beyond January of 1983.
14 Twenty-one percent could make it within the first six
15 months, which leaves us 10 percent of the plants that
16 would need to get into the Commissioners granting the
17 extension, and the rest could be accommodated for by
18 NRR.

19 This does not add up to 100 yet. When you get
20 to 17 percent of the plants, they have alternative
21 proposals for STAs. They have STAs right now that are
22 currently licensed as SROs, and they feel that there
23 should be a dual function allowed. If they have an STA
24 who is qualified as an SRO, he should be allowed to fill
25 both functions simultaneously. Two plants have

1 requested exemption altogether due to the size of the
2 plant, they shouldn't have to meet this.

3 So we are talking about 70 percent of the
4 plants being able to meet that requirement within the
5 six-month extension under NRR's cognizance, 10 percent
6 Commission action, 17 percent with other ideas, and 3
7 percent exemptions. We have not decided about what to
8 do on this yet.

9 There is a policy statement under
10 consideration by the staff at this time, and this is
11 tied in with the Part 55 rulemaking and the integrated
12 plant regarding qualification of personnel.

13 The Commission asked for a policy statement to
14 be issued in October which will address the STA versus
15 SRO functions.

16 There is under consideration at this point, if
17 a senior reactor operator has a bachelor of science
18 degree in engineering or a science, if he has two years
19 of power plant experience, if he has had the STA
20 training, then he could be the second SRO and be shift
21 technical advisor. But that is a draft policy
22 statement, and these decisions have not been transmitted
23 to the Commission yet.

24 MR. RAY: But this does not eliminate the
25 requirement that the classification of STA at the

1 station, I assume. How do you feel about that?

2 MR. MERSCHOFF: On that shift, on shift A, if
3 you second SRO meets those criteria so that the STA can
4 go one, you don't need one.

5 MR. RAY: Suppose that the station has enough
6 people with these qualifications to meet that on every
7 shift, will you eliminate the STA requirement for that
8 plant?

9 MR. MERSCHOFF: Yes, sir.

10 MR. REMICK: I recall correctly, LaSalle
11 proposed something very close to that. Did the staff
12 permit them to do that?

13 MR. CROCKER: If I may, Dr. Remick. The
14 staffing at LaSalle actually has three SROs, one of whom
15 is qualified as an STA. So the total number of bodie
16 is the same, but they actually have more capability than
17 we had asked for. The question on LaSalle was whether
18 we would let the STA actually pull SRO duty during
19 normal operation. The answer is, yes, we would let him
20 do that. In an accident situation, he would back off
21 and provide his advisory function, and not be involved
22 with the plant operation.

23 MR. WARD: I guess I wanted to ask you why
24 LaSalle has three SRO on a shift. But I want to get to
25 the point you just raised.

1 One of the reasons for an STA that has been
2 given sometimes in the past was the sort of thing that
3 Larry just said, somehow this fellow is not going to be
4 intimately involved in the operation during emergency.
5 He will back off and take a broad view.

6 Under your proposed policy, where the SRO
7 would be qualified as the STA, he wouldn't have that
8 capability. He would have to be involved in the
9 operation.

10 MR. MERSCHOFF: This is not a run-of-the-mill
11 SRO. This is an SRO with an engineering degree and STA
12 training. It is felt that he is a different type of
13 person. In reality, it may be worthwhile to have the
14 person with the ability to make the overall engineering
15 decisions also responsible for those decisions.

16 MR. WARD: My personal prejudice is that that
17 is much better. But one of the arguments given for the
18 STA in the past has been the point that Larry just made,
19 which is that some people think that it would be
20 desirable to have an STA who can stand off and not be
21 responsible for the operation, act as sort of an
22 advisor.

23 MR. MERSCHOFF: There are those on the staff
24 that agree with that position, and that is one of the
25 major problems with this policy statement, as a matter

1 of fact, going ahead and allowing that, because we lose
2 the standback capability. This has yet to be resolved
3 with the staff.

4 MR. LEWIS: Do I remember correctly that you
5 said a bachelor's degree in either engineering or a
6 science?

7 MR. MERSCHOFF: Yes.

8 MR. LEWIS: Are there named sciences, or is
9 zoology okay?

10 MR. MERSCHOFF: We discussed zoology and
11 biology at length, and geology. At this point, they are
12 not named. We are thinking about related sciences,
13 physics, mathematics, and so on. I suspect that we are
14 going to have cull out zoology and life sciences, but
15 those decisions have not been made.

16 MR. LEWIS: When you start doing this, you
17 will have to think what it is for.

18 MR. CATTON: I would like to make a comment on
19 this STA business.

20 At Ginna, I asked them what they did with the
21 STA during the steam generator tube rupture incident,
22 and their comment was, "We didn't know what to do with
23 him, so we had him keep track of what we were doing."
24 It turned out that the reason was that, when you go out
25 and find somebody that meets these qualifications, and

1 it turns out to be a kid right of school, he has about
2 as much knowledge of the way a power plant works as I
3 do, and that is not very good. I think the method of
4 the SRO having the degree, and so forth, is much
5 better.

6 MR. MERSCHOFF: There is another option under
7 consideration and that is the one where you can your
8 STA, the kid just out of school, and you get a shift
9 engineer and the shift engineer has a degree in
10 engineering or related science, and he has two years of
11 engineering experience, so he has been around the block
12 more than once, and he is also certified at the SRO
13 level. So he understands the plant and he has some
14 credibility with the operators. That is another method
15 under consideration.

16 MR. CATTON: That sounds good, too, but the
17 present way of getting an STA into the plant, I just
18 don't think is going to wash. Who in their right might,
19 with a degree, is going to go out and do shift work.

20 MR. LEWIS: This is an example of a personnel
21 action taken by the NRC, in my view, without thinking
22 through what the indications were. We certainly don't
23 want to do that again, do we.

24 MR. CATTON: That is right.

25 MR. WARD: I think the NRC got a lot of advice

1 from review committees.

2 MR. LEWIS: That won't change.

3 MR. WARD: Could I go back. I want to ask
4 Larry Crocker if he has any insight as to why
5 Commonwealth at LaSalle, in particular, is putting three
6 SROs on a shift.

7 MR. CROCKER: I think the prime reason is that
8 the individuals available and preferred to do that
9 rather than go out and hire these fresh engineers that
10 Dr. Lewis was talking about to fill the STA positions.

11 Duke is in an analogous position. Down there,
12 they had enough SROs that they took these individuals,
13 gave them upgraded training to become STAs, and they are
14 now functioning at STAs, but not the combination like
15 LaSalle has.

16 MR. WARD: You are saying that they are
17 fulfilling the STA requirement. While they are doing
18 it, they are also able to work as an SRO.

19 MR. CROCKER: At LaSalle, yes. At Duke, they
20 have given all of their SROs STA training, and some of
21 these they designated as the STA, and they have no
22 responsibility as such for plant operation on that
23 shift.

24 MR. REMICK: I thought that LaSalle came
25 pretty close to the shift engineer concept, but not

1 quite. Am I correct that LaSalle has not made a
2 commitment that they will live with that forever. They
3 have not made a commitment that they would keep that
4 arrangement?

5 MR. CROCKER: I think that is correct. I am
6 not aware of a long-term commitment to that.

7 MR. MERSCHOFF: Are there any other
8 questions?

9 MR. WARD: Is there anything else for Mr.
10 Merschoff?

11 (No response.)

12 MR. WARD: Let's go ahead with the next item
13 on the agenda.

14 MR. SHEAN: Good morning, gentlemen.

15 My name is Arthur Shean, and I am the Director
16 of Training for Maine Yankee Atomic Power Company. I am
17 here representing 19 utilities. With me today is Mr.
18 Charles Schrock who is the Licensing and Systems
19 Supervisor from Wisconsin Public Service Corporation.
20 Our purpose this morning is to provide some comments
21 from utilities on the proposed rule that you are dealing
22 with this morning.

23 We appreciate the opportunity to address you
24 on the subject this morning.

25 First off, you are being handed some

1 documents. The first packet of documents is a
2 cover-letter from the combined group through the means
3 of KMC Corporation, and under that are a series of
4 letters, which perhaps you may have seen before, which
5 are comments from various utilities within our group
6 making their individual points on the particular
7 proposed rule.

8 The second packet is a series of slides which
9 I will be referring to during my talk, although I will
10 not get to all of them, depending on your questions and
11 other comments that come about during the presentation.

12 First off, as a group, there are two points
13 that we are specifically opposed to in the rule. The
14 first one is the requirement for a fourth operator on
15 shift, and the second is the time table that is being
16 suggested for imposition of this rule.

17 We will take a look at those two ideas, and we
18 have four specific positions.

19 The first is, we do not believe that the rule
20 has sufficient justification for being put into place.
21 Secondly, we believe there are a variety of pending
22 items and initiatives that the Commission has come out
23 with, and all of these tend to indicate to us that there
24 has not been a coordinated effort to try to tie all of
25 these factors together into a nice, complete, uniform

1 package, without possible deviation in the future.

2 The third is the fact that the schedule that
3 has been proposed will cause serious problems for most
4 utilities. They may say that they can meet the numbers,
5 but what that means may be far different from what the
6 staff means.

7 MR. WARD: Will you expand on that?

8 MR. SHEAN: Yes.

9 The last item is the fact that this rule is
10 designed increase the safety that we have experienced at
11 our reactor, but in fact in the short term it will tend
12 to decrease the safety at our reactors.

13 Let's take a look at each of these
14 individually in more specific detail.

15 The lack of justification -- To begin with, I
16 do not believe that there is any major study done to
17 take a look at any kind of event report or other
18 experience from the industry to show whether or not an
19 extra individual on shift could make a definite
20 difference in that particular event.

21 In fact a little earlier this morning the idea
22 of whether, in fact, that extra SRO in the control room
23 would have made any difference at TMI, which purportedly
24 is the catalyst for this rule being proposed.

25 The other item that is being proposed here is

1 the fact that in the studies that have been quoted,
2 there are recommendations and even the one that does
3 specifically address the issue of an extra person on
4 shift, only recommends a task analysis be performed to
5 find out if it is needed. That was the Rogovin Report.

6 There are many task analyses and the staff
7 itself has admitted that none of these have truly been
8 completed to show what they intended to show. Yet, we
9 are at the point of trying to impose a rule without this
10 valuable information to decide whether it is even
11 needed.

12 So the question here of lack of justification
13 is one which goes beyond whether the rule is justified,
14 but whether the timing of this rule is even justified,
15 faced with the fact that other research is coming before
16 us, or should be due within a year or so.

17 In fact, some of that detailed information is
18 patterned after the Canadian information. I was at a
19 briefing where the Canadian task analysis people
20 expressed their methods, which we are basically
21 following to find out what we need for our particular
22 operators.

23 Both industry and the foreign nuclear
24 operators are performing studies, and there is a long
25 list of items which the NRC themselves are studying. It

1 seems strange, at this time, that they should decide to
2 go about trying to impose a rule, when their own
3 information has not even come back yet.

4 Moving on to other pending initiatives, there
5 is a list, which the staff this morning pretty well
6 elaborated on, probably better than I can do, the STA
7 requirement, the table B-1 requirements, college credits
8 and that has been from zero up to a bachelor of science
9 for various levels of operators, the degreed shift
10 supervisor, the shift engineer, overtime restrictions,
11 the number of shifts required for each plant, from four,
12 five or six, depending on the needs, and simulator
13 examinations.

14 In all of these initiatives, the important
15 thing that I like to underline or underscore is the fact
16 that we don't know exactly which way we are going, and
17 when we have gotten some particular information as to
18 which way to go, we find that they go and change their
19 mind again after they have imposed it once.

20 Some key examples of that are the idea of
21 overtime restrictions, which came out in several
22 different versions. Simulator examinations are a key
23 example of this where they decided to give simulator
24 examinations for reactor operators going for licenses.
25 After they tried this for a while, they found out that

1 this was not really working very well, and decided to
2 withdraw that requirement for non-plant specific
3 simulators. We, as a utility went out and made a lot of
4 contract arrangements to assure that we had that time at
5 a vendor, and now all of a sudden we don't need it any
6 more.

7 MR. DEBONS: Can I ask a question, Mr.
8 Chairman?

9 MR. WARD: Yes.

10 MR. DEBONS: I would like to examine the logic
11 of your initial statement. Let me see if I can repeat
12 it.

13 We haven't, in a way, given concrete evidence
14 that there is a need for the second SRO. Can I switch
15 the logic around and the conclusion from that is
16 obviously why go to the second SRO. The converse logic
17 goes something like this, inasmuch as we do not know
18 what the basic facts are in this case, but we have to
19 reduce the possibility of error in the situation, which
20 would then justify the second SRO.

21 That is the converse logic. I would like you
22 to respond to that second alternative logic.

23 MR. SHEAN: The last issue I have before you
24 is the safety issue, and we will bring some of the areas
25 where the additional person would tend to decrease the

1 safety.

2 MR. DEBONS: In other words, reducing the
3 safety.

4 MR. SHEAN: For my plant, and I can only speak
5 for my plant, we have been operating for ten years with
6 a three-operator level, and we have had no serious
7 problems. There is experience, as they seem to be
8 using, as an argument for their gut-reaction for
9 additional persons, which also counts.

10 MR. SCHROCK: Arthur Schrock with Wisconsin
11 Public Service.

12 I guess another thought on that is, we are not
13 sure, why should we make it a hard and fast rule until
14 we really know that there is a requirement. I could
15 reiterate Art's comment that in our eight years of
16 experience, we have had some events, a couple of
17 transformer failures, which the current shifts handled
18 quite well.

19 MR. DEBONS: I am going to wait for the
20 evidence that is forthcoming, but it would seem to me
21 that we are faced with a probability of risk assessment
22 in this situation, and the logic apparently could be
23 defended that inasmuch as we have no understanding about
24 reducing the probability, what you do is to increase the
25 probability of reducing the probability by having the

1 additional individual. That is the logic.

2 MR. SHEAN: I am not sure that more is better
3 in all cases.

4 MR. DEBONS: That is the evidence I am looking
5 forward to.

6 MR. WARD: Art, could I ask you. You
7 cancelled your reservation for some simulator time. Was
8 that just for the actual NRC testing, or have you
9 cancelled some of the training time in the simulator?

10 MR. SHEAN: Let me give you some background on
11 that. We, as a single plant utility, and that is the
12 only asset that the company owns, have gone out and
13 contracted for the delivery of our personal simulator in
14 1974.

15 We now go to a simulator which, because of our
16 unique design, does not very well simulate what we do
17 for a living. We go down there and we get some
18 transient accident analysis benefit from that simulator,
19 and our operators go through this at least one week a
20 year in the qualification on that simulator.

21 In preparation for this license examination,
22 we have to give every reasonable chance for our
23 operators to pass the examination, and they have
24 anywhere from one to two weeks of practice on that
25 simulator just to learn where everything is and become

1 comfortable with it, and then take the examination. So
2 we are talking anywhere from two to three extra weeks on
3 that machine for each candidate to assure them that they
4 have a chance of passing that examination.

5 I am not sure, because of the non-plant
6 specific requirements of that simulator that we get all
7 that much from the training.

8 MR. WARD: You seem to have concluded that the
9 non-specific training really doesn't do you any good.
10 The only reason you are doing it is to help the operator
11 pass the exam.

12 MR. SHEAN: In fact, when we get our own
13 simulator, which will be exactly as our plant is, we
14 would prefer to have simulator examination because we
15 believe that our people could do better because they
16 will know our plant, and that is what we train them to
17 do, to operate our plant.

18 But that is not the point that I am trying to
19 make. The point is that a ruling or an imposing was
20 placed upon us to comply with. We attempted in all good
21 faith to comply with that, and all of a sudden it was
22 turned around on us and dropped, because I believe that
23 the planning that went behind that was not complete, and
24 yet they went ahead and took action.

25 In a similar situation, if you will take a

1 look at the STA. The STA has been with us for
2 approximately three years, and I do believe any major
3 study has been done by the staff to verify the judgment
4 was required has truly been borne out by the actions
5 that have taken place.

6 Again, lack of planning, lack of study, lack
7 of follow-up, shows to me that there is a lack of
8 coordinated effort being put into the overall picture as
9 to how these individual pieces fit together.

10 I believe, from my point of view, that the
11 kind of action that was done with the emergency planning
12 SECY-82-111, should be performed and finalized before
13 any kind of ruling is taken a look at, nevertheless
14 taking a look at the studies that have been done to find
15 out whether it is really needed or not.

16 MR. PERSENSKY: They do have a major study on
17 the STA right now, on the concept of the STA and
18 engineering expertise on shift.

19 MR. CATTON: Have you, as a representative of
20 the utilities, done a study and is it available for us
21 to look at?

22 MR. SHEAN: Other than our individual
23 activities, we, as a plant, have decided to move away
24 from the STA, and we have gone to the shift engineer
25 concept.

1 MR. CATTON: Do you have any studies that you
2 reported on that justify the position you are taking?

3 MR. SHEAN: No, just our personal evaluation.

4 MR. CATTON: My own personal view of what you
5 are doing isn't buying it, if you don't do the study
6 that is at least equal to the kind of study that NRC is
7 doing to justify your position, all you can do is talk
8 about it.

9 MR. SHEAN: The point here is not the
10 individual item. What is concerning us is the fact
11 that, as we look at these various items in some cases,
12 which tend to pull away from each other, we are
13 concerned as to whether or not we should commit
14 ourselves to any one of them. Where we commit
15 ourselves, whether or not that will be pulled out from
16 under us, and we will be sent in another direction.

17 Moving along, the problem with scheduling and
18 planning, we have found that at the time we were being
19 asked to add more operators to our staffing
20 requirements, we were facing other things that are being
21 placed upon us that tend to impede us in maintaining
22 that goal.

23 For example, it has already been discussed,
24 the idea of increasing requirements at the various
25 operator levels, when you know that before you can be

1 tested at the SRO level, you have to spend three months
2 on shift as an extra person, and the additional four
3 years of experience required, as opposed to the ANSI
4 standard which requires a three-year experience level
5 for an SRO.

6 The educational requirements, if the various
7 decisions are made as to what level an operator must be
8 in as far as education, we find that we may have long
9 periods of time trying to upgrade the people we have on
10 shift now to some level of college attainment.

11 The training requirements -- At a time when we
12 are trying to gain more operators, we find that our
13 training programs must be lengthened to incorporate the
14 operator training that has been placed upon us. I don't
15 mean to imply that these are not good ideas. My concern
16 is the fact that they tend to extend the program and
17 lengthen the time necessary to get an operator's
18 license.

19 Some of these things, for example, the
20 requirements for mitigating core damage, the various
21 academic topics of thermal dynamics, heat transfer,
22 fluid flow, the requirements for pressurized thermal
23 shock, steam generator over-fill, station black-out, all
24 generic letters coming about since the TMI accident, and
25 the things that have been done to address the TMI

1 accident.

2 Again, other actions that have been taken -- a
3 stiffening of the examination, and the increase of the
4 grade that you must attain to pass the examination,
5 going from a 70 to an 80 percent level, as it has been
6 discussed, has caused major difficulties in getting
7 enough people to pass the examination. In fact, the
8 rate was quoted by someone as going from 15 percent to
9 50 percent failure rate at the beginning of the
10 examination process.

11 At the same time that we are increasing the
12 training, there must be people provided to give this
13 training, and at the same time that we are trying to get
14 more people to provide the training, the requirements of
15 those individuals has been increased to a senior reactor
16 level. This, in fact, has withdrawn from those
17 available to be on shift, because you would like to have
18 your best people train the future reactor operators,
19 thereby taking some experience from your staff.

20 The requalification examination -- I have a
21 letter on my desk from the Commission stating the
22 requirements for the requalification examination, where
23 they will be coming annually and testing 20 percent of
24 our people.

25 This impacts on licensing levels because they

1 have also stated that those individuals, if they fail
2 that requalification exam, must be removed from operator
3 duties for all intents and purposes, and that means that
4 they don't have a license, as far as we are concerned.
5 So they are proposing a reduction in the level, at the
6 same time that they are trying to increase levels.

7 MR. WARD: That seems to be contrary to what
8 Mr. Merschhoff said a few moments ago. That may be the
9 case, but I am not aware of it.

10 Mr. Thompson, do you want to comment on that?

11 MR. THOMPSON: Hugh Thompson, NRC staff.

12 The letter would require that an individual,
13 who did not demonstrate an adequate level of knowledge
14 on the requalificatin exam, be removed for an
15 accelerated retraining program which the utility then
16 would administer.

17 When the utility had demonstrated evidence
18 that he was qualified in those areas of deficiency, he
19 would be allowed to go back on shift. This is the same
20 way he is today when he doesn't demonstrate knowledge in
21 the utility administered requalification exam.

22 MR. WARD: You are saying that this is
23 actually the present practice?

24 MR. THOMPSON: That is correct.

25 MR. SCHROCK: Mr. Chairman, our program, which

1 is written in accordance with Appendix A of Part 55, has
2 two level. If the operator doesn't totally pass the
3 exam on one level, however he shows sufficient knowledge
4 in all other categories, he goes through a retraining
5 program immediately, but stays on shift.

6 At the second level, which is a little lower,
7 he is pulled off shift, relieved of his duties, and goes
8 through the retraining program until he does show
9 acceptable knowledge.

10 MR. WARD: But is that higher level just your
11 own utility imposed requirement?

12 MR. SCHROCK: It is our own utility imposed,
13 but we follow the guidelines of the 80 percent/70
14 percent in each section.

15 MR. WARD: Mr. Thompson, does that square with
16 your understanding of the policy?

17 MR. THOMPSON: I am not familiar with the
18 details, but in that sense it is the correct approach
19 that we would anticipate taking.

20 MR. REMICK: Am I correct, Hugh, that
21 individual requalification plans were proposed by
22 individual licensees so they would differ somewhat, but
23 would follow Appendix A of Part 55. So there would be
24 differences between the requalification programs.

25 MR. THOMPSON: That is correct. In essence,

1 the overall approach would be for an individual who had
2 demonstrated a deficiency that was of concern to the
3 utility, he would go to an accelerated retraining
4 program before he resumed watch-standing, but he would
5 not be required to take a new NRC requalification
6 examination.

7 I would be hesitant to that if everybody at a
8 utility failed the NRC requalification exam, then there
9 might be an additional exam administered, and there may
10 be some deficiencies identified in the program.

11 MR. WARD: Thank you.

12 Go ahead, Mr Shean.

13 MR. SHEAN: The last item on the problem of
14 scheduling and planning is the idea that since the Three
15 Mile Island accident, and other imposed actions that we
16 must take, we find that the need for reactor operators,
17 particularly the senior reactor operators, has just
18 expanded tremendously.

19 For example, the I.C.1 requirement to rewrite
20 emergency procedures truly requires the senior reactor
21 operator to be able to give the operations input
22 necessary to make those worthwhile. The training staff
23 itself, as I know in my own case, have with drawn from a
24 two senior reactor-operator operations to five, with
25 additions required with the advent of my simulator

1 training process. On my staff, I have more senior
2 reactor operators on my training staff than some of the
3 operating shifts.

4 The shift engineer process, if it goes to its
5 full fruition, will require at least, I believe, a
6 senior reactor operator license. This is a goal that we
7 have set for ourselves at our utility for our shift
8 engineer.

9 You go on with the other activities that are
10 happening in the industry, such as the Institute of
11 Nuclear Power Operations requiring support, consultants
12 in the training area and other areas, drawing these
13 individuals away from utilities to provide support in
14 starting up new plants.

15 New Plants, themselves, pirating individuals
16 because they must have certain levels of experience on
17 their staff to get their operating license.

18 At the same time, we are trying to seek higher
19 levels of shift staffing by means of additional shifts
20 to handle the training requirements and other overtime
21 limitations, we have been trying to do a six-shift
22 rotation, as opposed to a five or a four-shift
23 rotation.

24 This, in our mind, has become absolutely
25 essential. In our plan to address additional staffing,

1 we have taken that a cornerstone of our plan, to
2 maintain a six-shift operation, so that we can handle
3 the additional requirements.

4 The NRC staff itself, I believe, is a true
5 example of the shortage of qualified individuals at the
6 present time.. I believe they have not been able to
7 totally staff their own organizations. I don't have the
8 actual numbers on that, but perhaps you can ask the
9 staff if they have the numbers.

10 So idea, in the aftermath of TMI, the need is
11 becoming tremendously large and our training programs
12 are trying their best to meet these needs, but we are
13 having difficulties, and all of these items are trying
14 to pull away from and impede the possibility of
15 attaining the goals that they are trying to lay in front
16 of us with this proposal.

17 The last item is the safety implications, and
18 I hinted at those somewhat in my discussion to this
19 point. If this rule were to go into place with the
20 limitations that they propose, we would find, as we
21 already are finding, that there is a dilution of our
22 experience level at each of the utilities. The people
23 that we used to have who started the plants up, no
24 longer exist because they have been wooed away to other
25 plants or are required to do other activities.

1 We are also finding that because of this
2 movement and because we have to upgrade people faster to
3 the SRO level, that in all positions we find new people
4 filling those positions. Former ROs are now SROs.
5 Former auxiliary operators are now reactor operators.
6 AOs that just came in the door are now performing
7 auxiliary operator functions.

8 So even though the experience level of some of
9 these people may be the same ones that we have had
10 already, they are now in new and unfamiliar positions,
11 and, therefore, attempting to learn those positions,
12 even though we have provided training.

13 This situation is the idea that you put more
14 people on shift, but all of a sudden your ability to pay
15 absolute attention to what is going on in the control
16 room starts to diminish.

17 If you take three operators on shift, the
18 possibility of two or more people going into a
19 conversation is four, and if you add one more person,
20 the combination goes up to 11, the possibility of two or
21 more people engaging in some sort of conversation or
22 discussion. Those types of things can detract from the
23 very attention level that was input into the system by
24 continuous, on-going control of the operation.

25 MR. WARD: They might even be talking about

1 what is going on in the plant. You might have 11
2 conversations about the plant.

3 MR. SHEAN: I believe that one of the problems
4 that did come out of TMI, after the accident itself, it
5 was not the lack of people in the control, it is the
6 fact that there were too many people in the control
7 room.

8 In fact, they took steps to eliminate people
9 from the control room by having authority and specific
10 responsibilities designated, and setting up two other
11 facilities, the emergency operating facility and the
12 support facility, off and away from the control room.

13 There are some other short-term items that we
14 should take a look at. If you require a person to get a
15 reactor operator's license, you are basically telling to
16 take an examination and pass it. I am not sure that the
17 examinations at the current time truly represent what a
18 man needs to know to become an operator.

19 We have had that problem on our training staff
20 in trying to provide qualified operators and at the time
21 have them pass an examination. If the concern is to get
22 a license, then the sole effort is to seek a license and
23 not quality operation.

24 Another involved in that idea is the fact that
25 if you cram information in someone's, it is a fairly

1 common educational theory that if you cram for an
2 examination, you may pass the examination, but what you
3 retain is probably nothing or very little. You would
4 have gotten more retention if you had a longer period of
5 time to slowly absorb, and completely engrain it into
6 your way of operation.

7 So in the short term those two last items tend
8 to cause reactions which may not be favorable for
9 safety, as well as the other things we have discussed.

10 In summary, the items that we are concerned
11 with, we find that there is no justification that has
12 been shown for this rule. There are studies in place
13 which could show this, if we waited long enough to see
14 them.

15 Secondly, there has been a distinct lack of
16 coordination in all the different areas associated with
17 thi problem. We should have a consolidated, unified
18 plan, such as 82-111, to address these in a coordinated
19 manner.

20 Lastly, we should carefully take a look at the
21 results of trying to impose this kind of requirement in
22 such a short period of time.

23 This is the general opinion on this particular
24 rule. I am prepared at this time to discuss the kinds
25 of problems that a single utility, my own company, is

1 having in planning and getting ready for the
2 implementation of this kind of a rule.

3 MR. REMICK: I have a question about your last
4 comment about insufficient time to prepare. How do you
5 address the fact that 0737 had recommended this by July
6 1, 1982.

7 MR. SHEAN: And it recommended the non-plant
8 specific simulator examination also.

9 MR. REMICK: So you didn't think that 0737 was
10 something that you should address?

11 MR. SHEAN: We have been trying to address
12 this problem continuously. Because of these other
13 influences that are coming along, which pull away from
14 these activities, we have made a good effort to meet
15 that. We found in most cases that we have made good
16 progress, but also we have been torn apart.

17 I can quote from my plant. This year alone,
18 we had six experienced shift supervisors, and we lost
19 three within three weeks, two of them to go to
20 California to start up a new plant six times as big as
21 ours.

22 MR. REMICK: It is the reason, in the case of
23 your own plant, that you were unable to meet the July 1,
24 1982, date, because of loss of people. But you were
25 trying to gear up to the SROs.

1 MR. SHEAN: I don't think there is a plant I
2 am aware of throughout the United States that has not
3 made some modest effort to try to increase the number of
4 operators that they have on shift because, practically
5 speaking, the operators right now have us where they
6 want us because there is a supply and demand situation.
7 They are the supplier, and there is no other
8 alternative.

9 As in our case, we had to do some serious
10 readjustment. We lost our six-shift rotation when these
11 three individuals, and we had to go down to a five-shift
12 temporarily because there was no one there.

13 MR. REMICK: Did you give, at your plant, a
14 higher priority to six shifts than having two SROs on
15 one shift?

16 MR. SHEAN: When I am subject to 20 percent of
17 my operators being tested on an annual basis, the six
18 shifts are essential to me because that will help me
19 more than having people go off their license. So I have
20 a personal interest in the people have in my plant, I
21 want those people to keep their job and continue to be
22 able to be productive.

23 That is one of the things that we have not
24 really mentioned. There are some human factors here.
25 We have been bouncing these operators around vigorously

1 one way and then the other, telling them that they have
2 to have a college degree, and then that they don't have
3 to have a college degree; they have to go to the
4 simulator and leave their family, and then, no, they
5 don't have to go to the simulator and leave their
6 family. We have not treated them personally, and that
7 is why some of those people left. Some even left the
8 industry. We had one operator who is now a lobsterman.

9 MR. LEWIS: It is a bad time to go into that
10 business.

11 MR. SHEAN: This is the kind of real problem
12 they face. If we had some time, I would like to some of
13 the problems that are particular to my plant, because I
14 think they illustrate some of the struggles that other
15 utilities have in good faith experienced in trying to
16 address these kinds of issues.

17 MR. WARD: We would like to do that, but I
18 think Mr. Schrock has some comment he would like to
19 make.

20 MR. SCHROCK: In the case of Kewaunee, we
21 initially took exception to the second SRO in the fall
22 of 1979. We did receive a response from the staff on
23 that. So in the Spring of 1980, we decided to go ahead
24 and try to implement this. We went on a campaign to
25 hire people to put through a training program. By the

1 fall of 1980, we had people. We started the operator
2 training program in the Spring of 1981.

3 Normally, it would take about three-and-a-half
4 years to license a person that we take right off the
5 street. In this case, we are doing it in about 15
6 months. After these people get their ROs, then we place
7 existing ROs to upgrade to SRO, and then we promote the
8 ROs.

9 MR. WARD: Before you go on, I would like to
10 clarify something.

11 At the beginning you said that the specific
12 objections of the utility was the requirement for four
13 operators on shift. It has not become clear to me how
14 much of a problem is related to the rule requiring the
15 four operators, and how much of it is related to the
16 rule requiring a second SRO.

17 MR. SHEAN: As a group, we are opposed to the
18 fourth operator. In my own personal Maine Yankee
19 problem, we are not really opposed to a second SRO on
20 shift. In fact, until just recently, we normally had
21 two SROs and an RO on shift for many reasons. One, we
22 like to have a backup; and secondly, the senior reactor
23 operator can perform the same functions as our
24 operator. So we thought that it was a good policy and
25 good practice to operate to have this additional

1 experience on shift.

2 It is only recently, because of the problems
3 that we have encountered, that we had to go from that to
4 a one SRO and RO level. In fact, as I said, our
5 management is not opposed and would like to have that as
6 a standing operational mode.

7 MR. WARD: That is interesting. But the
8 utility group as a whole hasn't taken that position; is
9 that right?

10 MR. SHEAN: Some do and some don't, so I can't
11 speak for the whole group. Again, I am here only
12 representing myself, and we are part of that group of
13 individual utilities.

14 MR. WARD: Why don't you go ahead.

15 MR. SHEAN: I think there has been some
16 discussion of what it takes to get to the various levels
17 of operational staffing. This is a typical example of
18 the career pattern that one of our operators would go
19 through during his career with our company.

20 You can see, as a person enters at the top, he
21 has a period of training, and in our case it is anywhere
22 between three and four months of specific classroom
23 training. Then he has a period of on-the-job training,
24 and then he begins operation as an auxiliary operator.

25 After that they would spend a year as an AO,

1 and then they would go into the control room operator
2 training course. That program would take anywhere
3 between -- it is averaging right now ten months. Then
4 the licensing process, the testing, the feedback from
5 the license examination. We count on about a year's
6 time for that typically.

7 After that they must spend a minimum of one
8 year, at least, as a reactor operator before they can be
9 considered for a senior reactor operator license. At
10 that time, they would go into a senior reactor operator
11 program, and go through the testing, and then come on
12 shift as a senior reactor operator.

13 So we are looking at a minimum, for a person
14 coming off the street -- we are not talking about an
15 average individual. We find that we must have at least
16 a merchant marine background or, better, a Navy-nuclear
17 background.

18 Then they come out about five years later with
19 a reactor operator, and the five-year timeframe is when
20 get his senior reactor operator's license. After that
21 he serves a period of time as a senior reactor operator,
22 and then, only if he shows the appropriate assets and
23 capabilities, he is promoted to shift supervisor for the
24 plant. Again, this is the concept of two SROs on shift,
25 and one reactor operator.

1 The problem we are facing now is very similar
2 to the analogy of a steampipe. You take a steampipe,
3 and it springs leaks, and steam is leaked out throughout
4 the plant. You find that if you have the restriction of
5 having to have the steampipe filled with appropriate
6 numbers of people, who are the ones we have to have to
7 fill six shifts and meet the current rule, and the
8 requirement that you can't get from one place to the
9 other unless you start at the beginning of the pipe and
10 go to the end, and limitations on time as indicated for
11 the appropriate training program. If you throw in the
12 requalification or the potential college requirement on
13 the outside of the pipe, then all the way along you are
14 having leaks springing out to meet all these additional
15 requirements, and these are the requirements that are
16 being placed on us.

17 The question is, how many people do you put in
18 reasonably to get this constant flow and, hopefully,
19 provide some experienced people out the bottom here who
20 can augment your management staff, and maybe, for that
21 matter, become vice president of operations some day.
22 This is the kind of problem, and this is the kind of
23 thing that I have had to go to the president of my
24 company and discuss.

25 This slide comes from that presentation, to

1 try to bring that very question of how many people do
2 you put in, and how do you run this kind of pipe with
3 all these leaks springing out at all times.

4 To meet this requirement, a plan that we came
5 up with, and I am intentionally going to show you this
6 slide because it is rather complex and detailed, that is
7 the kind of plan that implements the kind of concept we
8 are talking about. I have a chart over here that I
9 could show you. It is the very same chart that we are
10 showing up there.

11 In this chart, you see the timeframe
12 associated across the top, and you are seeing various
13 inputs, so that you don't have people bunging up your
14 training staff and also not sitting around losing
15 interest because they are not moving ahead at a fairly
16 rapid pace, which seems to be the only assumed thing in
17 the industry, just move, move, move, and the interaction
18 that you must have between the various levels.

19 Each time, you have to go through this level
20 to feed the training program at this level. After you
21 go to the training level here, you may be able to come
22 down here and continue down here. Eventually, if you
23 are lucky, you go on to other activities.

24 This is the kind of plan and the kind of
25 activity that we have to get involved with to meet a

1 requirement of an extra man on shift. This is a
2 proposed plan to meet this very same goal.

3 If six months to a year down the pike someone
4 changes their mind that this is not what the study shows
5 we need, what happens to this effort? We started with
6 real people in here, and if now all of a sudden we have
7 got to send them to college, as opposed to this other
8 activity. This is the kind of problems we face with an
9 arbitrary decision as to timeframes and requirements.

10 MR. DEBONS: May I ask a question.

11 MR. SHEAN: Yes, sir.

12 MR. DEBONS: I am firing from the hip on this
13 one, but it doesn't seem that this is a very novel
14 issue. The military has faced this problem for years.
15 Have you done any research on this as a backup for your
16 arguments? The problem is there, as I understand it, it
17 is just that it doesn't seem to be a novel one.

18 MR. SHEAN: I don't claim it to be novel. It
19 seems that we should consider this when we make
20 decisions as we do.

21 I am the training director for my company. My
22 president has told me, you have to meet this
23 requirement, start planning for it. What do I do? This
24 is my way of presenting to him the needs that I have in
25 order to meet his requirement.

1 MR. DEBONS: Then I will have to go back to
2 our own people. Given that this is the particular
3 experience of the utilities, have the NRC people checked
4 the research in this to counteract or to support this
5 argument?

6 I find it very difficult to completely accept
7 the argument that this is an impossible situation. I
8 understand that it is a very complex one, but I wish I
9 had some data to support my suspicion that probably
10 there is some evidence as to how you counter this
11 cascading problem in personnel management, or personnel
12 training management.

13 MR. SHEAN: I want to refrain from saying that
14 it is impossible, because I can't go to the president of
15 my company and say that it is impossible. I try to
16 provide a solution, and the solution is complex. We
17 have identified quite correctly that it can be done.
18 The question is, I don't in our company see how we can
19 do it by January 1, 1983, by any means.

20 MR. DEBONS: Is the timing the problem?

21 MR. SHEAN: I can show you this chart here
22 which is one line from this overall chart. This is the
23 senior reactor operator chart. In this chart, in blue,
24 you see the actual manning you would expect to have at
25 any particular time. The red is the attrition factor

1 which we had to account for in our planning. I have
2 gone back and gotten the historic information from our
3 plant to justify our attrition rate.

4 We must also take into account the historic
5 failure rates on exams, so we know about how many people
6 will be added to the staff. We have but so many people
7 going through the training program.

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1 We have not, unfortunately, considered the
2 possibility of losing licenses because of
3 requalifications, and as long as we maintain six shifts
4 and continue our training program, we don't think we
5 will. But that is a possibility that has been imposed
6 upon us and is now being implemented.

7 But anyway, this chart shows the line that we
8 must attain to meet this requirement, and the time
9 frames based on the input of people in this chart that
10 we could hopefully attain this level. And you will see,
11 although we may maintain it at a level, say right here,
12 which is say the '83 time frame, July '83, yes, we'll
13 have that number.

14 But before the next program comes up we will
15 have attrition rates which will drop us from that level
16 and therefore drop us from six shifts and perhaps even
17 drop us below five shift rotations before the next class
18 comes along. And that class can't start until the
19 reactor operator program is finished, so we have enough
20 people to fill the reactor operator slot to fill the
21 senior reactor operator slot.

22 So we have a sawtoothed arrangement here. And
23 admittedly, this is statistical data that is projected
24 into the future, but we don't have any other information
25 to go on.

1 MR. REMICK: Are you addressing means of
2 addressing the attrition rate, or getting a higher
3 percentage of people to pass the exam through
4 selectivity, or higher salaries or better working
5 conditions, professionalism, esprit de corps, things
6 like this?

7 MR. SHEAN: Yes. If I can mention the
8 attrition rate, I just want to show you the data I used
9 to project this information. This is our failure rate
10 information. It's in your packet as well.

11 You will find that we as a utility take
12 extensive care to screen our people prior to going up
13 for an examination. You look at the rates we have for
14 passing the examinations and you'll find they're quite
15 good. In fact, we're quite proud of our success on the
16 examinations, because we screen our people effectively.

17 We have in fact consultants -- after we have
18 completely finished with them in our training program,
19 we have consultants who come in and give them a
20 simulated NRC examination. That's one of the last items
21 we look at before we recommend the man for going up for,
22 examination. In fact, in the RO level you will see we
23 have attained 100 percent in the last few years by doing
24 this kind of activity.

25 At the same time, we look at the attrition

1 rates. Notice, in the aftermath of TMI there wasn't any
2 sure idea of what was going on so people were hanging
3 on, but after all the requirements started coming down
4 on the heads of our senior reactor operators, then 3 --
5 and those three happened to be the most senior
6 individuals that we lost, unfortunately.

7 MR. CATTON: Six figure salaries in
8 California?

9 MR. SHEAN: Tremendous hours, overtime, et
10 cetera. I wouldn't want the job. Those are the kinds
11 of things we have to deal with.

12 When you talk about studies, I didn't do a
13 complete study of all the industry to find out if this
14 was a good way of doing it. We took our best shot at it
15 with the information we had available to us, and we went
16 back and got the research from our own statistics and
17 information and tried to put together a package for the
18 larger approach. This is just one area that we faced on
19 the list of items we talked about.

20 MR. CATTON: Groups like your own, you said
21 you represented 18 utilities?

22 MR. SHEAN: This is the group we're in right
23 now, yes.

24 MR. CATTON: Are you giving any consideration
25 to a national academy of some kind or other to train

1 your operators? DOE did that.

2 MR. SHEAN: Locally, for example, my
3 particular company is part of a Yankee complex of
4 companies. They have interrelation to the common
5 engineering firm, et cetera. We do try to share some
6 training experiences and training courses. Health
7 physics is an example. Unfortunately, our plants are so
8 diverse and different that there are always some basic
9 generic topics, such as thermodynamics, heat transfer,
10 this sort of thing, and reactor physics, that can be
11 taught. And those are, relatively speaking, about a
12 third at the most of the overall training requirements.
13 Most of it is the hands-on practical Maine Yankee
14 information they must know.

15 In fact, my background is in the mechanical
16 engineering area and I was brought to my company for
17 that specific reason. My greatest difficulty was trying
18 to relate my knowledge to the plant across the street,
19 not a general plant but the plant across the street
20 which they want to know about.

21 And the operators are extremely intensely
22 interested in what the sciences say about Maine Yankee.
23 They don't care what happens at CE; they don't care what
24 happens at Westinghouse, or anyplace else. They want to
25 know what happens at Maine Yankee because they are

1 responsible for Maine Yankee. That again is my personal
2 company's situation and it cannot represent any other
3 company because it's solely been developed for that
4 purpose.

5 So that is basically the essence of what I
6 wanted to say. Again, I don't feel there's a
7 justification for the rule. It is untimely and the
8 imposition of the timing of this thing is going to cause
9 us a great deal of difficulty, and the complex nature of
10 all the factors that are being thrown at us at one time
11 should be coordinated into a consolidated unified plan
12 so we can have one common set of marching orders to go
13 to a common goal, which is what we all want.

14 Mr. Schrock, did you have anything to add?

15 MR. SCHROCK: No.

16 MR. WARD: Thank you, Mr. Shean. That's very
17 helpful.

18 I think that completes the presentations. Mr.
19 Knuth, did anyone else have anything to say?

20 (No response.)

21 MR. WARD: Does the Staff have anything else
22 they would like to say, or comment on what you have just
23 heard?

24 MR. CROCKER: I have nothing.

25 MR. THOMPSON: I don't have anything

1 specifically. I think we certainly recognize the
2 situation they described. It tends to, I think, reflect
3 the utility's planning when they started serious efforts
4 to increase the input level to their training program as
5 to when they expect to be able to meet the increased
6 staffing levels. I would say that at least 50 percent
7 of the utilities are there now, and all of a sudden they
8 face the same sort of a loss through attrition, moving
9 on into the utility management.

10 It kinds of varies. We have those who started
11 up immediately and those who have waited until we had a
12 firm requirement before they significantly got their
13 program accelerated, and there will be different time
14 frames in each of those cases.

15 MR. WARD: I guess Mr. Shean's point on that
16 was, there may have been utilities who happened to guess
17 right on the particular point, that this was a
18 requirement that was not going to change. On some other
19 issue, where there was a tentative requirement in 0737,
20 do you think it is possible that there would be a
21 different wrackup of requirements, that some would have
22 been convinced that another tentative requirement was
23 going to end up as a real one and started to move on
24 it?

25 For example, you gave the example of the

1 simulator exam, which perhaps some utilities tooled up
2 to live with and others didn't in terms of what would be
3 necessary.

4 MR. THOMPSON: I'm not sure that that is a
5 true statement. Certainly, for the short run we
6 eliminated that on non-plant-specific simulators. I
7 think that issue is still an open one with respect to
8 the question of whether the long-term plant-specific
9 simulators will be required for examination purposes.

10 In any event, simulator training is still a
11 portion of the increased effort that we are supporting
12 for the operators in supporting the TMI action items.

13 MR. WARD: Thank you.

14 Let's see. Before -- Tony, did you have a
15 question?

16 MR. DEBONS: I have a question to you, Dave,
17 if I may. This is for my own education. When is this
18 rule supposed to be implemented? Is this rule now
19 current? I'm trying to understand.

20 MR. WARD: The Staff has proposed -- the
21 original proposal is that the rule be implemented the
22 1st of January --

23 MR. DEBONS: The first of January.

24 MR. WARD: -- with the flexibility of
25 permitting exceptions to July, the middle of '83. But

1 this is just a Staff proposal.

2 MR. DEBONS: I see. Well, I think that the --
3 this is my own problem that I am trying to grapple with
4 in terms of providing guidance on this situation. That
5 is, if we take a timing factor involved -- in other
6 words, we are now much more flexible in the application
7 of the rule. I would like to know what the implications
8 of that flexibility is.

9 I am not really sure what the flexibility --
10 if I were to recommend, for example, that based upon
11 what I have heard that it is not defensible to have an
12 implementation date, let's say, on January 1st, 1983,
13 but that we would project that for another year, I'm not
14 really sure what the implications of that recommendation
15 is.

16 In other words, to be very candid -- at least
17 I am trying to be candid with myself -- intellectually I
18 cannot cope with the tremendous complexity of the issue
19 here that flows from the NRC side in terms of the sort
20 of things we were discussing before in terms of the
21 nature of the competencies, the evidence to support it,
22 and the operational justification in the field in which
23 they feel that this rule is impeding --the technical
24 complexities are too severe for me to come to a
25 judgment, so I come to a very crude one that says, if we

1 now --

2 MR. WARD: Join the crowd.

3 (Laughter.)

4 MR. DEBONS: Pardon?

5 MR. WARD: I said, "join the crowd."

6 (Laughter.)

7 MR. DEBONS: If we delay this a year, then
8 what are the implications of this, if we delay this two
9 years? Or if you were to say, hey, Mr. Utility, you are
10 to be sure that you will comply with this rule in 1984,
11 what are the implications for the utility? That is the
12 sort of thing I'm worried about.

13 MR. CATTON: Or will they just wait two years?

14 MR. LEWIS: And with good reason.

15 MR. WARD: Mr. Schrock, could you respond to
16 that?

17 MR. SCHROCK: Yes, I could. We currently have
18 about 15 operators in training with no plant
19 experience. If the rule goes through, we would probably
20 put all of these people on shift and take out existing
21 RO's to train them as SRO's. So this would mean that
22 actually on the panels we would have inexperienced
23 people under the supervision of experienced shift
24 supervisors. If we had more time, we would put these
25 people on shift as extra people to work with experienced

1 operators, to provide them some actual operational
2 experience before we put them on the panels.

3 MR. DEBONS: How much more time?

4 MR. SCHROCK: We're looking at 1984 as the
5 proposed date, January 1st, 1984.

6 MR. DEBONS: Well, if that is 1984, then I
7 would like to know what the implication of the 1984
8 implementation date is.

9 MR. MERSCHOFF: Ellis Merschoff, NRC Staff.

10 The last handout in my package, which I didn't
11 discuss, may address that to some degree. It's entitled
12 "Status, NUREG-0737, Item 1813." We attempted to go
13 through all of the operating nuclear power plants and
14 put them into categories.

15 The first category of 38 units currently meet
16 the staffing requirements. The next category state they
17 need more time. There are 24 units listed there. Some
18 of them have dates behind them. That can give you some
19 feel for the additional ones that can meet it.

20 Then we go on further to the 17 percent with
21 13 units under the alternative proposals that I
22 discussed.

23 MR. DEBONS: Could you give me an idea of what
24 the implications are for the statement, need more time?
25 One year? Is the implication two years? Three years?

1 What technical implications come from the timing
2 factor?

3 MR. MERSCHOFF: Well, under "need more time,"
4 we put dates next to most of them. We're talking about
5 within six months more time --

6 MR. DEBONS: What does that mean in terms of
7 our objective for nuclear safety? What does that mean?
8 Does that mean that we are jeopardizing risks here? How
9 do I judge that? I could say three years. What does
10 that mean? If I say three months, what does it mean?

11 MR. THOMPSON: That's a difficult area to
12 quantify, we will definitely have a 10 percent reduction
13 in risk or a 50 percent reduction in risk. It's a
14 judgment factor that eventually the staffing levels of
15 utilities need to be increased, and the Commission
16 looked at this as a recommending following TMI and made
17 a judgment that we could live until July of '82.

18 When the Commission looked at it again in June
19 of this year, they changed the date to January of '82
20 because they recognized that there were those utilities
21 having difficulty meeting it.

22 MR. WARD: You mean January of '83?

23 MR. THOMPSON: January of '83.

24 As far as I know, there's no black and white,
25 on and off answer. If it's a utility that experiences a

1 significant incident, the additional staffing levels may
2 be there to provide that information that would prevent
3 that from degrading into a serious accident. If that
4 doesn't occur, then the engineering expertise on shift
5 and the extra SRO on shift is called for by the TMI
6 action plan, which may be put to use in other ways in
7 increasing the capabilities of the plant to operate
8 safely and increase its own on-line time, increase the
9 capabilities of procedures, and enhance those areas that
10 were identified.

11 These individuals would be doing something.
12 Typically, it's dependent on the utilities to assign the
13 various responsibilities.

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1 MR. CATTON: I think you have to weigh that.
2 If he has to go ahead straightaway, he's got
3 inexperienced people at the control board. I am
4 surprised that you would do that if you feel that puts
5 your plant at risk.

6 MR. SCHROCK: I would like to address that.
7 Our operations superintendent has expressed that as
8 being one of his major concerns. At Kaewanni we just
9 came off of a 305-day run and now we're on our second
10 roughly 157 days. The regional inspector said the same
11 thing. The challenge is going to be to take these new
12 and experienced people and maintain that excellence in
13 operation. We won't have any choice, though, if we are
14 forced to put these people on shift.

15 MR. CATTON: Have you attempted to make some
16 sort of a measure of the increased risk as a result of
17 doing this as an argument for your position?

18 MR. SCHROCK: We have already seen an increase
19 in the number of what we call personnel errors at the
20 aux operators level. So far, they haven't resulted in
21 any significant incidents, but I would suspect that if
22 we continue to put lesser experienced people on shift,
23 we will see an increase in the number of personnel
24 errors.

25 MR. WARD: Dr. Remick?

1 MR. REMICK: What is the staff's proposed time
2 table for coming back to the Commission on this proposed
3 final rule?

4 MR. MERSCHOFF: Originally, at the July
5 meeting, the Commission requested we put the rule out
6 for 30-day public comment and get it back to the EDO to
7 be issued as a final rule on October 30th. We since
8 requested and received a 30-day extension to that. We
9 are scheduled to get it to the EDO to be forwarded to
10 the Commission on November 30th, 1982.

11 MR. REMICK: To the Commission at the end of
12 November?

13 MR. MERSCHOFF: Yes, sir.

14 MR. WARD: Okay. Does anyone else have any
15 other questions before we go on to the next item?

16 (No response.)

17 MR. WARD: The next, we have two choices. We
18 can finish up this section of the meeting, in which I
19 would like to get comments from each of you on what you
20 think about what you have heard, what you think we
21 should be recommending to the full committee. Do you
22 want to do that before or after a break?

23 MR. CATTON: Before.

24 MR. WARD: I've got one vote for before and
25 one for after.

1 MR. LEWIS: After.

2 MR. WARD: I think I might vote.

3 MR. LEWIS: In that case, I have to make an
4 11:00 o'clock phone call.

5 MR. WARD: I would like to get your comments.
6 As I said earlier, we will report to the full committee
7 on next Friday morning at 10:30. We will have a
8 one-hour report. Don, are you leaving? I would like to
9 have next Friday for the full committee some sort of
10 industry comment on some summary of what we have just
11 heard. Can you organize that?

12 MR. KEUTH: I have to leave, but yes, sir.

13 MR. WARD: That is fine. So let's assume that
14 at the full committee meeting we will hear about a
15 half-hour from the staff and 15 minutes from the
16 industry, maybe a little less than that from the staff,
17 for a discussion.

18 Okay, let's go ahead. Jerry, would you like
19 to lead off? What do you think of what you have heard,
20 and what do you think we ought to be recommending to the
21 full committee?

22 MR. RAY: I am in sympathy with some of the
23 things the staff is proposing, the increased talent on
24 shift and so on, but I must confess I am impressed by
25 the story we have just heard from the Maine Yankee

1 representative. I have to concede that there have been
2 incidents where the staff has imposed requirements on
3 the industry perhaps with a minimum amount of
4 justification for it.

5 I would like to get a better feeling as to the
6 validity in the opinion of the staff of the claim that
7 there is -- there are efforts under way both under NRC
8 auspices and those of the industry the result of which
9 would provide better justification for this. I think
10 that is an area that might be valid.

11 So, at the moment, really, I am in a quandary
12 as to whether or not I would say we should recommend to
13 the committee to approve the schedule arrangement or
14 plan for taking this to the Commission for
15 implementation. There is no question in my mind but
16 that concessions should be made to the industry as
17 necessary as to an implementation date, but there is no
18 question at all about the need for that.

19 Obviously, if you stampede these people into
20 meeting it in the strict sense of a head count, you are
21 going to degrade the quality of operations and their
22 capability to handle an emergency. This makes me very
23 apprehensive.

24 So, at the moment, subject to some validation
25 of the near range availability, if I can put it that

1 way, of better justification, I am inclined to vote for
2 deferring action until a future date. I don't know how
3 long that should be, but I think too frequently this
4 kind of indictment about staff action has proved to be
5 true, and I am not sure this isn't another incidence of
6 that, and at the price of degradation of quality of
7 operations, I do not think we should risk it.

8 MR. WARD: Okay. Are you saying that the
9 implementation date should be relaxed?

10 MR. RAY: There is no question about that.
11 Yes.

12 MR. WARD: Or that the requirements should be
13 further justified before ever being promulgated?

14 MR. RAY: Well, taking a more logical approach
15 to presenting my thoughts, as you suggest, one, I think
16 a deferment of the requirement for better justification
17 is justified. Two, if a deferment of the requirement
18 cannot be implemented for whatever reason, maybe a
19 Commission to go ahead regardless, then a justification
20 of the date for qualification is very definitely
21 required, in my opinion, and I would vote for that.

22 MR. WARD: Thank you, Jerry.
23 Forrest?

24 MR. REMICK: Well, first of all, the
25 Commission approved the issuance of NUREG-0737. Now,

1 0737 is one of those nebulous documents. It is not a
2 requirement, so I will call it guidance. In that
3 document, guidance was given that the Commission
4 intended that licensees comply with this by July 1,
5 1982. This committee had an opportunity to make
6 comments on 737, the underlying documents. The one that
7 I scanned through this morning here during our meeting,
8 I don't think the committee directly addressed this,
9 although there was reference by Mr. Merschhoff, I
10 believe, on one committee statement.

11 The Commission found itself in a position, I
12 believe, that the thought was that two SRO's should be
13 on shift. Whether or not there was adequate research to
14 back that up, I'm not sure, but that was the
15 Commission's intent. They found themselves in the
16 position where some utilities were complying, others
17 were not. The Commission was in a position of, what do
18 you do about that? Do you reward those who are not
19 complying even if it is because they are second-guessing
20 whether the Commission is going to place this as a
21 requirement?

22 So, I feel the Commission has basically made
23 the decision that they are going to make the two SRO's
24 as a requirement and has ordered the staff to draft a
25 proposed rule, which has been out for public comment. I

1 think based on public comment, the Commission would
2 certainly seriously consider or reconsider if there was
3 adequate justification, but I think the staff has taken
4 a little bit of the rap here for what the Commission has
5 almost already decided.

6 So, from my perspective, let me just
7 summarize. I think that the two SRO's, I can buy that
8 as a requirement. The question of implementation is one
9 that I am inclined to agree with Jerry, it worries me
10 very much that it might be imposed and ultimately result
11 perhaps in a plant being shut down when we have no
12 adequate backup to say that that plant was going to be
13 so much less safe without two SRO's.

14 So, I think my advice would be that the
15 Commission consider implementation very carefully, using
16 staff advice for those cases where they think the
17 utilities really are trying to meet an implementation
18 date, but perhaps have extenuating circumstances.

19 So, I say on the two SRO's, I have no problem
20 with that being a requirement. As for implementation,
21 prudence on implementation. Do I make myself clear?

22 MR. WARD: Yes.

23 Hal, we will come back to you.

24 MR. LEWIS: I have the advantage of not having
25 heard what everyone else said.

1 (General laughter.)

2 MR. LEWIS: I have no objection to the two SRO
3 requirement, just as I would have no objection to two
4 captains in the cockpit, which the airlines often do.
5 It is a nice thing to have. What troubles me is that
6 although it is not a zero sum game, it is true that
7 given anything you do does detract from other things
8 that you do, the objective is to upgrade the quality of
9 the plant staff to cope with an accident. It has simply
10 not been demonstrated to me, and maybe that is in my
11 ignorance, that this is a carefully thought out thing in
12 the context of what is the likelihood of the accidents,
13 what do the operators have to do in likely accidents,
14 what does experience show in terms of the number of
15 operators on duty versus the ability to cope with
16 accidents.

17 None of those things have really been
18 demonstrated. The separation of the requirement for
19 four operators versus the requirement for two SRO's I
20 don't particularly want to deal with. It is clear that
21 this is causing some distress to the industry, but I
22 wouldn't care at all about that if it were really
23 clearly a contribution to plant safety, and I just have
24 not seen that.

25 Now, nobody -- you know, it is true that all

1 of these, the plants that are dealing with this do have
2 long-time scales associated with them. You have to
3 begin, you have to commit yourself early. You have to
4 get a thing in motion. It is true that there are human
5 factors, and there are career plans and opportunities
6 and that sort of thing to become involved in them.

7 But on the other hand, I hate to see us
8 continue on a track just because we are on the track
9 without thinking through whether, for example, you know,
10 just to pick a completely whimsical suggestion, which I
11 don't believe, whether instead one should have fewer
12 operators but have them all have Ph.D.'s. Now, that I
13 don't believe is the right way to go, but I don't think
14 that those comparative analyses of staff or crew
15 performance in the face of an emergency have been done,
16 or if they have, they have been well hidden from me.

17 So, I am nervous about pursuing a track just
18 because we are on it.

19 MR. WARD: Ivan?

20 MR. CATTON: I think I sort of agree with what
21 is being said. In my view, the new rule just adds one
22 staff person. I sat in on a lot of meetings that had to
23 do with TMI 2, and I was there, and I sort of came to
24 the conclusion that adding somebody else that knew what
25 they were doing was a good thing. So, I think the

1 staffing requirement is a very reasonable one. I like
2 the idea of combining the TA with one of the SRO's, the
3 STA, I think, being one of the other persons. I think
4 it's an excellent idea.

5 I became very concerned at Ginna when they
6 said their STA was a new hire. In fact, they said the
7 only thing he could do was keep records well of what
8 they had done. That is an interesting circumstance.

9 The implementation schedule is something
10 else. I really think in part the utilities are at fault
11 because they sit back and wait. On the other hand, to
12 force them now into meeting this requirement, I don't
13 think it would be a big gain to do that. I think the
14 utilities are justified, and the implementation schedule
15 should be relaxed.

16 I also think the utilities should take a good
17 look at their overall supply in the pipeline, and maybe
18 get INPO to start figuring out what they can do about
19 it.

20 MR. LEWIS: Could I add one extra comment to
21 what I said, Dave?

22 MR. WARD: Sure.

23 MR. LEWIS: If I tried to put together in my
24 head what we have learned from the experience of TMI,
25 where everyone agreed that the operators needed

1 upgrading, and what we have learned from the other less
2 well publicized accidents which have happened since TMI,
3 and which have been less well criticized because the
4 crews actually handled them pretty well, but there have
5 been a number of those things, the things that come out
6 as most important is just what you said, have somebody
7 around who really knows what's going on. It doesn't
8 have to be seven people who really know what's going on,
9 but at least one person who understands the plant
10 behavior off normal well enough to do the necessary
11 diagnosis and prescription writing for coping with
12 emergency.

13 I think that it was that vague feeling that
14 led to the STA requirement, and as you recall, people
15 thought about whether the STA should have a degree in
16 nuclear engineering, or a Ph.D., whatever. The real
17 need was for somebody to be well trained. That makes
18 sense, because the experience you get from functioning
19 as an operator if you understand the plant is better
20 than the experience you get if you don't.

21 But I wonder whether a track that leads toward
22 an upgrading in quality of one individual rather than
23 quantity of individuals meeting a certain minimum
24 standard isn't better directed towards assuring the
25 safety of the plant, and that leads to all these other

1 questions of whether the SRO can't go pee -- forgive me,
2 to satisfy human needs, which apparently has been
3 rejected offhand in a discussion of these requirements.
4 I am sorry, I spoke too much.

5 MR. WARD: Tony?

6 MR. DEBONS: When I was listening to Jeremiah
7 Ray speaking, I was saying, that is exactly what I would
8 want to say, exactly how he said it. I think I probably
9 can reflect my position by saying there is insufficient
10 data to support positions of either one of these two
11 situations, and there are so many questions that are
12 literally staggering in order to resolve some of these
13 questions, such as competency, to justify revision of
14 examinations, and the role of two people versus one
15 person in a kind of situation like this.

16 For example, I will take one instance, this
17 two SRO's versus one. What is the data overload in the
18 situation? Do I know that? Do I know what the data
19 overload is for a half an hour's sequence, an hour's
20 sequence, an hour and a half's sequence that would then
21 in fact enable me to plot the risk's dimensions if you
22 have one person to deal with the data overload, two
23 persons to deal with the data overload. Maybe you need
24 three people to deal with the data overload.

25 The other question would be, given these data,

1 can I then increase or improve the data processing
2 capabilities through a computer so that you don't need a
3 second SRQ? I mean, there are all sorts of these
4 tremendous things.

5 So, I come to the conclusion that most of my
6 colleagues come to right now, that I do not think we are
7 in a defensible position to recommend a rule for
8 implementation at this time, but I certainly would go
9 along with the recommendation that we stipulate a
10 particular time frame, providing we can in the interim
11 come up with defensible data to support it.

12 The other impression I have is that I have sat
13 through three or four of these ACRS meetings, and I have
14 heard the research people talk about their research
15 program, and no where did I get in that kind of
16 discussion the kind of problems I have heard this
17 morning, and it occurs to me, why was that the case?

18 If we are going to develop a cohesive position
19 about this nuclear safety, it seems to me that when we
20 are talking about research, the kind of questions that
21 surfaced today should also be at the forefront of the
22 research program. Maybe I was asleep at the time. If
23 so, I submit my apologies. But I did not hear them.

24 I would recommend that a clear statement be
25 generated from the discussions today which clearly

1 identify some research questions that have to be probed
2 and have to be studied as soon as possible. That is
3 what I would recommend.

4 MR. WARD: Bob?

5 MR. OVERBY: Chuck Overby from the Human
6 Factors Branch, Office of Research.

7 It wasn't mentioned explicitly today, but it
8 was referred to implicitly with regard to discussing the
9 task analysis. As a matter of fact, I believe the INPO
10 task analysis was referred to as well as the research
11 task analysis. Both of these programs are ongoing.
12 They have not yet been finished. But they are directed
13 towards developing very technical data we were
14 discussing with respect to operator qualifications and
15 control room crew data needs and display and control
16 relationships.

17 The point I want to make is, there is this
18 ongoing activity, and we believe it will provide a
19 substantial technical base for these kinds of
20 decisions.

21 MR. RAY: Questions?

22 MR. WARD: So this might lead to a change. If
23 the rule is promulgated this year, we might get a change
24 in that rule five years from now on the basis of this
25 research.

1 MR. RAY: Or two years from now. When do you
2 expect results?

3 MR. OVERBY: The research task analysis that
4 is presently ongoing, we are already collecting data
5 from two power plants. We expect to have a final report
6 and deliver the results of the task analysis June of
7 1983. INPO has completed their survey of PWR plants,
8 and in December I believe we are going to start the BWR
9 plants, and next fall they would expect to have
10 completed their analysis.

11 MR. LEWIS: Go ahead.

12 MR. RAY: By the fall of '83, both efforts
13 would have been consummated into a report of some form?

14 MR. OVERBY: Yes, sir, that's correct.
15 Assuming INPO can take the schedule.

16 MR. RAY: It would be interesting to have
17 someone tell us how long thereafter the NRC staff would
18 have digested these and come to the conclusion that they
19 might impose this rule or some other version, or they
20 might drop the whole thing. What kind of time lag do
21 they have there?

22 MR. THOMPSON: Hugh Thompson, NRC staff.
23 Right now we have a proposal for the program
24 before the Commission, which would have a July, '84,
25 time frame for a proposed rule on staffing and

1 qualifications.

2 MR. WARD: A new rule?

3 MR. THOMPSON: It still would be the same
4 thing if you got the details completed on that.

5 MR. RAY: So roughly speaking, that would be
6 '84, you say?

7 MR. THOMPSON: Right, for a proposed rule.

8 MR. RAY: You are two years away, really, from
9 the position, let's say, an updated justification, if I
10 can be kind to everybody, for what you are trying to do
11 now.

12 MR. THOMPSON: The technical basis, yes.

13 MR. GOWER: Clark Gower from the Office of
14 Research.

15 I would like to offer a few comments here. I
16 am a little concerned about the way the conversation has
17 trended. I would be very surprised if this research
18 caused any major changes in the direction of this rule.
19 I am also a little disturbed by some of the comments
20 being made about two SRO's in the control room and an
21 overabundance of people in the control room. I think we
22 have lost sight of how we got to where we are.

23 The intent was to assure that there be a
24 senior reactor operator in the control room at all
25 times. You never know when something will break. At

1 the same time, it is also recognized that the
2 intelligence and special expertise of the senior reactor
3 operator is often required elsewhere in the plant. That
4 is how you result with this new rule of requiring the
5 presence of two senior reactor operators in the plant.

6 The intent is simply to assure that there is
7 one in the control room, which is the main place you
8 need one when problems develop, at all times.

9 MR. WARD: Thank you. Hal?

10 MR. LEWIS: Just two comments, one in response
11 to this comment. Many people have said you need one in
12 the control room at all times, but that doesn't make it
13 any more true. Surely if we were to haggle, we would
14 agree that having one absent from the control room 1
15 percent of the time does not add very much to the
16 probability of a major reactor accident. If you quarrel
17 with 1 percent, I could go to a tenth of a percent.
18 There is certainly nothing magic about being there at
19 all times.

20 In the comparable airline case, the captain is
21 allowed to leave the cockpit. He is not allowed to
22 leave the airplane, but he is allowed to leave the
23 cockpit for a good reason, and there are extra
24 precautions that are taken in the cockpit to mitigate
25 the loss of security of the airplane when the captain is

1 out of the cockpit.

2 So, those things are not hard and fast. The
3 statement "at all times" really does not carry any
4 safety implication with it. The safety implication is
5 what percentage of the time he should be out of the
6 control room. That is one point. That is a comment.

7 Now a question. The task analyses that are
8 being done, whose results I look forward to with great
9 interest, presumably include both normal operation and
10 off-normal operation of the plant. In selecting the
11 off-normal sequences, one looks for crew requirements,
12 talents, and necessary knowledge. Are the choices of
13 these taken from the WASH 1400 list, from updated lists,
14 from other probabilistic analyses on the plant? Where
15 from?

16 MR. OVERBY: I can't identify the exact
17 scenarios, but there are about 23 or 24 scenarios that
18 are being tested on simulators at each of the nuclear
19 plants.

20 MR. LEWIS: On a plant-specific basis?

21 MR. OVERBY: Yes, they are.

22 MR. LEWIS: By whom?

23 MR. OVERBY: We inquire of the plant
24 themselves what their procedures for the various
25 scenarios we have identified are, and then the

1 contractor, which is General Physics on this, goes in
2 and advances the actual task analysis data collection
3 and assures that the procedures that we develop are
4 consistent with the plant procedures for each of the
5 scenarios.

6 MR. LEWIS: I am not so much concerned about
7 the procedures as the mechanism for selecting which
8 projected accidents, because that is what we are talking
9 about, which projected accidents you think are most
10 likely and therefore most relevant to the operator
11 qualifications.

12 MR. OVERBY: These have been selected as a
13 representative sample of what we think are the most
14 relevant for safety considerations. It includes small
15 break LOCA and station blackout.

16 MR. LEWIS: The ones that have been most
17 talked about.

18 MR. OVERBY: That is not a bad way to go, but
19 that is not exactly probabilistic risk analysis.

20 MR. GOWER: But you see, the reason that I
21 don't think the results of this research are going to
22 affect the decision facing us is that what one wants
23 here is the special expertise and intelligence of that
24 senior reactor operator in the control room in the event
25 of difficulties, unforeseen circumstances.

1 These task analyses are not going to shed any
2 light on how much that could have done or not done
3 depending on his presence there. It has already been
4 decided that there is a desirability of having the
5 expertise from a reactor operator and a senior reactor
6 operator. This rule we are talking about would go one
7 step further and require that that higher level of
8 expertise, the senior reactor operator, be in the
9 control room at all times.

10 MR. LEWIS: I understand what you are saying,
11 and let me only reply that if you know what the results
12 of research will or will not show, we should or should
13 not be doing research.

14 MR. GOWER: This research will provide a great
15 deal of other information. I think it just will not be
16 particularly specific to this question before us. It
17 won't give a clear answer to the question we are
18 grappling with this morning. I think it will give a
19 great deal of other information.

20 MR. LEWIS: I hate to waste time, but if you
21 say this research will not shed light on this question,
22 presumably it is not directed towards shedding light on
23 this question, in which case I have to come back, what
24 research is directed towards shedding light on this
25 question?

1 MR. OVERBY: I think the task analysis will
2 shed light on this question to this extent. Because of
3 the nature of some of the off-normal events that we're
4 testing and the fact that we are collecting a time
5 response, you may find out that if there was not in the
6 control room a senior reactor operator, just one, at
7 that time, that that has an effect on the performance.

8 I think again we are talking about
9 capabilities with two, but in the absence of that
10 capability, we worry about the station.

11 MR. DEBONS: But performance has to be -- you
12 know, we are at a point where generalities really do not
13 help very much. It seems to me that we have been
14 talking about generalities. When we talk about
15 performance, what performance are we talking about?
16 That one individual is unable to cope with a cascading
17 data flow, and consequently their support person? Is it
18 a question that they are necessary as
19 cross-communication in this kind of situation where if
20 one makes a decision it will be a higher risk? What are
21 we talking about in terms of performance?

22 MR. WARD: I think maybe you missed what Mr.
23 Gower has been saying. The intent of the rule is not
24 that we have two people in the control room. It is to
25 ensure that a large fraction of the time there was one

1 SRO in the control room who was qualified to deal with
2 data flow.

3 MR. LEWIS: They said all the time.

4 MR. RAY: They said all the time.

5 MR. LEWIS: They make a big to-do about all
6 the time and most of the time.

7 MR. CATTON: One or 2 percent.

8 MR. WARD: We are not talking about 1 or 2
9 percent, though. In fact, in most plants where there is
10 an SRO who is the shift supervisor, he may be out of the
11 control room a major fraction of the shift.

12 MR. RAY: But he is in the plant. He is not
13 on call some place back home. He is in the plant. So,
14 within a reasonable period of time, a matter of minutes,
15 he should be able to be in the control room.

16 MR. CATTON: Jerry, there are also
17 circumstances like TMI where the SRO was the one who had
18 to get that pump running again, so there was no SRO in
19 the control room.

20 MR. RAY: Maybe we should examine what they
21 did about getting him into the control room.

22 MR. LEWIS: That is right.

23 MR. RAY: So the modus operandi is perhaps
24 more important than the number of people.

25 MR. CATTON: That could be.

1 MR. WARD: Bob, do you still have some
2 questions?

3 MR. NERTNEY: I use complicated models to
4 study these things, but I won't bore you with that. It
5 really comes down to, I think, out in the field, we have
6 a bunch of people out there, shift supervisors, SRO's,
7 whatever label you want to put on them. We want control
8 knobs, and we want to analyze, and we want to compare
9 with the operational intent and standards, and we want
10 them to take proper action.

11 In that sense, I think we are probably a
12 little more premature, if we are talking about a final
13 rule that will stand forever, in trying to set up a hard
14 rule either on staffing or training, and I don't base
15 that on my own judgment. I base it on the fact that
16 this research is going on that we've been talking about,
17 this job and task analysis.

18 In terms of the roles of these people in
19 making decisions and doing the work, I think there's a
20 lot to be done. Now, we may not change the hierarchy,
21 but we may change the training and the job descriptions
22 a great deal as a result of the job and task analysis,
23 but I do think we probably are a little premature in
24 terms of role definition and the relevance to the cycle
25 that I just talked about. So, we may be a little

1 premature there.

2 The way I've been looking at this thing is an
3 interim hardening of the rules, really, to try to get
4 some definition into the staffing problem. I think my
5 impression is that there is the good side, which
6 primarily augments the technical judgment, and I think
7 in terms of what the NRC people said, they are right on
8 target in terms of augmenting technical judgment, with
9 no more than we know about the role definitions. In
10 other words, we've got to do a lot of technical backup.

11 On the other side, I think these people are
12 absolutely right in terms of the problems that are
13 resulting from the economics of the thing and the talent
14 pool, and I guess I am sharing what some other people
15 have said, that that kind of a cost benefit trade is
16 just too complicated to make in terms of the time I've
17 had to look at it and in terms of the information that
18 has been presented here.

19 So, I guess what I would say in view of the
20 fact that the goods are, I think, prima facie good even
21 without the technical basis, and the impact here seems
22 to be a very, very real impact, I think my
23 recommendation would be for this group, at least, to
24 defer to some compromise between the staff and the
25 utilities on that time schedule. That's the thing I

1 feel. Then, once that is done, then we may, in terms of
2 the way the research is maturing over here, it may give
3 us a completely different answer on inserting an interim
4 hardening of the rule. If those things start moving
5 together, it might be a good idea to just skip the
6 interim rule step and just go to the task analysis.

7 Certainly we will begin to get preliminary
8 results back, and I think we would be better off to
9 solidify the interim rule down the line. Does that make
10 sense, gang?

11 MR. WARD: I guess I would like to make a
12 couple of comments. It seems to me that the existing
13 rule is so far behind present practice and what is
14 universally agreed to be desirable practice that I
15 certainly sympathize with the staff and the Commission
16 that I think they need a new rule now.

17 On the basis of that, it does not seem to me
18 that the research that is going on realistically can be
19 counted on to impact the rule. That doesn't mean the
20 research should not be going on, and there may be a
21 threat that when the research is finished, the rule may
22 be changed again, but I think at the present time the
23 rule has to be based on best knowledge, which could be
24 based on the research.

25 I think that is true in many things other than

1 this rule.

2 I am persuaded by the industry's problems with
3 the implementation dates as being real, even though
4 perhaps in some cases they could have started earlier,
5 but it seems to me there is a real complex and human
6 problem there. So it seems to me that the dates for
7 implementation should be relaxed.

8 I was struck by the possibility that if the
9 dates are relaxed -- we are probably talking about a
10 year or more -- that there might be some intermediate
11 position of requiring two SRO's and an RO in the control
12 room as some intermediate goal for the utilities that
13 cannot reach the two and two rule because of the
14 practical problems with training -- obtaining people and
15 training them.

16 I do not know how this will fit in, but I am
17 certainly also persuaded that having the STA
18 requirements contained in at least one SRO is the way to
19 go.

20 Do we have any other comments on this area
21 before we take a break?

22 (No response.)

23 MR. WARD: Okay. Thank you all for your
24 patience. Let's come back at about 12:15.

25 (Whereupon, a brief recess was taken.)

1 MR. WARD: We will reconvene the meeting.
2 We have a new subject, and this is review of
3 the new draft of the staff's integrated human factors
4 program. Now, each of you received the draft, which the
5 staff tells me should be regarded as the October 6th
6 draft. There is a new one coming to you right now,
7 which is the October 15th draft, and I don't necessarily
8 expect you to react to that right now. It might be
9 suitable at the end of hearing comments from consultants
10 and the staff to hear what is different from the October
11 6th draft.

12 What I'd like to do now at this part of the
13 meeting, which is going to be rather unstructured,
14 perhaps, but if you remember our review of the plan in
15 September, it resulted in a number of criticisms of the
16 plan, particularly the written plan, which we expressed
17 to the staff. They have taken those and, as I said
18 earlier, other inputs which they received with the
19 benefit of time, and redrafted the plan.

20 I thought it was rather markedly improved,
21 myself. What I would like to do now is -- but I'm not
22 sure whether it thoroughly or appropriately has
23 responded to all of the comments that were made by the
24 subcommittee. So, what I would like to do now is to go
25 around the table, starting with Bob Nertney, and ask for

1 your comments on the new plan, new draft, the October
2 6th draft, keeping in mind the general problems that the
3 subcommittee had with the earlier draft, and then in
4 particular telling us whether you think the problems
5 that you yourself recognized in the plan are
6 appropriately addressed in the new draft.

7 From all of this input, I hope to have some
8 sort of a consensus and a report for a report to the
9 full committee. As I said, there will be a report to
10 the full committee. In fact, two hours' worth, at 8:30
11 next Friday morning, November 5th. We will want to have
12 about a one-hour summary. The staff has not presented
13 anything to the full committee on the program plan, so
14 we will want to have about a one-hour summary of the
15 plan at that time. That will allow some time for a
16 subcommittee report and general subcommittee
17 discussion. All that may result in a letter from the
18 committee to the Commission.

19 Okay, let's go ahead. Bob, if you'll tell us
20 what you think about the new draft.

21 MR. NERTNEY: Okay. I won't repeat the
22 comments that appeared in the literature that was
23 distributed to us. I think I agree with most of those.
24 I think it's a good plan, myself. In terms of its
25 stated purpose, that is, to determine the purpose of the

1 human factors program plan, to determine the appropriate
2 NRC role in assuring proper considerations, et cetera,
3 really, given this and the additional material in the
4 program, I really think the proof is going to be in the
5 way the staff really conducts their affairs, that we
6 really and truly keep these things coordinated.

7 I still have a little concern because of
8 divisions of responsibility over here that somebody
9 begins to work up a human factor related plan in the
10 mechanical area, and someone else is working in the
11 training area, and it doesn't mesh. It is going to be a
12 devilishly hard coordination job, but I think the issues
13 that are defined are proper, and I am comfortable with
14 the method of approach, recognizing that we are still
15 new enough in this game that there will have to be a lot
16 of revisions.

17 Really, I see the main problem now as a
18 coordination problem, two coordination problems. One is
19 keeping the human factors work coordinated, and the
20 other is the problem that we are running into this
21 morning, where we have got regulatory material flowing,
22 and the technical support backup coming out two years
23 later, and of course there is no way we could avoid that
24 in the past, but in the future, I think that is going to
25 be an important thing.

1 So, my reaction is favorable.

2 MR. WARD: Okay. The particular points that
3 you addressed in your report you think are pretty
4 adequately addressed, Bob?

5 MR. NERTNEY: I think so. Now, the one thing
6 that I tend to hang on is models, little stick man
7 models or something that says this is what we are doing
8 with the operators. I am assuming that you really can't
9 coordinate unless you do something like that.

10 I guess if I would look for a soft spot, the
11 soft spot in the general area, I think I saw back in
12 research, where this person we're looking at that's
13 actually doing the hands on work with the technical
14 people backing him up, the model that describes the way
15 that he is manipulated by the system, and I don't really
16 see a model like that.

17 I have not seen a model like that. And the
18 coordinating material here, of course, is really on test
19 coordination, not so much technical content
20 coordination. But I guess I did not see anybody that
21 was really working at this idea of tying it all
22 together, so that we get consistent regulatory material
23 related to procedures, to staffing, to training, so that
24 it all fits together all the way through.

25 MR. WARD: Okay. Tony?

1 MR. DEBONS: If you recall in my comments I
2 didn't have very much of a strong objection to the
3 original document. I know that there were some
4 editorial problems with it, some organizational problems
5 with the initial draft, but initially my reaction wasn't
6 that unfavorable.

7 I think -- you see, I see the problem in
8 perhaps a slightly different way. I see the human
9 factors problem as being a problem which is subordinate
10 to the information system problem, which is a different
11 problem and has a greater priority in my mind than the
12 human factors problem. Let me see if I can explain
13 that.

14 It is the information system that drives the
15 environment. That means that -- What do I mean by the
16 information system? Well, if I could just go into a
17 mini statement here, a mini lecture, an information
18 system includes the classification of events, the
19 categorization of events, the sensing systems that pick
20 up these events, the transmission components that
21 transmit this to the processing element, which could be
22 human or a computer. It could be the decision elements
23 of the decision-maker who is faced with data that he or
24 she in fact has to respond to the events, and the way
25 that these particular decisions are communicated among

1 the various elements.

2 That is the overall systems problem. I have
3 had one student at my university plot the entire data
4 flow throughout the system. It is not complete yet, but
5 it is being done by him, given the nine official
6 documents that we have had here. I have asked the
7 student to actually plot the nature of the
8 classification of events, the language used in the
9 events, the sensing system that picks up these events,
10 and so on.

11 Based on that analysis, it seems to me I could
12 then understand the human factors problem. So, I see no
13 problem with the human factors element as I see it here,
14 but I need preliminary data concerning the information
15 problem before I can make judgments on this. That is
16 where I stand.

17 Number One, I didn't have much objection to
18 it. Number Two, I think the information system problem
19 precedes it. And Number Three, based upon the
20 information systems, I could then make the appropriate
21 assessment about the human factors problem.

22 I made the statement that there probably is
23 not enough emphasis and priority given to a very
24 critical assessment of the Rasmussen model and the
25 cognitive processes that are involved, which I feel are

1 very, very crucial to this situation.

2 MR. WARD: Let me ask you, Tony, the
3 information systems problem, you are expressing that as
4 a problem you have got. You want to get a better
5 understanding of the information flow so that you can
6 understand the human factors problem. But it seems to
7 me that must be a problem. Is the staff, is the
8 industry dealing appropriately with the information
9 systems? Should it be?

10 MR. DEBONS: It should be, but it has not, in
11 my view. In other words, they have precluded the
12 information systems analysis and have paid attention to
13 the human factors problem. I am saying, before you can
14 actually understand the human factors problem, you have
15 to in fact understand the information problem, the CQ
16 problem. It is one of these concepts that does not come
17 to most people readily, but the whole nuclear plant
18 actually, the thing that runs the whole nuclear plant is
19 the information system, of which the human factor aspect
20 is only engineering to ensure the facilitation of the
21 information system, and not conversely.

22 In other words, what we are looking at is
23 fixing up the kitchen before we can understand what the
24 kitchen is for or what happens in the kitchen. That
25 might be a task analysis, but what I'm saying is, the

1 task analysis should not be focusing on the sink or the
2 stove, and so forth and so on, and what does the wife do
3 if there is a slight fire in the kitchen, and so forth.

4 What I am saying is, those problems are
5 secondary to the issue as to what events are likely to
6 happen in that kitchen, how do we talk about them, how
7 can we pick them up, how can we process them, all of
8 that. That's the information system problem, and that's
9 a crucial problem, and we've been addressing the human
10 factors problem, but when I see the human factors
11 addressed, yes, they are complex, but I think in my view
12 they are relatively manageable, but we may in fact be
13 amiss if we don't understand the information system
14 problem.

15 That's the reason why I was asking before what
16 happens when you have an overload of data when you have
17 this person. Who is going to process this? What sort
18 of decisions are going to be likely to be made if it's
19 one person, two persons? Is the second person going to
20 augment the data processing? Why not have a computer
21 that could do that?

22 You see, you cannot answer the human factors
23 problems until you get a firm grasp on the information
24 problem. And mind you, I have been stressing all along
25 there is a big difference between data and information.

1 MR. RAY: Could I add something?

2 MR. NERTNEY: We may have a definition
3 problem, because in my view, it does include the total
4 information system.

5 MR. DEBONS: Only at the utilization level,
6 not at the other levels.

7 MR. RAY: I think I can understand your point,
8 but it depends on the answer to this question. Are you
9 saying we haven't paid enough attention to the menu that
10 is going to be served from the kitchen?

11 MR. DEBONS: That is part of the problem. The
12 menus have to be related to --

13 MR. RAY: What is needed.

14 MR. DEBONS: The menu has to be related to how
15 we label the dishes. You know, the plates. And what
16 happens.

17 MR. RAY: So you can recognize what's being
18 served.

19 MR. DEBONS: That's it. It is an infinitely
20 more complex problem, but the human factors is
21 predicated on it. When the human factors people talk
22 about information processing as such, they are talking
23 about it at the utilization level, and they are not
24 talking about it from a whole systems point of view.

25 It is the CQ problem all the way down the

1 line. This is a beautiful environment for understanding
2 CQ right here. And CQ is not only human factors.

3 MR. CATTON: What is it? Command control?

4 MR. DEBONS: Command control communications.
5 Communications involves the kind of signals that are
6 received through radar, the way you label these signals
7 on radar, what kind of cables you use to transmit, the
8 satellites that might transmit this. It is an
9 infinitely more complex problem than simply providing
10 menus for decisions. That's what I've been stressing
11 all along.

12 MR. WARD: I am having trouble coming to grips
13 with what you are saying.

14 MR. DEBONS: For example, you could provide
15 the President of the United States with a very, very
16 beautiful telephone system. You could provide him with
17 an excellent resolution TV in his room. You can provide
18 him with Telenet and everything else. But that is only
19 one component. Where is he getting the signals from?
20 How are the signals being classified? By classify, I
21 don't mean intelligence. How are they being actually
22 categorized? How are they being identified? Is the
23 language a limitation in the classification and
24 categorization of those signals?

25 If you have, for example, a faulty valve, how

1 should you talk about a faulty valve in order to be
2 correspondingly effective in terms of its being
3 represented at the utilization level?

4 It is an extremely complex sort of thing. The
5 first thing you have to do is say, here are the events.
6 Who is going to pick up the events? Are humans going to
7 pick up the event, or is the sensor going to pick up the
8 event? Well, there are differences in sensors picking
9 up an event and humans picking up an event. What are
10 the limitations of sensors and humans, and so forth and
11 so on, all down the line.

12 Then, once you have determined the limitations
13 of the various components, then you can ask yourself the
14 question, how can we optimize the function of these
15 particular elements in the overall objective of the
16 system, and that is in this case to prevent a nuclear
17 accident. It is a much more complicated problem than is
18 represented by dollars and figures and what have you.
19 The control aspect is only one small element of it.

20 MR. WARD: I think maybe we need a seminar.
21 It might be interesting when your student completes his
22 data flow analysis.

23 MR. DEBONS: He is doing his dissertation on
24 that, as a matter of fact.

25 MR. WARD: So you will share that with us?

1 MR. DEBONS: Oh, sure.

2 MR. CATTON: Maybe he could come in here and
3 give us a seminar.

4 MR. DEBONS: He would be delighted to.

5 MR. RAY: I think we could very well use
6 perspective on that.

7 MR. DEBONS: This student, incidentally, has
8 worked at Bell Labs, and came to us as a graduate
9 student for his doctorate. He is doing this analysis.

10 MR. WARD: What sort of schedule are you on?

11 MR. DEBONS: Oh, about six to twelve months.

12 MR. WARD: So you don't think it will impact
13 the staffing rule?

14 MR. DEBONS: No, I don't think it will impact
15 the staffing rule.

16 (General laughter.)

17 MR. WARD: Thanks, Tony.

18 Ivan?

19 MR. CATTON: I have several comments. I think
20 first the integration with organizations outside of NRC,
21 in many cases they were mentioned, but it really didn't
22 indicate how they were going to integrate.

23 To give an example, in the thermal hydraulics
24 area, there are lots of joint programs, EPRI/NRC
25 NRC/EPRI, and some other small companies. This has been

1 very effective in transmitting information back and
2 forth. I would have felt better if they had said what
3 they were going to do in that respect. Now that I know
4 what JTA means, I can take a question mark out of the
5 middle of my notes.

6 MR. RAY: What does it mean?

7 MR. CATTON: I wrote it down. Job task
8 assessment. You didn't know either?

9 (General laughter.)

10 MR. RAY: I thought you were referring to the
11 analyses that the research was directed towards.

12 MR. CATTON: In reading through, I noticed the
13 NRC has plans to develop a training program for
14 prospective plant managers. If NRC thinks it is going
15 to do that, I think it is deluded. I really have
16 nothing more to say about that.

17 There was discussion of a human factors review
18 group. I think the makeup of the human factors review
19 group is very important, and it should include people
20 from industry as well as academia and NRC. Reading
21 through it, it looked to me like it was only NRC
22 people. It should broaden itself, and it should try to
23 get people who are somewhat negative about what they are
24 trying to do. I think it is very effective when you
25 have somebody reviewing your work who really starts out

1 as a disbeliever, and maybe somebody from Ontario Hydro
2 would make a good contribution, or Duke Power. I think
3 they both have pretty good programs.

4 This could become an arena for the overall
5 integration of the programs within NRC and industry. I
6 was very pleased to see that the maintenance area is now
7 called out clearly in the report. I think that's a very
8 important element.

9 I have to admit, I probably didn't read this
10 version as well as I read the previous version, but I
11 still think that one thing that would be very helpful
12 would be if the day to day people within NRC had an
13 appreciation for human factors, so that when the I&E
14 inspector is walking though and there's a valve on the
15 back side of something, he will comment on it so that
16 maybe it could get changed. I don't see any way that
17 thing is going to happen as a result of what I read in
18 this report.

19 Another thing I noticed that was very lacking,
20 or was lacking, was any attempt to try to attempt what
21 the operator really ought to know. Let me try to
22 distinguish what I'm thinking about from what is called
23 job task assessment. EPRI ran studies where they used a
24 simulator. They ran groups through it, and they found
25 some did better than others. When they tried to get a

1 feeling for why some did better than others, they found
2 that those who had a perception of their system that was
3 closer to what it really was did better in controlling
4 different incidents.

5 This gets down to, gee, do you just train a
6 person, or do you try to train him in a way that he
7 understands some of the things that underly what makes
8 his system work? I don't see that interest anywhere
9 within the document. I may have just missed it.

10 MR. WARD: I guess I would invite all of you
11 to comment on each other's comments as we go along.

12 MR. CATTON: You mean, I'm going to comment on
13 your comments?

14 (General laughter.)

15 MR. THOMPSON: If you are going to open it up,
16 I will provide a comment or two.

17 First, on the human factors review group, I
18 think you should notice that the Advisory Committee Act
19 does give some restraints to that, but I think it's a
20 comment which we could certainly evaluate. We set up a
21 peer panel, and we had individuals from the FAA and
22 other organizations who clearly had a disinterest in the
23 program, to review that, to provide comments.

24 With respect to --

25 MR. WARD: I notice that your four months'

1 reviews were going to include reviews of the industry
2 programs.

3 MR. THOMPSON: That's correct. We were
4 clearly planning to have input from all those who had
5 active programs ongoing, whether it's INPO, EPRI, DOE,
6 those related individual efforts. We wanted to make
7 sure those were clearly incorporated, and that those
8 individuals were aware of how the program was
9 progressing.

10 MR. WARD: Would those reviews be the primary
11 input for your review panel, or are they more apt to
12 be --

13 MR. THOMPSON: It would be each individual
14 branch chief, both in research and NRR keeping up to
15 date more frequently with the third or fourth meetings
16 that we talked about.

17 MR. CATTON: This has been very effective
18 where the person who has headed up the review group has
19 been from RAS, but he was not necessarily one of the
20 ones that was in the program itself, and he would write
21 up the results of the review group. I think it has been
22 very effective, somewhat disconcerting to some of the
23 contractors, but it has been very effective.

24 MR. WARD: So your point was that somebody
25 from another branch of the NRC should be in the review

1 group?

2 MR. CATTON: I should think somebody from
3 INPO, maybe even somebody from Ontario Hydro, because
4 there they have a little different idea about how things
5 should be done. Maybe somebody from Duke Power, EPRI,
6 as well as your own people, and maybe some people from
7 the universities.

8 MR. THOMPSON: Right now, we meet
9 periodically, about every six to eight weeks, and go
10 over programs, and we are obviously doing that in a more
11 structured, formal way of doing that. I would have no
12 difficulty with having those individuals there to
13 participate and provide comments. I think it is more of
14 the actual structure of the organization, whether it
15 gives a voice to the EDO on the programmatic changes, as
16 to whether we have some procedural trappings that we
17 must be careful to avoid, but certainly from the aspect
18 of interfacing and ensuring they are current on what we
19 are doing and they are doing and our programs are
20 meshing, that is what we intend. We had not thought of
21 Ontario Hydro, actually.

22 On the second point, the comment that there
23 seems to be no effort made to determine what the
24 operators really ought to know, I guess maybe the level
25 of detail in the program is not at the level that that

1 specific aspect is called out, but the entire training
2 program effort, as well as the job task analysis, is
3 aimed at having an effective training program teaching
4 the operators what they ought to know from an
5 operational viewpoint.

6 MR. CATTON: I think that's what I'm getting
7 at, and again, maybe it's just in part I don't
8 understand the language, but when you can train people
9 to do things by rote, or you can teach them the physical
10 processes that underlie, and then teach them a little
11 less than rote, I have a preference, but I don't know
12 which one is the best one.

13 I don't see anywhere where you are trying to
14 figure these things out.

15 MR. THOMPSON: I think that's what the
16 training program element itself is geared to, and the
17 entire effort.

18 MR. CATTON: The only way I can see that you
19 can really do that is to somehow get crews from
20 different places that are run differently, and see how
21 well they perform. I am not sure that's the way to do
22 it, either.

23 MR. THOMPSON: I think we were going to make
24 an effort at establishing a more functional evaluation
25 of the crews' operational capabilities rather than

1 saying you have to have 60 hours of training in systems
2 performance. It was having the utility identify what
3 the operators needed to know about the system
4 performance and gear the training program toward that
5 aspect, as opposed to a training program that was geared
6 to providing information.

7 MR. CATTON: When you ask the utility, what
8 does a person need to know, I suspect you could get 50
9 or 60 different answers to that question. I really
10 think the utilities' view is pretty much training like a
11 soldier charging up the hill. I'm not sure that's a
12 proper way to train your operators. If you are just
13 going to ask the utilities, you are just going to get
14 one view.

15 MR. THOMPSON: I think the approach we're
16 taking is a bit broader than that. It is a combination
17 of taking the job task analysis that INPO is doing,
18 making it plant-specific with respect to a planning
19 approach that emphasizes the functional knowledge as
20 opposed to how many classroom hours we had.

21 Maybe we need to discuss this in some other
22 detail with our training folks. Unfortunately, we've
23 got a different group here today.

24 MR. CATTON: Maybe I should read your report a
25 little more carefully.

1 MR. DEBONS: Could I comment on Ivan's
2 question?

3 MR. WARD: Certainly.

4 MR. DEBONS: We are going to deal with
5 information needs specifically. It is not sufficient if
6 we ask Ivan's question about which is better for doing a
7 particular function, rote, memory, or whatever. The
8 critical issue is not the knowledge requirement, that
9 is, what do I need to know about how many people are in
10 the street right now, but rather, what am I going to do
11 with that bit of knowledge? That is the crucial
12 question.

13 If, for example, the individual has to
14 understand the relationship about how many people are in
15 the street in relationship to a fire situation, he has
16 to understand that, so the information need is not that
17 there are people or there are fires. The thing is, what
18 is he going to do in relationship to the people and the
19 fires? In other words, are you really addressing the
20 whole issue of cognitive requirements, which are the
21 crucial dimensions of the task performance, not the
22 awareness.

23 The issue is not that there is a breakdown in
24 a valve, but what does the breakdown in the valve mean
25 in relationship to the total situation that is

1 occurring. That is the cognitive requirement. Now,
2 where in the constellation of your thinking is that
3 particular issue being addressed?

4 MR. THOMPSON: It is being addressed, I think,
5 in a couple of areas. One is in the procedures and
6 training -- in the procedures upgrade and testing. What
7 is, once the information is presented to the operators,
8 what are the procedures he uses to keep the plant in a
9 safe condition? What actions does he need to take? How
10 is that information presented to him? Is it an event
11 basis? Is it a system functional base? As well as how
12 that information interfaces with the managing of the
13 control room. How is that information displayed to
14 him? Is it there where he can recognize it? Is there
15 information overload that looks at the alarm functions?
16 And then, as that kind of ties back into training, those
17 are the procedures he is going to use, this is the
18 information where it is going to be presented. How has
19 he been trained?

20 MR. DEBONS: Is there a clear recognition that
21 trying to understand a bit of data is different from
22 analyzing data?

23 MR. THOMPSON: I want to say yes, but there
24 must be something more to the question.

25 MR. DEBONS: You see, comprehension and

1 analysis are two different functions. If the requirement
2 on the control situation is analysis, and the only way
3 we are looking at the human factors problem is that the
4 individual has to understand it, then obviously the
5 requirement will not be satisfied. They are different
6 intellectual activities that are required. We need to
7 understand that given a particular task, the
8 intellectual requirements are different to this extent,
9 and consequently we are going to train the individual or
10 we are going to engineer the environment so that that
11 intellectual function is satisfied.

12 Do you follow what I am trying to say?

13 MR. THOMPSON: I follow that, but I think part
14 of this effort, you tend to look at kind of a future
15 looking aspect, where we are looking at the advanced
16 control rooms as opposed to facing reality that we do
17 with a number of these control rooms. You may come out
18 with an entirely different animal when you start with a
19 clean slate of paper than what we are now working with.

20 MR. CATTON: You know, now frequently one of
21 the biggest problems is the recognition. He has pieces
22 of information. He has to sort it, see what he's got,
23 and then decide what he is going to do.

24 MR. DEBONS: Yes. The awareness need is
25 obviously satisfied by human factors, but I'm not sure

1 the analysis need is satisfied.

2 MR. CATTON: The way the present plants are
3 built, he has to understand what he sees on the board
4 before he knows what to do.

5 MR. DEBONS: Right.

6 MR. CATTON: That's the thing I'm driving at.
7 What do you do with this person so that he can best
8 understand that? And I am not sure the present training
9 programs do it.

10 MR. DEBONS: Exactly.

11 MR. BOOHER: This came from the NRC. As far
12 as the training program, from what I understand, we are
13 looking very closely at the ISE approach that considers
14 task analysis, job analysis as your basic data from
15 which there is a systematic employee look at the type of
16 media, the type of presentations that would be used,
17 depending on the information needs, et cetera, et
18 cetera, or whether or not you had a simulator, how many
19 times you need to practice in it.

20 This approach is what is attempted to be
21 reflected in the program plan. We are currently
22 developing a detailed implementation plan to back this
23 up, but I would hope that we are addressing your
24 concerns in this area.

25 MR. CATTON: Maybe I don't understand really

1 what you're telling me. Maybe if I give you an example,
2 you can tell me yes or no. Are you familiar with the
3 EPRI program that was run at SNUPPS?

4 MR. BOOHER: No. Not presently.

5 MR. CATTON: Gee, I would think you would be.

6 MR. WARD: Give him a chance. He just got
7 it.

8 MR. CATTON: This is an industrial program.
9 The reports have been out for a long time. It was done
10 by Alex Long. Do you know him?

11 MR. BOOHER: No.

12 MR. CATTON: He ran a series of crews through
13 the simulator. They put up several different kinds of
14 events that they went through. They tried to figure
15 out, gee, this group did better than that group, why,
16 and they came to some conclusions.

17 One of the conclusions that they came to --
18 and by the way, Alex Long started out by wanting to do
19 disturbance analysis in the control room, and was very
20 upset by the fact that it's an impossible task. The
21 operators couldn't handle it. One of the conclusions
22 they came to was, if they understood what a heat balance
23 was -- by that I mean steam generators, vessels, where
24 things were going -- they could find a path from where
25 they were at to ending the event much better than the

1 person who just knew that there were pumps and steam
2 generators and vessels, even though they were both
3 equally well trained.

4 To me, there is a message there. I would like
5 to see that message pursued. Maybe I am missing
6 something in that sometimes I don't understand the
7 language to describe what you want to do. Maybe I
8 missed the point.

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1 MR. WARD: Ivan, can I comment on that? I've
2 heard a little bit about that, too. It sounds great and
3 you can really get a massive data base built on that
4 sort of experimentation, which would probably be very
5 valuable.

6 But I got the impression that even the people
7 involved with it question the practicality of it. It's
8 a very expensive way to get data. Let me ask you, for
9 example, how do you decide which operator, in making
10 this correlation, has an understanding of the thermal
11 process? His grade on an exam? They all had some
12 understanding of it, so he must have separated them.

13 MR. CATTON: I'm not really sure how he was
14 able to get to that conclusion. But Alex is pretty
15 strong about it. As a matter of fact, when he was here
16 I asked him the same question so you guys would hear the
17 answer.

18 MR. WARD: What question?

19 MR. CATTON: About how do you want to think
20 about your system. You can think about it in terms of
21 pumps connected to pipes, that are connected to vessels,
22 and so forth, or you can think about it in terms of a
23 mass balance, heat balance system that you somehow have
24 to keep working. It's a different kind of thinking.

25 MR. DEBONS: Absolutely, absolutely.

1 MR. WARD: I agree with that. It sounds very
2 rational and everything.

3 MR. CATTON: It may be nonsense when you try
4 to implement it.

5 MR. WARD: When you're doing an experiment
6 with two different crews on the simulator, how do you
7 decide which crew is looking at things this way and
8 which crew is looking at things in a less analytical
9 way?

10 MR. CATTON: I suspect they had some kind of a
11 test, or even talked to them about what they thought was
12 happening. Some of the crews never did figure out the
13 situation that was put in front of them. There was a
14 tremendous variation. I think there is something to
15 what they are doing at the front end when they get this
16 guy ready.

17 MR. RAY: Would knowledge of what went into
18 their training program respectively help you
19 characterize what Dave is concerned with?

20 MR. CATTON: I would think so. Somebody is
21 surely going to have to do it, and it's not going to be
22 cheap. But is it going to be more expensive than not
23 doing it and winding up sorry?

24 MR. RAY: Would the billion dollar debit go on
25 your hands?

1 MR. WARD: Forrest, do you have any comments
2 you'd like to make?

3 MR. REMICK: Just a very few. I did not
4 participate in the earlier review and, knowing that as a
5 result of that there would be a revision, I didn't even
6 read the first version. I concentrated on reading the
7 comments that the Committee and the consultants made to
8 the Staff, and then read the October 6th version.

9 It seemed to me that the Staff was quite
10 responsive, as best I could tell, to many of those
11 comments. I found that it was readable and
12 understandable. It seems to me this has to be a living
13 document that will change at least yearly. I agree with
14 Bob Nertney that coordination of all the effort is going
15 to be extremely important. Of course, that's a problem
16 the Staff faces with different offices and doing a
17 multidisciplinary type program. They face that all the
18 time.

19 But I think it's certainly extremely important
20 in this case, being on top as research comes in. Tying
21 it together and so forth is going to be a tough job for
22 the Staff. There is one aspect of it. As I read it and
23 saw all the research that is being done and needs to be
24 done, a question came to my mind: Who is going to be
25 doing this research?

1 I would hope that the Staff would break away
2 from the general mold of, because it is easier to
3 contract with national laboratories -- it seems like
4 some of these things, when we get into validation of
5 exams and exam contents and processes, there is other
6 expertise. I don't say this because I come from a
7 university, but at least the universities and other
8 places. I would hope the Staff would tap the best
9 possible expertise in some of these areas, instead of
10 going the usual route, instead of going to national
11 laboratories.

12 That's the word I would have. I think it's
13 important to get people extremely knowledgeable in this
14 area, and I think it's a good opportunity to do that and
15 I hope the Staff will take advantage of the opportunity,
16 because then you have the same people doing the same
17 things. We need new thinking.

18 MR. WARD: I think that is an important
19 comment. I don't think you were here when we had some
20 comment from Gabe Salvende on that. He had sort of an
21 interesting -- I thought it was an interesting comment.
22 He said one reason that perhaps research in this area is
23 not being placed at the universities is it's really kind
24 of applied research. It is not of a very fundamental
25 nature and really the sort of thing that universities

1 are interested in doing. So the Staff might have a
2 problem placing that.

3 MR. REMICK: I'm not sure that is a very
4 unrealistic timetable.

5 MR. WARD: He says he thinks that's a real
6 problem, because here is not enough interest in this
7 general area, in the application of human factors or
8 human factors research related to the operation of
9 nuclear power plants, so that the universities are not
10 going to be turning out the type of people,
11 professionals, that the industry is going to need.

12 So I guess that is just two different
13 problems. It perhaps is another reason why there should
14 be an effort to place more research at the
15 universities.

16 MR. REMICK: I think there would be some
17 interest. I think some universities could at least
18 contribute to pieces of this in a knowledgeable way
19 where they could couple perhaps some operational
20 knowledge with people knowledgeable in testing. But I
21 do not know how these are handled, or if the
22 universities are even aware of this plan. I don't want
23 to restrict it to universities.

24 MR. CATTON: One of the problems with a
25 university dealing with NRC, there are two routes. You

1 can apply for a grant. I think the rule is one percent
2 of the RES budget goes to grants. Or you can respond to
3 an RFP, and professors just don't do that. Responding
4 to an RFP, you've got 30 days, you've got to write all
5 this stuff down, you've got to get it back in, and it's
6 a new ballgame for them.

7 MR. REMICK: In some institutions, that's
8 true.

9 MR. CATTON: The other problem with this is
10 the NRC Staff cannot ask for a grant. If they ask for a
11 grant, it's got to go RFP. So they're kind of caught
12 between a rock and a hard place. All you can do is kind
13 of tell your friends to provide a grant for the NRC.

14 MR. REMICK: Does the Staff foresee these
15 things going out on an RFP.

16 MR. THOMPSON: I'll speak for NRR and let Carl
17 Gower speak for the Research effort.

18 At least in one major effort, which is the
19 long-term examination development, we are going to go
20 out with a competitive RFP. We started the initial
21 effort in accordance with an effort to get back to the
22 Commission with items of upgraded programs. But it
23 takes you about six months to a year to do it all and to
24 make those evaluations.

25 I would anticipate that -- we were looking, at

1 least, at those efforts where we could do that. I think
2 we looked at one time to going to Educational Testing
3 Center and I think they wanted like a five-year program
4 and \$10 million to give us a new exam. And there's no
5 question that would have been a really fine exam and we
6 may include them in our overall efforts.

7 But it is one in which we are looking at the
8 national labs immediately, but they in turn are looking
9 at other organizations to provide their input and have
10 some private contractors associated with them.

11 I'll let Carl answer Research.

12 MR. GOWER: I think it has really all been
13 said already. Forrest, I think your comment is a very
14 good one. It's perhaps a good thing for someone to
15 remind us of periodically and make us try a little
16 harder.

17 We like to place contracts RFP. I personally
18 think we get a lot more bang for our buck. We do it
19 when it's at all possible. The biggest single contract
20 we have in human factors, the task analysis work, was
21 placed with an RFP.

22 However, I think you can overemphasize the
23 problems associated with going that way versus going
24 with a national laboratory. Some of these have already
25 been brought out. It usually takes about one year to go

1 with the RFP. I would go on the high side of that. I
2 know it sounds ridiculous until you get down with the
3 details, but to place an RFP contract in less than one
4 year is a real accomplishment, whereas a contract with a
5 national laboratory can be placed in a matter of a few
6 months.

7 There are other factors that come into play,
8 other things that push you towards the national
9 laboratory, particularly in this stage of budget cuts,
10 political pressures to keep national laboratories
11 afloat. Again, I say we're sensitive to what you say
12 and we are certainly going to try to place the work
13 where we think we'll get the best answer, and we will
14 try a little harder.

15 MR. DEBONS: I wonder if I can comment. I
16 wonder if it is possible to initiate a project in which
17 there is a solid attempt to correlate research that is
18 being done now sponsored by universities and other
19 things which correlates directly with your issues. I
20 brought one of these to Mr. Fisher's attention this
21 morning, the National Conference on Artificial
22 Intelligence, which was done by the EG&G company, which
23 addresses a problem here of an excellent system for
24 treatment of nuclear reactor accidents.

25 I went to a meeting last week in Columbus,

1 Ohio, and there were two papers, one by Dr. Underwood
2 and another by Dr. Jackowitz, which discussed diagnostic
3 treatment in nuclear plants. Now, I'm sure that the
4 space agency, the Department of Defense and many other
5 sources are in fact addressing problems that we have in
6 fact addressed around the table here.

7 Can we get a correlation of these efforts, so
8 that they could be funneled into the general effort?

9 MR. GOWER: I think the general answer to that
10 comment is, our effort to accomplish that is generally
11 done by way of literature searches that are almost
12 always the initial part of any contract. Generally,
13 there is a specific requirement for the contractor to
14 perform a literature search to try to determine what has
15 been done in that area or related areas out front.

16 I think we've got a comment, Mr. Overby here,
17 about the specific example you gave. We do have that
18 one included in our plan.

19 MR. OVERBY: One of the authors of that paper
20 is Bill Nelson. I think the gentleman sitting to your
21 immediate left will vouch for me that that work was
22 performed. It was a funded effort by the NRC Research
23 Group.

24 And I think that should be interpreted that,
25 yes, we are pushing out in those areas, and this goes

1 back to some of the additional work we're doing in
2 cognitive modeling that we are planning now. We don't
3 have the results in that area yet, but I think it is
4 quite consistent with your prods to us. I think we are
5 beginning to develop in this area.

6 MR. WARD: Jerry, I guess we are around to
7 you.

8 MR. RAY: I am in a position now that I can
9 benefit by the remarks made ahead. So I will give the
10 caveat that I feel in complete agreement with many of
11 the things that have been said.

12 I would like to say to the Staff that I think
13 this is a vastly improved document over the first. You
14 have really done some work on it. There is now a
15 structure to implement the program.

16 There is one thing, though, that is lacking in
17 the implementation that I feel might be considered
18 significant. There is the overall responsibility, as
19 indicated, which one might expect, and then there is an
20 indication of assistance from a Human Factors Review
21 Group, which is a very good concept, to have such a
22 group. And it is chaired by the Director of the
23 Division of Human Factors Safety, where he is going to
24 have a perspective that is limited to his, so they bring
25 in the directors of several other divisions to

1 complement his.

2 But throughout it all, there is no indication
3 of a centralization on a timely basis. Now, Bob
4 mentioned the need for careful coordination and
5 correlation and interrelations, and so did Tony and Ivan
6 and Forrest. The significant thing to me is that that
7 interrelation, that coordination, must be timely.

8 You cannot wait for a four-month review.
9 There are three reviews, spaced four months apart, that
10 will be implemented. You can't wait for that kind of
11 time on a project as widespread, as important to the
12 safety and welfare of the public, as this fundamentally
13 is.

14 It seems to me that this program, this whole
15 project, needs a program director, someone who is going
16 to, with the necessary assistance assigned to him,
17 someone who is going to keep the timeliness of the
18 reviews in mind, who is going to look from day to day,
19 week to week, who is doing what, is he meeting his
20 objectives or is he not meeting his objectives.

21 In that sense, it is not unlike a construction
22 project. It is almost as complex an effort in its
23 overall scope, the widespread nature of it, as many
24 construction projects. The way to implement those on a
25 timely basis is to have someone who is charged with the

1 responsibility that he will make his report at periodic
2 meetings with the EDO and the review group as to what
3 his experience has been, whether or not progress is
4 proper or so on, to complement the reports by the brach
5 heads and things of this nature.

6 In this sense, the implementation is
7 fragmented. There are responsibilities assigne' to the
8 functional organizations of the various disciplines
9 involved. It seems to me there is a need, in order to
10 keep it on course and to maintain schedules and the
11 progress that is conceived as being necessary for this,
12 to have the results in proper tune with the various
13 components, that there must be someone who is assigned
14 the responsibility for implementation, not from the
15 viewpoint of the responsibility of the EDO, but to get
16 the job done.

17 That's the only comment I could offer that
18 would complement what we have already heard.

19 MR. WARD: Thank you, Jerry.

20 MR. HELMS: Helms from DOE.

21 It seems to me that your point is well taken,
22 but that this area has both a big "R" and a big "D".
23 That is, you are tied to the immediate needs of the
24 regulatory process to promulgate regulations, and at the
25 same time the data base, that is the background or "R",

1 if you will, is not clearly in place, or if it is it
2 isn't correlated, if you could use that term.

3 I believe I can take a page from INPO ideas,
4 which was to take, for instance, the human factors data
5 and say, okay, we will take some data, we'll put it in a
6 book, and we'll use it and find out how many times we
7 have misoperated this valve.

8 Their view is that that is the beginning of a
9 process. We have identified a need and therefore you
10 can train to that need and you can correct that thing.
11 You shouldn't take this original nut, if you will, if
12 you had it, and treat it too sacrosanct. That is, there
13 should be a basis for re-examination, for design, for
14 training, for any other motivation that you might use,
15 for assisting the operator for whatever it is.

16 My own view, of course, is this: that I
17 believe in the human performance area that the
18 performance is cyclic, that is, similarly trained people
19 from day to day, from time to time perform irregularly.
20 I believe that can be demonstrated in air flight safety,
21 aircraft flight safety and other things, which I draw
22 from basically as a background.

23 You have accidents, you get more careful, you
24 don't have accidents, you relax on maintenance and
25 whatever it is that makes the accident. So that it is

1 our view that we are dealing here with a problem where
 2 we need performance in the 10⁻⁸ kind of level. That's
 3 what we like to think of, whereas human performance is
 4 more nearly like the bank teller, who makes one error of
 5 entry per about 3500 entries. It doesn't have the same
 6 consequence if somebody corrects it right away, but they
 7 don't leave until it balances to the penny that day.
 8 But you don't have that day in this case. That's about
 9 10⁻⁴.

10 So somewhere between the 10⁻⁴ normal human
 11 performance of fairly competent people to the
 12 requirement that we face, which is a 10⁻⁸ or 10⁻¹⁰ or
 13 whatever the number you're going to think about, we have
 14 got to structure things which get from A to B. And of
 15 course, this is part of it.

16 But as I say, you could take a simplistic view
 17 that you collect all of this data, whatever format you
 18 think you need it in. That's just the beginning point
 19 of beginning to address the problem.

20 I think that, for instance, on page 41, the
 21 discussion there of the data could recognize the breadth
 22 of that problem, the last paragraph on page 41. I think
 23 it needs to recognize the INPO input, but that should be
 24 the beginning point of training, at least from their
 25 point of view, and there are other points of view about

1 it.

2 We had also made some comments, which were
3 that it is desirable to have recognition of the ongoing
4 efforts at industry and other places, and I perceive
5 that this is pretty well incorporated in the plan. I
6 guess I would remind us that there are different points
7 of view. That is, the same research done by, for
8 instance, say a utility consortium, may have slightly
9 different objectives and methods and level of detail and
10 that sort of thing than, say, a big R&D from NRC.

11 So we see some need for what you might call
12 apparent duplication, in that there is some work going
13 on someplace that does not necessarily fulfil the NRC
14 requirement. We perceive that the plan and the work is
15 strongly driven by the need for regulation input. That
16 is, you want to have certain specific items, the big
17 "D", if you will, of the regulation business, out at
18 such and such a time.

19 One does not normally schedule big "R" that
20 way. You know, big "D" gets done right away.

21 But anyway, those are some comments I would
22 like to make here.

23 MR. WARD: Thank you, Mr. Helms.

24 Okay. Well, I appreciate all the comments on
25 the plan.

1 Let me ask Mr. Thompson for two things. Could
2 you just tell us what your schedule on the plan is? And
3 secondly, maybe you can outline very briefly what the
4 difference is between the October 15th and October 6th
5 draft, what should we look for or not bother to look for
6 anything.

7 MR. THOMPSON: Briefly, the schedule. The
8 plan was submitted to the EDO on October 15th. The EDO
9 has reviewed it and is waiting for the ACRS comments
10 before he transmits it down to the Commission. So I
11 would obviously be looking for a letter Saturday or
12 Sunday morning or --

13 MR. WARD: It'll be Friday.

14 MR. THOMPSON: And then I guess the EDO will
15 evaluate the comments and whether he wants to make any
16 corrections to the program plan. He is right now
17 scheduled to submit it to the Commission on November the
18 12th. If there are no problems, he probably will
19 continue on that schedule.

20 If there are major items that he wants to
21 correct, then he will probably wait. There really were
22 not any significant differences between the current
23 version and the October 6th version. There are clearly
24 a few other editorial changes that we would like to make
25 based on comments received from those who have reviewed

1 this version.

2 In essence, probably the most significant
3 shift was the table, I believe, which was the
4 introduction on the TMI action plan items to the present
5 Appendix A. That table is an attempt to reflect the
6 overall prioritization of these items in conjunction
7 with the prioritization of other generic issues with
8 respect to their relative payoff, and to be consistent
9 with the efforts that the Division of Safety Technology
10 has under way right now with NUREG-0933.

11 MR. WARD: It's an attempt to prioritize
12 within the human factors area?

13 MR. THOMPSON: Integrate it with all generic
14 issues, the hardware -- and we obviously have some
15 difficulty with the details of the prioritization on a
16 cost-benefit basis, with risk reduction. And we are not
17 sure that the modeling that the Division of Safety
18 Technology used is necessarily appropriate, but I don't
19 think we have any significant problems with their
20 overall evaluation and priority ranking that they have
21 been assigned.

22 MR. WARD: All right, very good.

23 Well, if anyone has any comments, has an
24 opportunity to review and get any comments to us on the
25 October 16th draft before the end of next week, we will

1 use them and we will appreciate it.

2 I guess I might -- let's see. The ACRS Staff
3 prepared a couple of documents reviewing the October 6th
4 plan which, Mr. Thompson, may be of use to you. One is
5 a memo from -- prepared by Preston, and I haven't read
6 it yet. But we might want to make that available. We
7 will make that available to you.

8 The other is Mr. Fischer's status report for
9 this meeting. He made some detailed comments on the
10 plan, and you might find that useful. So we will
11 provide you with that.

12 I guess, Dave, I would ask you to provide in
13 the meeting book, to include both of those for the
14 members. And I suppose we ought to give them the 10/15
15 draft as well of the plan. It's probably not practical
16 to mail it out to them in advance.

17 MR. FISCHER: That's probably true.

18 MR. WARD: Okay. Well, we're down to the last
19 item on the agenda, which is just talking about the
20 future meetings. Let's see. I guess there is one
21 future meeting. Dave Fischer has asked if the
22 consultants could furnish him with kind of a long-range
23 availability, you know, maybe over the next few months.

24 The members routinely -- we have a process of
25 doing that. But if it's obvious that certain blocks of

1 time -- we ran into certain problems when we scheduled a
2 Human Factors Subcommittee meeting on the same day when
3 there's a human factors convention on the other side of
4 the country, and we would want to avoid that. So if you
5 could furnish that ahead.

6 One of the things I would like to touch
7 briefly on, what we have listed here as "Sheehy
8 concern". We have had a number -- I have had and some
9 of the ACRS Staff has, and certainly the NRC Staff, has
10 had a number of discussions with Mr. Sheehy, who is
11 concerned about the program that the NRC and the
12 industry has for abnormal occurrence procedures.

13 Now, you might say that there is what everyone
14 seems to think is a good and very important program
15 going on in the NRC and the industry for providing
16 operating plants with better emergency operating
17 procedures. This is the program where the vendors are
18 furnishing to their customers symptom-based guidelines
19 for dealing with true emergency accident sequences.
20 Then the operators, utilities, are developing specific
21 plant procedures from those. Everybody thinks that's a
22 very valuable and important program.

23 Mr. Sheehy has expressed concern and continues
24 to express concern that there is another level of
25 incident which is not being appropriately covered yet.

1 This is what some people call an abnormal occurrence.
2 This where there really hasn't been a serious plant
3 accident, but there's been some degradation of the plant
4 performance. A key piece of equipment has failed; a
5 fire, a minor fire, let's say, in the control room, is
6 one thing that's pointed out.

7 His concern is that because the industry does
8 not yet have what he believes are an adequate set of
9 procedures, adequate training in that area, that there
10 is a potential for an abnormal occurrence cascading into
11 a more serious event. And I have had a little trouble
12 figuring out exactly -- the NRC program I think is
13 addressing this general area, perhaps not as
14 specifically as this particular individual would like to
15 see it addressed.

16 In particular, I think he believes there
17 should be some sort of a, rather soon, a detailed task
18 analysis made of certain abnormal occurrence sequences.
19 Now, I guess what I am looking for is -- my opinion I
20 think is that this is a concern. It is not nearly as
21 important as the emergency operating procedures which
22 are being developed, and I am not sure that the NRC and
23 the industry can do everything it wants.

24 I think it's appropriate to -- the schedule
25 that the NRC has outlined is appropriate. I guess what

1 I would like to find out from the Committee members is
2 whether you have any inclination to look into this
3 further. Maybe it's impossible to have any opinion
4 based on the sketchy outline I have given you.

5 Perhaps what we could do is give you some of
6 the documentation and ask you to look at it. And if you
7 think this is something that ought to be pursued by our
8 Subcommittee, let me know.

9 MR. RAY: A question, Dave?

10 MR. WARD: Sure.

11 MR. RAY: What is the nature of his
12 fundamental concern? Is it that the abnormal
13 occurrences are not being properly classified, that
14 there's no follow-up of them, or that the information on
15 them is lacking adequate dissemination throughout the
16 industry?

17 MR. CATTON: Or the operators don't know how
18 to handle them?

19 MR. WARD: He's concerned that at individual
20 plants an abnormal occurrence might not be dealt with
21 crisply enough, rapidly enough.

22 MR. RAY: Response.

23 MR. WARD: Yes, the response might not be
24 adequate and it could then cascade into a more serious
25 event or series of events.

1 MR. CATTON: I guess we all share that concern
2 a little bit, don't we?

3 MR. RAY: Yes.

4 MR. WARD: So really, it's a matter of
5 priority. You can't have everything on the top of the
6 list.

7 MR. CATTON: He doesn't like his concern being
8 at the bottom.

9 MR. WARD: That's right.

10 MR. RAY: Really, this is part of the overall
11 picture, that the response of the industry to the LER's
12 has been lacking. What he is saying is the more serious
13 of the LER's should get more attention.

14 MR. WARD: Yes, I think maybe that's one way
15 to look at it.

16 Okay. So Dave, you have passed out something
17 here? What did you pass out?

18 MR. FISCHER: I passed out the correspondences
19 between -- Sheehy to the Staff and the Staff back to
20 Sheehy.

21 MR. WARD: There's also something from Jan
22 Preston on October 26th, a memo describing discussions
23 at a meeting with Mr. Sheehy, between Mr. Sheehy and the
24 Staff. Perhaps you could get that.

25 MR. FISCHER: They all have a copy of that.

1 MR. WARD: Okay. Well, if you would read
2 those things and let me know whether you think this is
3 something that we ought to look into, I would appreciate
4 it.

5 MR. REMICK: Dave, just an initial reaction.
6 I have read it. I noted that a letter came in from the
7 Chairman of the Commission. He chose to give that to
8 the Staff, which is his prerogative. Apparently he has
9 not asked the ACRS to look into this issue. I would
10 hesitate to step into that if we have not been asked for
11 our advice. This has been given to the Staff. The
12 Commission is aware of it.

13 MR. WARD: Well, yes, he has written a couple
14 of letters.

15 MR. REMICK: That's just a personal
16 perspective, I guess.

17 MR. WARD: I guess I don't feel that
18 constrained.

19 MR. REMICK: No, I don't feel constrained.

20 MR. RAY: I think history will show that the
21 ACRS has not waited on ceremony --

22 MR. WARD: History will also prove maybe it
23 should have.

24 MR. RAY: -- to act and expect reactions.

25 MR. THOMPSON: Since I did spend about two and

1 a half hours with Mr. Sheehy, I could maybe add one bit
2 of enlightenment, as you read the documentation that's
3 before you. If I were to characterize his concerns, it
4 is that the overall program with respect to 82-111,
5 which is the detailed control room review, that the task
6 analysis that is called for focuses on emergency
7 operating procedures, and he believes that there is a
8 subset of the abnormal procedures that should be
9 included in the task analysis and would identify human
10 engineering deficiencies that will be overlooked by the
11 present approach.

12 Therefore, he believes that the Commission's
13 guidance as embodied in SECY-82-111 should be modified
14 to require some subset of the abnormal procedures to be
15 included as part of the task analysis.

16 I do not believe that he is concerned that the
17 1.C.9 normal and off-normal procedure upgrade efforts
18 are sufficient. In fact, I think his comments are that
19 goes beyond even what he feels is necessary to address
20 his concerns. So to the extent that you can put his
21 concerns into a context, it is the context that he
22 believes the control room modifications would likely
23 need to be identified and that the present approach in
24 82-111 will not identify them.

25 MR. DEBONS: May I take advantage of that

1 statement? That is essentially what I was talking about
2 before about the information system. That's exactly it
3 right down the line, that if you have an understanding
4 of the event and the nature of the event you can go from
5 there and develop the entire information flow. And what
6 Sheehy is saying, you have not accounted for the entire
7 whole broad range of events.

8 I thought I would take my opportunity to
9 defend my previous statement.

10 MR. THOMPSON: I hope I wasn't attacking your
11 previous statement. But to the extent of the Staff's
12 present evaluation, it is our belief that we are in fact
13 covering that information that is necessary as part of
14 the 82-111 approach.

15 The Staff is still corresponding with Mr.
16 Sheehy and we will do our utmost to keep the
17 Subcommittee fully and currently informed of all of our
18 activities in this area.

19 MR. WARD: Thank you.

20 Well, I would like to thank you all for your
21 help.

22 (Whereupon, at 1:35 p.m., the Subcommittee
23 meeting was adjourned.)

24

* * *

25

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

in the matter of: ACRS/Subcommittee on Human Factors

Date of Proceeding: October 28, 1982

Docket Number: _____

Place of Proceeding: Washington, D. C.

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Patricia A. Minson

Official Reporter (Typed)

Patricia A. Minson

Official Reporter (Signature)

STAFFING RULE

I BACKGROUND

- o TMI ACTION PLAN
- o EISENHUT LETTER 7/31/80
- o NUREG 0737
- o JUNE '82 COMMISSION MEETING

STAFFING RULE

II RULE CONTENT

- o CURRENT REQUIREMENT
 - SRO ON CALL
 - AN OPERATOR AT THE CONTROLS

- o PROPOSED REQUIREMENT
 - SRO IN CR WHILE OPERATING
 - ALLOW SS TO MOVE FREELY ABOUT PLANT
 - 2 RO PER OPERATING CR
 - SRO ON SITE WHEN COLD SHUTDOWN

STAFFING RULE

III NEED FOR RULE

- o SR0 VS RO TRAINING

- o POST TMI RECOMMENDATIONS
 - NUREG 0585
 - NUREG 1250
 - NUREG 0616

STAFFING RULE

DIFFERENCES BETWEEN SRO AND RO TRAINING

- CONDITIONS AND LIMITATIONS IN LICENSE
- TECH SPECS
- RADIATION HAZARDS
- COOLANT CHEMISTRY
- CORE LOAD/ALTERATION PROCEDURES
- ROD PROGRAMMING
- FUEL HANDLING
- DISPOSAL OF RADIOACTIVE MATERIALS

STAFFING RULE

IV SUMMARY OF PUBLIC COMMENTS

- o IMPLEMENTATION SCHEDULE
- o TECHNICAL BASIS
- o TRANSITION POINTS
- o SRO VS STA
- o TECH SPEC VS RULEMAKING
- o GENERAL SUPPORT
- o LIMITED ABSENCES FROM CR
- o EXTEND COMMENT PERIOD
- o VARY ACCORDING TO PLANT SIZE

STAFFING RULE

V ANTICIPATED CHANGES

o TRANSITION POINTS

o IMPLEMENTATION SCHEDULE

o SRO VS STA

OBJECTIVE

OVERALL UPGRADE IN THE ABILITIES
OF ON-SHIFT PERSONNEL TO RESPOND
TO BOTH NORMAL AND OFF-NORMAL
OPERATING CONDITIONS

CHANGES TO ADMINISTRATIVE PROCEDURES

- o SHIFT RELIEF AND TURNOVER I.C.2
- o CONTROL ROOM ACCESS I.C.4
- o FEEDBACK OF OPERATING EXPERIENCE I.C.5
- o VERIFICATION OF CORRECT PERFORMANCE
OF OPERATING ACTIVITIES , I.C.6
- o SHIFT SUPERVISOR RESPONSIBILITIES I.A.1.2
I.C.3

UPGRADED OPERATOR QUALIFICATIONS

- o IMMEDIATE UPGRADE OF RO AND SRO TRAINING AND QUALIFICATIONS I.A.2.1
- o ADMINISTRATION OF TRAINING PROGRAMS I.A.2.3
- o REVISE SCOPE AND CRITERIA FOR LICENSING EXAMINATIONS I.A.3.1
- o TRAINING FOR MITIGATING CORE DAMAGE II.B.4

BASES FOR STAFFING AND QUALIFICATIONS

PRESENT BASES

- o NO RULES FOR STAFFING FOR OTHER THAN LICENSED OPERATORS
- o PERSONNEL QUALIFICATIONS PER ANSI N 18.1 - 1971
AS ENDORSED BY REG GUIDE 1.8, 1975

UNDERWAY

- o MANPOWER AND STAFFING EVALUATION PROJECT
- o STAFFING SURVEYS
- o JOB/TASK ANALYSES

MINIMUM STAFFING
LEVELS PER
SHIFT

NUREG-0737 (AS AMENDED BY 81-10)

	ONE UNIT	TWO UNITS ONE CONTROL ROOM	TWO UNITS TWO CONTROL ROOMS	THREE UNITS TWO CONTROL ROOMS
<u>OPERATING STAFF (I.A.1.3)</u>				
SS (SRO)	1	1	1	1
SRO	1*	1	2*	2*
RO	2	3	4	5
AO	2	3	4	5
STA	1*	1*	1*	1*

EMERGENCY PREPAREDNESS STAFF (III.A.1.2)

COMMUNICATOR	1*
HP TECH	1*
RAD. CHEM. TECH.	1*

ASSUMES ALL UNITS OPERATING

*INCREASED FROM PRE-TMI LEVELS

SHIFT STAFFING COMPARISON (SINGLE UNIT)

<u>US</u>	<u>POSITION TITLE</u>	<u>CANADA</u>
1	SHIFT SUPERVISOR	1
1	SRO IN CONTROL ROOM	1
--	NO US EQUIVALENT	1
2	REACTOR OPERATOR	--
2	AUXILIARY OPERATOR	2
--	NO US EQUIVALENT	2
--	I&C/ELECT. MAINT.	2
--	MAINTENANCE TECH.	2
1	HP TECH	--
1	RAD/CHEM TECH.	--
1	COMMUNICATOR	--
1	STA	--
10	TOTAL	11



DOCKETED
USNRC

'82 SEP 27 P 4:06

OFFICE OF THE SECRETARY
DOCKET
FRANCIS THOMAS C. HOUGHTON
Associate

September 27, 1982

8

Mr. Samuel J. Chilk
Secretary of the Commission
Nuclear Regulatory Commission
Washington, D.C. 20555

DOCKET NUMBER
PROPOSED RULE PR-50
(47 FR 38135)

Dear Mr. Chilk:

On Monday, August 30, 1982, the NRC published a proposed rule in the Federal Register, entitled "Licensed Operator Staffing at Nuclear Power Units" (47FR38135) and requested comments by September 27, 1982. KMC, Inc, and the nineteen utilities who form the Qualifications of Reactor Operators (QRO) Utility Group are pleased to offer their comments for the Commission's consideration. The members of the utility group are listed in enclosure 1.

KMC, as the sponsor of other utility groups, has consistently brought to the Commission's attention the staff's apparent lack of coordination in imposing new requirements listed in NUREG-0737 upon the nuclear industry. This proposed rule indicates that there is still a lack of coordination in the human factors area. A similar situation existed in the area of emergency response planning until the approval of SECY-82-111, which recognized that there are trade-offs among various requirements. For example, an excellent SPDS negates the need for extensive control room design changes. SECY-82-111 pulled together the various emergency response requirements into a coordinated grouping. Similar coordination is needed for plant staffing. Presently NRR, RES and NMSS are developing an Integrated Human Factors Plan. It makes little sense to proceed with the proposed rule until the applicable portion of the Integrated Human Factors Plan is completed so there is an understood, technically justified reason for the shift manning required.

The justification listed for the proposed regulation is extremely weak; in fact, it is virtually non-existent. The background discussion of the rule refers to several investigations conducted in the aftermath of the TMI accident and states that they "concluded that, among other things, current shift staffing requirements should be upgraded." Upon review of

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add: E.W. Neeschoff
5650 NL

Acknowledged by card... 9/28/82 emp

the documents listed, one finds, contrary to the FR notice, that there is no mention of staff manning requirements in the study conducted by the President's Commission on Three Mile Island. Furthermore, the conclusions reached in the other documents (the NRC Special Inquiry Group, the Lessons Learned Task Force and the Bulletins and Orders Task Force) are not conclusions but rather bold requirements with no discussion or substantiation.

In NUREG/CR 1250, (page 612) the Special Inquiry Group, recommends: "8. Analysis and research should be performed to determine operator responsibilities and actions during normal and abnormal conditions. The results of this analysis should be used as a basis for determining operator selection and training criterion, manning levels, and procedural format and content. 9. Until recommendation 8 can be implemented, the NRC should require that all hot operations shifts be manned by a minimum of one SRO, two CRO's and one additional individual with demonstrated and tested capabilities in abnormal system diagnosis. Two of these individuals should be required in the plant control room at all times." Thus the conclusion of the SIG was not for two SRO's on shift and one always in the control room, but rather that there be at least 2 individuals in the control room, that an individual (such as the STA) be available on an interim basis and that analysis be conducted to determine manning levels. We see no justification to require an SRO to remain in the control room at all times. If he is touring the plant, or should his office be directly outside the control room with communications available, he is immediately available. On p. 854 of the SIG report, another recommendation states:

- ° On the same priority basis, onshift manning levels should be increased, if necessary, to conform with levels determined to be needed by the results of accident response task analyses conducted to define the tasks that may need to be performed in the event of serious accidents, including those that might involve significant core melting.

It is our understanding that both INPO and NRC have such task analyses underway. It is clear that the SIG does not support the proposed rule.

Thus the requirements of NUREG 0660, 0737 and the proposed rule for increased numbers of SRO's on shift, and the requirement that there always be an SRO in the control room are nowhere substantiated. In fact, the supplemental information fails to cite a single Abnormal Occurrence Report, LER, operating report, AEOD paper or IE investigation that even speculates that the addressed event would have, or could have, been prevented by the presence of an additional SRO on shift.

Perhaps the NRC's intention is to provide additional backup in emergencies to the shift supervisor by requiring a second SRO. If this is the reason, there appears to be little or no justification for the

current STA or the proposed shift engineer. The utilities believe that the shift supervisor would be far better served during unusual events by the presence of an experienced second SRO than by a degreed, relatively inexperienced engineer. The statement of proposed action states that "this change would assure that supervising and technical expertise is continuously available in the control room to respond to accident situations." If this is true, there appears to be no further need for a shift engineer.

The QRO Utility Group requests that the Commission reconsider the justification for this proposed regulation. Unless it knows the purpose of the proposed requirements, the Commission is merely stating "more is better." If two SRO's are required on shift to provide assistance in abnormal situations, then the need for a third individual (the STA or shift engineer) is in question. If the shift engineer is needed, what is the purpose of the second SRO? Without any analysis of how many individuals with what knowledge are required, how can the Commission proceed to rulemaking? The utility group would support the concept of the second SRO as the technical backup to the shift supervisor, thereby obviating the need for the shift engineer.

As stated in the supplementary information published with the proposed rule, the NRC has been considering means to upgrade current shift staffing requirements and in fact issued some interim criteria in NUREG 0737. Despite its concern over the direction in which the NRC was proceeding, the utility industry has been moving toward meeting these enhanced staffing requirements at the same time that the demand for licensed operators has been rapidly expanding due to the many nuclear units nearing completion, the need for operators to provide the insight of operating experience in technical organizations such as INPO, and the expanding training programs of utilities. At the same time, utilities are attempting to reduce overtime work and increase the number of operating shifts, all in accordance with NRC direction. The position of SRO is one which requires not only the ability to pass an examination, but also several years of experience, and most importantly, the maturity and judgment which will convince utility management to entrust the individual with a vital role. This experience cannot be gained quickly, nor can the imposition of a rule engender the necessary maturity required. While it is clear that all utilities are moving toward meeting these new manning requirements which were outlined in NUREG 0737, the severe manpower demand facing the nuclear industry may result in utilities falling short of the January 1, 1983 deadline proposed in the rule. This should be no surprise to the Commission, in that it has not been successful in adequately manning its Operating Licensing Branch which requires similarly skilled individuals, despite extensive recruitment efforts. We suggest to the Commission that should this rule be adopted contrary to our comments, the implementation date be modified to January, 1984 and licensees be required to present an implementation plan by January, 1983. In any case, extensions for "good cause" should be liberally granted based on the demonstrated shortage of operators, and the enhanced training, examination, and qualification requirements

which now exist, so that utilities are not forced to increase overtime, reduce the number of operating shifts, or lower their own standards for recommending operators to the NRC for licenses.

This position is consistent with our letter to Chairman Palladino of July 13, 1982 (a copy of which is enclosed). We feel that individual utilities should be allowed to establish the organizational arrangement which best meets their mix of talents while maintaining that set of functional criteria justified by the NRC. These should be worked out between the utility and the NRC, similar to the actions required in SECY 82-111, rather than through a specific rulemaking.

In conclusion, we request that the Commission reconsider the need to require two SRO's on shift and the need for an SRO to always be in the control room until it discovers a rationale for the requirement. Should the Commission reach the conclusion that the second SRO is the technical backup for the shift supervisor, we would recommend the "shift engineer" concept be dropped. The task analysis underway should be used to address this issue. Finally, we request that should this rule be issued, the implementation date be delayed for one year.

Sincerely,

Thomas C. Houghton

Thomas C. Houghton
KMC, Inc.

Enclosure 1

QUALIFICATIONS OF REACTOR OPERATORS
GROUP MEMBERS

Baltimore Gas & Electric Company
Cincinnati Gas & Electric Company
Consumers Power Company
Florida Power Corporation
Florida Power & Light Company
Gulf States Utilities Company
Maine Yankee Atomic Power Company
Nebraska Public Power District
Northeast Utilities Service Company
Northern States Power Company
Omaha Public Power District
Pacific Gas & Electric Company
Pennsylvania Power & Light Company
Public Service Electric & Gas Company
Rochester Gas & Electric Corporation
Sacramento Municipal Utility District
Toledo Edison Company
Wisconsin Public Service Corporation
Yankee Atomic Electric Company

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OFFICE OF REGULATORY
DOCKETING

DR DONALD F KNUTH
President

July 13, 1982

Chairman Palladino
Office of the Commissioners
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Chairman Palladino:

KMC, Inc. has been working very closely with a number of utilities and the NRC staff in the development of personnel requirements for operators of nuclear power plants. The Qualifications of Reactor Operators (QRO) Utility Group, whose nineteen members are listed in enclosure A, has previously provided both written and oral comments on issues such as training and experience requirements for operators, need for Shift Technical Advisors, staffing needs for emergency situations, NUREG/CR-1750, and SECY-81-84.

KMC and the member utilities of the QRO, having read the peer advisory panel's report and attended the Commission briefings on it, felt it appropriate at this time to provide you with our comments on establishing new staffing requirements and associated qualification needs to safely operate nuclear power plants.

The impression KMC has obtained from attending these Commission briefings is that certain Commissioners and NRC Staff members believe that the utility industry has a closed mind on staffing and qualification needs and has commissioned INPO and others to justify its views through some sort of complicated computer based hocus pocus. This misconception was particularly evident in the discussion during the briefings by AIF and INPO on June 10, 1982, and the follow-up briefings on June 11, 1982. This is an erroneous view, since both NRC's Division of Human Factors Safety and industry have programs to establish exactly what the operators must know and what previous training they need to function effectively. In fact, the Division of Human Factors Safety has plans to sponsor research on what the function of the "Shift Engineer" should be and what alternatives there are to that position. The peer panel made it clear that they could not discern a palpable need for a degreed engineer on shift. They acquiesced to the concept of a shift engineer because of specific NRC lobbying and a genuine doubt about technical backup in emergencies based on lack of knowledge of emergency

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action requirements already in NRC policy (30 minute on site goal for technical support) and current utility procedures which ensure that the qualified experts are called, consulted or brought in as necessary.

In this letter we wish to delineate the functional objectives of staffing, and in the attachments we describe several organizational concepts that can meet the objectives. The utilities are firmly convinced that the functional needs to counter emergency situations can be met by more than one single organizational concept which is mandated by the NRC. One of the these might be attractive to a large utility having multiple units in operation and others under construction, whereas others might be more suitable for a utility having a single nuclear unit in operation and no current plans to build another. There are many other organizational variations which could also provide the functional requirements.

The first issue to be addressed is the minimum staffing requirement for safe operation of a nuclear power plant. In the past, the number of persons and their required qualifications were based upon previous experience and utility judgment. A more rigorous technique, that of conducting Job and Task Analysis, is in progress at INPO and the NRC, and should provide a more comprehensive basis to establish the numbers of required operations personnel and the training needs. These generic Job and Task Analyses can be used by each utility in developing or refining their staffing levels and training programs. We are pleased that the Commission intends to withhold final rulemaking action until this information is available. For routine operation and responses to design basis accidents, published reports such as NUREG/CR-1750 and the report of the the peer panel which you appointed, hold that the operating staff need not be college graduates.

In responding to events which have conflicting or questionable indications or where plant responses are different than expected, it becomes more difficult to establish the required mix of talents to cope with the event. Since the Three Mile Island accident there have been improvements in system designs and operating procedures, and the capability of operators to deal with abnormal situations and emergencies. For example, symptom oriented emergency procedures which eliminate the necessity to immediately identify the initiating event or equipment malfunction are one example of improvements which are underway; these procedures are designed to trigger responses based upon preserving margins to safety parameters (such as pressure), rather than withholding proper actions until the root cause of the event has been diagnosed. Another example is the SPDS. Yet another is the required upgrading in the ability for utilities to augment the operating organization in a short time frame in the event of an incident. One vexing question is what, if any, additional capability should be available to the control room? More specifically, should a degreed engineer be available to the control room, and if so what is expected of him? It would be unfortunate if the Commission, in addressing these questions, mandated an organizational structure which for all but the largest utilities would be extremely difficult to meet. Degreed engineers do not want to spend their careers on shift work. They will put up with it for short periods of time if the pay is right and the

future holds greater promise. For a few utilities, with large nuclear plant commitments, this future may be readily available, but in a smaller utility, the mobility is just not there. For example, in a smaller utility requiring a degreed person on shift could result in high personnel turnover of college graduates who see minimal advancement opportunities. As a result, the shift engineer would never attain the experience essential to providing meaningful advice during an incident, nor would he gain the respect and confidence of the shift crew.

Having posed the difficult questions in the preceding paragraph, we shall now provide answers by defining the functional requirements to aid the control room and develop a few organizational strategies to meet those functional requirements although we recognize there will be additional acceptable methods. In answering the question, what capability needs to be available to the control room, we believe that in an incident one knowledgeable individual having comparable qualifications of a senior operator (as upgraded through STA type training) should be available to assess the situation without the requirement to execute procedures in response to the incident. The designated individual or "technical advisor" should be free to review the entire response to the incident. When items do not seem under control or unexpected indications or events occur, the "technical advisor" should, as appropriate: advise the shift supervisor, consult with other off site individuals, call in response personnel, and if needed begin to activate the Technical Support Center.

The second question to be addressed is should the "technical advisor" be a degreed engineer, and if so what engineering expertise is expected of him? In the role which we believe proper for the "technical advisor," it is not expected that the individual should perform analyses or engineering calculations, rather he should be experienced and trained to comprehend indications being received and recognize if the situation is under control or more assistance is needed. We do not see any particular advantage to having the person degreed. The concept of being free of direct operational pressures and having knowledge of plant operating details are more important than possession of engineering analysis abilities. If, for example, the "technical advisor" were a mechanical engineer and a particular incident were electrical in nature, the educational background would be of little use and the "technical advisor" would lean on his experience and training to cope with the situation. While we obviously would not preclude using degreed talent, it is the experience and training which should be utilized in providing advice. That experience and training should be of the caliber expected of a senior reactor operator. Finally, it seems evident that the shift operations personnel, in a highly unusual situation, would most likely turn to the most highly qualified individual in the plant organization rather than to a junior engineer.

Having now defined the type of talent which is desired, how can this be accomplished? We believe it can and should be met a number of ways. The reason we say this is that different plants have different operating modes, different control room arrangements and most important, different mixes of talent in terms of experience, training and education. In enclosure B we have defined a number of organizational means of

-4-

providing the functional capabilities. Some would be preferred by a particular utility, but all methods would satisfy the functional requirements we have discussed.

In summary, we are convinced that if the NRC should issue regulations or guidance, we believe it should specify the functional requirements and not dictate any one means of meeting the requirements. We have enclosed as Enclosure C language which would be suitable to state the requirement. The utilities who are charged with the responsibility to safely operate their power plants should be permitted to develop and propose means of meeting the regulatory requirements in a manner consistent with their site needs. Further pursuing this theme of utility responsibility, we fully recognize the desire for future utility managers and upper management to have front line nuclear plant experience. There are many ways to achieve this, including time spent on shift. But, we are sure you realize that this is not the only way. For example, tours of duty spent on the plant engineering staff and obtaining SRO licenses or certification provides engineering as well as operational experience which is desirable to upper management in decision making. This is an area in which the NRC should clearly allow each private utility the leeway to conduct its own management training programs. We would appreciate the opportunity to discuss our views with the Commission and would be happy to answer any questions on this matter.

Sincerely,

Donald F. Knuth
Donald F. Knuth

ENCLOSURE A

QUALIFICATIONS OF REACTOR OPERATORS GROUP

Baltimore Gas & Electric Company

Cincinnati Gas & Electric Company

Consumers Power Company

Florida Power Corporation

Florida Power & Light Company

Gulf States Utilities Company

Maine Yankee Atomic Power Company

Nebraska Public Power District

Northeast Utilities Service Company

Northern States Power Company

Omaha Public Power District

Pacific Gas & Electric Company

Pennsylvania Power & Light Company

Public Service Electric & Gas Company

Rochester Gas & Electric Corporation

Sacramento Municipal Utility District

Toledo Edison Company

Wisconsin Public Service Corporation

Yankee Atomic Electric Company

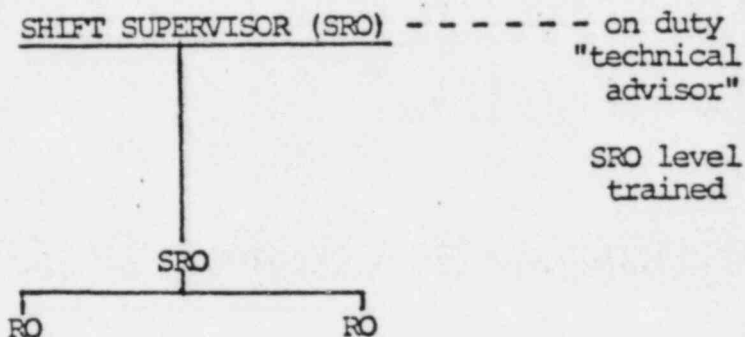
ENCLOSURE B

ORGANIZATIONAL CONCEPT TO PROVIDE TECHNICAL ADVISOR

1. DUTY "TECHNICAL ADVISOR"

One means of meeting the requirement would be as depicted on following schematic. In this instance, a concept similar to the Navy's engineering duty officer or military standby alert system would be used. Staff engineers from the plant staff, the Independent Safety Engineering Group (ISEG) or other company positions would be assigned to a rotating duty cycle and would remain on call to the control room as an advisor for a period of say 24 hours. These individuals would be completely knowledgeable about the details of the plant based on their regular job at the plant and the qualification program and would be current on plant status and evolutions as part of their duty turnover. This arrangement might be well suited for utilities having only a single or few nuclear units, where well qualified engineers could be attracted to periodically stand periods of "technical advisor" duty, but who would not be required to accept permanent shift duty.

NORMAL OR ABNORMAL OPERATION

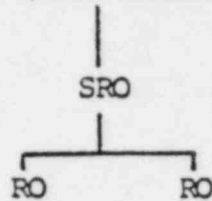


2. UPGRADED SRO CONCEPT:

This concept uses two SRO's and two RO's to control the plant under both normal and abnormal situations. The junior SRO maintains direct supervision of the panel operators, providing backup to their actions. The senior SRO, who has received additional training similar to that outlined for STA's and has extensive plant experience, is free to observe the panel operators and the junior SRO and to devote his attention to evaluating the overall response of the facility.

NORMAL AND ABNORMAL OPERATIONS

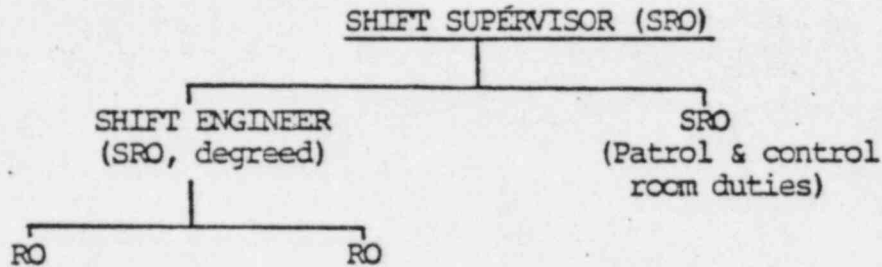
SHIFT SUPERVISOR
(SRO w/STA training)



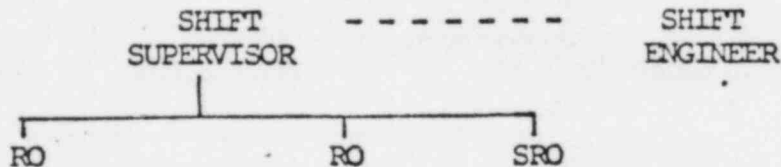
3. SHIFT ENGINEER CONCEPT:

In this concept the shift supervisor is in charge of the shift complement and holds an SRO. A shift engineer who is a degreed individual is assigned as the normal control room supervisor and another SRO is assigned patrol outside of the control room as well as performing duties in the control room. In the event of an abnormal event, the shift engineer summons the shift supervisor to the control room, assumes the role of "technical advisor", and does not have procedural responsibilities. A schematic depicting this organization's arrangement is shown below.

NORMAL OPERATION



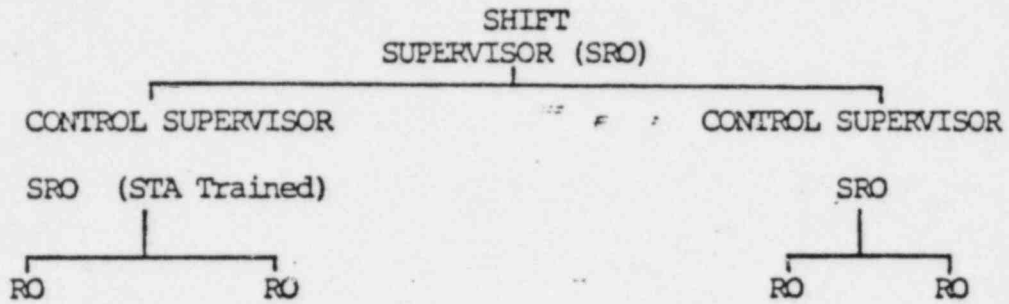
ABNORMAL OPERATION



4. TWO CONTROL ROOMS

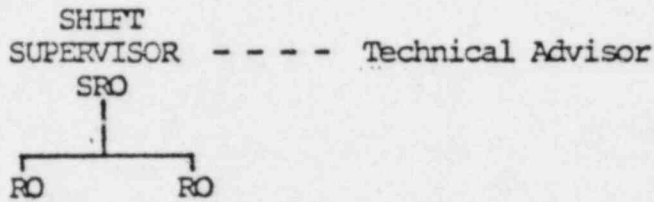
In a two unit plant with two control rooms one concept for providing a technical advisor would be to utilize one of the trained SRO's as an advisor to the unit experiencing the incident. In concept the arrangement would be as follows:

NORMAL OPERATION

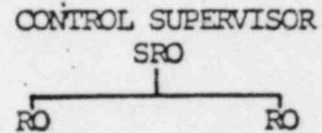


ABNORMAL OPERATION

Unit experiencing problem



operating unit



ENCLOSURE C

FUNCTIONAL STATEMENT FOR "TECHNICAL ADVISOR"

The following paragraph, which might be suitable for incorporation in 10 CFR 55, describes the required attributes of the Technical advisor function.

"A capability to evaluate the overall response of the facility shall be available during non-routine conditions. This capability shall be vested in an individual who has the training and experience necessary to recognize and evaluate the transient response of the facility and who is independent of responsibilities for routine direction of operating staff personnel during a transient."



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SACRAMENTO MUNICIPAL UTILITY DISTRICT □ 6201 S Street, Box 15830, Sacramento, California 95813; (916) 452-3211

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September 17, 1982

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BRANCH

SECRETARY OF THE COMMISSION
U S NUCLEAR REGULATORY COMMISSION
WASHINGTON D C 20555

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DOCKET NUMBER

PR-50

(47 FR 38135)

ATTENTION DOCKETING AND SERVICE BRANCH

DOCKET 50-312
RANCHO SECO NUCLEAR GENERATING STATION
UNIT NO 1
PROPOSED CHANGE TO 10CFR50.54

The Sacramento Municipal Utility District proposes that the comments in the following discussion be seriously considered prior to the NRC acting on the proposed change to 10CFR50.54 as published in the Federal Register, Volume 47, No. 168 of August 30, 1982.

All operating nuclear power plants are required to operate and staff within the requirements of the Technical Specifications issued uniquely for each plant. The Technical Specifications provide flexibility for the NRC to consider unique features at each facility when establishing minimum conditions for operation. Historically, the Technical Specifications have established the minimum staffing requirements for a particular unit and the requirements have frequently been more restrictive than the law required. There is absolutely no need to become prescriptive within the law to the working location of personnel (proposed 10CFR50.54 (m)(2)(ii) and 10CFR50.54 (m)(2)(iii)) nor the deadline for establishing staffing levels (proposed 10CFR50.54 (m)(2)(i)). To do so, removes the flexibility to consider other alternatives and may penalize a utility which has made good faith efforts to comply with the wide range of uncoordinated guidance recently issued by the Commission. This guidance includes staffing levels, experience requirements prior to licensing and overtime limits.

The Darrell G. Eisenhut letter of July 31, 1980, discussed Interim Criteria for Shift Staffing. The District's response to that letter dated November 3, 1980, established two realistic schedules for meeting the criteria. One schedule optimistically assumed no attrition and projected a compliance date of November, 1983. The other schedule provided for a more realistic 30% attrition and provided for a compliance date of June, 1983. The NRC made no response to the schedules and the District proceeded accordingly with staffing actions. On January 15, 1982, the NRC letter from John F. Stolz, again requested the District's schedule for meeting the Interim Criteria for Shift Staffing. The District reiterated the same schedule by letter dated

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February 11, 1982. The proposed rule change completely disregards the District's previous responses and fails to recognize that operating personnel cannot be licensed "overnight".

Historically, the District's Operator Licensing Program has been deliberate and extensive. Normally, a qualified candidate spends a minimum of eighteen to twenty-four months as an unlicensed operator in the plant prior to beginning reactor operator training. The license training program then takes approximately sixteen months to complete. In addition, the NRC has imposed a one year experience requirement as a licensed reactor operator prior to taking the Senior Operator Examination, and the District's upgrade training program for Senior Operator requires approximately seven months. Candidates put up for licensing by the District have been 100% successful in passing the NRC examination on the first attempt under the post-TMI 80%-70% criteria. This is in stark contrast to the experience of many other utilities. We firmly believe that any attempt to speed up the District program can only lead to adverse safety implications for the General Public.

IE Circular No. 80-02, of February 1, 1980, established overtime guidance to assure that operating personnel are physically prepared to stand a competent duty. The District, as a result of this guidance, has committed to establish a six-shift rotation to minimize overtime and in particular, to eliminate the requirement to conduct training on an overtime basis. As a result of industry's commitment to INPO, the required operator requalification program has expanded making the nonovertime training goal even more important. This commitment to six shifts was enhanced by INPO comments resulting from the 1981 audit and more recently by an outside consultant review conducted as a commitment given to the NRC Regional Director during an enforcement conference. This six-shift rotation commitment would have to be delayed for many months if a requirement is made to increase the licensed operator staffing per shift in 1983.

Discussions with other utilities indicate that many other plants would have to meet the increased shift staffing by scheduled overtime and by less than six shift rotations. In light of industry experience and IE Circular No. 80-02, this action seems contrary to the best interest of safety. It would seem that if in fact utilities do take these steps because of the proposed rule change, the NRC is guilty of enforcing one requirement without thoroughly evaluating its resulting impact on other guidance the industry is trying to meet. Here is an excellent example of how a rule change removes flexibility which the Technical Specifications allow.

Amendment No. 31 to the Rancho Seco Operating License prescribed in the Technical Specifications that a Shift Technical Advisor (STA) be available to shift crew personnel. The District has embarked on a training program to license Shift Technical Advisors currently on the staff. This program, voluntary in nature, is being pursued as a means of strengthening the overall capability of the operating crew and support staff. Two of the District's STA's are currently licensed as Reactor Operators and four others are in training with an anticipated licensing date of March 1, 1983.

A final comment that should be considered deals with a serious situation which the NRC guidance has caused. The proposed rule and earlier guidance is promoting personnel piracy within the industry.

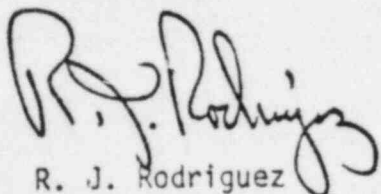
September 17, 1982

Enclosed is a letter that has been sent directly to the homes of numerous District employees. This is typical of several such piracy attempts which are known to District management. In addition, the local media in areas where experienced nuclear personnel are concentrated as well as industry publications are commonly used to advertise opportunities. The direct home mailing generally comes about from concentrated programs aimed at particular individuals. In the case of the example we have enclosed, we feel that it represents recognition that the District has acquired and trained excellent operating personnel. However, it also illustrates the extent to which some hiring firms will go to meet their employers requests. These requests are undoubtedly a direct result of the NRC's mandated staffing requirements and the proposed deadline dates which we fear are to become law without benefit of seriously looking at each facility's unique situations. What is particularly distressing about this solicitation is that the salary offers from the investor owned utility sponsoring the recruiter exceed the District's salary structure by 15%-32%, and the license bonus by 43% or more. Since the District is municipally owned, it has many of the same type of fiscal restraints and public responsibilities with respect to salary and benefits with which U.S. Federal organizations are faced.

It should also be pointed out in this context, that piracy of licensed personnel actually decreases the supply of licensed operators at U.S. Nuclear power stations. Not only do many of these individuals leave the utility industry, many that join other utilities do so in nonshift operations capacities. Even those licensed personnel who join a new utility to remain in shift operations are removed from licensed duty for one to two years while they train and license on the new facility.

If due consideration is given the above comments, the District is confident that the Commission will see the merits in dealing with power station staffing levels and deadlines for those levels on a case by case basis and rescind the proposed change to 10CFR50.54. The Technical Specification conditions for operation certainly provide for establishing Commission requirements and at the same time provide for much more flexibility than does the proposed rule change.

Sincerely,



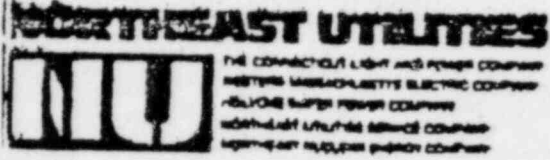
R. J. Rodriguez
Manager, Nuclear Operations

Attachment

cc: Richard DeYoung (NRC)
John F. Stolz (NRC)

bc: J. J. Mattimoe
D. G. Raasch
R. J. Rodriguez
R. A. Dieterich
J. V. McColligan
R. W. Colombo
L. G. Schwieger (2)
Supervisors
Tom Baxter
4th Floor Files
3rd Floor Files
Harvey Cantor

To: Samuel Chilk
From: Mike Bar
General Offices • Selden Street, Berlin, Connecticut



P.O. BOX 270
HARTFORD, CONNECTICUT 06102
(203) 688-6911

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JACKET NUMBER
PROPOSED RULE **PR-50**
(47 FR 38135)
September 27, 1982
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OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

DOCKETED
USNRC

Mr. Samuel J. Chilk
Secretary
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

'82 SEP 29 A7:46

Haddam Neck Plant
Millstone Nuclear Power Station, Unit Nos. 1, 2, & 3
Proposed Rule Governing Licensed
Operator Staffing at Nuclear Power
Plants (47 Fed. Reg. 38135 (1982))

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

Dear Mr. Chilk:

On August 30, 1982 the Commission published for comment a proposed rule governing licensed operator staffing at nuclear power plants (47 Federal Register 38135 (1982)). Connecticut Yankee Atomic Power Company & Northeast Nuclear Energy Company are pleased to submit the following comments on the proposed rule.

From the outset, CYAPCO & NNECO wish to emphasize that they have been working to upgrade shift staffing so that, consistent with the proposed rule, there will be on duty at each operating unit two licensed Senior Reactor Operators, two licensed Reactor Operators, and a minimum of two unlicensed auxiliary operators. These activities have been under way since 1980, even though they were not required by rule, regulation or order. In spite of this, we believe that the proposed rule includes an unrealistic compliance deadline which should be modified. We further recommend that certain technical changes be made in the proposed rule. These comments are set forth in detail below.

I. The January 1, 1983 Deadline
and the Exemption Process

As currently proposed, the shift staffing rule would have to be satisfied fully by January 1, 1983, unless a licensee can show good cause why it should be exempted from achieving compliance by that date. We submit that such a deadline is completely unrealistic because it fails to account for the very real difficulties already being encountered by licensees attempting to complete shift staffing upgrades in a timely manner. These difficulties include:

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resently operate Millstone Units 1 and 2 and the
Haddam Neck nuclear facilities. Additionally, Millstone Unit 3 is under
construction.

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- (1) increased training and other requirements imposed on current operating staff which lengthens training time;
- (2) unexpected attrition in current operating staffs;
- (3) elevated standards for obtaining operator licenses;
- (4) delays in NRC administering reactor operator tests; and
- (5) the need to distribute operating staff with commercial experience among not only currently operating power reactors but also among facilities which will soon begin functional testing, fuel loading, start-up testing and power ascension.

It is apparent to CYAPCO and NNECO that the NRC is sensitive to the difficulties in obtaining enough qualified personnel to meet staffing requirements given the Commission's difficulties in fully staffing its own Operator Licensing Branch despite extensive recruitment efforts.

During the past year, CYAPCO & NNECO have endeavored to bring these matters to the attention of the NRC Staff, apparently with little or no success. On October 22, 1980 we stated in a letter to Darrell G. Elsenhut that we were committed to certain upgrades in shift staffing by July 1, 1982. However, we also advised NRC that the July 1, 1982 date was contingent upon a number of factors such as minimum turnover of personnel out of the Operations Department and continued success at licensing new Reactor Operators and Senior Reactor Operators.²

On September 28, 1981 CYAPCO & NNECO again wrote to the NRC concerning shift staffing levels. We advised the Staff that we would be unable to achieve the increased staffing levels as early as originally anticipated and that it would require until July 1, 1983 to have a second licensed Reactor Operator on duty in the control room rather than July 1, 1982, as originally planned. The letter set forth a number of reasons for this change, including the need to staff Millstone

² October 22, 1980 letter from W. G. Council to Darrell G. Elsenhut, Director, of Operating Reactors, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission.

Unit No. 3 with the maximum number of experienced Reactor Operators, and increased regulatory requirements governing overtime and training.³ Following a meeting with NRC in December, 1981 and at the Staff's request, CYAPCO & NNECO prepared and submitted on March 1, 1982 a detailed plan (including its justification) to assure that required shift coverage would be available by July 1, 1983.⁴

Lastly, on August 31, 1982, CYAPCO advised the NRC with respect to Haddam Neck that it was unable to place two individuals with Senior Reactor Operators (SROs) on each shift as recommended in Staff guidance documents. This situation was due to unexpected attrition, efforts to provide college level training to SROs and delay in processing NRC examination results.⁵

At present, it is clear that CYAPCO and NNECO will be unable to meet the upgraded staffing levels by January 1, 1983 without reducing the number of shifts and violating the over-time guidelines of Generic Letter 82-12. However, as stated in the March 1, 1982 letter², CYAPCO and NNECO intend to achieve full compliance with these staffing guidelines by July 1, 1983. Also, as stated in our March 1, 1982, letter, as additional licensed operators become available, they will be placed on shift so as to meet the staffing recommendations on as many shifts as possible. Thus, some shifts could actually be staffed in accordance with the NRC's guidance as early as January 1, 1983. However, it will require until July 1, 1983 to provide this level of staffing on all shifts.

CYAPCO and NNECO find it extremely disturbing that not only has the NRC failed to respond to the merits of our previous submittals regarding shift staffing upgrades, but that it is now proposing to require that such upgrades be completed within approximately two months. If regulations are to include reasonable compliance deadlines, they must take into account the practical difficulties licensees will face in achieving compliance. There is no indication that the proposed rule does so. Accordingly, the January 1, 1983 compliance date set forth in the proposed rule should be extended at least six months, and, more realistically, should be extended one year to January 1, 1984.

We further suggest that it is misleading to state (as does the Federal Register notice) that the January 1, 1983 deadline is reasonable because "the utility industry has been attempting to meet the increased staffing levels called for in NUREG-0737 for approximately two years." (47FR38136). In fact, as the

³ September 28, 1981 letter from W. G. Council to Darrell G. Elsenhut.

⁴ March 1, 1982 letter from W. G. Council to Darrell G. Elsenhut.

Commission itself knows, NUREG-0737 was and still is a Staff guidance document to the extent that it applies to currently operating plants,⁶ and as such does not impose any legal requirements on current operating license holders.⁷ We believe that to establish a binding deadline for meeting a requirement based on the premise that licensees had ample notice of it by virtue of an earlier Staff guidance document retroactively transforms that nonbinding document to a formal requirement.

Moreover, aside from the legal questions raised by relying on a guidance document to justify a compliance deadline, we believe that the reference to NUREG-0737 indicated a failure of NRC to clarify the priority it has placed and now places on shift staffing upgrades. One effect of not imposing such upgrades as a requirement initially was to send a signal to both licensees and the public that, while NRC believed that shift staffing should be given attention, it was of a lower priority than other facility modifications (including procedural or organizational changes) which were required by law. Consequently, in those cases where both required modifications and recommended actions could not be completed simultaneously, licensees gave higher priority to completing required activities. The NRC should not now impose a short-term deadline based on its belief that licensees had a period of time preceding imposition of the requirement (i.e., the period when the "requirement" was set forth in Staff guidance documents) during which to achieve compliance. Rather, a compliance date should be established which takes into account fully the priority the NRC in fact placed on shift staffing upgrades.

Lastly, we do not agree with the assumption implicit in the proposed rule that even if the January 1, 1983 deadline cannot be met, the exemption process will provide a mechanism through which relief from that deadline may be provided on a case-by-case basis. We have already requested relief from those aspects of the Staff "guidance documents" which would be codified in the proposed regulation. Moreover, we have submitted detailed justification in support of such relief on September 28, 1981, and March 1, 1982. We have also met with the Staff to discuss the matter on December 1, 1981. As yet, no action has been taken on the request. And, the fact that the NRC has proposed a shift staffing upgrade rule without addressing the potential obstacles to meeting the January 1, 1983 deadline already brought to its attention in those submittals does not provide a basis for concluding that they will be considered by the Staff later on in the exemption process.

⁶ Transcript of June 11, 1982 Public Commission Meeting, "Discussion of Status of Shift Manning Requirement" at P. 26-28.

⁷ See, e.g., Matter of Fire Protection for Operating Nuclear Plants, C.I.-81-11, 13 NRC 778, 782 n. 2 (1981).

Other past experience with the exemption process confirms this view. For example, when it became apparent that licensees would be unable to meet the July 1, 1981 deadline for installation of a prompt public notification system originally required by 10CFR50.47 and Appendix E, the Commission proposed changing the date to February 1, 1982. See 46 Federal Register 46587 (1981).

In our comments on the proposed regulation, we advised the Commission that despite its best efforts, through no fault of our own we would be unable to meet the proposed deadline. Consequently, CYAPCO & NNECO recommended that a later date be selected.⁸ Because this recommendation was not accepted, we filed a request for a limited exemption from the February 1, 1982 deadline.⁹ The request was denied for the following reasons.

When the Commission chose the February 1, 1982 deadline, they were aware that some licensees were estimating that they might not be able to complete installation of their systems by that date. Even with this knowledge, the Commission decided that the February 1, 1982 deadline was reasonable, and that all licensees should have been able to meet this deadline by having applied sufficient resources to the task without delay.¹⁰

Importantly, the denial did not address our factual justifications for the exemption request. Rather, it asserted simply that the February 1, 1982 deadline was reasonable. The current rulemaking on shift staffing upgrades appears to be following this same unfortunate pattern. The NRC has proposed that licensees satisfy a new requirement in an unreasonably short time. The difficulties in doing so have been brought to the attention of NRC, yet so far these difficulties have apparently been ignored by the NRC. Accordingly, CYAPCO & NNECO urge that the January 1, 1983 deadline set forth in the proposed regulation be extended from six months to one year.

⁸ October 20, 1981 letter from W. G. Council to Mr. Samuel J. Chilk, Secretary, U.S. Nuclear Regulatory Commission.

January 18, 1982 letter from W. G. Council to Mr. William J. Dircks, Executive Director for Operations, U. S. Nuclear Regulatory Commission.

¹⁰ February 3, 1982 letter from Mr. Darrell G. Eisenhut to W. G. Council.

Another experience which has significantly contributed to our current perception of the workability of the exemption process concerns the fire protection of Appendix R Issue. Despite the explicit guidance provided to the NRC Staff in the United States Court of Appeals decision issued on March 16, 1982¹¹, it is not yet clear how the commission intends to ensure that exemption requests are in fact being elevated to a level comparable to the three alternatives specified in Section III.G.2 of Appendix R. The extensive resources that have been invested in documenting and pursuing the exemption alternatives could have been reduced significantly if the regulation had initially been founded on more sound technical bases.

II. Substantive Modifications

CYAPCO & NNECO have two specific comments on substantive aspects of the proposed regulation. First, the proposed regulation should be modified to account expressly for personnel absences of limited duration. We therefore recommend that the following footnote (footnote four) be added to the table set forth in proposed Section 30.34(m)(2)(i):

The above shift crew composition may be less than the minimum requirements for a period of time not to exceed two hours in order to accommodate unexpected absences, provided expeditious actions are taken to fill the required positions.

This provision would incorporate language similar to that already found in Section 6 of the Standard Technical Specifications, and in our existing Technical Specifications issued by the NRC.

In addition, we recommend that the transition points with respect to staffing requirements be identified in terms of operational modes now set forth in Standard Technical Specifications. Specifically, operating nuclear power units would be defined as units in hot shutdown, hot standby, startup and power operation. Units in cold shutdown or in refueling would be defined as not operating. See Section I, "Definitions", of Standard Technical Specifications.

III. Value-Impact Statement

We believe that the value-impact statement supporting the proposed rule is inadequate. When the Commission issued its existing value-impact guidelines, it contemplated that those guidelines would be a useful device in analyzing the need for and effectiveness of proposed administrative actions. It is difficult to understand how this Commission goal can be achieved in view of the inadequate manner in which the Staff has applied the guidelines.

¹¹ Opinion of the U. S. Court of Appeals for the District of Columbia Circuit, No. 81-1050, The Connecticut Light and Power Company, Et Al., v. Nuclear Regulatory Commission, March 16, 1982.

For example, the value-impact statement included with the proposed rule states:

"The impact on the industry would be the cost of training and maintaining the required number of licensed operators on shift."

and:

"The value of the proposed action to the public would be safer and more reliable operation of nuclear power facilities."

Yet, no attempt is made to quantify either the impact or the value. In fact, no information is provided to substantiate the statement that nuclear plant operation will be safer and more reliable with the increased staffing levels. Therefore, we judge the value-impact statement to be extremely shallow since there is no benchmark to judge relative costs and benefits.

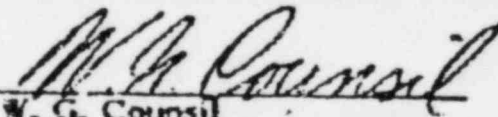
We trust that our recommendations will be considered by the NRC prior to promulgating the proposed rule, particularly with respect to the January 1, 1983 compliance date set forth therein. If that date is not modified, we would have no other alternative but to request an exemption from it. This administrative exercise of establishing an unreasonable deadline then taking enforcement actions against licensees that cannot comply will not result in any measurable increase in the public health and safety, especially since the resources of both CYAPCO, NINECO and the NRC could be better spent on resolving other issues. The NRC is urged to evaluate and respond to the merits of our justification at this stage, rather than promulgating the rule as proposed and obligating us to embark upon another administrative exercise.

In response to Commissioner Asselstine's request for comments on the feasibility of complying with the January 1, 1983 date, we are providing a copy of this letter to his office directly.

If you have any questions on these comments, we would be pleased to discuss them with you.

Very truly yours,

CONNECTICUT YANKEE ATOMIC POWER COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY


W. G. Council
Senior Vice President

cc: Commissioner Asselstine



ATOMIC POWER COMPANY

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CONFIRMED AS RECEIVED BY MR. BYRON BROWN
RESUBMITTED ON 9/30/82 BECAUSE NRC ONLY RECEIVED 1st
September 27, 1982
MN-82-184

JHG-82-173
SEP 29 11:22

Secretary of the Commission
United States Nuclear Regulatory Commission
Washington, D. C. 20555

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OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

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Attention: Docketing and Service Branch

DOCKET NUMBER PR-50
PROPOSED RULE 49 FR 381

- References: (a) License No, DOR-36 (Docket 50-309)
- (b) MYAPCo Letter to USNRC dated July 21, 1982, MN-82-142
"Request for Extension of Shift Manning Requirements"
- (c) USNRC Letter to MYAPCo dated September 1, 1982

Subject: Maine Yankee Atomic Power Company comments on Proposed Rule:
Licensed Operator Staffing at Nuclear Power Units, FR38135, et seq,
August 30, 1982

Dear Sir:

Maine Yankee is pleased to provide comments on the subject proposed rule. Our comments endorse the concept of a second SRO on duty for operating units, express reservations about the requirement for a fourth licensed individual on shift, express reservations about the reasonableness and workability of the proposed implementation schedule and suggest a revision to the definition of "operating" contained in a footnote to the proposed rule's staffing table.

Maine Yankee is a single unit plant and is required by license to have at least one SRO and two ROs on each shift crew during power operation.

We agree that there is a benefit associated with the proposed requirement for two SROs on each crew and have always attempted to meet that standard. However, attrition and the need for more operators to meet expanded training requirements has sometimes made it necessary to resort to meeting only the license requirements. Despite our past difficulties, we believe that the proposed two SRO requirement would improve the quality of operations.

We believe that the requirement for a fourth license on each shift is unnecessary, will not result in any compensating improvements in operational quality and may, in fact, be detrimental.

The addition of a second SRO and the increased SRO training requirements, plus the requirement for a qualified Shift Technical Advisor already increase substantially the technical competence of each shift crew. A second RO only adds yet another "pair of hands" which does not appear to be a "lesson learned" from TMI.

MAINE YANKEE ATOMIC POWER COMPANY

Secretary to the Commission
United States Nuclear Regulatory Commission

September 27, 1982
Page two

The additional training requirements imposed since TMI have prompted many utilities to go from five to six shifts and expand their training staffs. The added experience requirements for operators has made rapid staff expansion difficult if not impossible in some cases. The required fourth license will further strain the already pressed training resources of licensees requiring yet more instructors compounding the need for more licensed operators.

The requirement will force some licensees to back down from six to five and perhaps even to four shifts, increasing the work load on the operators, perhaps raising attrition which would compound the problem.

Furthermore, dropping back the number of shifts would reduce the time available for training, more overtime work would be necessary and training quality may suffer. In summary, increasing the quantity of licenses may decrease the quality of licensees.

We believe the schedule in the proposed rule is unrealistic. We have conducted a comprehensive study to determine when we could meet it using all available resources. Because of the time necessary to give new operators at each job level the required experience and training, our best estimate for meeting the requirements is mid-1984. Any early schedule imposed would force us to reduce the number of shifts with the possible adverse consequences described earlier.

Maine Yankee has previously (Reference (b)) indicated the time frames required to add a fourth (SRO) licensed individual to operating crews. Staff consideration of this matter was deferred (Reference (c)).

For your information, Attachment A outlines the steps we believe must be accomplished to place a fourth (SRO) licensed individual on shift.

We do not believe the definitions of "operating" in the proposed rule's staffing table are appropriate. We would suggest a revision which would hew more closely to the lines present in standard technical specifications. For example, the second SRO requirement might be applied to startup and power operating modes and relaxed in shutdown modes. This would promote consistency with familiar mode definitions and checkpoints. There seems to be no rational basis for making this requirement applicable at or above 200°F for PWRs - any other temperature would serve equally well.

MAINE YANKEE ATOMIC POWER COMPANY

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Page three

Maine Yankee believes that the requirement for a second SRO is worthwhile; that the requirement for a fourth license is unnecessary and may be detrimental; that the proposed schedule should be delayed at least one year to provide the time to meet it without an undue sacrifice in quality; and that the definition of "operating" should be revised for consistency.

Yours very truly,

MAINE YANKEE ATOMIC POWER COMPANY

JHGarrity
John H. Garrity, Senior Director
Nuclear Engineering & Licensing

HG:pjp

Attachment - 1 Page

cc: Mr. Paul A. Swetland
Mr. Ronald C. Haynes
Mr. Robert A. Clark

MAINE YANKEE ATOMIC POWER COMPANY

ATTACHMENT A: STEPS FOR ADDITION OF A FOURTH
LICENSED (SRO) INDIVIDUAL ON SHIFT

- Relief of unlicensed equipment operators by qualified replacements so the equipment operators can go into training for NRC RO licensing examinations.
- Training and NRC examination and licensing of RO candidates for assignment as reliefs for ROs on duty.
- Relief of on-duty ROs by new ROs so the relieved ROs can go into training as SROs.
- Training and NRC examination and licensing of SRO candidates. (Note: NRC experience requirements must be met by SRO candidates).
- Addition of the new SROs to the operating crew.

DOCKET NUMBER
PROPOSED RULE

PR-50
(47 FR 38135)

DOCKETED
USNRC

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DOCKETING & SERVICE

Secretary
Nuclear Regulatory Commission

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DPR-43
Power Plant
Proposed Rule Requiring Increased Shift Staffing

FR 168, pp 38135-38137 proposed 10CFR50.54 (m)(2);
dated August 30, 1982

Wisconsin Public Service Corporation's (WPSC) comments on the above proposed rule. The proposed 10CFR50.54 (m)(2) would require WPSC to assign Senior Reactor Operator in the control room of the Kewaunee Plant when the plant is operating. For the purposes of this rule, defined as any condition in which the average coolant temperature is 200 degrees F. The proposed rule also requires the minimum shift size to include Senior Reactor Operators, which would require WPSC to add an additional SRO.

The comments are divided into two categories--administrative and technical. They concern the proposed schedule as well as the substantive requirement which would require WPSC to increase our on-shift staff.

Administrative Comments

That the proposed rule was published in the Federal Register on August 30, 1982, the comment period ending September 27, 1982. This amounts to a 28-day comment period during which there is a national holiday--Labor Day. The statutory comment period for notice and comment rule-making is 30 days, under 5 U.S.C. 553(d) (1976). It concerns WPSC that the NRC is apparently violating the Administrative Procedure Act on such an important subject. Indeed, in WPSC's proposed rule deserves an even longer comment period to allow for proper public participation. In light of the passage of time during which the subject has been discussed, the unseemly haste in so short a comment period owing so little time for implementation seem unjustifiable.

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experience level of the operating staff, as well as creating the possibility of a flawed training and hiring program. If a utility is forced to license a certain number of operators by an arbitrary date, the temptation exists for the license candidate to study to "pass the exam", and not necessarily to operate the plant. Additionally, if the candidate is not allowed an adequate amount of time to absorb the information he is learning, his retention of that material may be decreased. Both of these possibilities have obvious safety consequences. WPSC has tried to minimize these concerns by establishing a rational schedule which allows an adequate amount of time to train license candidates.

The dilution of the overall experience level is of great concern to us. Prior to this requirement, WPSC's operational staff consisted of five shifts, with one SRO (the shift supervisor) and two RO's per shift. (WPSC also maintains an STA on site when the unit is above cold shutdown.) The experience level of these personnel was excellent, due to the extremely low rate of attrition which we have been able to maintain. For example, in March of 1979, every shift supervisor and licensed operator on shift had pre-operational experience at the Kewaunee Plant, even though we had been operating for five years at that time. The value of this experience cannot be over-emphasized. The control room operators are, in part, the first to respond to alarms and abnormal conditions in the control room. The insight into the workings of the plant that these personnel have gained from pre-operational experience is extremely valuable.

However, as a result of the proposed requirement for a second SRO, WPSC has been forced to take steps which will virtually eliminate all pre-operational experience "on the panels". WPSC acknowledges that this experience cannot be maintained throughout the life of the plant, however, under normal conditions the turnover of personnel would be much slower, allowing for a timely and more complete transfer of information and experience among the operators.

WPSC also acknowledges that this experience will not be totally lost, since present operators that will be upgraded to SRO's will be acting supervisors in the control room. Keep in mind, however, that the actual manipulation of controls rests with the control room operators (RO's), and these operators will be the first to respond to abnormal conditions.

Another negative aspect of the proposed effective date is the potential it creates for "pirating" of operators in the industry. An arbitrary shift manning requirement, with an arbitrary effective date, will increase the temptation for utilities to recruit qualified operators from operating power plants, causing a further reduction in overall experience levels.

Finally, with respect to an arbitrary completion date, WPSC would like you to realize the potential it would create for a contradiction with another one of your guidelines. Generic Letter 82-12 (June 15, 1982) informed all utilities of your guidelines concerning working hours for nuclear plant operating staffs. These guidelines limit the amount of overtime and consecutive days that operators should be allowed to work. The imposition of an arbitrary date when an increased staff size would be required could result in a forced overtime situation which in turn would result in the violation of your working-hour guidelines at those facilities which have traditionally operated successfully with small operating staffs. This would unreasonably place the utility in a "no-win" situation.

Technical Justification for Increased Staff Size

As justification for the increase in operating staff size which would be required by the proposed 10CFR50.54 (m)(2), the NRC has stated that "... studies and investigations have recommended changes in the numbers, qualifications, and organization of nuclear power plant personnel. These studies concluded that, among other things, current shift staffing requirements should be upgraded." Here, once again, WPSC finds history repeating itself. The NRC has not given any justification for the requirement with this statement, but has referred the reader to a set of other documents. This is exactly the practice for which the NRC was admonished by the Court of Appeals for the District of Columbia in their decision on the Fire Protection Requirements (Docket 81-1050, March 16, 1982).

WPSC feels that this continuing disregard for the requirements of the Administrative Procedure Act only serves to undermine NRC licensee's and the public's confidence in the rulemaking process.

WPSC has reviewed several of the reports and documents referenced in the proposed rule. Unlike the Commission, WPSC does not feel that these reports recommend an increase in the staff size of operating plants, as discussed below.

Kemeny Report

The report of the President's Commission on Three Mile Island (The Kemeny Report) includes recommendations for improvements in several areas, ranging from the NRC itself to Emergency Planning and Response. In reviewing these recommendations, WPSC has not been able to identify any that specifically recommend an increase in the on-shift staff at nuclear power plants. Perhaps the recommendations of the President's Commission that come the closest to this proposed requirement are those regarding training. However, these recommendations do not require an increase in the number of operators, but an upgrade in the training of operators. In WPSC's opinion, this proposed rule runs exactly counter to these recommendations by imposing an arbitrary date of implementation, thus undermining the objective of improved training (as discussed above).

WPSC's conclusion that the Kemeny Report does not recommend an increase in operating staff size is supported by Volume 2 of NUREG 0660, NRC Action Plan Developed as a Result of the TMI-2 Accident. Pages 3 through 26 of Volume 2 provide a cross reference of the President's Commission's recommendations to the Action Plan items. Item 1.A.1.3, Shift Manning, does not appear on this cross reference.

Bulletins and Orders Task Force

The report of the Bulletins and Orders Task Force is also referenced in the proposed rule as justification for increased staffing. Again, WPSC's review of this report has been unsuccessful in providing technical justification for this proposed rule. In fact, footnote (1) of the proposed rule suggests that NUREG 0660 be used to glean further technical information on this requirement. WPSC has found that the Bulletin and Orders Task Force report is not even referenced in Volume 2 of NUREG 0660 (see above).

NRC Special Inquiry Group (SIG)

WPSC's review of the report of the Special Inquiry Group (Rogovin Report) provided a repeat of our other reviews. Again, the report recommends an "upgraded set of requirements" concerning shift staffing, but falls short of suggesting an increase in the number of licensed senior reactor operators on site until appropriate analyses

are completed. The Rogovin report suggests that the qualifications of the utility's staff be certified to insure the management and technical qualifications of utility personnel. (pp 106-107 of the Rogovin Report)

In reviewing the recommendations of the SIG as summarized in NUREG 0660 WPSC could only identify a weak link between the SIG's recommendations and the actual requirement to increase the staff size. For example, recommendation 9 (page 75, volume 2 NUREG 0660) suggests that:

Until recommendation 8 can be implemented, the NRC should require that all hot operations shifts be manned by a minimum of one SRO, two CRO's and one additional individual with demonstrated and tested capabilities in abnormal system diagnosis. Two of these individuals should be required in the plant control room at all times (C.2.a, C.3.a).

Recommendation 8 suggests that research be performed to determine what an appropriate staff size should be. WPS has met the requirements of recommendation 9. It is our understanding that task analyses are being performed by INPO, among others; while this work is continuing our shift staff is made up of one SRO (Shift Supervisor), two RO's, one Shift Technical Advisor, one equipment operator and one auxiliary operator.

Similarly, recommendation 2 (page 76, Volume 2, NUREG 0660) suggests that "on-shift manning levels be increased to levels determined to be needed by the results of accident response task analyses." Again, it is premature to proceed with rulemaking on this topic until the appropriate research is completed.

Referring finally to NUREG 0737 and the preliminary value impact statement associated with this proposed rule, WPSC at last discovered an attempt to justify this requirement. The latter document states that this requirement is necessary (1) to ensure the presence of a person with a senior operator license in the control room at all times that a nuclear power unit is operating; and (2) to provide a minimum number of licensed personnel on each shift at all times.

NUREG 0737 states essentially the same purposes for this rule, with the justification that it would allow for the movement of key individuals (presumably, the shift supervisor) about the plant.

While WPSC agrees with the concept of mobility for the shift supervisor, we do not understand the reasoning that there should always be an SRO in the control room. WPSC's experience has shown that current staffing levels are adequate to provide for the health and safety of the public. In our off-normal experiences at the Kewaunee Plant, WPSC has shown that two qualified RO's, under the direction of the shift supervisor, can adequately handle the plant. Furthermore, since serious accidents at nuclear power plants are slow developing (e.g.: TMI-2), the shift supervisor can be allowed to move about the plant with assurance that he can return to the control room within minutes, if necessary.

WPSC has not been able to determine adequate technical justification in the referenced documents to require that an SRO be in the control room at all times. This requirement appears to have been assumed by the NRC, thus providing the basis for increasing the staff at nuclear power plants. Based on our eight years of operational experience, it is WPSC's opinion that such a requirement is not necessary.

In fact, WPSC feels that there are potential safety concerns in increasing staff sizes to a level where individuals become nonproductive. If the staff level is raised to such a point, the nonproductivity of the personnel will breed inattentiveness, which in turn can have serious safety consequences. WPSC recommends that this proposed rule be delayed to allow for the completion of appropriate research which will define the need for such a rule.

In WPSC's opinion, the safety of nuclear power plants is best served by highly qualified personnel. The number of personnel on shift will add little or nothing to safety if those personnel are not adequately prepared for their job responsibilities. WPSC feels that the NRC should not concentrate on numbers as much as on the proper selection, qualification and continual requalification of personnel. By imposing arbitrary completion dates for a rule such as this, the NRC is only undermining the key component in the safety of a nuclear power plant.

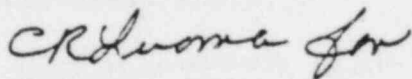
Such a generalized statement of purpose, unsupported by specific technical justification is an insufficient basis for imposition of a costly, inefficient and potentially counterproductive staffing requirement. The method of proposed implementation and lack of expressed justification suggest that the rule is being proposed more for its appearance of increasing safety than for its substance.

In summary, WPSC recommends that the commission not adopt the proposed rule for the following reasons:

1. The proposed rule violates the procedures and intent of the Administrative Procedure Act.
2. The proposed effective date is arbitrary; impositions of this arbitrary date could have severe safety consequences.
3. The commission has not provided adequate technical justification for the rule.
4. WPSC's experience at the Kewaunee Nuclear Power Plant has demonstrated the acceptability of our existing staff size.
5. The rulemaking should, at a minimum, be postponed until the appropriate analyses considering shift manning are completed. Paraphrasing the words of the Court of Appeals, the NRC has treated the safeguards of the administrative process too cavalierly, making it impossible for the public (or a reviewing court) to discern that the agency action has indeed furthered the public safety.

As always, WPSC would be happy to discuss these comments with you, and would appreciate your reply.

Very truly yours,



C. W. Giesler
Vice President - Nuclear Power

js

cc - Mr. Robert Nelson, US NRC
Mr. David Baker, Foley & Lardner



Northern States Power Company

414 Nicollet Mall
Minneapolis, Minnesota 55401
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October 6, 1982

Secretary of the Commission
U S Nuclear Regulatory Commission
Washington, DC 20555

Attention: Docketing and Service Section

Northern States Power Company appreciates the opportunity to review and comment on the proposed revision to 10 CFR Part 50 related to Licensed Operator Staffing at Nuclear Power Units published in the Federal Register on August 30, 1982.

We have the following comments to offer:

Requirement for Senior Reactor Operator (SRO) in Control Room

The proposed rule will require the presence in the control room at all times of one individual holding a senior operator license for each unit which is in cold shutdown.

At our Monticello plant (and several other plants), the Shift Supervisor's office is not located in the control room. This individual will hold one of the two SRO licenses required during plant operation. The Shift Supervisor's office is located immediately adjacent to the control room and transit time between the two areas takes less than ten seconds. Redundant communication channels are available between the two areas. We believe the rule should recognize such arrangements as being equivalent to having an SRO located in the control room.

We have long recognized the advantages of locating the Shift Supervisor's office outside of the control room (for example, reduction in traffic into and out of the control room resulting in fewer distractions to the control room operators). For smooth and efficient plant functioning, the Shift Supervisor must be easily accessible and spend most of his time in his office. The second SRO required by the rule should be free to move throughout the plant for routine inspections and evaluation of off-normal events.

Deadline for Meeting Requirements of Rule Relating to Two SRO's on Shift

The proposed rule has an implementation date of January 1, 1983. It would allow the Director of Nuclear Reactor Regulation to grant requests for extensions of the deadline to July 1, 1983, if the requests are timely and demonstrate good cause. In exceptional cases, further extensions may be granted by the Commission itself. We believe the January 1, 1983 deadline is unrealistic and the extension policy contained in the proposed rule is not liberal enough.

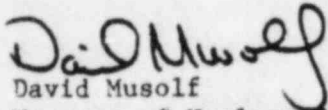
NORTHERN STATES POWER COMPANY

Secretary of the Commission
October 6, 1982
Page 2

The requirement for two SRO's on shift is an especially difficult one for a one-unit plant site to meet. At our Monticello plant we initiated steps long ago to increase the number of licensed and senior licensed operations personnel in conjunction with implementation of Item I.A.1.3.2 of NUREG-0737. On February 5, 1982 we requested an extension in the implementation schedule for Item I.A.1.3.2 until February 15, 1983 to train and license additional senior licensed personnel. In spite of good faith efforts, our goal of two SRO's per shift has not yet been met and we now believe an additional schedule extension request will be necessary.

We believe the proposed rule underestimates the difficulty involved in selecting, training, and licensing personnel. At a time when licensing requirements are becoming more rigorous and experienced personnel are in short supply, more training and preparation are necessary for license candidates. The final rule should recognize this fact and contain a realistic implementation date for the shift manning requirements. January 1, 1984 would be a realistic implementation date.

Please contact us if you have any questions concerning our comments related to the proposed licensed operator staffing rule.



David Musolf
Manager of Nuclear Support Services

DMM/bd

cc: Regional Administrator-III, NRC
NRR Project Managers, NRC
NRC Resident Inspectors
G Charnoff

YANKEE ATOMIC ELECTRIC COMPANY



1671 Worcester Road, Framingham, Massachusetts 01701 GLA 82-48

2.C.2.1
FYC 82-18
GLA 82-48

September 27, 1982

Secretary of the Commission
United States Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Docketing and Service Branch

Subject: Comments Pertaining to Licensed Operator Staffing; Proposed Rule
(47FR38135, 30 August 1982)

Dear Sir:

J.E. Tribble
D.E. Vandenburg
W.P. Johnson
L.H. Heider
D.W. Edwards/R.E. Helfrich
JAK/JBS/RFG/AL
ACK/LDM/RFS/JD
J.G. Robinson B.B. Beckley
S. Thomas
E.E. Pilat D.E. Moody
B.C. Slifer J.T. Cady, Jr.
J.H. Moody P. Higgins
W.G. McGee R.W. Huston
W.F. Conway
R.W. Burke
J.H. Garrity
J.B. Randazza

We welcome this opportunity to exercise our privilege of submitting comments. Yankee Atomic owns and operates a nuclear power plant in Rowe, Massachusetts. The Nuclear Services Division also provides engineering and licensing services for other nuclear power plants in the Northeast including Vermont Yankee, Maine Yankee, and Seabrook 1 and 2. The GLA-2 Lic. File

INTRODUCTORY REMARKS REGARDING LICENSED OPERATOR STAFFING

Yankee Atomic recognizes that some licensees already comply with the proposed staffing requirements for licensed operators. Others may achieve compliance before the proposed deadline of January 1, 1983. Still others, and we think the majority of licensees, will be unable to achieve the proposed levels of staffing by that deadline. Many in this latter category have already requested extensions beyond that date. Thus, the proposed rule abruptly confronts some licensees with the penalties of noncompliance, but rewards others who have already established their licensed operator staff consistent with NRC's proposed requirements.

The post-TMI literature that NRC cites in the proposed rule provides no explanation for NRC's belief that a backup SRO is necessary for reasons of increasing safety during plant operation. The President's Commission on Three Mile Island does not address staffing levels for licensed operators. The conclusions reached in other documents such as reports of the NRC's Special Inquiry Group, Lessons Learned Task Force, or Bulletins and Orders Task Force are official pronouncements and policy statements, not administrative rulemakings. They do not reflect the required level of reasoned decision-making that must precede NRC's promulgation of a new requirement.

In our opinion, the need for this proposed requirement has not been adequately established; especially in view of the difficult and unsettled task of describing what is the appropriate relationship between Control Room design, emergency operating procedures, and human factors. The questions raised by these relationships are multi-faceted, and cannot easily be resolved by a single-issue rulemaking. We believe the rule is premature and recommend that NRC delay their decision on licensed operator staffing, until the numerous and extensive studies now underway by NRC and Industry are completed (see Attachment to this letter). These studies are part of NRC's integrated effort to establish shift crew qualifications, which is necessarily related to the question of licensed operator staffing. The Attachment summarizes these studies, which represent a more holistic and less ad-hoc approach than this isolated proposal. At least five key activities are underway, representing a very significant commitment of

NRC and Industry resources, that would appear to provide the sound basis this proposed rule lacks. We believe that by proposing this rule in advance of gaining knowledge from these programs, the NRC may put the cart before the horse.

DISCUSSION OF THE PROPOSED RULE

1. A fixed deadline for compliance of January 1, 1983, even with the privilege of requesting extensions, may not be the most fair and reasonable choice.

The proposed rule establishes a deadline of January 1, 1983, for meeting its minimum licensed operator staffing requirements, but permits the Director, NRR, to grant extensions "for good cause" to July 1, 1983. Many utilities have already requested extensions from this date, based upon the NRC's criteria set forth in the Supplementary Information section. Although the proposed rule further provides for extensions, granted by the Commissioners to beyond July 1, 1983, no criterion are established for what "exceptional cases" would be eligible for such extensions. Despite NUREG-0737's prior requirements, concerning staffing levels for licensed operations, this proposed rule is the first official opportunity that NRC has provided for submitting comments on these requirements. Licensees are now faced with a codified deadline concerning staffing levels, and this proposed rule in which NRC has provided less than thirty days for public comments and merely four months until compliance is required.

We believe that an "exceptional case" may already exist for any request for extension beyond January 1, 1983. This date is too soon for many licensees, and does not correspond to a future date when results will be available from the extensive ongoing activities, listed on the Attachment to this letter. In particular, INPO's Survey of Occupational Employment in Nuclear Power Activities, which is due October 1982, could be consulted by NRC for projecting personnel availability and demands for licensed operators. There may be reason to find that January 1, 1983 is not the most fair and reasonable deadline that could be chosen. Moreover, NRC action in advance of the INPO survey will negate the purpose and timeliness of the survey, contrary to the spirit of Industry cooperation with NRC, which INPO has fostered since its formation.

2. Instead of fixing a deadline that may be unrealistic for many Utilities, NRC should permit each licensee to negotiate a more viable commitment date.

In the area of NRC requirements for emergency preparedness capability, the Committee to Review Generic Requirements has distilled many isolated, and in some cases ad-hoc, requirements into a single document in SECY 82-111. The Commissioners have approved a scheme for licensees to negotiate their commitments to SECY 82-111 requirements, together with their NRC Project Managers. The Commissioners explicitly recognized that a discrete deadline for the diverse SECY 82-111 emergency preparedness requirements would be unfair to many Utilities, who were continuing with good-faith efforts to implement these capabilities in the absence of a concise regulatory requirement.

Similarly, we believe that a negotiable commitment scheme is appropriate for licensed operator staffing requirements. Thus, NRC would demonstrate a fair consideration for a Utility with, among other factors, an active recruitment program, sufficient personnel in training, and an adequate training program. A fixed deadline can be unnecessarily demoralizing, to a utility whose good-faith efforts in these areas is only to be met with a finding of noncompliance, with the premature and arbitrary deadline of January 1, 1983.

3. Staffing requirements that abruptly increase, at a pre-selected core-average temperature, are unnecessarily inflexible and may prevent a Shift Supervisor from leaving the Control Room even when safety demands his presence elsewhere in the plant.

According to the proposed rule, taking pressurized water reactors for illustration, the minimum requirements for Senior Reactor Operators increase by one when core-average temperature reaches 200°F. A shift Supervisor supervising a plant heatup to normal operating temperatures would be forbidden from leaving the Control Room, in case he is needed elsewhere, until a second Senior Reactor Operator reports to the Control Room for duty. Thus, the consequence of basing the requirement upon temperature is paradoxical: either the plant heatup would be delayed until the second SRO arrives, or the SS must disobey a requirement if an emergency arises and he must exit the Control Room before the SRO arrives. Nothing about 200°F, however, compels this result for all pressurized water reactors. Plant operations are not suddenly made unsafe at 200°F, so that two SROs on Shift are necessary. And nothing is desirable about forcing a plant cooldown, merely so the SS can leave the Control Room. A pre-selected temperature transition point of 200°F for all plants is unrealistic since it does not correspond to any identified risk of plant operation, which would demand another SRO, and may create a safety hazard if it operates as a discentive for a SS to go where he is needed most.

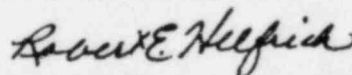
We believe, for example, if this proposed rule is promulgated, that a better way to administer the requirement for a backup SRO would be to key on Operating Modes 1-6, which are defined for each plant, and to only require the second SRO before a expiration of the subsequent shift. Thus, the transition-requirement more naturally corresponds to plant-specific definitions of modes, and a reasonable period of flexibility would exist to permit the SS to roam freely about the plant without delaying operation, until a backup SRO arrived.

CONCLUDING REMARKS

Yankee Atomic believes that this proposed rule should not be promulgated in advance of results of those NRC and Industry Activities listed as the Attachment to this letter. In addition, it should only be promulgated if NRC establishes that additional compliance costs to Utilities are justified by avoiding identifiable risks of plant operation as a consequence of requiring more licensed operators on shift. Otherwise, we feel the rule is both premature and not properly justified by reasons of significantly increasing plant safety.

Very truly yours,

YANKEE ATOMIC ELECTRIC COMPANY



Robert E. Helfrich
Senior Engineer - Generic Licensing

ATTACHMENT*

Projected Availability

Item

October, 1982

INPO Survey of Occupational Employment in Nuclear Power Activities, to determine employment status and demand for licensed operators by Utilities.

November, 1982

Brookhaven-Pacific Northwest Labs Contractor Report for the NRC's Division of Human Factors Safety, for use in developing guidelines for shift staffing and qualifications requirement.

December, 1982

NRC Division of Human Factors Safety Project, Preliminary Report, to define the preferred role of an engineer on shift, including: functions, responsibilities, qualifications, organizational relationship, integration with other operating staff.

June, 1983

NRC Division of Human Factors Safety, Application of Instructional Systems Development to Evaluation of Nuclear Utility Training, project to develop guidelines for operator training programs in the nuclear industry and for specific positions and plant type.

June, 1983

NRC Division Facility Operations, NRC-RES Job/Task Analysis, project to obtain detailed information on crew operations during transient and accident conditions, on human engineering design on Control Room number and types of operations, training requirements, etc.

July, 1983

INPO Job/Task Analysis, project to obtain detailed data and descriptions of skills and knowledge requirements of ten operational positions (e.g., RO, SRO, AO, SS, STA, etc.).

* Presentation by Dr. J. Persensky, NRC Licensee Qualification Branch, September 1, 1982 Meeting of AIF Subcommittee on Reactor Operations and Maintenance

- ° LACK OF JUSTIFICATION

- ° OTHER PENDING INITIATIVES

- ° SCHEDULE AND PLANNING IMPLICATIONS

- ° SAFETY IMPLICATIONS

- ° LACK OF JUSTIFICATION
 - LER EXPERIENCE
 - INDUSTRY STUDIES
 - INPO TASK ANALYSIS
 - NRC RESEARCH

- ° OTHER PENDING INITIATIVES
 - STA
 - TABLE B-1
 - COLLEGE CREDITS
 - DEGREED SHIFT SUPERVISOR
 - SHIFT ENGINEER
 - OVERTIME RESTRICTIONS
 - No. OF SHIFTS INCREASED
 - SIMULATOR EXAMINATIONS

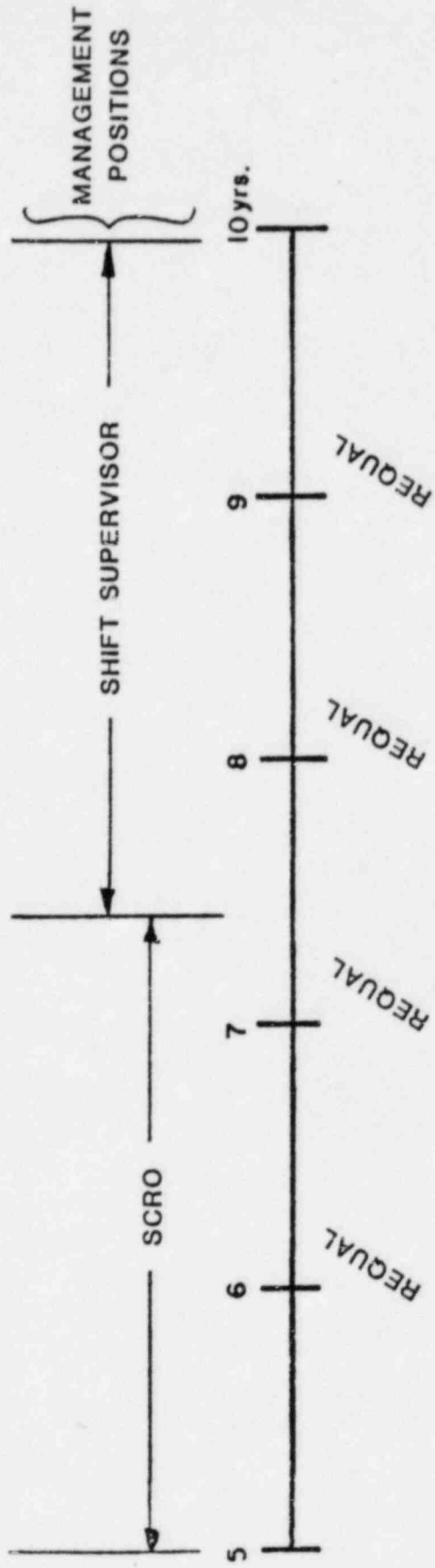
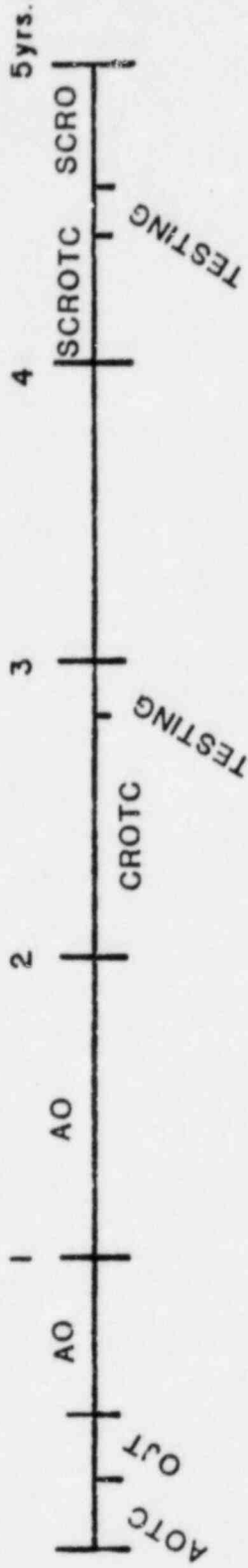
° SCHEDULE AND PLANNING IMPLICATION

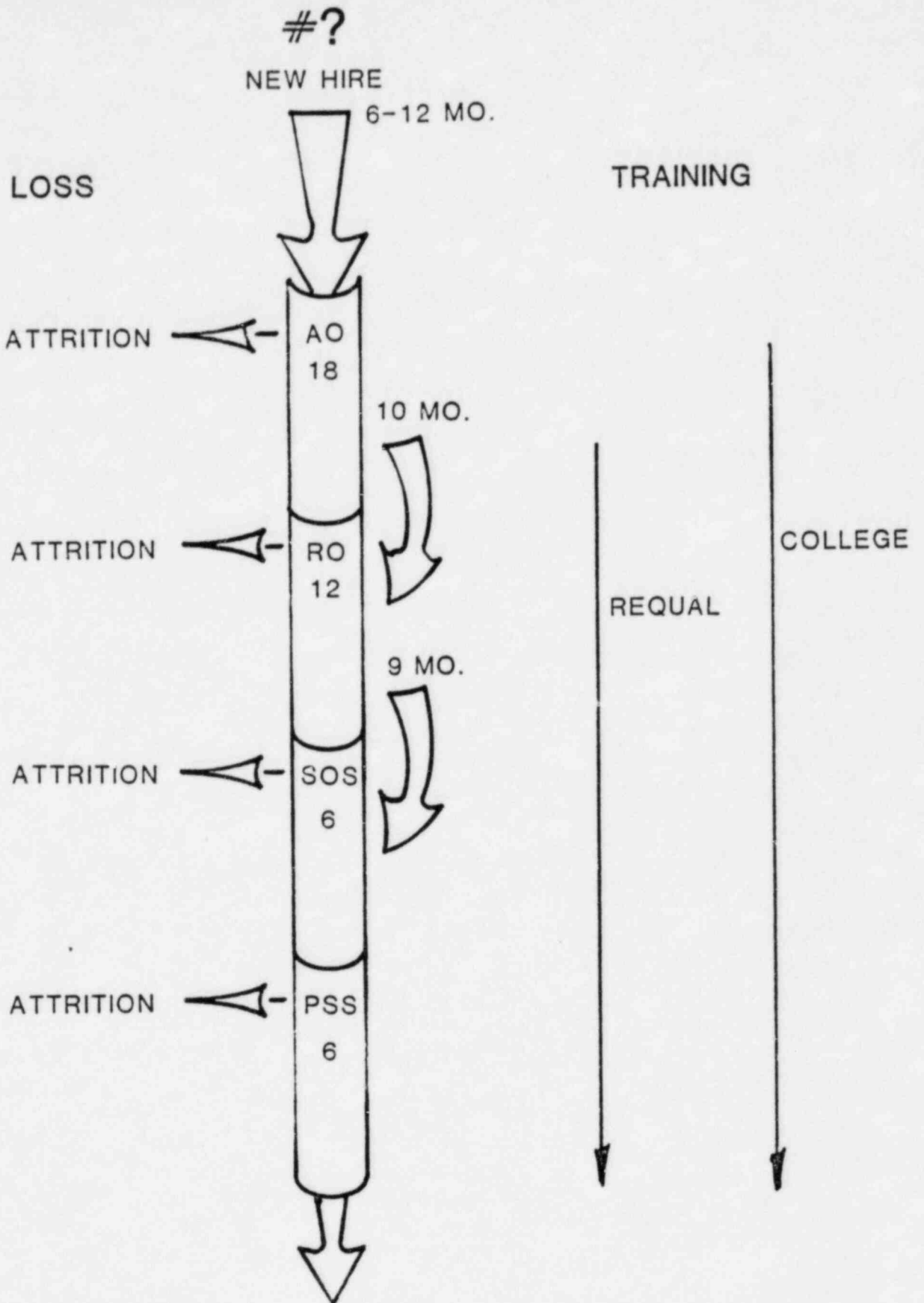
- EXPERIENCE REQUIREMENTS
- EDUCATION REQUIREMENTS
- TRAINING REQUIREMENTS
- MORE DIFFICULT EXAM STANDARDS
- EXPANDED TRAINING STAFF AND REQUIREMENTS
- REQUALIFICATION EXAMINATIONS
- EXPANDED NEED FOR LICENSED PERSONNEL

° SAFETY IMPLICATIONS

- DILUTION OF OPERATING EXPERIENCE
- LESS EXPERIENCE ON SHIFT
- POSSIBLE INATTENTIVENESS

CURRENT





proposal AS of 10/82

8/82 12/82 3/83 8/83 12/83 3/84 8/84 3/85 8/85

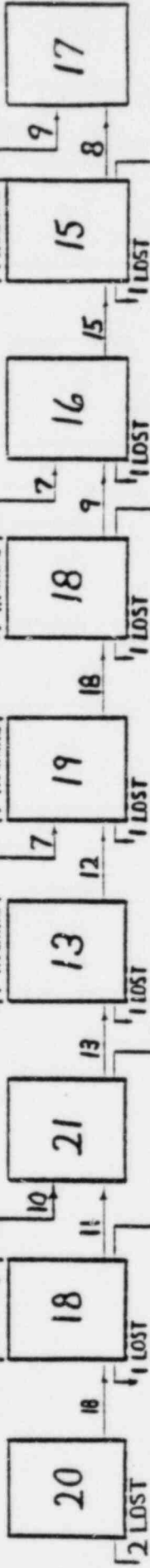
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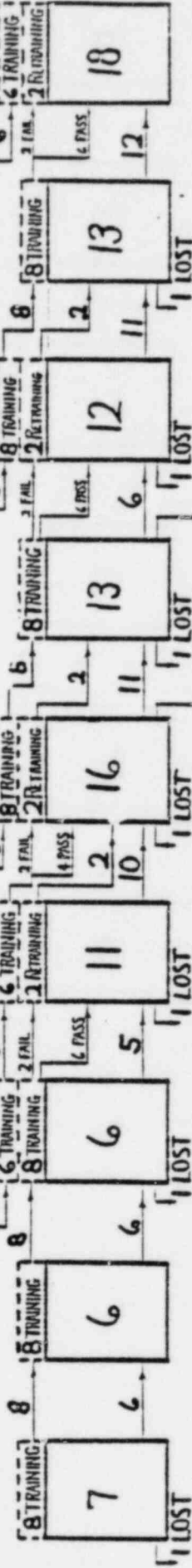
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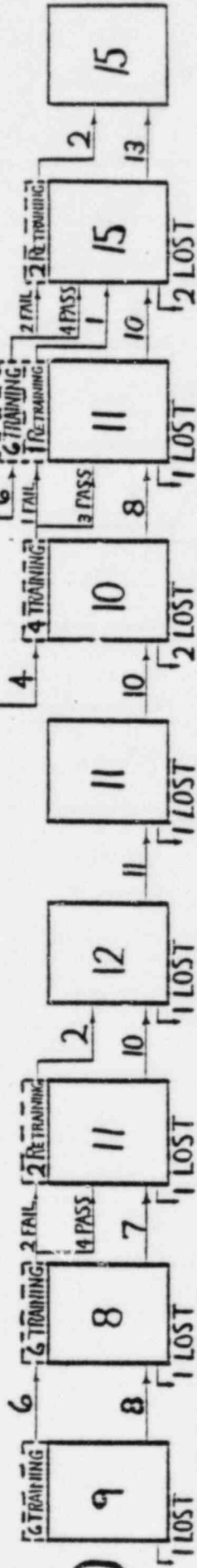
AO



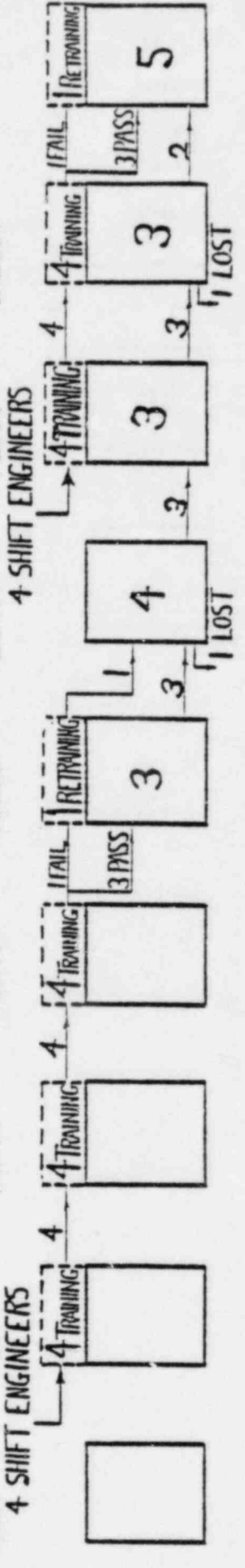
RO



SRO



SE



**MAINE YANKEE
EXAM FAILURE RATE**

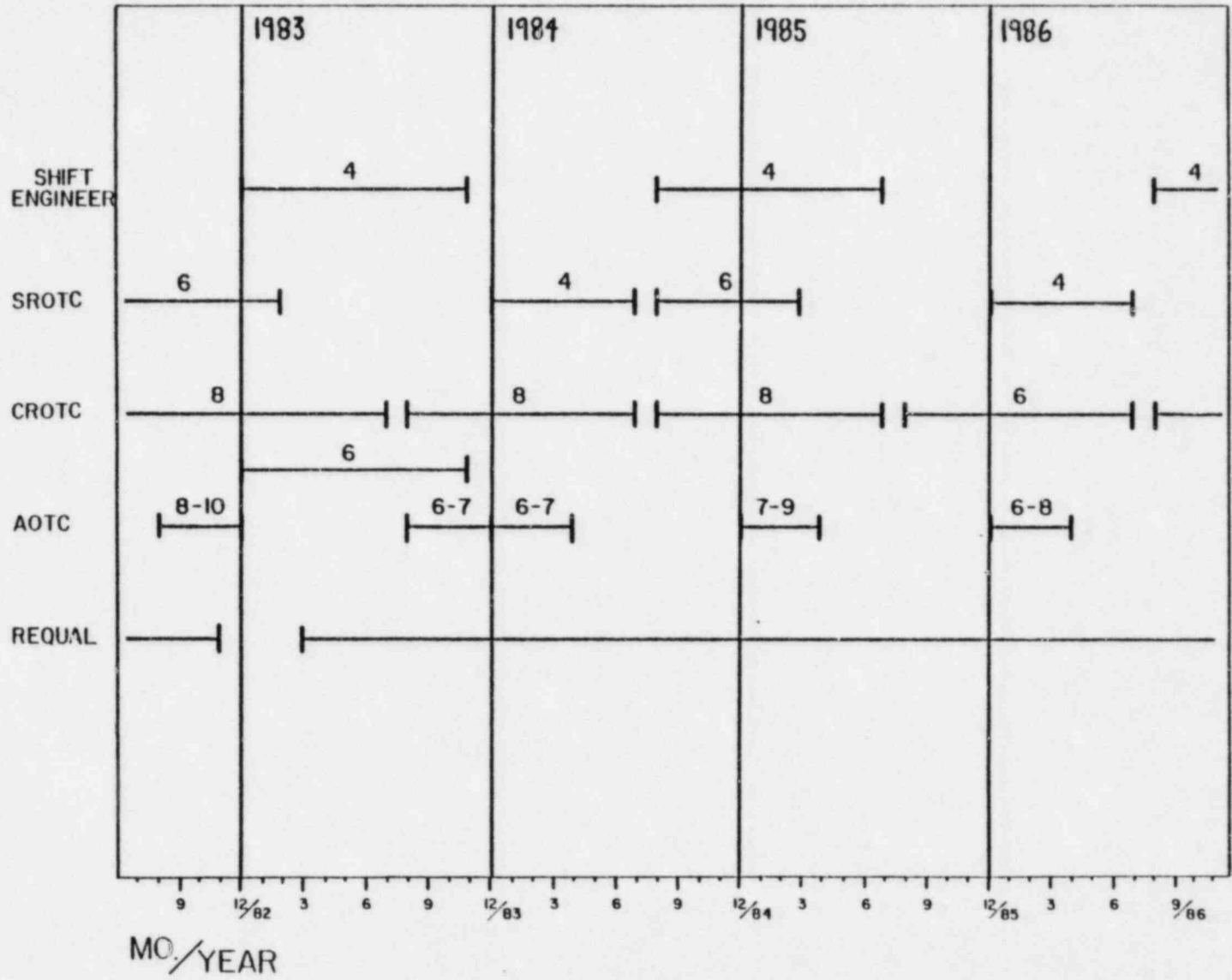
PROPOSAL AS OF 10/82

	PROGRAM			
	START	COMPLETE	PASS EXAM	
1979				
SRO	—	—	—	
CRO	5	4	4	
1980				
SRO	3	3	3	
CRO	6	4	4	
1981				
SRO	7	6	4	
CRO	6	4	4	
1982				
SRO	6	4	4	
SRO	1	1	1	
CRO	10	7	7	
SRO	5/3	<div style="border-left: 1px solid black; border-right: 1px solid black; padding: 0 10px;"> 1983 Completions </div>		
CRO	8			
<hr/>				
TOTAL				TOTAL
LESS UNFINISHED PROGRAMS	SRO	18	14	12 (67%)
	CRO	27	19	19 (70%)
		78%	86%*	
		70%	100%	

*2 RESIGNED

-7-

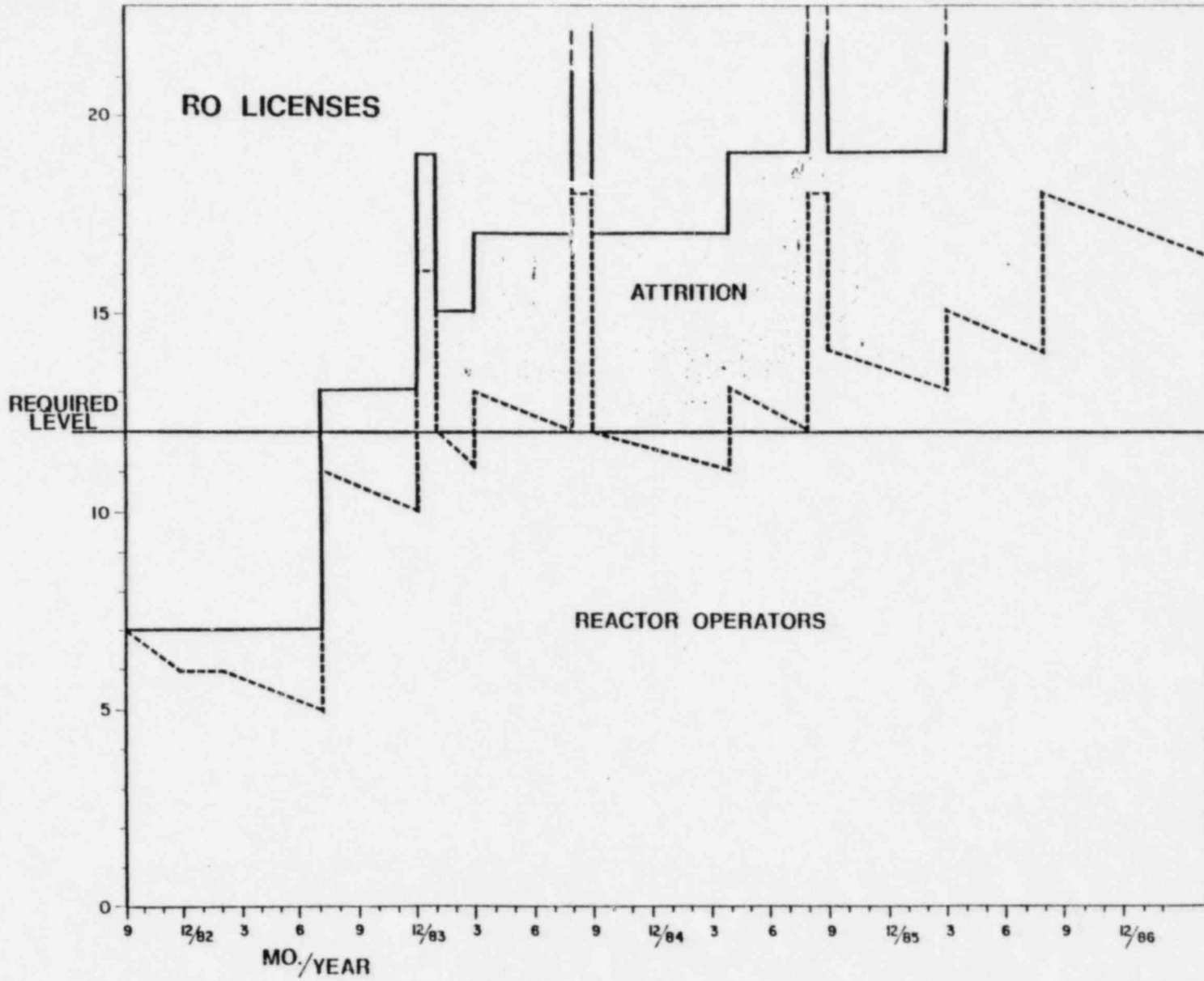
PROPOSAL AS OF 10/82



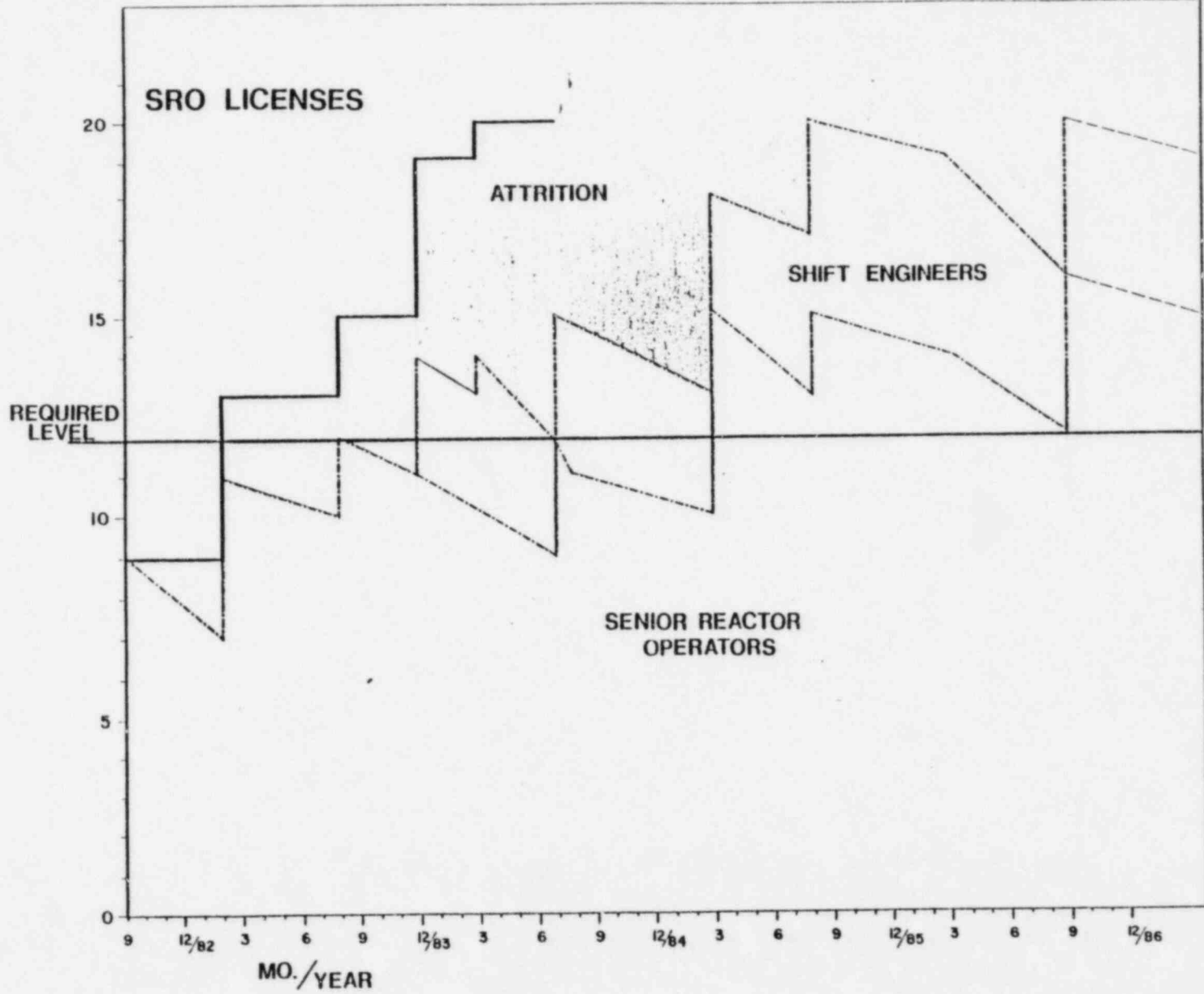
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8

MO/YEAR

PROPOSAL AS OF 10/82



PROPOSAL AS OF 10/82



10-

MAINE YANKEE
Operations Dept.
Attrition Rate

PROPOSAL AS OF 10/82

YEAR	AUXILIARY OPERATOR	CONTROL ROOM OPERATOR	SENIOR CONTROL ROOM OPERATOR	TOTAL
1977	1	4	2	7
1978	0	4	2	6
1979	3	1	2	6
1980	2	1	0	3
1981	4	1	5	10
1982	1	0	3	4
<hr/> <hr/>				
TOTALS	11	11	14	36
AVG./YR.	1.83	1.83	2.33	—
PLANNING RATE/YR.	2	2	3	7/year