Transcript of Proceedings

PRESIDENT'S COMMISSION ON THREE MILE ISLAND

INTERVIEW OF RICHARD T. KENNEDY

Washington, D. C.

Wednesday, 5 September 1979

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INTERVIEW OF RICHARD T. KENNEDY

Room ~~1115~~ 1113
1717 H Street, N. W.
Washington, D. C.

Wednesday, 5 September 1979

The Interview of Commissioner Richard T. Kennedy was convened at 10:15 a.m.

PRESENT:

KEVIN P. KANE, ESQ.
Deputy Chief Counsel, President's Commission on Three Mile Island

MARK E. CHOPKO, ESQ.
Attorney for NRC; for Commissioner Kennedy

JAMES A. FITZGERALD, ESQ.
JOHN STEPHENS, ESQ.
Attorneys for NRC

CLAUDIA STETLER
Assistant to Commissioner Kennedy

C O N T E N T S

WITNESS:	EXAMINATION:
Richard T. Kennedy	3

E X H I B I T S

KENNEDY EXHIBIT NO.:	IDENTIFIED
1	4
2	146
3	152
4	153

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P R O C E E D I N G S

Whereupon,

RICHARD T. KENNEDY

was called as a witness and, having been first duly sworn, was examined and testified as follows:

BY MR. KANE:

Q Would you state your full name for the record, please?

A Richard Thomas Kennedy.

Q Have you had your deposition taken before, Mr. Kennedy?

A Not in respect to this matter, but I have been deposed on previous occasion.

Q Let me briefly remind you of what we're doing here today. You have been sworn, and although we're sitting in the relative~~ly~~ informality of ~~our~~ your office, you should be aware that what you will give today in the way of testimony has the same force and effect as if you were testifying in a court of law. My questions and your answers are being taken down by the reporter here. They will subsequently be reduced to a booklet form. You will be given an opportunity to examine that booklet and to make any changes you deem necessary. However, it's important to avoid the necessity for changes as much as possible by being as accurate and precise as we can now. For that reason, if at any point you

don't understand a question or if you feel an answer needs some elaboration or clarification, please stop and indicate that you feel that is the case and we will make that clarification or that addition to the record at that time.

Lastly, let me remind you two of the basic ground rules in a deposition. One is that you respond audibly to my questions since the reporter cannot take down a nod of a head or gesture, and secondly, that you permit me to finish my questions before you respond even if you know what the question is going to be, as well may be the case, simply because the reporter cannot take both of us at the same time, and it make for a confused record. Do you understand all that?

A I do.

Q Fine. I have here a biography which was apparently previously provided to the Presidential Commission which I ha extracted from our files. It appears to be a biography of you, Mr. Kennedy.

Let me ask you if that is an accurate statement in summary form of your education and background.

A Yes, it is.

Q Let's have this marked as Exhibit 1 to the deposition, please.

(Kennedy Exhibit 1 identified.)

BY MR. KANE:

Q You became an NRC commissioner in January of 1973

Would you please describe your duties as an NRC commissioner?

A Yes. I share responsibility with my colleagues and am responsible for the general administration, operation of the organization, that is, the total NRC and its staff. And I am responsible for administering the laws under which the NRC functions, that is, the Atomic Energy Act as amended, including the Energy Reorganization Act which, in fact, created the NRC.

Q How much involvement do you as an NRC commissioner have in the actual day to day work of the NRC staff?

A I would say comparatively little given the fact that the day to day work of the NRC staff is of a highly technical nature involving the review of specific technical details, surrounding issues involved in the licensing processes and in the general inspection and enforcement processes. I should note that in addition to those things which directly concern, I think, the Presidential Commission' work, there are a large number of other issues before the NRC which involve our safety functions also.

The question of the licensing of materials, for example. The questions of safeguards which involve principally nuclear materials. We have a substantial research program. I do no I am not involved on a day to day basis, on a continuing bas in detail those matters, but rather in a general supervisory and policy viewpoint.

Q Coming back to the work of the NRC staff, you do have technical assistance available to you, don't you?

A That's correct.

Q Can you utilize that technical assistance to help you in evaluating any technical matter the NRC staff may be working on?

A I do.

Q Specifically looking at something like plant licensing, how much involvement do the NRC commissioners have as a group in plant licensing processes?

A The specific processes begin with detailed reviews that are performed by the staff. As a general rule I think commissioners are not involved in a major way in that kind of review. It's highly technical. It's based upon involved calculations and computer codes and the like. Commissioners do not typically involve themselves in that type of work.

When, however, a question arises either in a generic or a broad sense, the commissioners will become involved to determine the extent to which those generic matters need to be pursued or need to be factored into the existing licensing processes as to existing plants or proposed plants. At the same time, the commissioners also are involved in a review on the adjudicatory side in the licensing processes from time to time of specific questions that arise from the boards or

from the appeal board.

Q I wanted to ask you exactly how that works, Mr. Kennedy. As I understand it, there is Atomic Safety and Licensing Boards and then Atomic Safety and Licensing Appeal Boards. Beyond the appeals boards on occasions an appeal in a given licensing decision is taken to the commission itself; is that correct?

A That's right.

Q And how many appeals to the commission from the Atomic Safety and Licensing Appeal Board decisions have been made since you have become an NRC commissioner?

A I can't recall the number. I would say --

Q Is it large?

A No, it's not a very large number. I could give you an answer for the record, but I can't do it right now. I could check.

Q Perhaps we could have that followed up on. Just in terms of round numbers, do you think it's less than 10 times since you have been a commissioner?

A Well, I just don't know. I honestly don't know what the number is. I doubt it would be that small. That is something we can actually nail down. Let's do it. I just don't remember.

Q Do you think it's been as many times as, say, 50 times, or does that sound too much? I would just like to ge

an idea.

A That sounds a little high, but let's get the right number. We can get it.

Q Is that an appeal of right by the intervenors or the parties to it or something done only at the discretion of the commission?

A No. The commission -- in the first place, the commission can take a case on its own volition, but there are grounds for appeal within the regulations, and those grounds can be exercised by a party who finds himself in a position in which he can use those grounds.

Q If those grounds are invoked, then the commission is called upon to hear the case?

A The commission will take the case, normally.

Q In instances in which intervenors have become dissatisfied, has it been your experience that they will invoke that procedure and come to the commission?

A My understanding is if they don't, they will not be able to further invoke the right to go to the courts. Normally, the courts look to the intervenor to come to us since that is his right.

Q Required to utilize those?

A Right.

Q How many appeals has the commission taken up on its own initiative in licensing decisions?

A Again, I can't recall the number. There have been cases in which the commission has elected to review a decision either of the appeal board or of the Atomic Safety and Licensing Board.

Q When the commission elects to take up an appeal or when an appeal is presented to the commission by one of the parties to the proceedings below, how does the commission go about evaluating technical questions relating to that appeal?

A Well, the commission has its -- has some technical capability on its -- what shall we say -- it's sort of personal staff, that is, in the office of policy evaluation so-called OPE. It's a -- this is a group in which there is some technical expertise. The commission is able to apply that technical expertise plus the technical assistants, too. Each of the commissioners, of course, are able to bring some technical expertise to bear.

The commissioners are not totally without this kind of expertise. Obviously they do not -- except in the particular instance ~~either~~ of our present chairman -- they do not have the extraordinary amount of technical expertise which the average staff member will have. Nonetheless, they are famili with a number of the technical issues. They have reviewed many of the issues in previous matters. So they're able to call upon that background, but as to the detailed technical

review, it's done by experts who are available to the commission directly.

Q So the commission, at least in part, in seeking further technical elaboration, would go back to the staff?

A It may. But what I'm saying is that it has this independent capability, independent of the larger staff.

Q That is the technical assistants?

A It has personal staff in the way of OPE and the individual technical assistants of the commissioners.

Q At some point prior to the appeal reaching the commission, the staff customarily has taken a position on whether or not the license should be issued, have they not?

A Yes.

Q Presumably if the appeal is coming up from intervenors, the determination has been that the license should be issued and someone's objecting and they want it brought to the commission. Do you think under those circumstances that it raises some difficulty in the commission going back to the staff for further technical elaboration to decide an appeal upon which the staff has already taken a position?

A I'm suggesting again that to the extent it does that, is not asking for -- it would not be asking for staff to argue its case at that point. It would be asking for specific technical facts. Now -- but as to further review and evalua

the evaluation will be done by the personal staff, that is, the OPE people, and which is staffed directly to the commissioners rather than the licensing staff.

Q I see. So the office of policy evaluation would be entirely independent of the licensing staff?

A That's correct.

Q Your technical assistants, Mr. Kennedy, how many do you have?

A I have one technical assistant and a further assistant who is an intern, has been an intern but has been elevated to a full assistant.

Q So you have two, then?

A Yes.

Q How much involvement as an NRC commissioner do you have with analysis of safety problems at operating nuclear power plants? I don't mean just on a generic basis but even on a plant specific basis.

A Every time that we get a report of a -- and we get them increasingly now -- of an unusual incident, we try to follow up through my technical assistants to find out what the significance of the matter is, what the staff thinks about it, and we look for their analysis.

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Q Do you regularly get reports of safety prob that have arisen at operating nuclear power plants?

A Yes, we do.

Q Can you explain the process whereby you are informed of that?

A Well, first there is the ~~licensing of that~~ licensee event report. Secondly, there are, of course, the reports from our inspection and enforcement staff and the licensees under a variety of circumstances, and I can't recite them all, are required to notify even by phone our regional offices of particular kind of events.

Q Twenty-four-hour notification?

A Yes. These matters are put before us promptly by the staff by means of a report which comes to us very quickly in which the event is summarized. The title of which is — I don't even remember.

Q Is that a weekly publication?

A No. What I am talking about is a — we'll get to perhaps a half a dozen a day of specific reports of incidents or events which range from notices that plants may have been — a plant may have been the subject of some demonstration which has potential ~~possible~~ safeguards implications or certainly would be a matter of public notice that the Commission should be aware of to an event of actual — of safety significance where leakage has been ascertained

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in a particular piping system and required either a temporary or longer-term shut-down to fix it.

Q So these are summaries of LERs which are routed on a daily basis?

A No. They don't represent necessarily LERs.

Q Or I&E reports?

(Discussion off the record.)

BY MR. KANE:

Q Mr. Kennedy, while we have been off the record, we have been discussing the various ways in which the NRC Commissioners — some of the ways in which the NRC Commissioners are informed of events at operating nuclear power plants. Before we went off the record, you were making reference to this daily type of information that you get and I believe you commented off the record that this is the preliminary notification procedure whereby for certain types of events, at least, the licensees are required to report to the NRC within a 24-hour period.

Was that ~~when~~ what you were referring to when you talked about the daily notification?

A Yes, that is the notification that comes to us from the staff. It is not the notification that came from the licensee. But that is certainly correct. We may get this information much quicker than 24 hours, depending what it is.

Q You also mentioned a weekly notification procedure?

A This is a procedure of ~~the~~ weekly staff notes, which are a summary of important events from the staff. It ranges across the entire staff.

Q Is there any further means by which the NRC Commissioners are notified of the contents of 30-day LERs that may be submitted by licensees or would that come up in the context of the weekly notification of issues that the staff thinks are important?

A I think that is the most likely way.

Q How long, that is, this procedure of preliminary notification coming through the staff to the NRC Commission for a — on a very timely basis and also this weekly notification procedure — how long has that existed?

A So long as the Commission has existed.

Q Since you have been here in 1975?

A Yes.

Q This daily notification procedure, is that a summary of what the staff has perceived to be a —

A This is a — each of these relates to a specific event. It is a summary of the nature of the event and whatever the staff knows about it at the time it forwards the notification to us. It says it is a preliminary notification.

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This is a matter of continuing significance. It will be followed by a more detailed report by the staff either in the form of a briefing or a memorandum which will describe something more about the event and what steps need to be taken to deal with it.

Q Can you recall any instances in which the NRC Commission after receiving that kind of notification from the staff has deemed certain action to be necessary and held a collegial meeting, if you will, and moved on that?

A Yes. There have been such events. I can't identify particularly which ones. In addition to that, I think individual commissioners and I certainly among them, react to these things frequently by asking for additional information about the event itself, the process by which it would be dealt with by the staff, its genesis.

Q There has been a good deal of discussion in the course of the Presidential Commission investigation about a transient which occurred on September 24, 1977, at the Davis-Besse plant in Ohio. Have you made any effort to determine whether or not the preliminary notification which was submitted on that particular transient was transmitted in any form to the NRC Commissioners?

A I have not checked this but I am reasonably confident that in fact it would have been the subject of a preliminary notification to the Commissioners.

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Q Okay. Can you describe —

A Again, I can check that positively.

Q Can you describe the format of what this preliminary notification that comes to your desk looks like?

A I could give you a copy of one.

Q That would be excellent.

(Discussion off the record.)

BY MR. KANE:

Q The licensing and training of reactor operators is a subject that's come up several times in the course of the investigation. As an NRC Commissioner, Mr. Kennedy, how much involvement have you had in the process of licensing and training of reactor operators?

A As a Commissioner, not a great deal.

(Discussion off the record.)

BY MR. KANE:

Q Just so we can clarify this, Mr. Kennedy, my misunderstanding. I had thought that the preliminary notifications were something which were generated by the licensee. However, I have been corrected while we have been off the record by your counselor, and as I understand it, the preliminary notification is generated by the NRC staff based upon the 24-hour telephonic notice that they receive from the licensee and that preliminary notification itself is then passed to the NRC Commissioners on a daily basis; is

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that correct?

A There may be several a day.

Q All right. But on a very timely basis?

A Yes.

Q Coming to the question of reactor operator training and licensing, I believe you state you had very little involvement as an NRC Commissioner?

A In a direct sense.

Q Why has that occurred?

A Well, we were, I think, aware generally of the nature of the program. We understood the nature of the training. Let me say that when I say ~~why~~ that I had no direct involvement, I meant simply in the actual training program itself or in the actual licensing of the operators.

But I was aware and indeed, visited on a number of occasions training facilities where this operator training was actually taking place on simulators operated, by the way, by the vendors of the equipment involved.

But it was a matter handled by the staff.

Q Was it a matter which, as far as the NRC Commission as a collegial body was concerned, did not need or require the attention of the NRC Commission itself? Was there a feeling among the NRC Commissioners that the matter was being adequately handled by the staff?

A I think that is a fair conclusion.

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Q Is that — does that continue to be a fair conclusion as of today?

A I do not think so. It is perfectly clear to me, at least, that a number of changes in the operator licensing program are necessary and many of them are already under way.

Q Would you say the same with regard to the plant licensing program of the NRC?

A The plant licensing program? You mean — you mean do I think it was a program with inadequacies?

Q Yes.

A Well, let me say, Mr. Kane, that I doubt there is any program of any kind of which I am aware that could not be a better program. I think there have been inadequacies in the licensing reviews.

I think, on the other hand, on balance, the program has been an effective one. I think there are improvements that can be made in it and they will be made.

Q Do you think prior to the Three Mile Island accident on March 28, 1979, the perception of the NRC Commissioners was that the plant licensing program was being adequately handled by the staff?

A Let me speak of this Commissioner; I don't want to speak for my colleagues, please.

I am sure they can — they would be more than happy to

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express themselves. My own perception was that the licensing process was continuing to improve. The reviews were becoming more and more stringent.

Remember, this is a process which had been evolving over a number of yearswup to the date of the standard review plan. With the standard review plan which in a sense codified all of the work up to that time, the review programs increased in their intensity.

So, on balance, I would say yes, that my perception was that this was an effective program. I still believe that.

Q That was my next question.

A I still believe that.

Q You believe after the Three Mile Island accident it still continues to be an effective adequate program?

A Now wait. Effective, I said.

Q Excuse me.

A One can, as I said, find ways to improve it and it should be improved.

Q All right. Yes. There is always room for improvement, Mr. Kennedy. Do you feel as the licensing program is currently constituted that it is an adequate program for the protection of the public health and safety, as it is currently constituted?

A I believe the program does adequately protect the public health and safety.

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Q Are you aware that single-failure analysis is one of the cornerstones of the NRC approach to the licensing process?

A I am.

Q Can you briefly explain what single failure analysis means, as you understand it?

A As I understand it, this is an analysis which is based on the assumption that you take the worst case and analyze that, guard against it, and you will then have essentially protected against lesser events.

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Q Does single failure analysis necessarily involve the assumption that in any given failure scenario, only a single system will fail as opposed to a series of failures, each of which is independent of the other but which collectively causes serious effect?

(Discussion off the record.)

BY MR. KANE:

Q Just before we went off the record, I believe I was asking you whether or not an essential assumption of single failure analysis is that you will not have multiple failures, one independent of the other.

A I think that is correct.

Q At TMI-2, what we had was a series of multiple failures, did we not?

A That's correct.

Q To that extent, the fact that TMI-2 happened at all as an accident would suggest that single failure analysis is not a reliable approach; is that right?

A No, I don't think that follows. I think that what does follow is that we have to look harder at the question of the possibility of multiple failures. We have to look also and equally importantly at the possibility of those lesser failures. The concentration has been since I have been here and began before that, the concentration has been on the large break which would cause an almost immediate loss of

coolant. To first prevent it, and if not able to prevent it, mitigate its effects. The whole ECCS system aimed at that objective. It seems to me what TMI has taught us, among other things, is that the small break, the lesser event, if, in fact, compounded, can cause serious difficulties. We need to address those.

Q Yes. You're now speaking of the approach that was taken in the past with bounding calculations for the worst case and then the assumption being that the smaller events would fall within that umbrella. I was attempting to focus on something a little different, that is, successive or multiple failures. PORV sticking open, operater error in terminating the high pressure engines, two separate items, neither necessarily relate to the other, both happen, both contribute to the accident. The concept of multiple failures It's my understanding, and I take it it's your understanding, that in the past under single-failure analysis, that type of situation would not be addressed; is that right?

A To the extent that it was addressed, it was not a primary consideration in the review. I think that is correct. Let me point out that to do so, of course, leads one into an extraordinary set of permutations. How many of such possibilities should one analyze.

Q Exactly.

A And I don't know the answer to that but based upon

all the work that was done in the WASH-1400 study and in the Lewis committee's review of that, it seems to me there are bases for reexamining those questions. That reexamination is under way.

Q That was going to be my next series of questions actually, Mr. Kennedy. It's my understanding, and I wanted to know if you're aware, that the NRC staff has now identified the TMI-2 accident as a class 9 accident in connection with a question from the Atomic Safety and Licensing Board proceedings for Salem Unit No. 1.

A Yes.

Q Are you aware of that?

A Yes.

Q The proposed answer to Appendix D of 10 CFR Part 50 states the following about class 9 accidents; "The occurrences in class 9 involve sequences of postulated successive failures more severe than those postulated for the design basis for protective system and standard safety features. Their consequences could be severe. However, the probability of their occurrence is so small that their environmental risk is extremely low. Defense in-depth such as multiple physical barr quality assurance for design, manufacture, and operation, continued education, surveillance, and testing and conservative design are all applied to provide and maintain the required high degree of assurance that potential accidents

in this class are and will remain sufficiently remote in probability that the environmental risk is extremely low. For these reasons, it's not necessary to discuss such events in applicants' environmental reports."

Now, I take it that the fact that the TMI-2 accident occurred and the fact that the NRC staff has now identified the TMI-2 as a class 9 accident would suggest that all of that language I just read needs substantial revision, wouldn't it? It's not extremely remote. The fact is factors that have been applied here have not prevented it?

A That is true. I don't think one can say it's not extremely remote.

Q The fact that it happened does not indicate it's not extremely remote to you?

A No. I think it continues to be extremely remote. Extremely remote does not mean impossible.

Q You feel that the TMI-2 accident is the exception that proves the rule?

A I think it's an exceptional occurrence. It's an unusual case.

Q Do you feel that --

A I think that as were all such cases, I think the likelihood of its repetition or anything closely similar to it is dramatically less than it was even when it was consider remote.

Q So then you would stand by the language I just read about the class 9 accident?

(Discussion off the record.)

BY MR. KANE:

Q Was there some explanation you wanted to give in connection with what we have just been discussing?

A Let me just say that the matter that we have been discussing is a matter which is essentially before the commission in respect to a particular case. Moreover, there is a rule-making on the question of class 9 accident issue. Thus, for me to discuss that in any conclusive way here or conclusory way here could affect my ability to act on the matters later on.

Q Okay. I did want to ask you about that and this may be as good a point as any. That is the fact that it's my understanding that the NRC commissioners are called upon to play a double role, at least, and perhaps it's even more compounded. At the very least, it's my perception that the NRC commissioner is called upon in some circumstances to act as adjudicator, judge of some sort, and on other occasion is called upon to act as regulator, that is, directly administer the process of regulations applying to the nuclear power industry. Do you find that poses problems in terms of your ability to act as a regulator in situations where you may be called upon to act as an adjudicator at some point?

A No, I do not because when the particular

adjudicatory question arises, it will arise in a context in which it can be very clearly defined, circumstances described, and we can insure against the likelihood of ex parte communication fairly readily. At that point, when the situation arises, we are able to rely upon our personal staffs and the office of policy evaluation and our own general counsel to provide us with the kinds of advice and counsel that we need with respect to adjudication without affecting our role in the regulatory process.

Q For example, if you had a particular plant coming through for licensing, and the staff is doing an evaluation, a technical evaluation of the safety aspects of the plant, and for one reason or another, problems with that plant as it's going through the licensing process come to your attention as an NRC commissioner. You have your technical assistants who look into it, and you decide that the staff is making some significant error in the way they are evaluating the safety aspects of the plant. You want to do something about that as an NRC commissioner. On the other hand, you recognize the fact that it will go to the Atomic Safety Licensing Board hearing and eventually to an appeal, and perhaps to you as a commissioner on appeal. Doesn't that thought inhibit your ability to inject yourself into the licensing process prior to that time?

A Not at all. It does not.

Q I'm curious as to why that would not impeach or inhibit your position later on to act as an adjudicator.

A I don't think so. I don't see why it should. We're talking about a technical consideration and technical facts. If I am concerned about a question as to whether the staff has properly considered certain criteria, there is no reason why I can't raise that question with them. Having raised it with them, the matter would be reviewed by the Atomic Safety and Licensing Board in any event.

Q Does the NRC commission, acting as a body, have the authority to order that a license not be issued for a particular plant by the staff on the grounds that the NRC commission concludes that the plant is not safe enough?

A Yes.

Q And that would be prior to the time that the license is issued?

A Yes.

Q Again, I'm curious because had the license been issued, it could have -- and if the commission chose to do so -- it would have come to the commission on appeal; is that right?

A Yes.

Q But the commission prior to that time is empowered to interrupt the process, if it will, in order that no licens be issued?

A I believe that is correct.

Q Fine. I don't want to pin you down to any particular regulatory position and I understand this matter is under consideration, but I am curious about the theoretical basis for this. Coming back to what we were talking about, about a class 9 accident, doesn't the TMI-2 accident and its recognition as a class 9 accident change the design process by proving that class 9 accidents can happen and must be designed against?

A That is what the rule-making question is really all about.

Q You don't feel you can express any individual opinion on that without inhibiting your ability to participate in the rule-making process?

A I don't think it would be proper for me to do so. Am I correct?

Q What is the status of that rule-making proceeding as far as you know?

A Can we go off the record?

(Discussion off the record.)

BY MR. KANE:

Q Mr. Kennedy, just so we have it on the record, as I understand it from what we have just discussed off the record, there is a proceeding before the commission now relating to Offshore Power in which the question of the applicability

of class 9 type of accident analysis that would be necessary has been raised and that that matter is the subject of a rule-making proceeding before the commission now; is that right?

A That's correct. It's to be shortly. The commission is going to act to initiate a rule-making.

Q Once that rule-making proceeding is initiated, as I understand it, it would take several months before the matter is resolved?

A That's correct.

Q Does it bother you in the meantime, Mr. Kennedy, that there are some 70 operating plants in this country that have not been subjected to class 9 accident analysis?

A No, because I believe the likelihood continues to be extremely remote.

Q Okay. How does or how would the nuclear industry design against seqiences of postulated successive failures no severe than those postulated for the current design basis for protected features, in designed safety features? If you start planning for successive failures, multiple failures, where do you stop?

A Well, I think the Defense in Depth concept is in part ~~of the~~ an answer to the question. It ~~is~~ just does not seem possible to me, I don't think, to design against every conceivable set of interrelated actions. It seems to me the Defense in Depth

concept which tries to isolate the effects of systems from others so that should a system fail, and even should a second system fail, there isn't developed a synergistic effect between them and each of them is isolated in its effects.

Q How long has the NRC been utilizing the Defense in Depth concept?

A For as long as I am aware.

Q So that would be back to 1975?

A Yes. It's been a basic postulate of the licensing process.

Q It would have been used as a regular part, then, of the design and review process for Three Mile Island-2?

A Yes.

Q Something else that's come up in the course of our investigation has been exemptions from regulatory requirements, Mr. Kennedy. It's my understanding that on occasion exemptions from certain regulatory requirements have been granted. For example, during the public hearings of the Presidential Commission last week, Mr. Stello told the Presidential Commission about an exemption he granted for Three Mile Island Unit 1 in March of 1979, a few weeks before the accident. Who approves exemptions from regulatory requirements?

A Prior to Three Mile Island, they were approved by the director of Nuclear Reactor Regulations. Since that

time, the commission has -- technically, the approval is ultimately given by the director of nuclear reactor regulations to whom the responsibility is delegated, but since Three Mile Island, as a practical matter, it's been understood that all such matters should be brought before the -- to the attention of the commission before the exemption is actually granted in order that the commission may express themselves in the matter.

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Q Why has that change been made with regard to exemptions from regulatory requirements?

A Because we believe that we want to know more clearly what the specific safety exemptions might be.

Q The Three Mile Island accident itself did not bring into play any exemption from any regulatory requirements, at least not in the sense I mean it. I mean specific requirements.

There was nothing about the accident that would indicate you had to do that. Is there something else which comes up that has indicated to the NRC Commissioners that they should now be kept informed about exemptions from regulatory requirements?

A I don't think so. I think there has been a generally increased direct attention and concern on the part of the Commissioners.

Q Was there anything wrong, as far as you are concerned, Mr. Kennedy, with the old system of having these things approved by the director of DOR?

A No, but I think I feel more comfortable now that I am aware of them before the fact.

Q Were you aware that exemptions from regulatory requirements were being granted, at least in general, prior to Three Mile Island?

A Yes.

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Q And on occasion were you aware —

A Yes. And was satisfied in a general way that the exemptions were being granted after — only after a careful safety analysis, and the determination on the part of the director of regulation that in fact the exemption did not interfere with the adequate protection to public health and safety.

Q Do you feel since Three Mile Island that you need to be kept apprised of each exemption for —

A Let me just repeat. I believe that certainly from my own perspective, I feel more comfortable knowing about these matters before the fact.

I think that if we have a question, the time to ask it is before the exemption has been granted.

Q Whereas prior to Three Mile Island-2 you didn't have that opportunity?

A We didn't take it.

Q Let me see if I understand. Before the accident, you were not being informed of each exemption from regulatory requirements as they were being made?

A That is correct.

Q So, in effect, the director of division of operating reactors was going ahead without any approval from the NRC Commissioners and granting exemptions?

A No, he had approval. He had delegated authority

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to do so.

Q He had blanket approval across the board?

A That is correct.

Q So without getting any specific approval for any given exemption from regulatory requirements before the Three Mile Island accident, the director could and did grant exemptions from regulatory requirements without further consulting with the NRC Commission?

A That is correct.

Q Since Three Mile Island, the NRC has deemed it should change that procedure and instead have the Director of DOR or the Director of NRR come to the Commission, tell the Commissioners they want to grant this exemption, and get a reaction from the Commission?

(Discussion off the record.)

BY MR. KANE:

Q We have had a discussion off the record, Mr. Kennedy, about the question of authority for granting exemption from regulatory requirements. If I understand what you explained, it was that it is your belief that the NRC Commission delegated this authority before the Three Mile Island accident to the Director of NRR, ~~Howard~~ Harold Denton.

It is my recollection that the specific exemption granted for TMI-1 in March of 1979 was signed by Mr. Stello as Director of DOR. It is your surmise, I take it, that what

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that would reflect is that Mr. Denton as Director of NRR delegated that authority to Mr. Stello as the Director of DOR?

A Or their predecessors, yes. That is right.

Q What guidelines are utilized in determining whether or not an exemption should be granted?

A Specific guidelines, I don't know. Clearly the basic guideline is tha it cannot be a matter which will adversely effect the public health and safety. That is, safety is the principal concern.

Q Can it be a matter which relates to the basic protection devices installed in the system, such as the emergency cooling system itself?

A I do not believe that that is possible.

Q Okay. Are there any written guidelines that you are aware of as to granting or not granting exemptions from regulatory requirements?

A I am not personally aware of them.

Q Since the Three Mile Island accident, have any requests for proposed exemption from regulatory requirements from existing operating nuclear plants been brought to your attention?

A Yes.

Q How many times has that occurred?

A I can't honestly recall.

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Q Several?

A More than one.

Q Have you had to make a determination in those cases as to whether or not the exemption should be granted?

A Yes.

Q Have there been any written materials or guidelines that you have gone to to guide you in making that decision?

A There have been thorough analyses of the effects ~~for~~ of the exemption based upon which the judgment as to its actual effect is made and the exemption is either authorized or not.

So far as I recall, in cases — I do not recall, let me put it another way, I do not recall a case in which an exemption was requested and then not granted. Requested by the staff and not granted. I don't recall that.

Q In any event, if I understand the situation, in exercising your discretion to make a determination as to whether or not the exemption poses any problem for the public safety, there are no formal written guidelines that you would go to?

A Not ~~so~~ which I am aware of.

Q Is there any vote by the NRC Commissioners as to whether or not the exemption should be granted?

A The answer is, I believe, yes. We have acted.

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Now, I cannot say whether this was in the nature of a formal action, I simply can't recall. By a formal action of the Commission — I can't recall.

But all of the Commissioners expressed their views on each matter.

Q Must all five Commissioners unanimously agree before an exemption from a regulatory requirement can be granted?

A Not necessarily.

Q How many are required to be in favor of the exemption before it can be granted?

A Presumably it would be a majority.

Q Three out of five?

A Three. But I am reasonably confident that should there be significant opposition, the matter would be thoroughly rereviewed.

Q Have there been any exemption from regulatory requirements granted on the basis of a three-commissioner vote?

A I simply cannot recall.

Q Have there been any granted on a four-commissioner vote?

A I don't recall.

Q Okay.

A But those are factual matters we could check.

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Q In any event this is a relatively new procedure since the Three Mile Island accident?

A Yes, that is my recollection.

Q Prior to the Three Mile Island accident, was there any routine procedure whereby the NRC Commissioners were notified for exemptions from regulatory requirements being granted?

A These I believe were included in the weekly staff notes. I do not recall any other specific notification.

Q Did those weekly staff notes —

A Let me say I am not altogether sure that all such exemptions would have been reported in those notes.

Q So there might be some exemptions simply not reported in those notes?

A That is correct. Matters which were considered of very minor character.

Q That would be in the consideration of the staff that they were very minor character?

A Yes.

Q Does the staff have guidelines for determining what should or should not be included in those weekly reports to the NRC Commissioners as to exemptions from regulatory requirements?

A Not that I am aware of.

Q Prior to Three Mile Island-2, when these matters

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were brought up in these weekly reports to the NRC Commissioners, did those weekly reports present the justification for granting the exemption?

A I simply don't recall. I doubt it.

Q Do you recall —

A However, let me add, that if anyone obviously wanted to pursue the matter, it could be — justification would have been presented.

Q Do you recall any instance in which you personally were not satisfied with the description you got in the weekly report of the exemption and therefore followed up and requested some justification?

A No, I do not recall.

Q Another matter which has come up at several points in the course of the Commission investigation has been the issuance of operating licenses with open items still outstanding.

Is the issuance of operating licenses by the NRC with open items, and I would include in that safety-related items, a common practice within the NRC?

A I don't know what common practice is meant to imply. It has been done. Now my understanding has been that these matters have been matters which the licensee has agreed to resolve and that their resolution will depend on the actual placing of the reactor in operation.

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The issuance of the license does not put the reactor online as an operating plant the next day. In the normal course of events, there are several months of start-up time which are involved and testing after that reactor has been given a license to operate.

Q Has it been your experience that these open items are resolved before the facility reaches commercial operations?

A For the most part, I think that is correct.

Q Okay.

A But not necessarily all of them.

Q Has this been a frequent occurrence in the last few years that operating licenses have been issued by the NRC with open items appenced to those operating licenses?

A I believe that it has happened frequently.

Q Why has that happened frequently?

A Because the staff I think determined that from its judgment those matters could be resolved over the time that it would take to get the plant in operation. That in any event the items themselves were not of a level of significance which would say to the staff that they could not ascertain that there was an adequate protection of the public health and safety.

Now, should the latter occur, we simply could not have allowed a license to issue.

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Q That would be a violation of the very statutory mandate to the NRC?

A That's correct.

Q I should caution you because it is occurring here again; I know my questions are very obvious and you already can see where they are going before I finish, but let me finish before you respond.

A Sorry.

Q Are you aware that there were 14 open items on TMI-2's operating license?

A I am aware now; I was not aware at the time.

Q Are you aware that among those open items is deficiencies in the small break LOCA analysis provided by B&W?

A I have been informed that was the case, I was not aware of it.

Q Do you think TMI-2 should have received its operating license with an open item such as small break LOCA deficiencies, knowing what you know today?

A Knowing what I know today, I would say that was a matter that should have been resolved.

Q Before operating license was issued?

A Before the plant was allowed to operate.

Q How did it occur that an operating license was issued with that item being opened?

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A They assume, they have ~~have~~ assumed that in fact that analysis would have been completed by B&W before the plant was in full operation.

Q In fact that analysis was not completed before it went into commercial operation; is that right?

A I am not sure of that.

Q As far as I have been able to tell from the record, that is the case. But I must confess I am not positive myself.

Are you aware that having open items appended to an operating license like this creates a reluctance by the Division of Operating Reactors to accept responsibility for the projects from the Division of Project Management?

A I understand that is the case and I can understand the Division of Operating Reactors' reluctance.

Nonetheless, it also tells me that we must have a better interface between the Division of Operating Reactors and the Division of ~~Safety, both~~ Project Management as to the resolution of such open items which ought to be — which ought to occur promptly.

By and large — those items ought to be looked at very, very carefully. There are clearly some matters which are de minimis in their effects or concern.

One would not, I don't think, wish to hold up an operating license for the color of the paint somewhere. But it is quite another matter, for a serious matter to be ~~there~~ open.

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Even if one assumes, in my judgment, ~~even if one assumes~~ that it can be resolved in a reasonable period of time, resolution should be assured without any doubt before that plant is allowed to operate.

Those two organizations, I believe, have to work much more closely together and I believe Operating Reactors ought to assume that the minute that plant is going online, that ought to be the Operating Reactors' responsibility.

Q Were you aware before the TMI-2 accident that these open items created this reluctance by DOR to accept the project from DPM?

A I was not aware of that.

Q But you were aware before Three Mile Island that OLs were being issued with open items on them?

A Yes.

Q Were you aware of that roughly from the time you became an NRC Commissioner?

A I can't recall when I first became aware of this.

Q Are you aware that having these open items appended to the OL and the reluctance by DOR to accept the project from them, that the project is in a kind of limbo where neither DPM nor DOR focuses closely on the plant?

A If there is that reluctance to take it over, I am confident that is the case. That is why I said earlier that in my judgment that is a matter which must be cleared up

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promptly.

The responsibility must transfer to DOR and that means those open items have got to be resolved.

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Q Well, of course, the argument of DOR is that they don't have the technical capabilities that DPM does and the technical resources to resolve these open items. The underlying thought is that they should be resolved before the OL is issued, operating license means that you are ready to operate and you don't have any open safety problems.

I take it that is the feel of this. Why should DOR be called upon to accept a responsibility for an operating project which still has open safety problems, the technical aspects of which can be most effectively resolved within DPM?

A I think that is what I just said.

Q I am sorry, I thought I misunderstood —

A I believe the responsibility must be transferred to DOR when the plant is ready to operate. That means that those safety issues have to be resolved.

Q So, you should not have OLs issued with open items?

A I distinguish among open items. There are certainly some open items that are in their effects de minimis.

But any item of significance, in my judgment, ought to be resolved before a plant is allowed to operate.

Q In the case of OL issuance, if intervenors do not come and raise issues and take the matter up as far as they

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can, presumably to the NRC Commission, and if the Commission itself, the NRC Commission does not elect to take that matter, it is going to be left in the hands of the staff to determine what open items should or should not be resolved before the OL is issued?

A That's correct.

Q So it is going to be left to the judgment of the staff as to whether a particular item in connection with an OL issuance is important enough to be taken care of before the issuance or appended and taken care of later; is that correct?

A That is certainly correct. My own view of the staff is that its basic concern is, as it has always been, with safety. They are not going to leave open items which will have major safety significance.

Q Well, again —

A If there is any question on that, then, it seems to me, that is a matter that — that I think ought to be reiterated by the Commission.

Q Okay. You did state just a little while ago that knowing ~~nothing~~ what you know today, the small break LOCA analysis deficiencies for TMI-2 should have been resolved before they received their OL.

They were not and presumably the staff determined that TMI-2 should receive an OL with the small break LOCA

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analysis as an open item? Does that not give you some pause then as to the ability of the staff to correctly determine what items should or should not be left open when an OL is issued?

A No, it doesn't. It gives me pause all right, but it doesn't give me pause of the ability of the staff — of the staff to determine that. It is a matter of perception. I think we need to — if there is a misperception of the relative level of safety significance, then that is a matter which the Commission should convey to the staff in clear terms.

Q It is your feeling then that the reason it occurred in the case of TMI-2 was a mistaken perception on the part of the staff?

A That could have been the case. I simply don't know the reasoning which the staff used.

Q But you are confident that the staff has the ability and the inclination to weed out all of the problematic open items and be sure they are resolved before OLs are issued?

A I am confident of the staff's ability to do that.

Q Are you also confident that the staff's current determination that as modified for the short term, the B&W plants in this country do not pose any undue risk to the public health and safety?

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A Yes, I am confident.

Q There was an order issued by the NRC in connection with TMI-1 which was setting up a ~~heading~~ hearing and review process before the reopening of the plant. It was directed to the various commissioners or actually has the heading of the various commissioners. It is dated August 10, 1979.

Have you seen that order before? It concerns Three Mile Island Unit 1 and connection of reopening that plant.

A Yes.

Q If you could turn to page 3 of that order, the order sets out the features of the B&W design that contributes to its sensitivity. It goes on to note at that page that the results of all these various factors is that the B&W design places a large burden on the operators in the case of off-normal system behavior during such anticipated transients. It lists some five factors.

One of them is the — the end of the paragraph in the middle of the page, it states, "Because of these features, B&W de" — then the last sentence says "places a large burden on the plant's operators in events of off-normal system behavior, such as loss of all feedwater."

Going back to the paragraph four, before it lists the five factors. The first is design of the steam generators to operate with relatively small liquid volume in the secondary side.

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What I wanted to ask you is since the Three Mile Island accident, what has the NRC done to remedy that feature in the B&W design?

A I don't think we have done anything to remedy that feature of the design. Rather, what has been done is a series of steps which would mitigate the effects should the feature of the design ever come into play in a significant way in a transient.

Q If I understand it, one of the effects of that particular fact, the relatively small liquid volume in the secondary side is that the B&W, once through steam generator, will boil dry very quickly in a loss of all feed - water type of transient, specifically in about two minutes.

It is my understanding also with the modifications that have been made to the B&W design, including installing an anticipatory reactor scram and adjusting the set points on the PORV and a number of other matters, that the B&W once-through steam generator would take about five minutes to boil dry completely in the loss of all feedwater transients.

Does that sound about right to you?

A I think that is about right, yes.

Q It is also my understanding that the shortest boil-out time for the recirculation steam generator used in the Westinghouse design is 13.5 minutes and, in fact, it can

go as high as 30 to 40 minutes.

That then leads me to the question, has it been the determination of the NRC, and the NRC commissioners that lengthening the time for the B&W boil-dry of the steam generator from two to five minutes has been sufficient, particularly on the basis of the comparison of the 13 to 40 minutes in the alternate design, the Westinghouse design, has it been their consideration that that constitutes a margin of safety that that allows B&W plants to operate?

(Discussion off the record.)

THE WITNESS: The answer to that question is —

BY MR. KANE:

Q We have been talking, before we went off the record, Mr. Kennedy, about the steam generator and the relatively small liquid volume in that generator as commented in the TMI Unit 1 order that we just discussed.

We commented there have been certain adjustments which have now made the boil-out time in the event of loss of all feedwater to be increased from two minutes to five minutes. I also commented on the recirculation steam generator that has 13.5 to 40 minutes under the same circumstances.

My question to you as a regulator, NRC commissioner, is do you feel that that adjustment has now, at least in the short term, eliminated any undue risk in the use of the B&W

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design in the operating plan in the country?

A That plus all the other steps that have been taken.

Q There has been nothing specifically done about the amount of volume that the steam generator for B&W holds?

A No.

Q The fifth factor is a low steam generator elevation relative to the reactor vessel which provides a smaller driving head for natural circulation.

Again, are you aware of anything specific done by the NRC as to that feature of the B&W design?

A No, I don't believe so.

Q It is my understanding that the NRC's thought here is that that may pose some problem for natural circulation; is that right?

A That is my understanding as well.

Q Another matter which has come up at several points in the Presidential Commission's investigation has been the matter of control room design. Prior to Three Mile Island-2, do you think it is fair to say that the NRC Commission did not give adequate attention to control room design in nuclear power facilities?

A We certainly, as the commissioners, did not give any significant attention to the matter of control room design.

Q Why was that?

A Well, I believe that there was a general conception that the control room design itself was not a matter of direct safety related consideration. That the systems themselves were the place to put emphasis and the control room simply was a — was reading out what the facts were from those systems.

And, therefore, it was of a lesser order of significance.

Q Is it fair to say then on the basis of that statement that prior to Three Mile Island-2, the NRC gave more attention to machines than it did to the interface of the people who would have to operate those machines?

A I think it is fair to say that.

Q In addition to that, the NRC did not examine all of the various systems that go into the nuclear power plant, but only those which are safety related?

A That's right. Now wait -- that does not go to say that it did not look at any of the nonsafety related systems in the plant. That is not correct. It did.

But the primary emphasis was on safety related systems.

Q Do you think that that safety related concept is a valid basis for regulation?

A I think it is a valid concept. The question, I guess, in my mind at this juncture is how do you ~~design~~ decide what

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is safety related. It is my understanding that up until now, the parameters went to all of those systems which encompassed the primary system boundary.

I am asking myself now, and I have not really reached a conclusion, whether that is a ~~wrote~~ wholly valid concept, or whether there are other systems ~~in~~ or other matters beyond that which ought to be taken into account when one thinks of safety related.

Q Do you think as it was applied, the concept of safety related, relating to the primary system boundary was properly applied?

A As a general rule.

However, I am aware of Roger Mattson's view of — quite well taken, it seemed to me ~~--as~~ that the PORV and its block valve, neither gear was considered safety related for the reason that each was dependent upon the other. As I think he put it, that was Catch-22, and so it — it is.

Q Is it also true in the normal process, the licensee designated what specifically is and is not safety related and the NRC examines that to see whether or not it concurs in that listing?

A I think that is a generally true statement.

Q Do you think that is a proper approach for the licensing process?

A I think there needs to be a much closer

surveillance of that on the part of the NRC. I think the NRC certainly should be in a position of being the final arbiter of what is and what is not safety related.

Q Certainly that should have been the case before the Three Mile Island accident?

A Yes, that's correct.

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Q How did it come about that before Three Mile Island the NRC was not giving as much or — as much surveillance as you would now prefer to the Licensees' designation of what is and is not safety related?

A There was a fundamental view of, I think, the way licensing and regulation ~~could~~ should effectively take place which said the NRC, that is the regulator, will have to depend to a very large extent on laying out standards requirements and then resting upon the decisions in this regard made by the Licensee. It's a fundamental burden getting placed on the Licensee. This was a reflection of the mass of data, information, and requirements that would have to be reviewed.

And there was an obvious limitation on the total amount of resources to do that review within any kind of reasonable timeframe. So, I think — and that was not an unreasonable view. It seems to me, however, that there is a middle ground here. There is no way in which we, the regulators can do the entire job. There is simply no way to do that. It's just too big for us to review directly as a matter of first resort, every single matter that is involved in the construction operation of the nuclear power plant.

Indeed, I would suggest that that is probably true of almost any substantial kind of enterprise. It's just not

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possible to do that. What one has to do is provide a system which checks and balances in the most effective way possible to assure what is supposed to be done by the Licensee in the matter is in fact being done in accordance with the standards that have been established.

Let me add there a bit of my own philosophy about that. There is a popular notion abroad that if only regulators get tough and do a great deal more, all problems in safety would go away. I don't think that's true. Indeed, I would argue without statistical basis, I admit, I would argue that there comes a point where the regulator may become self-defeating if he has not imbued in the minds and ethic of all of the people whose business it is to design or even conceive before designing, build, and operate plants, the absolute necessity for safety at every step of the process and on the part of everybody who was involved, then the regulator is going to lose the battle anyway.

Q You cannot force safety?

A Because he cannot do it himself.

And to the competent — what I am concerned about is that we not make the assumption that tighter and tighter and ever tighter regulation, it's called tough regulation I read in various places — we ought not to delude ourselves that that is the panacea for all ills in the health and safety business. It simply is not. I am concerned that we may

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think it is, proceed on that basis, and sooner or later we will ~~have~~ discover, as I said, it's been self-defeating, because we will have roobed from those people whose business it really is, the incentive. They will be waiting for us to tell them what is safe. They won't be out looking themselves to find out what is safe.

Q I have heard your comments in this connection in front of the Presidential Commission, Mr. Kennedy, and your comments here today, again, suggest the same reaction to me. That is that underlying this, I gather, is a feeling on your part that at some point we do have to assume, necessarily, that the industry itself is going to make good faith consistent efforts toward safety. And that there is no way that anyone can force them to do that. As a matter of fact, the attempt to do so through the regulatory processes would be self-defeating. That we have to somehow encourage the industry itself to take the initiative in this regard?

A Let me correct that just a bit. We can force them to do a great deal. What I am trying to say is that if we have to continually force them, we are then engaged in what I think is a losing battle. If we can reach the point where it is reasonable to assume that the industry will make those, as you put them, good faith decisions always aimed at being safer, then the regulatory activity will have done its

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job. The regulatory activity will have created a climate in which the industry perceives it to be in its own best interest. Not simply to avoid being castigated by the regulators but rather because it is the right way, the best way to do business.

I basically believe that deep down, that is the way the industry does see it. I think what happens all too often is that between that basic notion and all of the little steps that are involved in carrying that through, there are some slips.

Q I would like to address one slip in that regard, if I can, with you, Mr. Kennedy. The Davis-Besse transient of September 24, 1977 has been discussed a great deal. Would you agree that one of the significant facets of that transient from the safety point of view was the operator interruption of the high pressure injection system?

A I think that is a generally fair statement.

Q I have been through the documentation that has been generated in connection with — or at least some of the documentation generated in connection with that transient. I was interested because a memorandum was previously provided to us from a Mr. Hartfield of the Division of Technical Support of the Office of Management and Program Analysis. It was a memorandum for each of the Commissioners, including yourself, concerning distribution

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of operating experience documents to Metropolitan Edison. It's dated June 11, 1979. Let me ask you if you have seen that memorandum before?

A Yes, I have.

Q It appears to try to set forth the various ways in which Metropolitan Edison was advised of the September 24, 1977 transient of Davis-Besse. It suggests there was quite a bit of documentation that went to the Licensee in connection with that transient. I have gone back and looked at this documentation. You are welcome to do the same but I can make certain representation to you about the nature of the documentation which is surprising to me. The preliminary notification is dated September 26, 1977, a much better copy of which your assistant has provided. It describes the events. It does not mention anywhere the operator error in interrupting high pressure injection. There is no such mention at all?

A Let me just say there that that does not surprise me because the date on which that was reported was two days later and actually — well, this was within a matter of — this report was based on a report which was something like twelve hours — less than twelve hours, eleven hours after the event had occurred. I doubt that by that time the analysis had been complete to indicate that that is really what had happened. So I am not surprised that the

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notification at that point didn't say it.

Q You would think after they had time to really do a study that would have come out?

A Certainly.

Q The next documentation I am aware of concerning the accident is the LER, formal LER that was submitted, which is accompanied by a letter dated October 7, 1977. So that is about two weeks after the accident, a little bit more than that. Again there is no mention of operator error concerning interruption of high pressure injection anywhere in this LER. Now it goes on. There is also a supplement to that LER which is of some 59 pages in length. It's accompanied by a letter from the Licensee to the NRC dated November 14, 1977. It simply states that at six minutes into the event the operator stopped the high pressure injection pumps. It doesn't say on what basis or for what reason. It also says that operator action was timely and proper throughout the sequence of events.

The next documentation I am aware of is an I&E report which is the NRC evaluation of this event based in part, I take it, on the submission made by the Licensee. It's accompanied by a cover letter dated November 22, 1977 to the Licensee from the NRC. Again there is no mention of operator error concerning interruption or termination of the high pressure injection. The only reference appears on page

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5 as part of a detailed chronology and it says, "HPI pumps were shut down at this time as pressurizer level was normal."

In addition to that I understand that the NRC puts out a monthly publication summarizing LERs on events and the specific reference to the Davis-Besse incident appears on page 18 of the LER monthly output put out on December 9, 1977, that summarizes the topic of the LER. Again the summary makes no reference to interruption of high pressure injection or any operator error.

What is probably one of the most anomalous things to me is NRC puts out a publication Current Event Power Reactors on a bimonthly basis. The one that covers this particular time period, during which this transient of September '77 occurred at Davis-Besse, the issue of Current Events Power Reactors does have a section in it called operator error. But that is not the Davis-Besse transient. That is put under valve malfunction.

And again it makes no reference to any operator error involving termination or interruption of high pressure injection. Stacking up all that documentation, it's obvious a lot of paper went to the Licensee describing the events and some paper came from the Licensee. None of it focuses on one of the key facets of that transient for purposes of the Three Mile Island accidents or for purposes of analysis

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of that transient. How can that kind of thing occur?

A I can't explain thought processes of people who put all that together. It seems to me however that it is not unreasonable to assume that it was not considered at that time to have been, necessarily, an operator error. Remember he shut off the high pressure injection, it said, because the pressurizer level was up.

Q Yes.

A Now that, if in fact, he saw that, I suspect he may well have believed that that was the appropriate thing to do.

Q As the operator at Three Mile Island apparently thought?

A That doesn't mean an operator error. It does in retrospect mean an operator error because there were some other things about the system they didn't know, or didn't understand.

Q Clearly it was —

A So when you think about what is an error, one has to decide what the definition is of error.

Q And there can be differences of opinion?

A Certainly.

Q As a matter of fact we know James Creswell regarded this as an error and attempted to bring the matter up and had dubious success in doing so, at least prior to

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the accident. Aside from that, doesn't this illustrate an accident where the Licensee failed to appreciate certain aspects of the transient and the NRC failed to appreciate certain aspects of the transients, so for all of the documentation, one of what we now recognize to be a very important aspect of the transient was not documented, not communicated?

A It's fair to say. And that is the reason the Commission has long since now moved to create a special office for the particular review of all of these kinds of events, all LERs.

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(Recess.)

BY MR. KANE:

Q Mr. Kennedy, while we were off the record, there was a discussion concerning Roger Mattson and the contacts by a member of the Division of Systems Safety, Gerald Mazetis, with the Davis-Besse transient of September 24, 1977, and I understand you'd like to make a statement concerning that matter?

A It's my understanding that there was a trip report made in which reference was made to the operator actions and their potential effects upon the transient. Indeed, that was subsequently discussed by the nuclear reacto regulations people with the inspection and enforcement office It was reduced to a short note. So I raise this only because you have mentioned that throughout this -- all this documenta tion, there was no recognition of the operator's role. I thi that -- I'm only saying that whereas maybe the recognition was not quite as direct, positive as it might have been, maybe it wasn't reflected as fully through the system as it might have been, it was not wholly ignored. It was recognize

Q I'm glad you make that point, Mr. Kennedy, because we're aware of that situation, of course. We did take Mr. Seyfart's deposition of I & E. He's the one to whom Mr. Mattson entrusted the matter or rather he's the one with whom the matter was left by Mr. Mattson so far as inspection

and enforcement had authority over the matter from the beginning. The determination was made at this meeting in Mr. Mattson's office that responsibility would remain with inspection and enforcement. When we took Mr. Seyfert's deposition, we asked him what was the follow-up. He had no specific recollection, but he does state that the follow-up would have been in the ordinary course this I & E report of November 22, 1977, which I have mentioned, which is a document which has no mention of any operator error concerning HPI termination. And the only reference again that appears on page 5 was that HPI pumps were shut down at this time as pressurized level was normal.

I think the point you have made actually exacerbates the failure to address this in the formal NRC documents in that internal NRC documents do reflect some discussion and some recognition of operator error concerning HPI interruption. However, the formal documentation, the I & E report, the LERs or the information available to the licensee for him to analyze as to the meaning of this transient does not reflect that specific facet of the transient.

What I wanted to come to — my whole point in going into this was to examine the information available to licensees around the country to determine what they should or should not do about that phenomenon potentially occurring at their plants.

I think the point from the documentation is that operator error concerning HPI interruption does not come through from that documentation.

A I think that is a fair statement.

Q Okay. Is it true in your experience, Mr. Kennedy, that a standard feature of utility vendor contracts is that the vendor pays for changes ordered by the NRC as a regulatory requirement and the utility pay for any other changes?

A I am not -- I do not have personal knowledge that that is the case. I have heard reference to it. I simply don't know.

Q My knowledge comes about as a result of a colloquy that occurred between Professor Pigford of the Presidential Commission and Jesse Ebersole of the ACRS. Mr. Ebersole, as you know, was with the Tennessee Valley Authority for many years, and they had a discussion at the last Presidential Commission hearing on that subject matter. The general tenor of Mr. Ebersole's testimony was that this is a fairly standar feature, it occurs quite a bit in contracts between vendors and utilities.

Assuming that is the case, don't you think that creates a substantial disincentive for the vendor to conclude that a transient poses a generic safety problem for the nuclear steam supply systems that are sold by that vendor?

A I can't make any such assumption.

Q Okay. Applying a little common sense, if the vendor concludes that the system it's sold poses a generic safety problem which is going to be addressed by the NRC if it's brought to the NRC's attention and which may well become the subject of a regulatory requirement which could cost many millions of dollars to correct, doesn't that give the vendor a substantial disincentive not to find such generic safety problems?

A I think one could make that theoretical argument. I simply don't know what the actual reaction of the vendor is. I wouldn't presume to comment on that.

Q Doesn't it also create a substantial disincentive for the utility to identify safety problems which may not be considered generic and for which the utility alone will be responsible and will have to pay?

A That depends upon whether the utility is in a situation in which it will be unable to recover such costs.

Q By passing them in some fashion?

A Right.

Q However, that is always a problem, in any event, for a utility, isn't it? They have to go through that proces to pass it along?

A Yes.

Q So, again, I'm not asking you to suggest in any way that neither the utilities nor the vendors are deliberately

concealing generic safety problems or deliberately lying to the NRC or anyone else about that matter, but I am trying to get the nature of the system, the contractual arrangements are such, that a natural consequence is that neither the utilities nor the vendors will actively seek out generic safety problems.

A Well, you're coming back to the point that I raised much earlier, I think. If those contractual arrangements work to that end, then it seems to me that it's self-defeating in the search for safety.

Q As a matter of fact, I spent some time deposing Robert Minogue. Do you know who he is?

A Yes.

Q We had a discussion generally about some of the things we have been discussing today in terms of the nature of the industry. He made this statement in his deposition: "There's a presumption that there is a real dedicated commitment to achieving those requirements, performance and safety requirements, that doesn't require an inspector behind every worker. My faith in that presumption was sadly shaken by TMI, so the remarks I made to Mrs. Omang, a Washington Post reporter, about heavy regulation was based also on the perception, not just the things we have been talking about, but a perception that maybe this industry should not be presumed to be in good faith compliance."

Do you agree with that?

A No, I can't. I am not going to charge anybody, as that seems to — I don't believe Bob Minogue would either -- with bad faith.

Q He said maybe.

A I don't think it's a question of being in bad faith. I think there is always, in the industry view, the economic considerations. Now, what has to be done is that the economic considerations have to give way to the safety considerations. The safety considerations inevitably must be first.

Q But I thought what you said before, Mr. Kennedy, was that if the NRC takes it upon itself to force that situation, it can well wind up in a self-defeating posture where the industry starts saying, okay, you have now taken over the safety functions. Whatever you say we won't do anything further. That is the danger, isn't it?

A That's correct.

Q How do you force them to put safety first over economic considerations and at the same time --

A If you remember, I think my own view -- I think I stated that they have to see that as in their own best interest. I think that is something that has to come to them as they recognize whether the industry survives, does well or not depends upon that.

Q Do you think the industry currently sees it in their best interest to be this safety conscious?

A If they don't, all I can say is after Three Mile Island, I would be mighty surprised.

Q I take it that means you do think that they do have this in mind?

A I think so.

Q Before Three Mile Island, was it your feeling that they did have this in mind?

A I think they thought they did.

Q Did you think they did?

A I think they did, but it was a matter where complacency had set in. Complacency isn't -- I don't think - is a bad thing necessarily. It's nothing mischievous. It grows out of success. The industry up until that time and, indeed, the regulators, too, had reason to feel some pride in what seemed to have been a substantial measure of success. And they --

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Q What do you mean by success?

A Success in the sense that that accident hadn't happened. All those catastrophic things that people predicted didn't happen, hadn't happened, and people believed, I think, people began to believe that it wouldn't, maybe couldn't. So when they looked at safety, they looked at safety questions they looked at it from that posture and that perspective.

Q Did that lead the NRC prior to Three Mile Island-2 to a presumption that the industry was in good faith compliance

A I think there was a general presumption of good faith compliance.

Q Do you feel as an NRC commissioner prior to Three Mile Island-2 that you participated in that presumption

A Certainly.

Q And since Three Mile Island, now, do you still participate in a presumption that the industry is in good faith compliance?

A I participate in a presumption that the industry sees itself as threatened, that it has lost substantial credibility. It must restore that credibility if there is to be a continuance of the industry, that is, if people are going to have any willingness to accept the technology. And thus, it has to show without any question whatever in anyone mind that, in fact, safety is paramount among its considerations. Now, that is where I think the industry is.

Q That really went beyond my question and I'm not sure it answered my question.

Does the current system of regulation today, being applied by the NRC, involve a presumption in any sense that the industry is in good faith compliance?

A There is inevitably some element of presumption simply because, as we know, the NRC cannot do more than audit it in some respects.

Q Why cannot the NRC do more than audit in some respects?

A Because the job is simply too great. It's not possible to examine every single part, every single ounce of concrete, every single -- it cannot possibly participate in every action that an operator will take.

Q Is it your perception that the only reason that the NRC does not check everything is because it is financially lacking the resources to do it?

A I don't really believe it's necessary. Indeed --

Q That is my question. Is it a perception it's not necessary or simply that the NRC cannot do it?

A It cannot do it, that is the first thing.

Q That is the bottom line? Whether or not you think you should, if you can't, you don't?

A You can't. I don't think it's necessary in any event, so the fact that you can't doesn't trouble me. I

don t think it's necessary. I think one can discern whether a presumption of good faith is warranted by the kind of examination, review, that one does.

Q Well, of course, that kind of review was done in the Three Mile Island plant, was it not?

A I understand that.

Q We did have the accident?

A I don't think that was a question of bad faith.

Q Given the fact that we had the accident, given the way the Davis-Besse transient was reported, for example, given everything that we know today that we didn't know six months ago, do you feel that the NRC should not examine every aspect of a plant to be licensed if -- say, if it were given the resources to do it?

A No, I do not because as I said earlier, if we come to that, then we are assuming the job which just has to be the industry's.

Q In other words, now given if you have got the resources to do it, you feel the industry should be doing these things and not the regulatory agency?

A The regulatory agency should be assuring itself that it's done.

Q Can the NRC reach that level of assurance given Three Mile Island, given the Davis-Besse transient, given the problems with operating training that have now surfaced, can

it do that job in the short term, let's just take the next six months?

A Yes.

Q In the short term, can it do that job without checking everything?

A Yes.

Q How can it do that? How can it be assured that the industry is not -- bad faith, good faith are labels. How can it be sure the industry is not still neglecting certain safety aspects that were neglected before Three Mile Island and could conceivably still be neglected?

A By a more extensive look ~~on~~ at how it does its job.

Q In other words, increasing the regulations?

A Some.

Q Where it's feasible for the level ~~of~~ of regulation to be increased, at least for the short term, to examine everything about a particular problem, shouldn't the NRC do that?

A It depends entirely upon what the everything means.

Q Let me give you a for instance. Right after the Three Mile Island accident, all of the B & W plants were closed and all of the operators were required to undergo a week's retraining on the B & W simulator, recreating the Three Mile Island accident.

A Yes.

Q At the end of that week of training, each of those operators was required to be administered a test by his utility to ensure that he understood how to handle the Three Mile Island type of transient; is that right?

A Yes.

Q Then as I understand it, the NRC spot checked the results of those examinations and did not reexamine each individual to be certain from the NRC's point of view that that operator understood the Three Mile Island accident?

A That's correct.

Q That suggests to me that unless --

A The spot check was a very thorough and deep one. As a matter of fact, all of those examinations, or most of them were brought here, looked at.

Q Operator examinations in the past have always been looked at by the NRC, have they not?

A Yes.

Q Yet it's clear that some people in the control room at Three Mile Island on March 28 did not understand what to d at least not in the correct way? There is no doubt that there was some failure by the operators to appreciate the nature of what they were confronted with, and that suggests, then, that there was something wrong with the training, some deficiency somewhere. So the NRC didn't spot check that in examinations in the past and suggested that something should

be done to change that. I understand that there are many things in the workings to change the rule of operating training vis-a-vis the NRC. What I come back to is that the procedure that was followed at the end of that week's training for the B & W operators suggests to me that there may still be operators at B & W plants throughout this country who do not fully understand the TMI-2 accident, and the NRC won't know that because the NRC did not reexamine each of those individuals. Isn't that a very real possibility under the circumstances?

A I don't think so.

Q Why not?

A Because the training that was given was aimed precisely at the questions involved. The examinations were reviewed for their quality. I think those who passed those examinations and are therefore in those control rooms can be presumed at this point to have that kind of understanding.

Q If the NRC had examined each of those individuals with an NRC administered examination and graded the examinati wouldn't you be in a more certain position to make that state ment that you just made?

A Maybe some small measure more. But I'm not sure -- I ok, let me just say that I don't think that all knowledge and wisdom rests in the NRC, I come back to what I said earlier. If it does, then the industry simply isn't going

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to be able to survive.

Q I don't think all knowledge and wisdom rests in the NRC either. I wasn't suggesting that, Mr. Kennedy. Although I must say I'm impressed by the nature of many of the individuals I have dealt with from the NRC. But I do think it's fair to say, and I would ask you if you think it's fair to say, that the general perception of the public is that it's through the NRC that the public looks for protection of its health, welfare, and safety and not to the industry.

A I agree with that, absolutely. What I'm saying is that if the public and if the industry is ultimately looking to the NRC to be the ultimate repository of all safety wisdom then I think we're not going to get the kind of ~~rule~~ assurance that I think we all want to see.

Q So you feel in pursuing that particular viewpoint, then, that it was perfectly proper for the NRC to only spot check the persons at B & W plants who are operating those plants as to their understanding of the TMI-2 accident; is that right?

A With the understanding that all those people had been trained against the requirements that we laid out.

Q Okay. Were the operators at TMI Unit 1 so trained?

A I don't know whether they went through the training or not.

Q The reason I ask you is coming back to this order

of the NRC dated August 10, 1979, which relates to Three Mile Island Unit 1 that we referred to. At page 5, in the orde sets out the following requirements that the licensees shall take with respect to TMI-1. Number 1 (e) states that there shall be an augmenting of the retraining of all reactor operators and senior reactor operators and all operators will receive training at the B & W simulator on the TMI-2 accident and the last sentence is "The NRC will administer complete examinations to all licensed personnel in accordance with --" and then it's the training section. Apparently, as to the operators on TMI-1, the NRC will itself reexamine all those individuals before they can start up Unit 1. Why wasn't the same procedure followed at Rancho Seco and all the other B & W plants in the country?

A It simply wasn't deemed necessary.

Q But it is deemed necessary for TMI Unit 1?

A One has to recognize that there are some slight differences between TMI Unit 1 and the other plants.

Q In terms of the NSSS system there are not any major differences?

A I am talking about the fact that the people at Three Mile Island have been through this transient.

Q Therefore they would procably know more about it than the people at Davis-Besse, wouldn't they?

A Not necessarily.

Q Would they know less than the people at Davis-Besse or Rancho Seco?

A They would have had a traumatic experience.

Q It seems to me that that would have it more freshly enmeshed in their minds?

A Not necessarily the procedures that should be followed, however.

Q So what you are suggesting is that because the people at Three Mile Island unit 1 had more graphic involvement with the accident they should be re-examined in total whereas operators at Rancho Seco and Davis-Besse and other B&W plants do not really need to be re-examined, each and every one, by the NRC; is that right?

A I am saying what I said earlier. I think we have satisfied ourselves that those operators, by a spot checking, those operators did get the training and therefore can be presumed to understand the situation, having passed ~~needing pass~~ the examinations.

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Q Why can't the same be said of the Three Mile Island unit 1 operators?

A I think it is a different situation at Three Mile Island 1. Three Mile Island situation is a situation unto itself in the sense that it is a higher order of concern.

Q Higher order of concern for them or for —

A For us.

Q It is a higher order of concern as to Three Mile Island unit 1 than it is to other B&W plants?

A Because of the nature of the situation at Three Mile Island, yes.

Q Again, if I can just understand what you mean by that. I have been to Three Mile Island unit 1, I have seen it. I am not sure I know what you mean.

A I am talking about the fact that the accident occurred there; there is a general sort of presumption that more needs to be done there than anywhere else.

Q Even though we are still dealing with the same NSSS system which presumably behaves the same way under these kinds of transients wherever it is located; is that right?

A Yes.

Q Okay. Has the NRC Commission ever turned down a license application recommended for issuance by the NRC staff?

Has the NRC Commission ever turned down a license application which has been recommended for granting by the NRC

staff?

A I simply cannot recall one.

Q Okay. And that would apply at both the construction permit and operating license stage?

A That is correct. So far as I can recall.

Q Okay. So when we deposed Commissioner Ahearne I believe he commented at one point that if the Diablo Canyon operating license were denied that would be the first instance he has ever been aware of where a plant got its construction permit, went through all of its construction and then was denied an operating license.

Would that be your understanding also?

A That would be my understanding. To the best of my recollection. I certainly cannot recall one.

Q Why has it occurred that whenever the staff has recommended the issuance of a construction permit or operating license it has been granted?

A Well, it seems to me, by that time all of the conditions for the granting of a license — that is all of the regulations have been met, standards and requirements have been met, and there would be, at that point, no ground or justification for not issuing the license.

Q Okay. Based on what we know today, however, and jumping back for a moment to that discussion we had relating to class 9 accidents, it now appears clear that something

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like a consideration of multiple failure analysis is going to have to be put into the licensing process, doesn't it?

A Something like that, probably, yes.

Q It is fairly accurate to say that the existing plants that are operating in the United Stations today have not been subjected to that kind of analysis; is that right?

A Not that they have not been subjected to that analysis; I think probably some analysis of that kind was done. I can't tell you the extent to which it was done.

Q It has not been done to the extent we are now talking about?

A Possibly not. Probably not.

Q Probably not. Insofar as we are talking about a possible change in the licensing process itself, it is highly probable that these previous plants were not subjected to that kind of analysis?

A Right.

Q Yet I take it all those plants are still operating and have not been shut down by the NRC; you do not feel those plants as they are currently constituted and are operating pose any undue risk to the public health and safety?

A That is correct.

Q Therefore you don't feel that this change in the licensing process would involve recommending what would otherwise constitute an undue risk?

A No. Recommending an undue risk, no. But, that does not go to say that should a change be determined appropriate and in the interest of additional safety, additional safety, that we would not order it. We might well, and indeed probably would.

Q You would feel it would fall within your responsibilities to —

A Sure.

Q Let me finish. To seek a change which makes the licensing process significantly safer, even though without that change there is no undue risk? You don't take undue risk as a bottom line, you see greater safety beyond that?

A That is right. If the greater safety, we believe to be significant and important, we require it.

Q All right. Why don't we — it is now 12:30 by my watch — why don't we break for an hour for lunch?

MR. CHOPKO: To clarify one point, I believe, Mr. Kane, you understood the answer to an earlier question about the appeal to the Commission as an appeal of right, in the ordinary sense. I would like to clarify that the NRC regulations indicate a party to an appeal board decision has the right to appeal to the Commission, but that the Commissior retains the discretion to deny the petition for review. So that we have, in effect, the Commission general authority as the overseer of the regulatory process.

MR. KANE: Therefore at any point the Commission as a body decides it does not want to hear a particular appeal from a particular licening process, it does not have to hear it.

MR. CHOPKO: It does not have to grant any appeal.

THE WITNESS: If I am correct, then, of course, the appeal having been registered with the Commission, the intervenor, the party would have pursued the available remedies and would be entitled to a petition to the federal courts.

MR. KANE: It would have exhausted their administrative remedies, I understand that.

(Whereupon, at 12:30, the hearing was adjourned, to reconvene at 1:30 this same day.)

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AFTERNOON SESSION

(1:30 p.m.)

Whereupon,

RICHARD T. KENNEDY

resumed the stand and, having been previously duly sworn, was examined and testified further as follows:

EXAMINATION

BY MR. KANE:

Q Mr. Kennedy, just before we began this session this afternoon, we have just been discussing the NRC Commissioners' consideration of safety issues. I have heard it suggested that there has been prior -- there have been prior statements or a statement to the effect that since the NRC Commission was created, it has not considered safety issues. It never had a meeting on safety issues.

I would like your views on the accuracy of that statement and if it is not accurate, why it is not accurate.

A I don't think it is accurate at all. The record is replete with detailed examination of safety issues by the Commission as a body, and by Commissioners individually since the founding of the Commission.

It was only after all a matter of a few weeks into the Commission's existence when the Commission was addressed by the staff in the matter of pipe cracks in boiling water reactors. At that time the Commissioners rather promptly

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moved to order the shutdown of some score of reactors pending a thorough examination to determine the source and nature of these pipe cracks and their difficulty.

Now that was just the beginning. The Browns Ferry fire which occurred some weeks or months after that, early on again in 1975, was the source of a great deal of direct involvement on the part of the Commission as a body and the individual Commissioners in reviewing its ~~implementation~~ implications for safety.

So it's been since the beginning of the Commission. I am certain that if you wished, we could provide — give the Secretary of the Commission a little time, we could provide a list of the safety-related papers brought before the Commission as briefings and discussions and as decision matters for the Commission in this regard.

I am sure that the numbers would run into the scores of such matters. And regularly I know — I speak for myself but I am confident that the same thing is true of other Commissioners. I know it always has been.

I speak for myself, for most of the time that I have been on the Commission I have involved myself in safety questions by getting detailed briefings on matters which were of considerable and current interest to be sure we understood the nature of those issues, that my staff was fully briefed and up to date on ~~what~~ where we stood and what the Commission

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was doing, and as a basis for further consideration on my part when the matters would finally be brought before the Commission.

So I don't think it is quite fair to imply that the Commission had not been involving itself heavily in safety matters. As a matter of fact, it has. That's been true throughout the life of the Commission.

Q Do you think it is fair to state, however, that the NRC Commission has not effectively engaged in on-going management of the NRC organization?

A Effectively engaged?

Q Before you respond, let me read to you a portion of a speech that was given by Commissioner Ahearne before the National Energy Resources Organization on June 24, 1979. In that speech Commissioner Ahearne cited a portion of a staff report of the Joint Committee for Atomic Energy in 1976, which stated the following:

"The Chairman of the Commission, the NRC Commission, would not appear to have the time to administer the Commission on a daily basis. Even if he did, he is much too removed and isolated from the day to day problems by the layer upon layer of management in the organizational structure.

"The Executive Director for Operation could not perform as an effective manager of the Commission offices because

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the major offices can bypass him and go directly to the Commission. No one is in the position to manage effectively the Commission organization. And no one is so doing."

In this speech Commissioner Ahearne states that he agrees with that statement and in his deposition a few days ago, he did affirm that he does believe that is correct.

My question is, do you believe that is correct?

A No, I don't.

Q Why don't you feel that is correct?

A Because I think the organization has been managed. If you would like my judgment about how well it has been managed, I will be glad to give you that too. It has been managed reasonably effectively. I think it could be managed a lot better.

I think some changes ought to be made in the way it is managed. Among those changes are an enhancement of the chairman's powers and prerogatives, ~~and~~ and an assumption on ~~this~~ his part of the prerogative in a much more direct way than has been up to now.

I say that mindful of an article I read even this morning in the local press to the effect that another commission in town is being charged with bad management because there the chairman has assumed unto himself the large number of prerogatives to the dismay of his colleagues on the commission, who feel that they are not being properly

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consulted. You can't have it both ways.

I have been brought up in a school which, of course, recognizes a rational hierarchy of decision and response. I don't think five people can effectively manage something, but don't forget that boards of directors of major corporations, to a considerable extent, manage the corporations.

It is the administration that is the problem. You have to administer through an executive agent, someone who is empowered to act. And that ought, in my judgment, to be the chairman.

Now, the chairman's responsibilities are fairly clearly spelled out but at the same time they are a bit circumscribed. There was an amendment to the Energy Reorganization Act shortly after the Commission was formed. This occurred in, it seems to me, late 1975, toward the end of the summer, I suppose, or thereabouts.

As I recall, it is vague at the moment, but it was about in that time frame, which conveyed some additional responsibilities and authorities were conveyed to the chairman. ~~and authorities~~

But at that time there was a little unhappiness over that since the matter came up on the — in the Joint Committee, maybe on the floor of the Senate, even, introduced by one of the senior senators. It seemed to have considerable support, although the matter had never been

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Some Commissioners, and I think I was one, expressed a little bit of dismay that at least we hadn't been consulted. All that went away and the matter was finally resolved with the Senate and then the House passed the legislation which amended the law, gave these additional powers to the chairman.

But, the fact that there was this little dissatisfaction over how it all had occurred and that we hadn't had at least an opportunity to express ourselves in the matter, I think, resulted in the then chairman, who was still the first chairman of the Commission, and his successors, being a little bit more careful of the use of those authorities than I think is warranted.

I think they ought to use those authorities. They are there. I think the authorities should be strengthened. That is as far as the Commission is concerned.

Commissioners, as a body, can serve very much as to the administration and the management of the organization — can serve very much in the way of a board of directors, if you will. They can't go out individually and manage. You can't do that. You can't have five people managing the place. One person speaking for them can if the other four of them will cede to ~~them~~ him their authorities in this regard.

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I will tell you I would be the first to do so. I believe he is the spokesman; if I think something needs to be said on behalf of the Commission, I expect him to say it. I don't expect me and four other guys to say it.

Q I think on the other hand Commissioner Ahearne was pointing out in his deposition as he understands the legislation that on one hand it provides that all of the NRC Commissioners are equal, they have an equal say in things and their positions are given equal weight.

On the other hand, that the chairman is the chief operating officer?

A With all due respect, I don't think that's quite right. We are all equal except as to those matters which are conveyed to the chairman by the law. It doesn't — the law is not, in my judgment at least, the law is not so ambiguous as to say on the one hand that all five Commissioners are responsible for X but that the chairman is responsible for X. It doesn't do that.

It says that the chairman is responsible for certain things — first it says that the Commissioners are responsible for everything that goes on in the Commission. Then it goes on to say, specifically, however, the chairman is responsible for these particular things and is conveyed the authorities to act on his own behalf in that regard. It is anticipated, it is expected that he will obviously

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consult with his colleagues in matters of significance. As he would.

Q Is it your understanding that the Commissioners as a body, however, could overrule actions taken by the chairman in pursuit of his specific powers as chief operating officer?

A It is not my understanding. So what I am trying to say is, ~~I think~~, that I don't think that it is impossible to run an institution of this kind this way. Indeed, there are a good many of them around town that run very well this way. But in almost all such cases, there are certain powers conveyed to or — they are by law or by agreement of the Commissioners, to the chairman, to act on behalf of the Commission.

He has to have then somebody to act with. As far as the layers, there are a lot of layers of supervision. They aren't in the administrative sort of business. If you look at a chart, I recall some years ago giving a speech and I threw this chart up on the wall and somebody wanted to know what does our organization look like?

I threw it up on the wall and said, my God, it's unbelievable, is it not? It certainly is not what the Harvard Business School would suggest as the ideal way to organize anything. But one has to recognize that what you have here is a very, very large body of people performing

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specific kinds of technical tasks. And all that hierarchy of supervision that one sees is not the administrative management chain. What it is is the technical management chain.

It is the management of technical talent and the direction of technical talent. That is what all that is. Really, the management chain runs down, I suppose, to the division director level. The rest of the institution is there performing specific technical tasks under the guidance of technical experts of recognized competence. That is what a lot of that is for.

So one doesn't have to think about that chart as an example. There is an anomaly in the law. It was put there for a very clear reason, I think. That is the conveyance to the three principal office directors, safeguards, ~~reactor safety, and the~~ reactor safety research, and reactor regulation, the right to direct relationship with the Commission.

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Q You go around the Executive Director of Operations?

A I don't describe it that way. One could. I don't. I don't because I think it was put there for ~~the~~ a very sound reason. You never expected that the Executive Director was going to be the technical director of the staff. These people were very substantial technical directors. That is precisely what they were.

One has to go back to the old AEC to recall perhaps some of the genesis. There, there was a general manager who, in effect, was just that. The commissioners didn't run the institution, the general manager did.

And the founding ~~fathers of this~~ institution — and I was not one of them — believed, I think, that they didn't want that kind of a situation. They wanted to be sure that the highest order of that technical talent, the directors or those principal officers, had direct access to the people who ought to be making those kinds of decisions. They did not want those decisions to be short-circuited by someone in between. So it was not an unsound concept.

Where it gets difficult, or early on certainly did, was in leaving some ambiguities about his relationship. It is one of those things you can't have both ways. You can tell the man, "You direct that staff," and, at the same time, telling him, "But you can't direct them." It just won't

work.

Q Because they can report directly to your superiors?

A So my view is that the Executive Director functions in the role of chief of staff. He is not the director of the staff. He is their chief in the sense that he is a coordinator, a facilitator, and he makes sure that the things the Commission is looking for get done and that they get done in a coordinated way.

He is not there to direct the safety activities that are involved in reactor regulation or the research activities. He is not there to decide what the research activities ought to be in reactor safety research. He is not there to determine on his own what the responsibilities should be for safeguards.

Q Is there one single person anywhere within the NRC who does decide all of that as a source of ultimate responsibility?

A That is the Commission's responsibility.

Q Collegially?

A Collegially.

Q It is your understanding them, and your experience, that the NRC commissioners in fact do what you just described?

A That's correct.

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Q Okay. I am looking at the Senate/House conference report on the legislation which created the Energy Reorganization Act of 1974. It does describe the role that was envisioned for the Executive Director of Operations.

Specifically it says, "It is expected that the Executive Director of Operations will be the coordinating and directive agent below the Commission for the effective performance of the Commission's day-to-day operational and administrative activities. He will coordinate and direct in behalf of the Commission the operating and administrative units."

If I understand what you just said, as far as you know, the Executive Director of Operations does not direct the operating and administrative duties?

A He does in the administration sense. But I was talking about — I should have made that clear, I realize I did not. He does in the administrative sense. That is in terms of resource allocations, in terms of the normal sort of administrative function.

Q Let me back up a little —

A He does not direct them, as I tried to point out, as to their specific technical responsibilities. That, he does not do.

Q So, for example, when the House/Senate conference report refers to the Executive Director as the directive

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BY MR. KANE:

Q The task force study refers to the resident inspector program. It says: "The program of resident inspectors, NRC personnel permanently on-site, currently being implemented should in the opinion of the task force be carefully evaluated. The surprise visit inspections by an off-site inspector may well be of more value than a resident inspector who may be biased in views and inhibited in actions due to the development of personal relationships with the utility personnel." Do you think that is a legitimate concern?

A It's always been a concern. We are trying to do everything we can to make sure it doesn't become a reality. A, those resident inspectors are required to remain aloof from social contacts with the people who are operating, managing that facility. B, we are making an effort to, if you will, evaluate on a particular basis the work of the resident inspectors. C, he is not alone.

As a matter of fact, the resident inspector program does not do away with all of the specialized inspection work that comes out of the regional office.

Q So this would be just on top of everything else?

A That's correct. Essentially on top of everything else. And --

Q That is where the resources problem comes in?

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A Well, sure.

Q The task force did address the question of obtaining people to fill these positions. It went on to say, in the same paragraph, I am quoting from, "also information obtained from Mr. Seyfert, of NRC, I&E, I believe, indicated difficultty —

A He is the regional director in Arlington, region 4.

Q Mr. Seyfert indicated difficulty in obtaining qualified number of personnel from NRC to fill the required number of resident inspectors position. The need for frequent rotation of such personnel makes the position less attractive to the better qualified and experienced individual. Do you think that is true?

A To an extent. We are trying to build incentives in that will offset the disadvantages. They are clearly disadvantages. We are trying to build in incentives that will offset them.

Let me add that we are mindful, obviously, of the difficulty in acquiring and getting the right kinds of people. We are not going to put them on-site until we are satisfied that the man is the right man and that he has in fact been trained for the job, and he is provided with tools to do that job. But we are committed to the program. We have scaled it out spread it across the years to be sure

that we are able to get the people and get the right kind of people and train them. So they are coming in gradually. You can't put them all there overnight.

Q All right. We talked before about Mr. Denton's proposal to resume licensing which was discussed last week at the Presidential Commission hearings. Diablo Canyon is among these plants from which Mr. Denton proposed to resume planning. Are you aware that Jesse Ebersole of the ACRS has raised a generic safety issue concerning interference with natural circulation cooling by either condensable or noncondensable gasses in all pressurized water reactors?

A I am. I hear he has.

Q Are you aware that due to the configuration of the Westinghouse steam generator, there is no readily perceivable way to prevent that issue by installing venting devices?

A I am not aware of that.

Q Are you aware of any discussion about the fact that the Westinghouse steam generator has a large number of U tubes in it such that it would be impractical to install a vent on each one?

A I am familiar with the Westinghouse steam generator and I would visualize it as being very difficult indeed to install a vent on each one of those U tubes. I have not heard this discussed.

jer MGM

Q Are you aware of any discussion currently within the NRC about Mr. Ebersole's concerns in this regard of noncondensable gasses and natural circulation?

A I am not. That does not go to say that in the Staff the question is not being examined.

Q Are you aware Diablo Canyon is a Westinghouse plant?

A Yes.

Q Who is the vendor of the NSSS nuclear steam supply system for Salem-2?

(Discussion off the record.)

THE WITNESS: Both of the plants are Westinghouse.

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BY MR. KANE:

Q Salem-2 and North Anna?

A Yes.

Q My final question for you, Mr. Kennedy, is one that we are posing to each of the NRC Commissioners because, after all, you are in the chief executive position within the agency. That is, if you had unlimited resources and you had unlimited authority to do what you feel should be done, what changes, if any, would you make in the current structure and way of operating of the NRC?

A First of all, let me preface my comments by saying that I am not one of those who believes that reorganizations are the panacea for all ills. Indeed, I think they should be pursued sparingly and only after one has identified the substantive issues that one is trying to deal with. All too often, I guess what I'm saying, one sees in this town and elsewhere a quick flurry to deal with a problem by reorganization. What that tends to do, I believe, is paint over, not cure. And the same problems will arise again. So I would not substantially disturb the ~~Commissioner's~~ Commission's structure. I believe that the existence of an independent commission has great merits. I believe it introduces that measure of objectivity which five inquiring minds coming from different backgrounds and perspectives can bring to issues. I think that is very valuable.

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It also brings a measure of independence which I think is very important. It was the reason I believe that the Commission structure was selected in the first place, and it is my understanding that at least there had been some discussion of alternative structures. I am not sure of this. I didn't participate in it. But I know that some had discussed alternative structures and concluded that the Commissi structure was well-suited to the mission because it did provide a level of independence that would be difficult to achieve any other way.

That independence, when you are dealing with issues of thi kind, was extremely important. I can only say that in the years that I have been here -- we spoke earlier of pressure. There are pressures. I think it is more easily dealt with, more readily resisted, by a group of five people acting collegially ~~active~~ than might be possible for an individual in a single position.

So having said that, I also recognize the inefficiency th may exist in the managerial sense about which we discussed earlier. I would say that those can be corrected to a very large extent by a greater concentration of the executive authority in the hands of the chairman. I think that's all it takes. It takes that, plus a willingness on the part of his colleagues to cede a little bit of their own wishes, muc less their authorities, to him.

I think that can be done; I think it should be done. I do not believe that the Commission should try to become, or indeed the head of the agency, whatever forum, should try to become the ultimate safety authority in the sense of detail. It simply can't.

If one looks at the vast amount of computational detail which is required to reach specific safety conclusions, through the licensing process, and indeed in the activities o the operating reactors, it would simply be feckless for the head of the agency to try to immerse himself, itself in that kind of activity. It would soon be lost. I think it would b ineffective very quickly. It would be swamped upon with detail. You just couldn't cope with it. That's what the agency is for. That's what the staff is for.

So how to harness the staff? I thought a lot about alternative ways of getting better reaction. I think we believed since 1975 that we had opened the doors, that in fa we had been able to get people to feel free and interested i presenting alternative views.

I am surprised sometimes that people don't believe that. I am surprised as well that in some levels of supervision there is still resistance to that. I suppose in part it's t human condition. People like to have people agree with them parti larly if they are a little bit insecure. ~~of themselves~~ We have to do more to make it clear that legitimate dissent,

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if that's what you call it, is encouraged. We can do more. And, indeed, we are just about to issue still another document on this subject which will be made available to every single individual working in the entire organization, recognizing that he's here because he has a technical competence and ability. He's here because he's been selected for that job and, fortunately for us, from a large number of his peers, th is why I think the quality is as you see it.

We are fortunate in this regard. Therefore, they are respected. They have to understand that they are respected and that their views are respected. We can do that; we can d it better than we have. I think we are a lot better than we were. I think we can be a lot better than we are.

Q Okay.

A Now, as to how you harness the organizational staff Well, as I say, I thought a lot about how you might reorganiz You could put all the technical people back together. But if you do, that's put the project management people and systems safety people and the operating reactors people all back in t one great big pot, and put them all focused on specific technical specialties. Then run the whole thing through as a project management exercise.

I reflected back to why we changed it from that, essentially that configuration, once before. The reason was we have got 70 reactors, as you pointed out, out there, and a

lot more presumably, perhaps, that will be operating reactors That seemed to us -- it seems to me now -- worth special attention by people other than just inspectors. I don't mean by saying just inspectors to denigrate the ~~inspection~~ inspectors. Inspection responsibility is focused in a particular way, as it should be. It's focused on assuring that, in fact, the standards and the regulations, as they have been laid down -- and the technical specifications as they have been agreed to -- are being fulfilled. That is the mission of the inspection service.

But there is a job beyond that. That has to be done, but there is a job beyond that. It's a different kind of a job. That is: What do we know about the reliability of these systems? What do we know about how well they function, and how well they function in interrelationships? That's what the operating reactors people are for. If you don't have them, you are going to lose something.

What we have to do is get into that organization much more the data that is available. That means there has to be a much greater interface between the inspection and enforcement people and the nuclear reactor regulation people. But then that is song that is sung by someone singing for a very long time.

Why haven't we done it? Let me suggest that it is very easy to ascertain how organizations might better function. It's less easy to get them to do it because, in the first ca

you are looking at a concept. In the second place, you are looking at human beings interacting. Even though you draw the boxes, and even though you pass the papers in the right direction, it's in the last analysis the way human beings interact that counts and tells you whether the organization i functioning the way you want it to.

There has been in this organization from the very outset separation. I am not talking about physical separation; I'm talking about separation of functions. In part, that was because the old regulatory concept did separate regulation that is licensing from inspection in a very, very real way. They were separated, intentionally separated.

I am suggesting that that separation has got to be broken down considerably. There should be a constant interaction. It ought to be all part of the same process. What you learn from inspection, from the Creswells or whoever, ought to be the basis for the work that the licensing people are doing, what the research people are doing. Let's not forget them. They are out there, too. So they have got to be brought together.

I'd take a few simple first steps. I would lift people bodily -- first of all, the Stello move is one of those that I applaud greatly, that I have been trying to get done for a long, long time. I am not pushing my own ideas. I just hap to think it's a good one. You can't have any organization

that's going to function except in a separate mode if there are walls between organizations and people don't move through them. When I say "move through them," I mean they ought to literally work over there, understand what that fellow over there does and why he's movitated as he is. They just might learn something that would be useful back over here, and vice versa.

I think moving Stello is already having its effect in this regard. He understands what he's been doing all these years. Now he's doing something else that he clearly sees interfaces very closely with what those fellows he left behind are doing A lot more of that is needed. I think we are going to get there.

You know these things aren't too big; they are not great, enormous things. Two or three of the people from DOR ought to be permanently set over there in I&E, in my judgment, as a sort of permanent liaison staff. I mean the spaces are there the people rotate. Put two or three people -- I don't know what the number is; leave that to the guys who operate. Put some people in I&E here in a sort of permanent liaison capacity.

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When I said permanent, I didn't mean the individuals would stay there permanently, they would rotate. Because the last thing you want are liaison guys to become permanent liaison officers. One of the things you get from such people is knowledge. You need the knowledge over here. The same thing with I&E. Put them over in DOR. I would do the same thing in the field establishments.

As far as the field establishment is concerned, I don't think it's big enough. I don't think it's located properly. I think there ought to be at least one more, maybe two more regional officers. That is where resources will come in. That is where the reactors are.

I have to make a sort of an offhand comment, I don't think that offices located in Walnut Creek are likely to have as good a communication as those located in San Francisco. Do you know where Walnut Creek is? Of course, you do, you are from California.

Q It's not exactly an urban center.

A But, where are communications? Where are resources? That is a very minor thing. As I said, my ideas are not great and enormous ones. The executive director, his role has to be clarified. He ought to be, I believe, what I said I thought he should be, he ought to be the chief of staff. He is not directing the technical

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activities of those people and it should be clear that he isn't. The Commission can stand a span of control that involves four or five people, or six.

Q That would be the various division heads?

A The big chiefs, yes. ~~We~~ When we are talking about a technical matter we should go to him, go to the director, as we do. Director of NRR. I think that is right. By the same token, the executive director ought to understand that as to the coordinating activities within that staff, making sure that if NRR has a safeguards problem, it's coordinated with the people who are the safeguards experts in NSSS, that it is done. Somebody needs to do that. That is what I think his job ought to be. And his job ought to be assuring that resources are available; and if they aren't, coming to the Commission to get them.

That is a pretty big role. It simply is not trying to put a superguy in charge of all the technical activities of the agency. That is not what he is for.

Q That person would be the Chairman?

A That person would be the Commissioners through the Chairman, that is right.

Q Okay.

A I also think that we do some things that we ought not to do. We are in the business of export control. Now I don't think we ought to be there. We have some technical

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expertise in our Nuclear Materials Safety and Safeguards office and elsewhere in the agency. That can be brought to bear on questions. But deciding whether an export should be authorized or not, has two basic aspects. One, an economic one which involves the export and its value to the economy. And two, the foreign policy aspects of a relationship with a country to which the export is going. Neither of those are matters which I believe this Commission has any particular expertise in.

I spent a good many years in that kind of business and I don't think this is the place to be making decisions of that kind. I don't think an independent commission, sitting off here, able to do its bidding and its own choosing ought to be deciding things which are within the purview of the President or the Secretary of State.

I recognize that the Congress gave us that responsibility; I think it's unwarranted. As long as we have it, I intend to discharge it to the best of my ability. I just think it's unwise for a whole variety of reasons, not particularly because it's a great time consumer. It does consume time and attention. I just think this is the wrong place for those kinds of decisions.

We certainly can and should offer our technical advice but we ought not to be the repository of the final say.

I guess I have got a lot of other ideas —

jermcm

Q That pretty much covers the big ones, though?

A I think so. I think, as you could see, as I said they are not big, I don't think they have to be that big.

Q Let me invite you, Commissioner Kennedy, if after this session today, there should be some further ones that occur to you that you would like to bring to the attention of the Presidential Commission, you should certainly feel free to submit those in writing. Let me ask if your various counsel have any questions to ask.

(Discussion off the record.)

THE WITNESS: One matter which I would like to clarify. I think we talked earlier about when the Commission first began to consider exemptions. I think I may have implied or indicated that it was around TMI or after. As a matter of fact, it's been called to my attention and I now recall it was really over a year ago. I think it was in 1978 at least that we began looking at these matters. And have looked at them ever since.

BY MR. KANE:

Q So, for example, I made reference before to an exemption granted by Mr. Stello, or signed by Mr. Stello, for Three Mile Island, Unit 1, in March of 1979?

A I presume that would have been brought to our attention.

Q Can you describe how it's brought to your

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attention? Is there a document that is prepared for presentation to the Commission?

A We are informed either by a memorandum or our technical assistants are advised of the proposal if it's — you know, there are many, many. If it is a very minor thing, it may be brought to the technical assistants who in my case would always bring it to my attention.

Q Is it then subjected to some type of — has it been since mid-78 subject to some kind of vote by the Commission?

A Not vote in the precise technical sense. The Commissioners would express themselves as having no objection and this would simply be communicated back to the Staff, but not as a formal vote of the Commission. But if a Commissioner had an objection, then the matter would actually come before the Commission and it would be considered.

Q Can I request then that, Commissioner Kennedy, that you have your assistants or someone search your files to determine what documentation may exist concerning Commission concurrence in an exemption granted by Mr. Stello, as I understand, March 16, 1979 for Three Mile Island, Unit 1. It related to a deficiency in the ECCS system for Three Mile Island, Unit 1.

MR. CHOPKO: If we have the Federal Register

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notice, it might be easier to take a citation from that.

MR. KANE: I don't have it here.

MR. CHOPKO: It's tab 32 in the briefing book.

MR. KANE: I didn't bring that with me. If there is any difficulty, please let me know. I can give you that cite very quickly. am specifically concerned with any documentation that reflects concurrence by the NRC in that determination and anything that reflects any basis for that concurrence. Other that that I have no further questions at this time.

MR. CHOPKO: We have no cross-examination.

MR. KANE: What I have been saying in the past is this is an ongoing investigation still and if we have further facts that come to our attention, it may be necessary to brin you back for a further session of your deposition. So I will adjourn the deposition rather than terminate it but we will make every effort not to bring you back, and I thank you for the time today.

THE WITNESS: I appreciate your courtesy.

(Whereupon, at 5:15 p.m. the deposition was adjourned.)

UNITED STATES
NUCLEAR REGULATORY COMMISSION
OFFICE OF PUBLIC AFFAIRS
WASHINGTON, D.C. 20555

BIOGRAPHY

RICHARD T. KENNEDY

Richard T. Kennedy was Deputy Assistant to the President and Director of National Security Council Planning when he was appointed to the Nuclear Regulatory Commission (NRC) in January 1975. He had been a senior staff member of the National Security Council staff since October 1969.

Born on December 24, 1919, in Rochester, New York, Mr. Kennedy was graduated with a Bachelor's Degree in Economics from the University of Rochester in 1941. He holds a Master's Degree with Distinction from the Harvard Graduate School of Business Administration and is a graduate of the National War College in Washington, D.C.

Mr. Kennedy is a member of the American Nuclear Society's International Advisory Committee.

Mr. Kennedy is married to the former Jean Martin of Rochester, New York. They live in Washington, D.C.

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April 1978

March 13, 1975

Commissioner Gilinsky

Thru: Acting Executive Director for Operations

TECHNICAL ISSUES

Attached you will find, in accordance with your oral request, discussion of some technical issues I believe to be important subjects for Commission consideration, although not necessarily in the immediate future. The list is confined to reactor safety topics.

I have also appended a list of some reactor safety policy issues that have come to my attention in technical reviews.

These enclosures represent my personal views and have not been staffed out with the organizations normally concerned with such matters.

Stephen H. Hanauer
Technical Advisor

Encls
1. Technical Issues
2. Policy Issues

cc: w/encl
Chairman Anders
Commissioner Kennedy
Commissioner Mason
Commissioner Rowden
L.V. Gossick
E. Case
H. Kouts
F. Schroeder
A. Giambusso
R. Minogue

1. Design Objectives and Safety Design Basis for Water Reactors

Although your mother-in-law and your Congressman will tell you that the safety goal is zero risk, we know that this is unattainable and that some non-zero risk must be accepted in all activities. The social questi involving cost/risk/benefit comparisons of the various alternatives that are realistically available needs to be established. The Rasmussen Study made an important first step in quantitative risk evaluation but the technology is not yet available to resolve this question in a completely quantitative way. The study has pointed out a disparity between (a) our present "design basis" safety approach in which all potential accidents are either put into the design basis for complete mitigation or remain outside the design basis and have no safeguards compared to (b) the more realistic viewpoint of a spectrum of accidents each with probability and consequences of its own. Serious consideration should be given to modify the present all-or-nothing approach in the light of reality.

2. Design Objectives and Safety Design Basis for Non-Water Reactors

For non-water reactors, we have neither the operating experience nor the Safety Study to guide us in developing criteria. The situation is reasonably well in hand for HTGRs, but the potential for autocatalytic positive feedback leading to core nuclear explosions in LMFBRs is creatin great uncertainty regarding their design requirements. Calculations of such violent events are increasing in scope and sophistication. However, the results presently depend to a considerable extent on the phenomena postulated to occur. For the near term, the staff has already decided that a core disassembly accident must be part of the licensing design basis. This decision is subject to future revision based on further rese that ERDA is convinced will show that such events are so improbable they not be considered.

Adequate safety must be provided. Too much safety - added safety equ not actually needed to provide adequate safety - wastes scarce and valuab resources. Attention to improbable severe postulated events tends to sho change, more probable but less severe accidents that should be considered.

An important corollary issue is whether the planned LMFBR safety rese programs meet the totality of NRC needs.

... has not established quantitative reliability criteria for safety related systems. The operating plants are one of our chief sources of information but we do not know whether the rate of abnormal occurrences now being experienced is a satisfactory one or not. We do know that nuclear unit availabilities and capacities are not satisfactory. We nee to find out whether safety system availability is satisfactory and to improve whatever aspects of reliability need improving.

4. Human Performance

Present designs do not make adequate provision for the limitations o people. Means must be found to improve the performance of the people on whom we depend and to improve the design of equipment so that it is less independent on human performance.

The potential for internal and external sabotage constituting a publ safety hazard, and the degree to which design and operation needs to tak sabotage into account, need to be delineated. Studies now underway shou help, but some of the issues are non-technical. In spite of this diffic technical criteria are needed.

The relative roles of human operation and automation (both with and w on-line computers) should be clarified. Criteria are needed regarding al computerized safety-related functions and computer hardware and software requirements for safety-related applications.

5. Plutonium Dose Criteria

Present accident dose guidelines values are given only for whole-body and thyroid doses. Other dose components (lung, GI tract, bone) should b covered by similar guidelines. A number (or numbers) for plutonium is particularly badly needed and will be particularly hard to establish.

6. Siting

Present criteria for siting are in need of improvement in the follow areas:

a. The design basis external events now in use for licensing are fou on various schemes for estimating a "probable maximum" event. We do not any good way of estimating the return interval or the frequency of the earthquake or flood calculated in this way. Furthermore we are not likel to develop good methods for doing so in the near future because of the sh

(sometimes we talk about a million years). Various developmental metho for estimating frequencies of design basis events, chosen as we choose give recurrence intervals substantially shorter than a million years. lack of knowledge and the desire to be conservative is going to make resolution of this problem very difficult.

b. Our population siting criteria are indefinite at best. The app is required to study population distributions around a site and to proj them for the life of the plant which, of course, he can do only very cr but our criterion for population distribution surrounding the plant are vague. Recent attempts to be more quantitative in this area met with g resistance from the industry and from the old AEC. They tend to be ove simplified, but I believe we could do better than has been done. A rel problem is our present total lack of control over what goes in near the plant after the site is approved. We have some vague words about the licensee's responsibility to stay informed about subdivisions, ammunitic plants, LNG terminals and other post construction materialization of thi that would have made the site unacceptable if known before licensing. S some operating reactor is going to have a new neighbor of a really abomi kind and we are going to have trouble coping with it.

c. I believe we are not being serious enough about siting alternati that may offer substantial safety improvements. An obvious example is underground siting about which we are just starting a study in RES.

7. Degree of Detail and Realism in Safety Evaluations

The great improvement in computer codes available for use in analyzi the course and consequences of postulated accidents has rather naturally to a corresponding increase in the depth and detail of Regulatory review these accidents. On the face of it this is a good thing. It leads to b technical understanding and increased realism in evaluations. But is ov safety review enhanced by such detailed examination of certain design ba accidents? It is at least arguable that a broad brush treatment, with p of arbitrary conservatisms, gives at least as much safety with a lot les work on everybody's part. A recent and obvious example is the new ECCS regulation, which specifies in gory detail exactly how these calculation to be made. There are many arguments for and against use of such detail the subject is about right for reopening, in my opinion.

A related subject is the very large increase in the capability of the staff to make independent calculations in many accident areas. This has proved to be invaluable in increasing the staff's technical understanding and should be continued even if some of the details are recognized as too detailed for licensing.

1. Internal Quality Assurance

We are not taking our own medicine with regard to a quality assurance program in Reg. We do not have a quality assurance organization, indepen of the line, reporting to higher management and we have very little audit and QA in the line. If 10 CFR 50, Appendix B, is good stuff, then it sho be applied to the NRC organization. This must be applied to the quality of our product - safety decisions - as well as the quantity and timelines of our output.

2. Making Better, Faster and More Generic Decisions

Our recent record is mixed. A good example is ATWS and a bad example is turbine missiles, about which we seem not to be able to make up our minds. Future technical safety review should not be endless and mindless repetition of what we have been doing for the past couple of years but rather consolidation into general decisions and general principles, bette identification of what is truly important (risk evaluation?), and increas automation of routine evaluations.

3. Stabilization of Regulation Requirements and Standardization of Desig

Our recent reviews of the standardized designs that have been submitt and recent discussions on standardization (and piggy-back) show the following:

a. The standardization designs submitted are not consolidations of previous experience. The proposed standard designs include a large numbe of "improvements" not yet actually designed. So, these first standard CP will be based on a bunch of promises, even more than recent custom CPs.

b. New information from design and operating experience and safety research programs, and new insights as a result of this experience and research have pointed the way to improvements in safety that seem worth-while and in some cases necessary. The pace and guidelines of the standa reviews has not permitted implementation of these, so they are hanging ov our heads as a serious threat to standardization.

c. As a result of a. and b. and of the long time lag between today's bunch of promises and construction and operation of standard plants, more attention needs to be paid to the execution of standardization over the next several years and stabilization of Reg requirements.

This is closely related to Item 3. In the past couple of years surp have come both from operating experience and from improved understanding by both Reg and the industry of safety problems we thought were put to b An obvious example is all the trouble we had with ECCS evaluation models Innovation by applicants will continue to generate surprises. We must develop methods for dealing with these surprises, in cases and generical without having a fire drill each time.

A COMPARATIVE LISTING OF SAFETY CONCERNS BEFORE AND ACTIONS AFTER THE TMI ACCIDENT

May 17, 1979
REV. August 23, 1979

SAFETY CONCERNS EXPRESSED BY D. L. BASDEKAS, REACTOR SAFETY ENGINEER, U. S. NUCLEAR REGULATORY COMMISSION ON NOVEMBER 19, 1976 AND DECEMBER 20, 1976, SAFETY ISSUE NO. 22, NUREG-0153

SAFETY IMPLICATIONS OF CONTROL SYSTEM FAILURES AND PLANT DYNAMICS *

The effects of control system failures or, sometimes, non-faulted operation n safety are not being systematically reviewed. I believe that their effects n safety and plant availability should receive the proper attention. The irst step would be to have the applicants perform a Failure Mode and Effects nalysis (FMEA) for normal operation, and in conjunction with postulated ccidents and other off-normal events."

In evaluating plant safety, the effects of control system malfunctions should e reviewed as initiating events for anticipated transients and also as failures hat could occur concurrently or subsequent to postulated anticipated events initiated by a different malfunction) or postulated accidents."

... one has to consider that design features to mitigate the consequences of uch events are not established, and therefore, those provided for postulated nd analysed accidents may not be sufficient, thus, in essense, having an nprotected series of events."

n a related issue on reliability and risk assessment:

... common mode failures and events that may result in such failures, along ith human factors, are expected to contribute most significantly to the navailability of the shutdown system. ..." (From Discussion of Issue No. 88, UREG-0133)

* In countering Basdekas' arguments in December 1976 the NRC Regulatory Staff maintained:

> "Although analyses have not been performed for these postulated sequences of events, the staff believes that the consequences would be acceptable, and much less severe than those calculated for postulated accidents."

In a Report to the Congress, NUREG 0438, April 12, 1978, the Office of Nuclear Regulatory Research of NRC, in justifying its position that no further research effort was needed on "Improved Plant Controls", reported:

RECOMMENDATIONS BY THE NRC REGULATORY STAFF INCLUDING A COMMITMENT MADE BY BABCOCK AND WILCOX COMPANY, DESIGNER OF THREE MILE ISLAND UNIT 2 NUCLEAR POWER PLANT SUBSEQUENT TO THE ACCIDENT AT TMI

On April 26, 1979, almost a month after the TMI accident The Babcock and Wilcox Company, designer of the TMI Nuclear Power Plant, made the following commitment to NRC by letter from J. H. MacMillan, Vice-President Nuclear Division to H. R. Denton, Director, Office of Nuclear Reactor Regulation U.S.N.R.C.:

> "Subject: Integrated Control System
>
> This letter documents the commitment of Babcock and Wilcox to undertake a reliability analysis of the Integrated Control System (ICS) which will include a failure mode and effects analysis.* This analysis will identify sources of transients, if any, initiated by the ICS and develop recommended design improvements which may be necessary to reduce the frequency of these transients.
>
> In addition, means will be developed for decoupling of the auxiliary feedwater control of steam generator water level from the ICS. This modification will provide control of feedwater under emergency conditions independent of the ICS.
>
> The scope of the reliability analysis and schedule for both the analysis and development of independent feedwater control will be provided within 48 hours."

On May 16, 1979 the NRC Regulatory Staff issued report NUREG-0560 entitled Staff Report on the Generic Assessment of Feedwater Transients in Pressurized Water Reactors Designed by the Babcock and Wilcox Company.*

The report recommends that:

> "All classes of operating plants should be re-analyzed using failure mode and effects analysis to identify realistic plant interactions resulting from failures in non-safety systems, safety systems and operator actions during transients and accidents."
>
> "The role of control systems in all plants, and their significance to safety, should be reevaluated by NRC and the vendors. The evaluations should be performed by the industry with guidelines developed by the NRC. Consideration should be given to establishing criteria regarding the rate at which transients challenge the plant safety systems. Such transients should include (a) those initiated by control failure plus (b) those initiated outside the control system that are not successfully mitigated by the control system."

A COMPARATIVE LISTING OF SAFETY CONCERNS BEFORE AND ACTIONS AFTER THE TMI ACCIDENT

SAFETY CONCERNS EXPRESSED BY D. L. BASDEKAS, REACTOR SAFETY ENGINEER, U. S. NUCLEAR REGULATORY COMMISSION ON NOVEMBER 19, 1976 AND DECEMBER 20, 1976, SAFETY ISSUE NO. 22, NUREG-0153

SAFETY IMPLICATIONS OF CONTROL SYSTEM FAILURES AND PLANT DYNAMICS

"The effects of control system failures or, sometimes, non-faulted operation on safety are not being systematically reviewed. I believe that their effects on safety and plant availability should receive the proper attention. The first step would be to have the applicants perform a Failure Mode and Effects Analysis (FMEA) for normal operation, and in conjunction with postulated accidents and other off-normal events."

"In evaluating plant safety, the effects of control system malfunctions should be reviewed as initiating events for anticipated transients and also as failures that could occur concurrently or subsequent to postulated anticipated events (initiated by a different malfunction) or postulated accidents."

"... one has to consider that design features to mitigate the consequences of such events are not established, and therefore, those provided for postulated and analyzed accidents may not be sufficient, thus, in essence, having an unprotected series of events."

On a related issue on reliability and risk assessment:

"... common mode failures and events that may result in such failures, along with human factors, are expected to contribute most significantly to the unavailability of the shutdown system. ..." (From Discussion of Issue No. 08, NUREG-0138)

In countering Basdekas' arguments in December 1976 the NRC Regulatory Staff maintained:

"Although analyses have not been performed for these postulated sequences of events, the staff believes that the consequences would be acceptable, and much less severe than those calculated for postulated accidents."

RECOMMENDATIONS BY THE NRC REGULATORY STAFF INCLUDING A COMMITMENT MADE BY BABCOCK AND WILCOX COMPANY, DESIGNER OF THREE MILE ISLAND (TMI) UNIT 2 NUCLEAR POWER PLANT SUBSEQUENT TO THE ACCIDENT AT TMI

On April 26, 1979, almost a month after the TMI accident the Babcock and Wilcox Company, designer of the TMI Nuclear Power Plant, made the following commitment to NRC by letter from J. H. Taylor, Vice President Nuclear Division to B. R. Denton, Director, Office of Nuclear Reactor Regulation, U.S.N.R.C.:

"Subject: Integrated Control System

This letter documents the commitment of Babcock and Wilcox to undertake a reliability analysis of the Integrated Control System (ICS) which will include a failure mode and effects analysis. This analysis will identify sources of transients, if any, initiated by the ICS and develop recommended design improvements which may be necessary to reduce the frequency of these transients.

In addition, means will be developed for decoupling of the auxiliary feedwater control of steam generator water level from the ICS. This modification will provide control of feedwater under emergency conditions independent of the ICS.

The scope of the reliability analysis and schedule for both the analysis and development of independent feedwater control will be provided within 40 hours."

On May 16, 1979 the NRC Regulatory Staff issued report NUREG-0560 entitled "Staff Report on the Generic Assessment of Feedwater Transients in Pressurized Water Reactors Designed by The Babcock and Wilcox Company."

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"All classes of operating plants should be reanalyzed using failure mode and effects analysis to identify realistic plant interactions resulting from failures in non-safety systems, safety systems and operator actions during transients and accidents."

"The role of control systems in all plants, and their significance to safety, should be reevaluated by NRC and the vendors. The evaluations should be performed by the industry with guidelines developed by the NRC. Consideration should be given to establishing criteria regarding the rate at which transients challenge the plant safety systems. Such transients should include (a) those initiated by control failure plus (b) those initiated outside the control system that are not successfully mitigated by the control system."

C-4

CORRECTION SHEET

NAME OF WITNESS Richard T. Kennedy

DATE OF TESTIMONY September 5, 1979

PAGE	LINE	CORRECTIONS
1	5	Room ~~1115~~ 1113
3	16	in the ~~relatively~~ relative informality of ~~our~~ your office, ...
5	24	in detail in those matters, but rather in a general ...
5	25	~~and----from-supervisory~~ and policy viewpoint.
6	11	The specific processes begins with detailed
6	15	upon involved calculations and ~~using~~-a computer codes and
6	24	on ~~an~~ the adjudicatory side in the licensing processes ...
9	20	instance ~~either~~ of our present chairman -- they do not have
10	22	I'm suggesting again that to the extent it does that it
12	6	Well, first there is the ~~licensing-of-that~~ licensee event
12	22	demonstration which has potential ~~possible~~ safeguards,
13	19	Was that ~~when~~ what you were referring to when you talked about
14	3	This is a procedure of ~~the~~ weekly staff notes which are a
14	23	whatever the staff knows about it at the time it forwards the
17	12	training. Let me say that when I say ~~why~~ that I have had no direct
28	25	ing to Offshore Power in which the question of the ~~amicability~~ applicability
29	23	part ~~of-the~~ an answer to the question. It's just does not seem ...
30	25	by the director of Nuclear Reactor Regulations. Since that
33	4	safety analysis. ~~And~~ and the determination on the part of the
34	22	Mile Island accident to the Director of NRR, ~~Heward~~ Harold ...
36	10	~~for~~ of the exemption based upon which the judgment as to its
36	22	Not ~~to~~ which I am aware of.

CORRECTION SHEET

NAME OF WITNESS Richard T. Kennedy

DATE OF TESTIMONY September 5, 1979

PAGE	LINE	CORRECTIONS
42	1	They assume, they have ~~have~~ assumed that in fact
42	18	Division of ~~Safety,-both~~ Project Management as to the ...
42	25	it is quite another matter, for a serious matter to be ~~there~~ open.
43	1	Even if one assumes, in my judgment, ~~even-if-one-assumes~~
45	12	I think ~~what~~ that is what I just said.
46	21	~~nothing~~ knowing what you know today, the small break LOCA ...
48	3	with TMI-I which was setting up a ~~heading~~ hearing and ...
52	25	guess, in my mind at this juncture is how do you ~~design~~ decide ...
53	5	conclusion, whether that is a ~~whole~~ wholly valid concept, ...
53	6	there are other systems ~~in~~ or other matters beyond that which
53	14	well taken, it seemed to me, as -- that the PORV and its block
55	6	licensing and regulation ~~could~~ should effectively take
55	14	And there was an obvious limitation on the total amount of
57	2	will ~~have~~, as I said, discover it's been self-defeating, ...
57	24	those, as you put them, good faith decisions, always aimed at
71	4	didn't happen, hadn't happened, and people believed, I think,
74	12	By a more extensive look ~~on~~ at how it does its job.
74	15	Where it's feasible for the level ~~or~~ of regulation
77	13	then I think we're not going to get the kind of ~~rule~~ assurance ...
77	14	think we all want to see.
79	24	presumed to understand the situation, ~~heading-past~~ having passed ..
85	25	reactors. At that time the Commissioners rather promptly

CORRECTION SHEET

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DATE OF TESTIMONY September 5, 1979

PAGE	LINE	CORRECTIONS
86	8	individual Commissioners in reviewing its ~~implementation~~ implications for
86	25	and up to date on ~~what~~ where we stood and what the Commission
88	17	chairman's powers and prerogatives. ~~Add~~ and an assumption on
88	18	~~this~~ his part of the prerogative in a much more direct way than
89	20	responsibilities and authorities were conveyed to the chairman. ~~and authorities.~~
90	25	will cede to ~~them~~ him their authorities in this regard.
92	8	to say is, ~~I think,~~ that I don't think that it is impossible
93	7	Really, the management chain runs down, I suppose, to the
93	15	the three principal office directors, safeguards, ~~reactor~~
93	16	~~safety, and the~~ reactor safety research, and reactor
94	4	don't. I don't because I think it was put there for ~~the~~ a
97	5	It depends upon what is ~~describes~~ described as operational.
97	13	If one describes it as that, he does not do that. If one
99	19	at a ~~reasonable~~ reasonably early date.
99	22	pressure. I believe they were reasonably putting before us for
99	23	~~reasonable~~ consideration ~~from~~ their perspective as a public
100	10	Now, this was not taken by me, as pressuring, certainly, in ...
100	12	Commission. ~~The;~~ the second was a meeting which was ...
101	17	revision of the construction be accomplished. ~~They~~ We do it
103	4	~~involving~~ involved the whole range of Defense in Depth ...
105	6	have a choice. Either they'll follow the order or they won't
105	22	large cost, and that ~~happened~~ happens to be true.

CORRECTION SHEET

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DATE OF TESTIMONY September 5, 1979

PAGE	LINE	CORRECTIONS
107	12	about those issues identified by the lessons learned ~~by the~~
108	11	people were not ~~might have been~~ doing 15 years ago. ...
108	15	When I first started flying ~~an~~ in airplanes, a DC-3 was ...
110	6	sensible to continue building one like the DC-3 design. ...
110	7	keep building them when you can build ~~another~~ a better one?
111	3	That is where I think the industry ~~I think~~ ought to
118	8	technology. It would seek ways of finding ~~to~~ it and introducing it.
118	9	~~and to introduce.~~
122	4	~~Mr. Kennedy~~ Dr. Kemeny recalled Dr. Roger Mattson's testimony ...
124	22	composition of the plants, which mitigates the effects of the
125	2	have a synergistic effect, (and we think that we have done
125	5	that these lessons have applied to other plants ~~and~~ we have also
125	6	advised other licensees.), if we can see that, then it seems
125	9	review processes, to the extent that any change occurs that
130	14	What I want to know is if the operator has and that is a
134	9	retraining programs ~~or~~ at the B&W plants was in fact reviewed by
138	14	out all the ~~PORVs~~ PORVs failing to open. It wasn't programmed
138	16	Not ~~to be~~ so obvious, necessarily.
139	22	plant, I suppose that would be something that ought to be
140	18	I suppose, about how far they can go ~~with~~ in this regard
142	3	nuclear power ~~plans~~ plants.
143	4	organizational elements of this institution.
146	24	issues ~~enforced~~ remedied before somebody else spots them.

CORRECTION SHEET

NAME OF WITNESS Richard T. Kennedy

DATE OF TESTIMONY September 5, 1979

PAGE	LINE	CORRECTIONS
148	6	is was not properly taken ~~take~~ care of and the action now ...
148	12	THE WITNESS: To ~~o~~ back to your question, your
155	14	If you are going through the ~~certification~~ solid.fication ...
156	6	building ~~to~~ until you remove that material. It's ~~desirable~~ ...
158	5	These are also by the way ~~a-factor-of~~ subject to the ...
158	12	My understanding was that there ~~were~~ was not any such
162	3	Again, off the record, your counsel has been
163	21	what we are looking at in this kind of an accident -- we will
163	22	have some notion of the total level of liability, if any~~,~~ is
163	23	assessed~~,~~ ~~to~~ will be. I think we could then better look at ...
166	7	But it was required by the ~~1969~~ 1966 amendments to ~~the~~
166	8	published written criteria which would be adopted after a
178	7	along, there are plans. B~~,~~ There ~~are~~ is also a very, very
179	6	we are talking about state ~~plants~~ plans, aren't we?
182	11	because ~~we~~ did not ~~invest~~ insist that those resources ...
182	12	available to the Office ~~and~~ of State Programs. We had the
183	17	It was not true. But I'm not sure that -- I'm not
183	22	were with. I don't think they fully knew the import. We ...
186	1	core -- not in the core but in the pressure vessel ~~up-ahead~~ head --
187	5	of an iffy ~~thing~~ thing, and ~~they~~ they finally concluded ...
187	17	people and other industry people together with advice ~~from~~ and
187	18	counsel ~~on~~ from our own staff and assistants, we'll be able to

CORRECTION SHEET

NAME OF WITNESS Richard T. Kennedy

DATE OF TESTIMONY September 5, 1979

PAGE	LINE	CORRECTIONS
188	6	hearing some of the ~~things~~ things that Governor Thornburg
188	24	~~commissioner~~ commission an emergency. It had a whole establishment design-
189	16	~~mercurial~~ cargo compartments of airplanes. However, the Commissioners should
191	1	charge ~~is~~ as required is there, and is provided.
191	23	light, we ought to continue with responsibilities ~~there~~ here.
192	6	putting it in in his hands, as I think ~~they~~ it should be.
193	14	Commissioner has in fact seen the document and is familiar
194	2	The task force study refers to the resident
195	22	satisfied that the man is the right man and that ~~he's~~ has in
198	20	not substantially disturb the ~~Commissioner's~~ Commission's ...
199	15	more readily resisted, by a group of five people acting ...
199	16	~~active~~ than might be possible for an individual in a single
200	24	particularly if they are a little bit insecure. ~~of themselves.~~
202	4	by saying just inspectors to denigrate the ~~inspection~~ inspectors.
202	21	people and the nuclear reactor regulation people. But then ...
206	5	The big chiefs, yes. When we are talking about a
206	16	That is a pretty big role. It simply is not trying to put

CERTIFICATE

I certify that I have read this transcript and corrected any errors in the transcription that I have been able to identify, except for unimportant punctuation errors.

Date: October 4, 1979 Richard T. Kennedy

Richard T. Kennedy

Event 1 - Sprays and Coolers Operative

Time=0 Flow stops, core and water start heat-up

Time=100 min Core starts to uncover

Time=150 min Core begins to melt

Time=200 min Molten core is in lower head of reactor vessel, pressure is 2500 psia

Time=210 min Reactor vessel fails, containment pressure goes to 25 psia

Time=210 min Hydrogen burns, containment pressure goes to 67 psia
Steam explosion possibility - minor consequence

CONTAINMENT SURVIVES (Failure assumed 130 psia)

Time=10 hours Molten core has melted about 1 meter into basemat

Time=days Major problem - handle hydrogen, oxygen - maintain containment integrity

CAUTION:
- Keep sprays running
- Keep water many feet over molten debris
- WITHOUT RECOMBINERS Hydrogen continues to build up

BASEMAT SURVIVES

Event 1 Conclusion: This event should not produce major releases

Event 2 - Sprays and Coolers Failed Before Flow Stops

Time=0 to Time=210 min Same as Event 1 - containment pressure is 25 psia

Time=810 min Containment pressure is 70 psia

Time=1 day Containment fails due to steam (mostly) overpressure - about 135 psia

CONTAINMENT FAILS

Event 2 Conclusion: This event leads to major releases.