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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

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BRIEFING ON LEVEL OF DESIGN DETAIL FOR PART 52

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PUBLIC MEETING

Nuclear Regulatory Commission
One White Flint North
Rockville, Maryland

Friday, December 7, 1990

The Commission met in open session,
pursuant to notice, at 10:00 a.m., Kenneth M. Carr,
Chairman, presiding.

COMMISSIONERS PRESENT:

KENNETH M. CARR, Chairman of the Commission
KENNETH C. ROGERS, Commissioner
JAMES R. CURTISS, Commissioner
FORREST J. REMICK, Commissioner

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STAFF SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK, Secretary

WILLIAM C. PARLER, General Counsel

JAMES TAYLOR, Executive Director for Operations

DR. THOMAS MURLEY, Director, NRR

MARTIN VIRGILIO, Chief, PTSB, NRR

REBECCA NEASE, Technical Assistant, NRR

BRIAN GRIMES, Director, DRIS, NRR

EUGENE IMBRO, Section Chief, DRIS, NRR

CHARLES MILLER, Director, Standardization and Life
Extension Project

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

10:03 a.m.

CHAIRMAN CARR: Good morning, ladies and gentlemen.

The staff is here to brief the Commission on its recommendation for the level of detail required for an essentially complete nuclear power plant design that must be submitted in an application and that must be available for audit for design certification and for a combined license under 10 CFR Part 52.

In addition, the staff will discuss staff review plans, issue finality, flexibility to incorporate changes while preserving standardization, and applicability of the industry's proposed two tier approach to design certification.

The Commission also requested the staff to be prepared to discuss briefly the proposed decision process by which it intends to determine the design documentation and the material retained for audit is both necessary and sufficient to make its safety determination. Such material from the documentation retained for audit would become part of the design as certified by rulemaking.

In January of this year, the staff issued for Commission consideration SECY-90-016 concerning

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1 proposed departures from current regulations for
2 evolutionary designs. In that paper, the staff
3 recommended that resolution of 15 specific issues be
4 required for each evolutionary design submitted for
5 certification in addition to the requirement for
6 resolution of unresolved safety issues and medium and
7 high priority generic safety issues. The 15 issues
8 had been identified by examining operating experience
9 and existing probabilistic risk assessments.

10 The Commission, in an SRM, gave guidance
11 to the staff for consideration of these 15 issues in
12 the certification process, approving 13 of the staff
13 positions and modifying those dealing with core melt
14 frequency and containment performance.

15 In July of this year, the staff issued for
16 Commission consideration SECY-90-241, which described
17 four options regarding the level of detail to be
18 required of an applicant for design certification. As
19 a result of this paper and the associated Commission
20 briefing, the Commission requested additional
21 information about seven specific subjects and
22 recommendations for implementing the provisions of 10
23 CFR Part 52.

24 At the outset, I would comment that we
25 must keep in mind that what we are addressing is very

1 important to the successful implementation of the 10
2 CFR Part 52 rulemaking. The staff and the Commission
3 are required to certify the safety of a design, not a
4 power plant constructed and ready to operate. And, as
5 numerous design reviews and design basis
6 reconstruction efforts have shown us our way, even
7 with as-built plants to look at, this task is very
8 difficult. It will be even more so with a design only
9 on paper. However, we should not lose sight of the
10 objective, to settle the problems up front before huge
11 sums of money are invested, so that there will be
12 assurance that once a combined license is issued the
13 plant can be built on time at a predictable cost and
14 capable of operating safely. As I've said many times,
15 we can't afford to build the next 100 like the last
16 100.

17 I understand that copies of the slides for
18 the staff's presentation are available to the
19 entrances to the meeting room. The SECY paper was
20 released to the public last month.

21 Any of my fellow Commissioners have
22 opening remarks they wish to make?

23 Commissioner Rogers?

24 COMMISSIONER ROGERS: Yes. I'd just like
25 to say that the staff has done a very outstanding

1 piece of work in SECY-90-377 in a very short time, and
2 I want to acknowledge and commend the staff's
3 professionalism in preparing this paper and developing
4 a staff position as to the required level of design
5 detail required for safety and standardization
6 purposes.

7 However, in my opinion, it does not
8 clearly reveal the process and the criteria and the
9 reasoning behind them by which the staff has laid down
10 the information that it believes to be both necessary
11 and sufficient to make its safety determinations. I
12 realize that these may be difficult to articulate if
13 one approaches this task by attempting to draw a
14 distinction between levels of design detail
15 information absolutely required for safety analysis
16 and level of design details which contribute to safety
17 in a general way through standardization.

18 In my view, standardization does
19 contribute to safety and I reject the phrase
20 "standardization for standardization's sake" that has
21 crept into the debate and suggest that it is
22 unhelpful. I really don't believe that any
23 Commissioners or staff are approaching the
24 standardization issue from such a simplistic point of
25 view.

1 However, I do believe that it may be
2 possible to draw a distinction between level of design
3 detail that is absolutely necessary to safety analyses
4 that take into account all of the lessons we've
5 learned from the more than 30 years of nuclear power
6 plant operations in this country and what is useful to
7 specify in addition to those levels of design detail
8 to give additional safety benefits through
9 standardization. If we can draw that distinction,
10 then it should be possible to endorse without any
11 question those levels of design detail necessary for
12 safety analyses and then to review separately those
13 matters which, if specified in the certified designs,
14 would significantly contribute to safety to greater or
15 lesser degrees and decide to admit or reject them as
16 requirements in the certified designs. I hope that in
17 addressing the recommendations in SECY-90-377 the
18 Commission will be able to approach them from this
19 point of view.

20 Thank you.

21 CHAIRMAN CARR: Any other comments?

22 If not, Mr. Taylor, please proceed.

23 MR. TAYLOR: Good morning.

24 With me at the table today, starting on
25 the right, are Rebecca Nease, Marty Virgilio, Tom

1 Murley, Brian Grimes, Gene Imbro, and Charles Miller,
2 all from the Office of NRR. There are others here who
3 also worked on the proposal that the Commission is
4 currently reviewing and considering and I, on behalf
5 of the staff, thank you, Commissioner Rogers. I also
6 believe the staff worked very hard to at least lay
7 this approach or blueprint, so to speak, together for
8 the Commission and got down to the specific levels of
9 systems as examples in the draft enclosure which may
10 potentially be a reg. guide.

11 With those thoughts, I'll ask Doctor
12 Murley to commence the briefing.

13 DOCTOR MURLEY: Thank you.

14 Mr. Chairman, Commissioners, this topic of
15 level of design detail is one of a series of policy
16 issues concerning design certification and
17 implementation of the new licensing process that's
18 outlined in Part 52. There will be several other
19 issues like this that come along as we implement this
20 new process. We're trying to compress into a period
21 of a few years the development of a process that
22 evolved over 30 years in Part 50, as you know, and
23 it's new to us, the staff, as well.

24 Last year, our focus was on the staff's
25 own review process and the Commission's approval of

1 policy issues concerning design certification. Early
2 this year our focus was on some 15 specific safety
3 issues largely concerning severe accident requirements
4 for advanced light water reactors.

5 In April, we briefed the Commission on the
6 resources and the schedules for our safety reviews.
7 At that briefing the subject of level of design detail
8 came up, and from the discussion at the meeting the
9 staff sensed that the Commission was looking for a
10 greater degree of standardization and therefore more
11 design detail than the path we were on at the time,
12 which we said at the time would be a revealed
13 standard -- namely, we would do the reviews, our
14 safety reviews, asking the sorts of questions and
15 coming to safety judgments and then when we were done
16 and ready to issue a safety evaluation report we would
17 look backwards and say, well, this was the level of
18 detail that we needed. We couldn't have predicted it
19 ahead of time, because this is such a new process to
20 us. I'll talk a bit about that in a minute. We
21 estimated that it would lead to a level of
22 standardization somewhat greater than that which is in
23 the FSARs in the past under Part 50.

24 In July, we issued SECY-90-241 where we
25 described four options for levels of standardization

1 and the corresponding design detail. The Commission
2 asked a series of questions and further directed the
3 staff to seek public comments. This paper, SECY-90-
4 377 answers those Commission questions and provides a
5 recommendation on an approach to design certification.

6 The paper has been made public and, as you
7 know, has generated a good deal of interest. A number
8 of the vendors have expressed concerns. They appear
9 to be based on a reading of the recommendations of the
10 staff which we think is not quite correct, although I
11 have to acknowledge that there are some sentences in
12 the paper which could have led to that
13 misunderstanding.

14 Specifically, staff is recommending three
15 things, and Mary Virgilio will go into detail on these
16 recommendations. First is a graded approach to level
17 of design detail. Second is a two-tiered approach to
18 certification. And the third is an approach to
19 flexibility in allowing changes to the design once
20 certified. Staff is not recommending that we use
21 what's quoted as being a maximum feasible and
22 practical standard, as some have inferred.

23 The detail that's outlined in Appendix A
24 to the paper is an example on the high side of the
25 level of design detail that could be developed to

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1 maximize the safety benefits of standardization. Of
2 course, the Commission may want that level of detail
3 as a matter of policy. Our proposal is that the
4 precise details on the level of detail be worked out
5 in preparing a reg. guide with guidance from the
6 Commission, of course. The reg. guide, we estimate,
7 would take about a year to complete.

8 There are two basic choices in choosing
9 level of design detail. The first is the one that I
10 mentioned, the path we were on, say, a year ago, and
11 that is the staff continue the review process for each
12 design. We ask for the level of detail in our
13 questions that we believe is needed to make our safety
14 judgments, and then we write a safety evaluation
15 report. We look backwards and say that that is a
16 revealed standard. We estimate it would be somewhat
17 greater than the FSAR level of detail.

18 The second choice is the one that we
19 understood in April the Commission was interested in,
20 and that is to develop the design detail up front.
21 That is the recommendation the staff made in this
22 paper, and Appendix A is an example of a quite high
23 level of detail that could be asked up front.

24 There is a variation on this second choice
25 that the Commission may want to consider. We have not

1 developed it in detail and certainly not in the paper,
2 but it's been alluded to in some of the industry
3 correspondence on this subject. That would be a two-
4 step certification process where the Commission would
5 get the level of detail that we needed, but we'd do it
6 in two steps.

7 The first step would be that the staff go
8 through its review process and issue what I would call
9 here today a preliminary safety evaluation report
10 which would indicate licensability, our belief that
11 the plant is safe and is licensable. It would not
12 give the industry the level of issue preclusion that
13 they would like under, say, a certification. But with
14 that preliminary safety evaluation report, then
15 vendors could take that and perhaps find a customer
16 who could provide the resources to complete the
17 design.

18 With the complete design, then, the staff
19 would review the details. It would be, I would
20 suspect, comparable to the level of detail that we've
21 outlined in Appendix A. And then we would issue a
22 final design approval and we would go into the
23 certification proceeding and their certification would
24 flow from that second step. We have not, of course,
25 developed all the details and we can come back to this

1 at the end of the discussion if the Commission would
2 like, but we see it as a variation on this second
3 choice which is that we do have the full high level of
4 detail up front before we issue the certification.

5 A question that's been asked, and
6 Commissioner Rogers got at it this morning in his
7 remarks, is have we asked for more detail in this
8 paper than the staff needs strictly to make our safety
9 judgement. And the answer is yes. In the past, the
10 staff has not required the proposed level of detail to
11 make its safety finding for one of a kind plants.

12 Clearly, there are some safety benefits,
13 although unquantifiable, to having standard designs.
14 We understood that the realization of the safety
15 benefits of standardization was a principal goal of
16 Part 52 and that it was important to the Commission.
17 The level of detail shown in Appendix A to this paper,
18 therefore, reflects this desire to maximize the safety
19 benefits of standardization.

20 We are not able to separate that detail
21 requested solely for the safety benefits of
22 standardization from the detail needed otherwise to
23 make our safety judgement. If the Commission asked us
24 to, of course, we would try to do it, but we really
25 don't think that it's possible to make a clean

1 distinction at this stage, and the reason largely is
2 that under Part 52 the staff must make its basic
3 safety determination absent a completed plant.

4 Therefore, the staff is proposing to
5 require more detailed design information to be
6 available for audit during our review -- that is, more
7 relative to the old two-step licensing process -- be
8 available for audit in order to validate the key
9 design principles in the proposed certified design to
10 make sure that they've been translated into design
11 details. And it's this newness of the process and the
12 fact that the staff under Part 52 will not have a
13 completed plant to look at -- we will not have the
14 second step, that is the operating license proceeding
15 and hearing in order to complete our safety judgement.
16 We have to make it completely up front, based strictly
17 on paper designs, and it's for that reason that we
18 feel that we're not able to accurately break-out the
19 amount of information we need strictly to make safety
20 judgments, because we've just never done this process
21 before.

22 With that introduction, then, we'll get
23 into what the paper does recommend, and Marty Virgilio
24 is going to give those recommendations.

25 MR. VIRGILIO: Thank you, Doctor Murley.

1 (Slide) Mr. Chairman, Commissioners, if
2 you'd turn to slide number 1, as Doctor Murley said,
3 the staff is proposing the design to be developed to a
4 level of maturity that will support decisions on
5 safety matters and systematically achieve a
6 substantial degree of standardization. In addition,
7 the staff is proposing reasonable controls that permit
8 changes needed to construct the facility and to
9 operate the facility without compromising the
10 regulatory reforms of Part 52.

11 In today's presentation, we're going to
12 talk about the three bullets I've outlined here: the
13 graded approach, the contents of the application, and
14 the change process.

15 (Slide) If you turn to slide number 2, by
16 way of background, in its paper on options available
17 under part 52, SECY-90-241, the staff discussed
18 several features of the rule and our discussion and
19 our thoughts on these matters haven't changed. I just
20 wanted to go back and make sure we clarify.

21 The contents of the application have to be
22 sufficient to support the staff's safety judgments.
23 They have to allow the preparation of construction and
24 installation specifications and procurement
25 specifications by the applicant without recourse to a

1 lot of additional engineering. And it has to be
2 sufficient to allow the staff to judge the
3 acceptability of the ITAACs.

4 Tier 1 and Tier 2 were introduced in that
5 first SECY paper, and it is a formatting of the
6 application into two parts, the part that is certified
7 Tier 1 and the part that is not certified, Tier 2.
8 The certification process, Tier 1, is the
9 solidification of key features of the design and the
10 design bases by rulemaking.

11 Material available for audit is material
12 normally contained in procurement specifications and
13 construction and installation specifications, and in
14 SECY-90-241 we outline four different levels of detail
15 by varying the content of the application. By varying
16 the content of the certification and the material
17 available for audit, we by example showed four
18 different levels of standardization that one could
19 achieve.

20 (Slide) If you'd turn to the next slide,
21 what I've done is provided the definitions associated
22 with those four different levels. Using the HVAC
23 system for an example in SECY-241, we demonstrated
24 four different levels of detail. In general,
25 following the proposal contained in this new SECY

1 paper, 90-377, for a graded approach based on safety
2 will result in a level 2 or greater standardization
3 for the more safety significant design features and
4 lesser degrees of standardization for other design
5 features commensurate with their safety significance.

6 (Slide) If we turn to the next slide,
7 we'll talk a little bit more about the level of
8 detail. What the staff is proposing is that the
9 design details will reside in three different bodies:
10 first, the information that's submitted in the
11 application and certified; the information that's
12 submitted in the application and not certified; and
13 the third body of information that's available for
14 audit.

15 We believe that the application itself
16 will roughly follow an FSAR, as Doctor Murley pointed
17 out. It will be minus the as-built features and site
18 information and probably include a little bit more
19 detail than we had in the past, but roughly follow the
20 FSAR as we saw for the 1985 to 1990 vintage licensed
21 plants.

22 In the next bullet, material available for
23 audit, it's material normally contained in procurement
24 specs and construction and installation
25 specifications. With regard to this material

1 available for audit, as Doctor Murley said, in order
2 to validate that the key design features have been
3 properly translated into the design details we're
4 going to need to examine more information than we have
5 in the past.

6 In SECY-90-377, we're proposing that
7 applicants develop this third body of information and
8 have it available for audit in sufficient detail to
9 support audits of safety significant features of the
10 design to a depth commensurate with their safety
11 significance. The staff is only going to audit a
12 portion of that information that's developed. We will
13 audit what we need in order to make our safety
14 decisions. What we don't audit and what we don't use
15 to support our safety decisions will be the remainder,
16 and that remainder will be there to support
17 standardization.

18 Audits will supplement the staff's review
19 of the application in two ways. First, audits will
20 provide additional information to help us understand
21 the details of specific features of the design.
22 Second, audits will help us provide an understanding
23 of how the design criteria of Tier 1 and Tier 2 have
24 been translated into the design. These are two
25 separate findings that we're doing. One is an

1 understanding of the design feature itself, and second
2 is an understanding of the process and how well the
3 Tier 1 and Tier 2 information has been translated into
4 the more detailed design products. Information that
5 we obtain through these audits that we need to form
6 our basic safety findings will be brought back forward
7 into the application, and the application will stand
8 as the body of information that supports the staff's
9 safety finding.

10 (Slide) If we turn to slide 5, the graded
11 approach based on safety, when you view the three
12 bodies of information collectively, this is what we
13 propose in terms of the graded approach.

14 You're going to see greater, more standard
15 in certain nuclear island features: for example, the
16 reactor vessel and major components in the primary
17 cooling system. And you'll see level two for key
18 nuclear island features: for example, the ECCS systems
19 in the central support systems; for level 2 for key
20 turbine island features, for example the turbine
21 control systems. And at the time of certification,
22 you'll see level 4 for the site features, but we
23 anticipate and require that this level of detail be
24 brought up at the time of the COL for the site-
25 specific features.

1 It's a graded approach. What I've pointed
2 out here is the maximum level of details we expect
3 commensurate with the safety significance. In
4 particular, through the turbine island we would expect
5 to see different levels of detail, not all of level 2,
6 for all of the turbine island.

7 COMMISSIONER REMICK: Let me just ask you
8 a question. I was surprised, I guess, that there was
9 no level 3 mentioned at all. Isn't it possible
10 there'd be some systems --

11 MR. VIRGILIO: Yes.

12 COMMISSIONER REMICK: -- at level 3 that
13 would be suitable for --

14 MR. VIRGILIO: I'm sorry if I didn't make
15 that clear. That's the graded approach. You're going
16 to see level 3 in the turbine island, and you'll see
17 less than level 3 where we don't need that information
18 at all to support any safety decisions with regard to
19 the translation of the tier 1 and tier 2 information
20 and with regard to the specific features of that
21 individual component.

22 COMMISSIONER REMICK: That had been my
23 guess, but it was not in the document which I found a
24 little surprising.

25 MR. VIRGILIO: (Slide) If we turn to

1 slide number 6, I'm going to shift the focus now from
2 design detail to flexibility.

3 Key elements of the design will be
4 certified through the rulemaking process and not be
5 changed without prior NRC approval. Those are the
6 Tier 1 elements of the design. The key features of
7 the design and the key features of the design basis
8 and principal design criteria will not be changed
9 without prior NRC approval, and I've outlined in these
10 three bullets the process by which that Tier 1
11 information can be changed.

12 (Slide) If we turn to the next slide,
13 slide number 7, I'll discuss the flexibility
14 associated with the material in the application but
15 not certified. This is the Tier 2 information.

16 Because Tier 2 forms the basis for the
17 findings that the more general features of Tier 1
18 provide adequate safety, the staff is proposing that
19 more stringent requirements apply and that these
20 requirements change at different milestones in the
21 process. This is also in order to ensure that the
22 bases that we used in the certification process to
23 provide issue resolution is maintained at different
24 phases of the facility license where it's most
25 important. These controls will change with time.

1 If we focus on the first bullet, between
2 design certification and COL, the staff is proposing
3 that the same requirements as I've shown on the last
4 slide associated with changes for Tier 1 be applied to
5 this Tier 2 information.

6 Following issuance of the COL, the
7 proposal in the next two bullets provides the ease and
8 flexibility necessary to construct the facility and
9 accommodate technological advances while still
10 preserving safety and the licensing reforms envisioned
11 in Part 52. This approach does allow an opportunity
12 for an erosion of standardization, but we believe this
13 is mitigated by four factors.

14 First, you have to comply with Tier 1, and
15 so whatever changes that you're making to the Tier 2
16 material you have to keep an eye on the Tier 1
17 material, and if it impacts any of the Tier 1 material
18 you have to go back to that more stringent change
19 process.

20 The second is, changes to the Tier 2
21 material will introduce at certain points in the
22 process vulnerability for relitigation of issues that
23 we hope to have resolved.

24 The third reason is the cost of redesign.
25 Once the design is developed and details are

1 established, there will be tremendous disincentive
2 early on in the process. We recognize that these
3 disincentives will diminish with time as technology
4 advances.

5 And the fourth reason is industry's own
6 initiatives designed to advance standardization.
7 These have not been provided to us in detail, but
8 they're outlined in the NPOC strategic plan that has
9 been presented to us. It now includes schedules, and
10 we hope to hear more from the industry with regard to
11 their proposals for preserving standardization.

12 (Slide) In the next slide, slide number
13 8, we'll focus on the material available for audit.

14 Appendix B to Part 50 will ensure that
15 changes are done in a manner that both preserves
16 quality and ensures that safety is preserved for the
17 structure systems and components that are designed to
18 mitigate the consequences of potential accidents.

19 Changing Tier 2 to Tier 3, the material
20 available for audit, the applicant will have to comply
21 with the change provisions associated with both Tiers
22 1 and Tier 2. And again, just as with Tier 2, the
23 cost of redesign will provide some incentive to ensure
24 standardization. And, in addition to the cost of
25 redesign, the industry's own initiatives again in this

1 area will foster standardization.

2 That pretty much completes this portion of
3 the presentation. What I'd like to do now is return
4 this to Doctor Murley to review our recommendations.

5 DOCTOR MURLEY: What we're proposing in
6 the paper an proposing that the Commission agree with
7 is the general approach that the staff has outlined,
8 namely a graded approach to design finality, and that
9 would be that the staff undertake to prepare a
10 regulatory guide that provides in a little more
11 detail, let's say, the kinds of material that's in
12 Appendix A, not necessarily Appendix A itself. Here,
13 we of course would welcome any guidance that the
14 Commission would give us on whether the material in
15 Appendix A is about the right level, too much, too
16 little, whatever.

17 I must say, frankly, I don't think at this
18 stage trying to provide a revised Appendix A would be
19 very fruitful. It's, as I said, on the high side of
20 what we think is the level of detail that's
21 achievable, but I don't know to what standard we would
22 use to fall back to something less than that.

23 To get back to the point where the staff
24 when asked how much detail do you need to make your
25 safety judgement, at this stage they're always going

1 to overestimate it because they don't want to
2 underestimate it. And so, we're going to get back to
3 something that's very close to Appendix A again.
4 That's how we got there in the first place.

5 So, the graded approach, with ultimately
6 being developed in a reg. guide, we will of course
7 plan to work with industry and NUMARC in preparing
8 that.

9 The second recommendation is the approach
10 on the content of the application, namely the Tier 1
11 and Tier 2 material and also the material available
12 for audit that would be part of the background to the
13 certification process.

14 And the third element is the general
15 approach on the change process that Marty Virgilio
16 outlined for the material in the application itself,
17 the Tier 1 and Tier 2 material and the change
18 processes for that and, as I mentioned, finally to
19 authorize the staff to develop a reg. guide.

20 We have not, as I said, developed in
21 detail the possible alternative for getting the high
22 level of detail that we are suggesting for enhanced
23 standardization, namely the two step process. We've
24 not developed that. If the Commission would like us
25 to do that, of course we could do that as well.

1 That concludes our recommendations.

2 CHAIRMAN CARR: Questions, comments,
3 Commissioner Remick?

4 COMMISSIONER REMICK: Some comments and
5 then some questions. My understanding of Part 52 as
6 it was intended was to advance standardization by the
7 design certification process, and it was to increase
8 regulatory stability by making it difficult for
9 anybody, including us, from changing a certified
10 design, and it restricted the necessity of rereviews
11 and relitigation of issues that had already been
12 decided, what we call finality. And I think there
13 were no special conditions placed on the information
14 not certified beyond what we did with our past
15 traditional practice.

16 Now, as we began to put rubber to the
17 road, there were concerns that arose about the need
18 for some kind of flexibility to account for the
19 unforeseen in design and construction and so forth, and
20 the price of flexibility is the loss of some of the
21 stability that people were seeking and loss of some of
22 the finality.

23 Now, I agree with what has been stated by
24 the Chairman and Commissioner Rogers. I think the
25 staff has done a real yeoman's job, and that's not

1 only my view but the views of a number of people. I
2 think your response was in response to what you
3 perceived was the Commission wishes and you worked
4 hard on a very difficult and complex matter. No
5 question about it.

6 What you've said today was enlightening to
7 me. It's not what I read in the document. It's what
8 I got out of the document when I read it the first
9 time and did not read the appendices. When I came
10 back a second time, read the appendices in, it was a
11 different document than what I heard you describe
12 today.

13 But, what you said is very helpful. It
14 reminds me a little bit of a Bob and Ray show that I
15 heard a number of years ago in which they were talking
16 about having an anchor, buoy factory in which they had
17 a production line on which these products were made.
18 At the end of the production line it had a huge tank
19 of water and as the products rolled off the assembly
20 line they went into this tank of water. If they
21 floated, they marked them and sold them as buoys, and
22 if they sank, why, they marked them and sold them as
23 anchors.

24 I do have a lot of questions, some of
25 which I submitted to the staff in writing. Tom, I

1 appreciate I think many of the things I detected in
2 your remarks responded to some of those questions. I
3 probably will have a couple additional written
4 questions and some this morning, all of which to help
5 me better understand why I think 90-377 is going to be
6 marked as a buoy or an anchor.

7 The first one that I have is in Section
8 52.47(a)(2). It says that what we are loosely calling
9 the third body or Tier 3 of information that you refer
10 to being audited, it says that it must be developed,
11 quote, "if such information is necessary for the
12 Commission to make its safety determination."

13 Now, as I read your proposal, it seems to
14 me that you've read the "if" out of that by requiring
15 that such information be developed and available for
16 audit to confirm the implementation of Tiers 1 and 2.
17 So, to me, it seems to me you've read out the "if" in
18 that -- "if it's necessary."

19 Do you have any comment on that?

20 MR. VIRGILIO: I think we've read the "if"
21 now to be "because." And in order to ensure that this
22 additional information provides the translation of the
23 design, the Tier 1 and Tier 2 information down into
24 the design details, what we're trying to do is
25 validate the key design criteria in Tier and Tier 2

1 have been properly translated into the design. And
2 the proposal, you're right, is on that statement and
3 our basis for requiring this information is that
4 translation number and number 2 in order to provide
5 additional insights with regard to specific features
6 of the design.

7 In the end, we're only going to audit a
8 part of the information, as I said earlier. And in
9 the end, the information that we have not audited,
10 although we required it to be developed on a
11 systematic basis, that remainder will serve to further
12 standardization.

13 COMMISSIONER REMICK: But if you've read
14 out "if" and made it "because," have we changed the
15 regulations?

16 MR. VIRGILIO: We don't see it that way,
17 and the analysis provided by OGC that supports this
18 paper, their independent analysis, I think supports
19 the way we've proposed to proceed in this matter.

20 COMMISSIONER REMICK: Yes, certainly. Go
21 ahead, Ken.

22 COMMISSIONER ROGERS: It seems to me this
23 is one of the big sticking points on this whole thing
24 and a very important point. Is it possible for you to
25 think of accepting an application which contains the

1 information in the audit area that the vendor believes
2 is adequate to do a safety analysis and if it is later
3 found to be inadequate would then have to be developed
4 by the vendor?

5 In other words, does this -- the problem,
6 it seems to me, is that if you require everything in
7 the material available for audit that you're asking
8 for with the point of view that you're just going to
9 reach into that big barrel of material whenever you
10 feel you need it, but that to some extent it's just
11 there. It's ultimately going to be needed. We all
12 know that ultimately that detail will have to be
13 developed. The question is whether it's necessary
14 right up front.

15 What it seems to me your saying is that
16 you want to have it all there, even though you know
17 there will only be a small amount of it that you need.
18 You don't know what that amount is. You don't know
19 what that is, so let's ask for it all. And that is a
20 very open-ended situation and that's, it seems to me,
21 where one of the big problems is.

22 Is it possible to consider the material
23 available in the audit to be what the vendor believes
24 should be totally all you need to do the safety
25 analysis and then they take their chances? If, in

1 your doing the safety analysis, you find you need more
2 material, it's not there, the process stops until it's
3 supplied. Is that a conceivable way of going?

4 DOCTOR MURLEY: The answer is yes, and
5 this is the path we were on and it's generally,
6 although I didn't articulate it that way, it's
7 generally the revealed standard process where --

8 COMMISSIONER ROGERS: You could say what
9 you felt you needed, you know, and they would say,
10 "Well, we don't think you need that, but we'll give
11 you what we think you need and if you really do later
12 on need more, we'll just have to develop it." Is
13 that, you know --

14 DOCTOR MURLEY: We'll ask questions and
15 get answers and if we're not satisfied we'll ask more
16 questions and we'll go through that process and
17 ultimately we'll develop a certain level of detail
18 that's there and a certain back-up amount of design
19 information that, although it doesn't have to come
20 into our Headquarters here, it's available for audit
21 out there. That will lead to somewhat of an uneven
22 level of standardization throughout the plant,
23 probably, because some people, let's say in the I&C
24 area, will ask for a lot of questions, a great deal of
25 detail, and perhaps in some of the structural areas

1 the staff may not ask for a lot of detail. But, in
2 any case, it's a way that we could go, yes.

3 CHAIRMAN CARR: Let me step into this
4 while we're talking about it. In that same paragraph,
5 it says "the application must contain a level of
6 design information sufficient to enable the Commission
7 to judge the applicant's proposed means of assuring
8 the construction conforms to the design," and I'll
9 emphasize this, "and to reach a final conclusion on
10 all safety questions associated with the design before
11 the certification is granted."

12 Now, "final conclusion" is what concerns
13 me. Going along in steps, I'm trying to get the final
14 conclusion and it's obvious, to skip a little bit, but
15 it says "the Commission will require prior to design
16 certification that information normally contained in
17 certain procurement specifications and construction
18 and installation specifications be completed and
19 available for audit if," as you say, "if such
20 information is necessary for the Commission to make a
21 safety determination."

22 So, as you say, if you don't have it it's
23 going to stop until they produce it, but it won't be a
24 certified design and so nobody's going to use it until
25 it is certified.

1 COMMISSIONER ROGERS: Well, but then when
2 that is supplied then the process can start again.

3 CHAIRMAN CARR: That's fine with me.

4 COMMISSIONER ROGERS: It may go in fits
5 and starts, but -- or it might go smoothly if the --

6 CHAIRMAN CARR: The more he's got
7 available, the less likely it is to hold up progress.

8 COMMISSIONER ROGERS: Right. But, the
9 problem seems to be that it's so open-ended. Give us
10 everything, but we don't know what we'll need.

11 CHAIRMAN CARR: Well, but the problem
12 we've had before is we designed it as we went along,
13 and we're trying to do as little of that as possible
14 now. And so, I think the guidance that they're trying
15 to say, "Here's what we think we need at the front
16 end," that may not be all inclusive and so we're
17 arguing about how much is in that box. The vendors
18 say it's too much. We say it may be too much, but we
19 think we need it.

20 COMMISSIONER ROGERS: But then when you
21 need it, you have to have it. And it seems to me that
22 that goes without any question. The staff needs --

23 CHAIRMAN CARR: We're trying to keep from
24 designing it as we go along.

25 COMMISSIONER ROGERS: Well, I understand,

1 but I'm wondering if we can't find some middle ground
2 here where an adequate assessment, professional
3 assessment that calls upon the experience of the
4 vendors -- I mean, these people have been in the
5 business a long time, so they're not neophytes in this
6 and they claim that they are going to give us
7 everything that we need. Well, then, they take their
8 chances if they haven't given us everything.

9 CHAIRMAN CARR: And I think that's proper,
10 what you say, and that was my impression that that was
11 what was going to be worked out in the reg. guide.

12 DOCTOR MURLEY: Yes, and what we can't
13 tell you is the level of standardization that that
14 approach is going to yield in the end. My guess is
15 it's going to be uneven, but when we discussed it --

16 CHAIRMAN CARR: Well, it's going to be
17 settled before the design is certified.

18 DOCTOR MURLEY: Well, not necessarily.

19 CHAIRMAN CARR: If you need it to make the
20 final conclusion, then it's going to have to be
21 available.

22 COMMISSIONER ROGERS: Got to do that.

23 DOCTOR MURLEY: Yes.

24 MR. VIRGILIO: And that's the revealed
25 standard.

1 DOCTOR MURLEY: That's true, but I guess
2 what I'm trying to say is that in the course of its
3 review -- let's say that the staff that's reviewing
4 some of the systems out in the balance of plant in the
5 turbine building. They may not care whether there's
6 two or three unsafe booster pumps, something like
7 that, and therefore that may not be part of the detail
8 that we ask for in the normal course of review and in
9 the past we haven't. And we used as an example the
10 BWR-6, Mark 3s as the level 4, I believe it was,
11 product line degree of standardization. And when one
12 gets out into the balance of plant area, it just
13 varies all over the place. Our impression was that
14 the Commission wanted a degree of standardization
15 higher than that.

16 My point is, if we use this approach of
17 kind of asking what we need for safety information,
18 we're likely not to ask the kinds of questions that
19 get out into the balance of plant and therefore when
20 we issue a certification it may be silent with regard
21 to condensate pumps and numbers and types and even
22 locations. So, what you can get -- it's not a trivial
23 cost item in the plant. What you could get then is
24 quite a wide variation in designs in that part of the
25 plant.

1 What we tried to do in Appendix A here,
2 then, is to list the amount of information that we
3 thought could yield a high degree of standardization
4 and the safety benefits that go with that, although as
5 I mentioned they're unquantifiable.

6 COMMISSIONER ROGERS: I'm a bit troubled
7 there, because it seems to me unless we have some kind
8 of operating experience to suggest that we really are
9 concerned about something that we ought to look at
10 that a little bit separately and make some decisions
11 as a separate pure standardization issue. And it
12 seems to me that one of the things we've learned is
13 the balance of plant is very important for the total
14 safety of the plant. We've seen so many things start
15 out there. You know it much better than I do.

16 So, we've certainly moved way far away
17 from the notion that it's only the nuclear island that
18 we're concerned with when we're concerned with safety.
19 But, when we move out into the rest of the plant, it
20 seems to me we should be looking at the total
21 operating experience. The Chairman has pointed out
22 AEOD follows this and is a good repository of this
23 kind of thing, and we should call on all of that and
24 see what it tells us we need to look at from a safety
25 point of view.

1 If there is something that doesn't arise
2 in any of the operating experience of any kind that
3 then would represent -- if we don't require it, it
4 could vary, such as two or three or four pumps or
5 something, then it seems to me we ought to look at
6 that separately and decide do we want to impose that
7 just to get standardization. That's what I was
8 referring to in my opening remarks.

9 I think if we can draw that distinction,
10 then, and say, "Well, we still think it's a very good
11 thing to require," well, then let's debate that. To
12 me, that would be debatable. But what would not be
13 debateable was anything that you could connect with
14 any safety issue in any part of the plant, and that's
15 what I think the rule says.

16 COMMISSIONER REMICK: Commissioner Rogers
17 touched on what was my next question.

18 COMMISSIONER ROGERS: Sorry.

19 COMMISSIONER REMICK: No, that's all
20 right.

21 Why can't the question and answer process
22 work? And you indicated there are some things the
23 staff might not ask for. Why would we expect the
24 vendors to have to have that at application stage?
25 Why can't it be in response to your questions on

1 safety issues? I think you indicated that was the
2 staff direction the way you were headed.

3 DOCTOR MURLEY: It could, yes.

4 COMMISSIONER REMICK: It is reasonable.

5 It seems to me that if you look at a
6 standard review plan, you look at the requirement of a
7 level 3 PRA, you look at what we've been claiming
8 we're getting out of the EPRI requirements document,
9 the staff's hazards analysis and going through that,
10 it seems to me you're going to end up with a pretty
11 standardized plant with the various requirements we
12 already have.

13 I think the concern is when you say this
14 information must be available at the certification
15 stage for audit. I sure read into that that all of
16 that detail has to be there whether we ask for it or
17 not. And I agree. If it's not there and we need it,
18 the vendor is at risk. But they do have experience,
19 as Commissioner Rogers pointed out, in doing this. I
20 think they can reasonably well predict the type of
21 information and it's a question of requiring all that
22 detail up front in case we might need it.

23 MR. TAYLOR: You're really talking about a
24 potential way to structure the reg. guide which may be
25 used and which may evolve in terms of the level of

1 design detail. That's what you're saying. It's
2 behind you lesson and the staff.

3 I should point out one of the objectives
4 too that, you know, material not asked for, not
5 included and not reviewed, then it falls outside of
6 the certification envelope. So that, then, presents
7 the other side of the issue of it then being --

8 COMMISSIONER REMICK: Absolutely.

9 MR. TAYLOR: -- it may indeed be a source
10 of contention later on. So, one of the objectives was
11 to complete that.

12 CHAIRMAN CARR: Let me ask you to explore,
13 on your slide 4, the second bullet under "available
14 for audit." You need that available for audit so you
15 can confirm translation of safety criteria into
16 design. How about running over your thought process
17 on what you really mean by that?

18 MR. VIRGILIO: Just as during the
19 licensing under Part 50, we went out and conducted
20 audits, IDIs, IDVPs to look at the process of ensuring
21 that you're starting with the top level design
22 criteria and key design features in Tier 1 and you
23 look at how those have been implemented in order to
24 provide adequate safety in Tier 2.

25 What we're looking for is how have those

1 details then been translated down into this third body
2 of information. How have the design products been
3 developed in a way that those top level criteria from
4 Tier 1 and the information that supports your safety
5 decision in Tier 2 has been translated into the
6 design? Again, it's similar to the thought process
7 that started us down the path in the Part 50 licensing
8 to conduct these audits, to ensure that the details
9 were properly translated. This is, again, one of two
10 reasons why we're looking to conduct the audits.

11 Again under Part 50, we went out and
12 conducted audits to get a better understanding of
13 specific features of the design, additional details
14 beyond what was provided in the application itself.
15 And, as in Part 50, some of that information was
16 needed to support our safety judgments and we brought
17 it back into the application through the Q&A process.

18 CHAIRMAN CARR: Were those audits of as-
19 built plants?

20 MR. VIRGILIO: They were audits of design
21 drawings, of as-built plants or plants under
22 construction at the time that we conducted the audits.

23 CHAIRMAN CARR: I think this is what I
24 read as to why they need this material available. But
25 now, as you say, if you want to wait until it becomes

1 available if it's not available, that's just fine.

2 COMMISSIONER REMICK: There's a question
3 in my mind when the staff would do that, because if
4 you went out and did that and found that the
5 implementation of the design was not consistent with
6 what was in the certified rule, they'd be in violation
7 of it. Right? They'd be subject to --

8 CHAIRMAN CARR: But there's no
9 certification at this point. You can't certify a
10 design until you've made this audit, because he needs
11 to define safety --

12 COMMISSIONER REMICK: No, I think you can
13 certify the design. It's a question of whether you're
14 going to certify that the implementation of that
15 design is consistent with the certified design.

16 CHAIRMAN CARR: You and I have a
17 disagreement on that point.

18 MR. TAYLOR: You're reducing -- the staff
19 is going to need some assurances that the design, the
20 data has been translated appropriately as the design
21 process proceeds in the safety area.

22 CHAIRMAN CARR: Counselor, do you want to
23 make a comment?

24 MR. PARLER: Well, as was said at the
25 beginning of this meeting by someone, the fairly and

1 simply straightforward objectives of this Part 52 rule
2 is to decide up front those things that needed to be
3 decided about the design which is going to be
4 certified. That's what's being certified, the design,
5 so that the design will stand up with finality if
6 somebody tries to or decides to use it in a licensing
7 proceeding with the ultimate objective being that very
8 few if any design certified issues would be reopened
9 even at the combined CP and OL stage and hopefully not
10 any before the license to authorize is issued.

11 If that is the objective, it seems to me
12 you certainly cannot have a piecemeal process to
13 arrive at the design certification. You can have
14 questions and answers leading up to that decision.
15 That can be a stage process. But, I think it's
16 fundamental to the Part 52 that when the design is
17 certified that for all of the benefits of the Part 52,
18 particularly about finality and not reopening issues
19 are concerned, that that has to be the real thing and
20 not just a partial solution to the problem.

21 If it's something short of that, we simply
22 have, after many rulemaking efforts and much rhetoric,
23 the old two step licensing process labeled under the
24 Part 52. That's not what the people that worked on
25 this for several years had in mind.

1 DOCTOR MURLEY: Yes. We did not have in
2 mind -- at least, I did not have in mind that after
3 certification we would go and review design documents
4 and do audits. That was not contemplated by the staff
5 at all.

6 COMMISSIONER ROGERS: I'm not suggesting
7 that. We did recognize that the level of detail or
8 the details that would be available in the application
9 would exceed what would be in the certified design.
10 We've always taken that point of view, that the
11 certified design would be a kind of nucleus, a core,
12 whatever you want to call it. That's firm. But,
13 there would be additional information that would
14 support that in the application.

15 Now, if what we're asking available in
16 that application is material that's available for
17 audit that is very, very broad, it's really just a
18 question of that process. I'm not talking about, you
19 know, a two step process or anything like that. I'm
20 just saying how you implement our rule, and it occurs
21 to me that there's a debate going on here -- I seem to
22 have noticed somewhere -- that involves how much
23 material has to be supplied in the application to
24 support the ultimate certification decision. And
25 there I'm simply saying that there seems to be a

1 difference in judgement.

2 The potential applicants say, "We think we
3 can give you everything you're going to need," and
4 we're saying, "We don't know what we're really going
5 to need." And so, you know, it's a little bit of a
6 crap shoot, in a sense, if -- but why not allow them
7 to submit an application which could be amended if you
8 need further additional materials? You don't certify
9 until you've got absolutely everything you need. No
10 question about that. But, it's a question of what you
11 bring in to begin the process.

12 CHAIRMAN CARR: Let me throw one more item
13 in from the statement of consideration, and I quote,
14 "The final rule is even more stringent about
15 completeness of design than the proposed rule was.
16 The final rule's provision on scope -- see paragraph
17 52.47 -- reflect a policy that certain designs,
18 especially designs with are evolutions of light water
19 designs now in operation should not be certified
20 unless they include all of a plant which can affect
21 safe operation of the plant, except its site-specific
22 elements."

23 When you talk about all of a plant which
24 can affect safe operation, that's a pretty complete
25 design.

1 COMMISSIONER ROGERS: That includes the
2 roof, I guess.

3 COMMISSIONER REMICK: That's right, the
4 flagpole falling on it.

5 CHAIRMAN CARR: Trucks backing up into
6 switch yards.

7 They're questions. Go ahead.

8 COMMISSIONER REMICK: Excuse me. I think
9 Jim has a --

10 COMMISSIONER CURTISS: As I listen to
11 this, I think I understand what the choice is. What
12 you're suggesting is that all of this level of detail
13 on what is now called Tier 3 which may or may not
14 encompass everything safety related, under the staff's
15 approach it will because it may be broader than that
16 which is safety related. And I gather what the staff
17 will do is whittle that down with the individual
18 vendor, focusing on those things that are safety
19 related and those that would kick up into Tier 2.

20 What you're suggesting is that sort of a
21 "pay me now, pay me later" approach. The advantage, I
22 guess, is that you don't have to develop that all up
23 front, but you have the option of developing that
24 information as the Q&As go back and forth between the
25 vendor and the staff where it is determined that it's

1 necessary for safety purposes. And then I guess the
2 down side of that is, as the Chairman has pointed out,
3 that that may be a more hurky-jerky process with
4 stopping and going as they develop information that
5 they would have submitted up front and at potentially
6 greater cost in terms of delay of the review.

7 What you're saying, I guess, leads to the
8 conclusion that you wouldn't have a Tier 3 at all
9 because Tier 2 is all the safety information.

10 COMMISSIONER REMICK: No, that's not--
11 no, I agree with what Commissioner Rogers said.
12 Whatever we need for safety determination needs to be
13 provided. We have to provide that. As I read the
14 paper --

15 CHAIRMAN CARR: Before certification.

16 COMMISSIONER REMICK: Before
17 certification, yes.

18 COMMISSIONER ROGERS: If I could just add
19 to that.

20 COMMISSIONER REMICK: Yes, go ahead.

21 COMMISSIONER ROGERS: That it's got to be
22 the staff that decides that they need for that, not
23 somebody else, not the vendor who decides what you
24 need for safety review, it's what the staff needs for
25 safety review. I don't think we can accept a

1 statement from somebody that says, "I've given you
2 everything you need. I'm done." No, the staff has to
3 decide whether they've given us everything that they
4 need, whether they've been given everything they need.

5 But it does seem to be reasonable that
6 there might be, in fact, a congruence there between
7 what the vendor thinks you need and what you find you
8 do need. They could take their chances. If they fall
9 short, then they'd have to supply it. I don't see it
10 as a hurky-jerky process if they really can deliver
11 what they claim they can deliver, namely everything
12 you need to do a safety analysis. Then it ought to go
13 smoothly. But that's their chance. It only stumbles
14 if they haven't made the right choice. But
15 ultimately, the choice has to be the staff's on what
16 they need to do a safety analysis. If they don't have
17 what they need, the process stops until they get it.

18 COMMISSIONER CURTISS: Let me sharpen my
19 question. Is there anything left in Tier 3 if you
20 define that information which you are going to request
21 as that necessary to make the safety determination?
22 As you read that, what is left in Tier 3?

23 COMMISSIONER REMICK: I think a
24 considerable amount of information. The point I have
25 is there's going to be what is referred to as a

1 warehouse of additional information we call Tier 3,
2 literally a warehouse of information, some of which
3 the staff as it goes through is going to have
4 additional questions. They're going to have them with
5 the vendor and the vendor is going to either have it
6 already prepared or, as he has in the past, he's got
7 to prepare that information for your satisfaction.

8 DOCTOR MURLEY: You have to keep in
9 mind --

10 COMMISSIONER REMICK: But there's a large
11 part of that warehouse out there that you're not
12 going --

13 DOCTOR MURLEY: -- that the staff -- in
14 the past, the staff has always had this warehouse
15 available to it and it was because it didn't make its
16 final safety judgment until they issued the operating
17 license. So they could go in and look at the detail
18 until it wouldn't stop.

19 Now, Commissioner Remick, I'm reminded of
20 a *New Yorker* cartoon some years ago. I feel like
21 Christopher Columbus. He's on the carpet in front of
22 Queen Isabella and she says, "Three ships? Why can't
23 you discover America with two ships?" We're doing
24 something new here and when we ask the -- this is the
25 three ship proposal that the staff has here.

1 COMMISSIONER ROGERS: Well, it might be
2 the 30 ship proposal.

3 DOCTOR MURLEY: Let me ask Brian to
4 respond to --

5 MR. GRIMES: A couple points, I guess, on
6 the design process itself. We've found that through
7 the Part 50 process reviews that the design process is
8 iterative in terms of as you get more design
9 completed, it really impacts the upper tier documents,
10 what we are now calling Tier 1, Tier 2 documents. As
11 you go through the design details in terms of layouts,
12 in terms of system interactions in terms of hazards
13 analyses, impact one thing or another. It causes a
14 lot of changes in the FSAR level of information.

15 So, I think we can expect if we don't get
16 everything completed to a generally consistent level
17 that we will have a lot of changes later on that come
18 back in that will have to be dealt with one way or
19 another. That may force some compromises that we
20 would prefer not to have made. We've made similar
21 compromises in whether valves are on the ceiling
22 instead of down, accessible for maintenance or
23 whatever. Those kinds of things get forced when you
24 allow things to go at different rates and different
25 depths of information.

1 I guess a second point is that both our
2 inspection or audit process of that information
3 available for audit and the question and answer
4 process on the FSAR type of information are both audit
5 type things. We don't look at everything in the
6 plant. We don't look at every safety question. We
7 expect vendors to use certain codes and standards and
8 follow certain commitments and design things well, but
9 no means are we able to turn over every rock either in
10 terms of the FSAR or in terms of the design
11 information. We do go out and try to look in-depth at
12 particular pieces that carry us sometimes horizontally
13 into other areas, but we really rely on that audit
14 process.

15 So, I would say we really need to set up a
16 system that in the absence of an actual design that's
17 available for audit and an actual plant that's
18 available for walkdown. We have to have some level of
19 general level of information developed that we can be
20 confident provides enough discipline interaction to
21 work out all the detailed things that really impact
22 safety and the commitments for safety.

23 COMMISSIONER REMICK: I don't differ at
24 all. It's a question of what part of the warehouse is
25 that.

1 MR. TAYLOR: Well, I'd like -- we
2 ultimately will be coming forth proposing a rule to
3 certify and this process of how deeply we go into the
4 detail drawings and the execution of the design is
5 going to be a matter of great interest to the
6 Commission I know at the time you are asked to certify
7 a design. In fact, that whole process is one that
8 concerns me of laying out just the resources and the
9 ability to carry that out in designs that we work on.

10 So, there's a great warehouse, Brian is
11 right. We won't have the staff or resources to look
12 at every single aspect of the design. But we will go
13 in, as we've developed in the past, in vertical type
14 areas, going through systems and the processes we have
15 used that have proven worthwhile in the past for audit
16 of designs and see that the safety aspects have been
17 appropriately translated into the system. I think you
18 will expect that and say --

19 COMMISSIONER ROGERS: Well, I'm a little
20 troubled here by something because it sounds to me as
21 if you're saying you're going to do an audit on the
22 design, safety aspects of the design itself. I don't
23 think you're saying that, but you've got a design and
24 you're going to have to look at that from every
25 possible safety angle that you can look at. You've

1 got to have the information to do that. You're not
2 going to do a safety audit, you're going to do a
3 safety analysis, as far as I understand it, on that
4 design.

5 MR. TAYLOR: Well, we're going to see that
6 the safety --

7 COMMISSIONER ROGERS: You're not going to
8 do some samples here and there, you're going to do as
9 much of an analysis as one can do on a new design. Is
10 that correct?

11 MR. TAYLOR: Yes, we're going to look at
12 the design to be sure that the attributes of the
13 system --

14 COMMISSIONER ROGERS: Ask the safety
15 questions.

16 MR. TAYLOR: -- have been appropriately
17 translated into the detail design. That's what we've
18 done many, many times when we've done this process in
19 the past and we have found problems on a case by case
20 basis.

21 MR. GRIMES: But I think you're asking
22 that the --

23 CHAIRMAN CARR: Yes. I don't think that
24 they're going to look at everything. We haven't got
25 that kind of -- I think it's going to be an audited

1 program. There will be a lot of analysis on those
2 things that are critical, but I don't see how we can
3 do it any other way.

4 MR. MIRAGLIA: May I try to address that?

5 CHAIRMAN CARR: Identify yourself for the
6 recorder, please.

7 MR. MIRAGLIA: Frank Miraglia, NRR.

8 Our process, I think, in terms of breadth,
9 our review process for safety is we say these are the
10 areas that we're going to look at. The SRP gives us a
11 breadth or scope of review. We do not do 100 percent
12 design review in all of those areas. We look at them.
13 We do look. That's a sampling kind of basis based on
14 what we find. That indicates our depth. The absence
15 of having a completed plan, what we have found in the
16 traditional two step process when we went out and had
17 a plant, they didn't implement the design or didn't
18 consider something in the design. We found that out
19 by doing a vertical slice across the kinds of system
20 and went deeper than we would go with PSAR or even
21 FSAR information.

22 So, I don't think the Commission should
23 have a perception that we do 100 percent design
24 review.

25 COMMISSIONER ROGERS: Well, it's not in

1 replicating design, I mean that, you know, go back and
2 redo everything. No, I understand that.

3 MR. MIRAGLIA: We get the design from the
4 vendor and the utility and then we look at the
5 principle parts, the safety features of that design
6 and make a determination that indeed they're following
7 accepted practices and codes and meeting acceptable
8 standards and if they do the totality of the design
9 with that same degree with the QA programs being
10 adequate and all that, that should result in an
11 acceptable product.

12 MR. GRIMES: And the standard review plan
13 also directs the reviewer to take samples. It doesn't
14 direct him to review every aspect.

15 COMMISSIONER REMICK: Well, if I may
16 proceed.

17 CHAIRMAN CARR: Please, go right ahead.
18 You're taking a lot of time here.

19 COMMISSIONER REMICK: Yes, I am.

20 Jim, you introduced something that was
21 going to be a later question. That is was have
22 Appendix B of Part 50 which lays out certain
23 requirements, good management requirements in design
24 as well as operation. In that we make a finding that
25 the licensee or applicant has a process in effect to

1 implement the design. We're now talking about a
2 process where we're going to go out and do vertical
3 slices and so forth and that's defensible. It seems
4 to me that we're going to be making a determination,
5 if not a finding, that the design has actually been
6 implemented in accordance with proposed certification.

7 Has the staff looked at what that means
8 from the standpoint of resources? That is, to me, a
9 tremendous increase in activity.

10 MR. TAYLOR: That's of concern to me as to
11 how -- and I think that depends upon decisions made
12 today.

13 COMMISSIONER REMICK: Well, you made that
14 point a few minutes ago and it is essential.

15 Going back to this material audited, as a
16 practical matter, isn't there a high potential for
17 that information ending up in the certification
18 record? If not, how are you going to keep it out?
19 This is my point. If I'm somebody that questions
20 whether we as an agency have done a thorough job of
21 auditing that material to glean out the information
22 which is important to our safety determinations, I
23 would challenge the Agency that you haven't look at
24 all of it, you haven't thoroughly audited it and so
25 forth and therefore it ought to be put in the record

1 so I can see it.

2 MR. TAYLOR: Well, we do almost all of our
3 process on an audit basis. I mean that same kind of
4 question has to be faced in even the construction of a
5 plant such as -- and what we've done in the past.

6 COMMISSIONER REMICK: But we're now going
7 to make determinations or findings that the design has
8 been implemented based on our going out and auditing
9 information. I might question whether we've done a
10 thorough job. Maybe there's information we didn't
11 look at in our audit that we should have.

12 DOCTOR MURLEY: Commissioner, I don't
13 think it would wind up in Tier 1, which is the
14 certified portion. Even if it were dragged into the
15 application, it would certainly be no more than the
16 Tier 2 information.

17 COMMISSIONER REMICK: Could be. Could Be.

18 DOCTOR MURLEY: I think the real concern
19 that you're getting at is could this whole warehouse
20 full of information be subject to litigation in the
21 certification hearing. I think that's always a risk,
22 yes. But I don't know how you stop it other than not
23 have it available in the first place. That's how you
24 stop it.

25 COMMISSIONER REMICK: No, but if we're

1 going to ask that it be all available so we can audit,
2 that certainly increases those chances over that we as
3 part of our process, if the information is not there,
4 we ask for it during the normal question and answer
5 process.

6 MR. TAYLOR: The audits are your assurance
7 that that information has been appropriately
8 developed. That's the answer. The answer is that our
9 program for auditing that material must give you
10 assurance that the designer, everybody having the
11 right motives in mind, has carried out what they've
12 committed to do. Wouldn't you say that?

13 DOCTOR MURLEY: Because in the past, we
14 have audited architect/engineering offices and their
15 processes and their drawings and things like that,
16 material that never gets into NRC's application and it
17 isn't drawn into the hearing process.

18 COMMISSIONER REMICK: But remember in the
19 past we were finding that the process was in effect.
20 I believe that's what we did. They had a process. I
21 interpret what we're saying here now, and I could be
22 wrong, that we're going to make a finding or some kind
23 of a determination that they've actual implemented and
24 we've looked at it. We've audited the material to
25 come to that determination. The Commission is going

1 to have to make a --

2 DOCTOR MURLEY: But that's how we do
3 business. Even under Part 50, we audit
4 architect/engineering offices and come to the
5 conclusion that the process is adequate based on what
6 we see there, based on the drawings and the
7 calculations.

8 COMMISSIONER REMICK: That's right. It's
9 a finding on process.

10 CHAIRMAN CARR: I don't think we are doing
11 anything different than putting past practice into
12 operation.

13 COMMISSIONER REMICK: I would hope that's
14 it, but that's where I'm not convinced. I think we're
15 going beyond that. I could be wrong.

16 CHAIRMAN CARR: Well, I think you have to
17 go beyond if you don't have the plant. As I say, when
18 you're working with paper, it's tougher than when you
19 can go out and look.

20 COMMISSIONER REMICK: No question about
21 that.

22 CHAIRMAN CARR: This plant has not really
23 been fabricated at the time we're supposed to certify
24 the design.

25 COMMISSIONER REMICK: It's a difficult

1 one, no question about it.

2 May I go on, Mr. Chairman?

3 CHAIRMAN CARR: Please.

4 COMMISSIONER REMICK: Okay. Okay.

5 CHAIRMAN CARR: Hopefully you'll cover 95
6 percent of the problem. If you don't, we'll pick up
7 the other five percent.

8 COMMISSIONER REMICK: Well, as I say, I
9 might have a few more additional written ones.

10 Am I correct in interpreting the SECY
11 document that as a bottom line you are in effect
12 defining the required level of design detail to be
13 "all feasible and practical design detail" in contrast
14 to that necessary for us to make our safety
15 determinations?

16 DOCTOR MURLEY: No, we're not. There are
17 a couple of sentences we found in here that could lead
18 to that conclusion, but the staff is not recommending
19 that we use a feasible and practical to achieve
20 standard.

21 COMMISSIONER REMICK: Okay. Well,
22 that's --

23 CHAIRMAN CARR: My impression is they use
24 those words because we asked them what was practical
25 and feasible.

1 DOCTOR MURLEY: That's right.

2 CHAIRMAN CARR: We gave them that word and
3 they gave it back to us.

4 DOCTOR MURLEY: The staff requirements
5 memorandum was one of the questions and so it got into
6 our dialogue and may have left the unfortunate
7 impression that we were recommending that, but we're
8 not.

9 COMMISSIONER REMICK: That's a very
10 important point.

11 CHAIRMAN CARR: I was trying to find out
12 if I could get to Level 1.

13 COMMISSIONER REMICK: I think you've
14 already answered this, Tom, but is there any reason
15 why the evolutionary designs could not serve as the
16 template, the cases in point to develop the regulatory
17 guides that would be used in the future? Is there any
18 reason? Now, I think that you were saying that that
19 would be the case, but at the same time you were
20 recommending that you proceed with a regulatory guide
21 which makes me feel that you'd be moving ahead and
22 producing reg. guide before that process was complete.
23 I'm thinking ABWR and System 80+ as two evolutionary
24 designs in-house.

25 Is there any reason why -- and I thought

1 this was the direction you were going before, you
2 perceived what the Commission was asking for -- why
3 that couldn't be used as the experience to determine
4 what is it that we need?

5 DOCTOR MURLEY: Well, under this proposal,
6 we would do the regulatory guide and the ABWR review
7 in parallel, the intent being that when we're done
8 with the ABWR review, we would have the same amount of
9 material available as that which we outlined and
10 require, request in the reg. guide.

11 I don't know if that answers your
12 question.

13 COMMISSIONER REMICK: Well, it seems, like
14 you say, at least the ABWR, but the timing. You
15 indicated you'd have a reg. guide out in about a year.

16 DOCTOR MURLEY: Yes.

17 COMMISSIONER REMICK: Do you feel that
18 you're going to have the ABWR design review completed?

19 DOCTOR MURLEY: No, but we'll be enough in
20 the middle of it to know where we need more
21 information. I think that Q&A process will help us
22 write the reg. guide actually. We're quite sure that
23 we don't have enough information now to make our
24 safety judgments on the ABWR. That's the one that's
25 furthest ahead. We've been doing the review for

1 several years now and there's still a fair amount of
2 detail that's not available.

3 COMMISSIONER REMICK: Well, my point is,
4 isn't that going to be an excellent example, plus the
5 System 80 as it goes along, to determine what should
6 be in that reg. guide? Is there any reason for
7 proceeding at a faster pace with the reg. guide using
8 those, as I say, as a case study of what should be in
9 a reg. guide?

10 DOCTOR MURLEY: I haven't thought a great
11 deal about the timing, but I think it would be useful
12 to proceed with the reg. guide to help other plants,
13 like the passive plants and some of the other advanced
14 plants in terms of guidance. They wouldn't have to
15 wait until the full certification process is done,
16 let's say on the ABWR before they know what kind of
17 level to be aiming for.

18 COMMISSIONER REMICK: Well, it seems to me
19 that the people best able to write that regulatory
20 guide are the people that are actually reviewing those
21 evolutionary plants. It seems to me that their plate
22 is full, that we are having difficulty putting the
23 resources to proceed with those reviews and
24 placing -- and I don't think it would be proper to
25 give that to another office to develop because I think

1 those people who are actually in the day to day design
2 and see what the needs are, or design reviews, excuse
3 me, are the ones who could best do that.

4 I'm trying to get at is there a sense of
5 urgency on the regulatory guide and any reason why it
6 couldn't proceed using ABWR -- I was thinking also of
7 System 80+, but maybe that's not necessary -- as that
8 actual case in which we could develop something that
9 might be more meaningful than we would otherwise.

10 DOCTOR MURLEY: Well, in a sense it's not
11 urgent if this path that we were on, namely -- I call
12 it the revealed standard path of do our safety reviews
13 and then when we're done, that's the level that we
14 needed. If that's acceptable and that's what the
15 Commission wants to do, then there is not any urgency

16 COMMISSIONER REMICK: Okay.

17 COMMISSIONER ROGERS: What about the
18 standard review plan? You're going to modify that
19 because that's very out of date. So, how do you see a
20 change in the standard review plan schedule addressing
21 this? What are you going to use for a standard review
22 plan in looking at the ABWR and the 80+ applications
23 if you haven't redone that standard review plan?

24 DOCTOR MURLEY: That's a good question.
25 What role does the standard review plan play in all

1 this? It was developed back in the early '70s when
2 the Atomic Energy Commission was literally receiving
3 one application a week. The staff was growing by
4 leaps and bounds. It was necessary that there be this
5 standard review plan so that every application
6 received the same review. That was the purpose. Now
7 when we're doing the review of one design, it's less
8 needed for standardization of review purposes.
9 However, there are some parts of it we know are out of
10 date. So, we'll use the standard review plan as it
11 exists because, of course, a lot of the structural
12 design aspects and thermal hydraulic aspects are the
13 same. Where it's out of date, largely, I think, in
14 instrumentation control and maybe control room errors,
15 we'll have to supercede that with instructions to the
16 staff on how to review it. But here again, we'll have
17 to do this as we go along.

18 I don't think it would make any sense to
19 try to revise the standard review plan now until we've
20 completed, let's say, a design or so and we go through
21 the ABWR. Then it might make sense to take time to
22 update the standard review plan so that System 80+ and
23 the passive plants receive the same kind of review
24 that the ABWR did.

25 COMMISSIONER ROGERS: Yes, but shouldn't

1 the reg. guide, the updating of the reg. guide and the
2 updating of the standard review plan track each other?
3 I mean they're really different aspects of the same
4 thing, aren't they?

5 DOCTOR MURLEY: No. No.

6 COMMISSIONER ROGERS: I mean your people
7 are supposed to supply --

8 DOCTOR MURLEY: I mean they're related,
9 but the reg. guide is really to tell the industry,
10 "Here's what the NRC expects to have available in
11 terms of design before you submit an application to
12 us, or certainly before you get certified." The
13 standard review plan is focused on how the staff is
14 going to do its safety review. So, it's how we look
15 at that vast bulk of material that is available. So,
16 they're related, but they're not -- I mean, we could
17 proceed one without the other, I think, to some
18 extent.

19 COMMISSIONER ROGERS: I think so. I don't
20 know. I would feel more comfortable if I knew that
21 they were somehow or other looking at each other very
22 closely. If you're saying you're going to review from
23 a certain point of view and you're telling somebody,
24 "Supply information that's going to be reviewed," then
25 those two ought to be fairly tightly linked in our

1 minds in terms of our expectations. We're not saying,
2 "This is how you review something and this is what you
3 supply." They really ought to be congruent in some
4 sense, one much bigger than we've talked about here so
5 far.

6 DOCTOR MURLEY: Yes, yes. In that sense,
7 certainly they have to be consistent.

8 COMMISSIONER ROGERS: Absolutely.

9 DOCTOR MURLEY: Right. We can't have
10 something in the standard review plan that asks for
11 detail that we haven't asked for in the reg. guide, in
12 the application, sure.

13 COMMISSIONER REMICK: Can I make one final
14 question?

15 CHAIRMAN CARR: Sure.

16 COMMISSIONER REMICK: Correct me if I'm
17 wrong, Tom. I perceive that SECY-90-377 is the staff
18 response to your perception of what the Commission
19 asked you to do or did ask you to do in the SRM, I
20 guess, of August. But I perceive that your preference
21 was the path you were on until that day when we had
22 the last Commission on the subject. I think you call
23 it kind of an ad hoc review of these first cases to
24 get the experience and so forth. Am I right or wrong
25 in that --

1 DOCTOR MURLEY: Well, it's true that that
2 was the path we were on. We have not, in all honesty,
3 given a lot of thought to standardization and the
4 benefits of standardization. The Commission -- I mean
5 I sense -- felt at that meeting quite strongly that
6 there was a benefit to it, that we hadn't given it
7 proper consideration. So, yes, then we went back and
8 developed this based on what our sense of what the
9 Commission wanted, to enhance the safety benefits of
10 standardization. Yes.

11 COMMISSIONER REMICK: Well, I want to say
12 again the staff, I think, did an outstanding job of
13 really digging in and trying to develop the issues and
14 laying out the bounds and appreciate it.

15 CHAIRMAN CARR: I might say on that last
16 point, in my opinion it's far easier on the staff to
17 review a complete design than it is to review one
18 that's incomplete. This question and answer type
19 stuff takes a lot of time and a lot of work.

20 COMMISSIONER REMICK: I still have lots of
21 questions and answers on what somebody would call a
22 final design.

23 CHAIRMAN CARR: But if the answers are
24 already there, it doesn't take so long to produce.

25 COMMISSIONER REMICK: No, I agree. Thank

1 you.

2 CHAIRMAN CARR: Commissioner Curtiss?

3 COMMISSIONER CURTISS: I don't have a lot
4 of questions. I do want to clarify a couple of
5 things.

6 The material available for audit that you
7 propose to have under this approach, if you determine
8 that any of the material that you examine is necessary
9 for you to make your safety determination, that
10 material becomes Tier 2, is that correct?

11 MR. VIRGILIO: That's correct.

12 COMMISSIONER CURTISS: Forrest, you're
13 proposing -- I understand what you're saying. You
14 talked about in that category of information simply
15 asking for and reviewing in the audit fashion that we
16 would only that information that is necessary to make
17 our safety determination.

18 COMMISSIONER REMICK: Yes, I would assume
19 that's what we do, yes.

20 COMMISSIONER CURTISS: Is there anything
21 left in Tier 3? What is left in Tier 3?

22 MR. VIRGILIO: Just as under the Part 50
23 process we went out and conducts audits, there was
24 always this Tier 3 base of material. I was doing I&C
25 reviews, for example, and we would go out and conduct

1 an audit in the vendor's shop and certain portions of
2 that information I felt I needed to make my safety
3 judgment. That was part of the Qs and As that we
4 asked be supplied on the docket and became part of
5 Tier 2. There was a lot of information I did review
6 that I didn't need to support my safety judgment and
7 it remained out in the vendor's shop and there always
8 was a Tier 3 under the Part 50 process.

9 DOCTOR MURLEY: Let me just clarify that
10 Tier 3 you're referring to this --

11 MR. VIRGILIO: This material available for
12 audit.

13 DOCTOR MURLEY: -- material available for
14 audit. Okay.

15 COMMISSIONER CURTISS: It's actually not
16 information that we have any regulatory interest in.
17 We know it's out there and under the approach that
18 Commission Remick has suggested, it would not be
19 material that we would ask for?

20 MR. GRIMES: I would say there is
21 regulatory interest in that Appendix B would require
22 it for all safety related material, that this
23 information must be kept in a cogent manner. It must
24 support the design and that it forms essentially the
25 basis for the design, the design basis, the basis for

1 future configuration control of the plant.

2 COMMISSIONER CURTISS: In other words,
3 that presupposes the information has to be available.
4 The category of information that Commissioner Remick
5 talked about is that which is necessary to make the
6 safety determination on certification.

7 MR. GRIMES: But that's somewhat different
8 than the implementing information which must be
9 controlled in a certain fashion, is different than the
10 information that we use --

11 COMMISSIONER CURTISS: I understand that.

12 MR. GRIMES: -- to perform our FSAR or SER
13 judgments.

14 COMMISSIONER CURTISS: And that
15 information has to be available at some point, at some
16 time albeit kept in the vendor's files? Is that
17 right? Okay.

18 Let me back up and ask more of a global
19 question. Give me a sense of perspective here. You
20 indicated that the approach that you've proposed would
21 lead to about 70 to 80 percent of the design and about
22 50 percent of the engineering being done. Put that in
23 context for me, for a typical construction permit that
24 we have issued in the past. Can you contrast that to
25 what we've had in the past?

1 MR. GRIMES: I guess just a top of the
2 head estimate, I would guess perhaps at the time of
3 the construction permit there'd probably be less than
4 20 percent of the design engineering hours performed.

5 DOCTOR MURLEY: Oh, five percent. I
6 actually looked at a plant that had been done and the
7 total number of engineering manhours on this plant was
8 15.6 million, for example. At the time of the
9 construction permit, there was only about five percent
10 of the engineering manhours had been done.

11 COMMISSIONER CURTISS: Okay. Along that
12 same line, I've taken a look at your analysis in
13 Enclosure F on the impact on the ABWR. Can you say a
14 word or two in terms of what you proposed here in
15 terms of overall engineering work done, 50 percent and
16 70 to 80 percent of a design? Could you put that in
17 the context of where System 80+ and the ABWR are and
18 what areas in particular you think each of those two
19 may come up short?

20 DOCTOR MURLEY: Yes. I've talked with
21 some staff from General Electric, for example, and the
22 major area that they don't have and that this level of
23 detail would require would be out in the balance of
24 plant and the turbine building. The estimate is
25 roughly, I guess, a couple of hundred million dollars

1 to develop that information. I can't put that in
2 terms of percentage. My guess is it's probably about
3 20 percent at the time, something like that. Perhaps
4 Brian can --

5 MR. GRIMES: I think that's reasonable. I
6 would guess, based on what we've seen, that the level
7 of design detail is very high for certain key
8 components in the nuclear island. It's at probably
9 level 2. But most of the rest of the plant is much
10 lower, including control room and --

11 CHAIRMAN CARR: But that just tracks what
12 they're building in Japan. What they're building
13 they've already designed pretty well and --

14 MR. GRIMES: Well, that's true for the key
15 mechanical systems, but the rest of the systems it may
16 turn out to be a very different design in Japan than
17 it is in the U.S. or GE may choose to adopt some of
18 that. I would just guess that GE is probably
19 considering all the architect/engineering.
20 Engineering also required probably between 20 and 30
21 percent of the design and we're asking them to come up
22 to 50 percent of the design.

23 COMMISSIONER ROGERS: How current is your
24 dialogue with them on that?

25 MR. GRIMES: That was as of last February,

1 but they did not have a very large ongoing engineering
2 effort in the U.S.

3 COMMISSIONER ROGERS: Could you get an
4 update on that?

5 MR. GRIMES: Sure, I suppose we could --

6 DOCTOR MURLEY: Charlie Miller had a
7 point.

8 MR. MILLER: While we haven't gone out and
9 conducted an audit like was done last February, since
10 the time of the submittal, or the time of the audit,
11 GE has submitted three conditional amendments to the
12 SSAR. Included in that information is some more
13 information on the control room. That information is
14 currently under evaluation. I think it's a little
15 premature to try to say that to this level or to that
16 level. But in all fairness, the audit was fixed in
17 time in February. It reflects the findings that the
18 staff was able to make by going out there all the
19 time, to give a reference point of what we saw. The
20 application continues to grow and get more expansive.

21 Now, whether it gets anywhere near in some
22 of those areas to level 2 or whatever remains to be
23 seen. My guess is that based upon GE's reactions that
24 they still do feel that an additional 200 million or
25 whatever, as Doctor Murley has said, would be

1 necessary in order to bring the design into the
2 conformance that they feel that was asked for in
3 looking at the staff's SECY.

4 MR. GRIMES: We don't have any reason to
5 doubt GE's estimate. It sounds in the right ball
6 park. I'm not sure how much of that will be required
7 anyway as we go through the iterative process.

8 COMMISSIONER CURTISS: Their estimate
9 includes the time of how much they think it will take
10 the staff to review that. Was that a pretty good
11 estimate too?

12 MR. GRIMES: My reaction was not that we
13 could properly review things as they were developed,
14 so I wouldn't see staff review on the end of the
15 development process. I would envision the staff
16 review --

17 COMMISSIONER CURTISS: As you're going
18 along.

19 MR. GRIMES: -- as it's developed.

20 COMMISSIONER CURTISS: I have two just
21 specific questions. The 50.59 process that you talked
22 about between issuance of the COL and authorization to
23 operate, is that the same 50.59 process that you would
24 use after operation or are there differences in the
25 standards?

1 MR. VIRGILIO: About the only difference
2 that we envision would be in the reporting
3 requirements in order to keep the staff more current
4 on changes being made. I would envision that we would
5 ask that the information associated with the changes
6 that were made to the design be provided much more
7 frequently than currently called out for in Part 59.

8 COMMISSIONER CURTISS: We haven't talked a
9 lot about, I guess, the Tier 1 and Tier 2 information,
10 but I have a question focusing on that.

11 Take a hypothetical case. Let's say the
12 vendor wants to come in and on a cable tray, rather
13 than to identify the specific location of the cable
14 tray in the plant. And assuming there's only one
15 factor that bears on the location of the cable tray,
16 let's say it's fire hazard, the vendor, instead of
17 identify the specific location says, "I'll permit a
18 fire hazards analysis that would address all the
19 concerns that the staff has with respect to that one
20 factor." Let's assume it's the only one, for the sake
21 of the question. And that ought to be sufficient in
22 terms of giving the staff the necessary detail on how
23 and where that cable tray will be located.

24 Would either approach be acceptable to the
25 staff, either specifying the precise physical location

1 or an approach that would, through the example
2 mentioned, rely on say a fire hazards analysis to
3 scope it out?

4 DOCTOR MURLEY: Oh, dear. Brian?

5 MR. GRIMES: Yes. Gene, do you want to
6 try that one?

7 MR. IMBRO: Yes, let me take a shot at it.
8 I would think the performance of the fire hazards
9 analysis is really dependent on the location of the
10 cable trays. The two really interact, so I think if
11 you'd just approved based on a fire hazards analysis
12 on a global basis, then I think you'd have to make
13 sure then, you'd have to have some way to guarantee
14 that when the cable tray was actually located that it
15 would all within the balance of what you analyzed.

16 I mean, to me it would seem like you
17 would -- I would prefer to see the cable tray routed
18 and then a fire hazard analysis performed and that
19 designed be fixed so that it wouldn't change. Then,
20 once the analysis was completed and you were satisfied
21 with it, then it was kind of a settled question. You
22 wouldn't have to ever revisit that again.

23 MR. GRIMES: I would also add that it
24 would avoid design compromises in other system areas
25 if you knew physically where the cable tray was and

1 didn't have to reroute it later or fit it around other
2 parts of the design.

3 CHAIRMAN CARR: Isn't it true that you
4 couldn't make the final determination until the cable
5 tray was in place?

6 MR. IMBRO: That's probably true, yes.

7 COMMISSIONER CURTISS: Hypothetical is--
8 I know it's simpler than the situation we actually
9 face, that when you move the cable tray to address the
10 fire hazards, it could impact other things as well.
11 In the fire hazards analysis, you may put it under a
12 pipe that might break or next to a component that
13 might fall off the wall. I realize that in practice
14 there are complications that make it a much more
15 difficult question.

16 I guess I'm looking for the principle here
17 that if in that case or with whatever additional
18 considerations would bear on the location of the cable
19 tray it were possible, then I simplified it to say
20 there's only one factor bearing on the location of the
21 cable tray. If the analysis were done in a manner
22 that addressed all the staff's concerns with respect
23 to fire hazards, would that be an acceptable
24 alternative to actual designation of the physical
25 location?

1 MR. VIRGILIO: I think the answer is yes,
2 but as you put it --

3 COMMISSIONER CURTISS: But it's complex.

4 MR. VIRGILIO: It's much more complex.

5 COMMISSIONER CURTISS: I don't have any
6 other questions. I thought the staff, for the first
7 time that I've seen -- I don't mean the first time by
8 the staff's part -- put together what I think is
9 probably the most coherent and cohesive analysis of
10 this issue. It holds together, it's internally
11 consistent. I know there are strong feelings about
12 the substance of what you have proposed and we've seen
13 some of those comments from the vendors and I suspect
14 we'll hear some additional comments from others, but I
15 thought the analysis that the staff went through, the
16 work that Marty and Rebecca did and the rest of the
17 staff, Gene, really did present a very cohesive, well
18 structured and coherent analysis of this most
19 important issue. Thank you for that.

20 CHAIRMAN CARR: We'll have to wait for the
21 ACRS comments on the coherency.

22 Commissioner Rogers?

23 COMMISSIONER ROGERS: Well, we've
24 discussed a lot today and I think it's been a very
25 useful meeting. I certainly have got a great deal out

1 of it. But a couple of things that -- well, one or
2 two, not too many, that I'd like to just go over a
3 little bit more.

4 I wonder if you could say something about
5 the concept and extent of prototype testing that
6 you've referred to, particularly in this area of
7 innovative systems that are a little different from
8 what has been in place before. This would be probably
9 instrumentation and control areas, use of
10 microprocessors, fiber optics, things like that,
11 multiplexors, networks. What are you talking about
12 there in terms of prototype testing? That's been
13 mentioned, I think, in the SECY. Would you also talk
14 about software validation and verification plans? How
15 do you see those as relating to design verification?

16 DOCTOR MURLEY: Let me -- I'll ask Bill
17 Russell to talk about V and V in a second.

18 But with regard to prototype testing, it
19 really depends on the type of reactor we're talking
20 about. For the evolutionary plants, the vast bulk of
21 the systems we understand, we don't think anything is
22 needed. Perhaps some confirmatory tests on pumps,
23 let's say, or aspects of new pump designs.

24 The one area in the evolutionary plant we
25 do think will need some testing, and perhaps a

1 prototype, would be the new -- if they go to a new
2 control room design that's heavily computerized. We
3 would like to see it laid out. We would like to see
4 how it works and that sort of thing.

5 With regard to the next generation of
6 water reactors, the passive plants, my sense is that
7 we're probably going to require quite a bit more
8 testing because a lot of the concepts that they're
9 proposing are new to us. So, we expect that we'll
10 require some integral tests. We'll no doubt require
11 some heat transfer tests to convince us that the
12 method of cooling the containment from spraying the
13 outside, that this will work under various conditions
14 and atmospheric conditions and so forth.

15 COMMISSIONER ROGERS: I was really
16 focusing on the current evolutionary --

17 DOCTOR MURLEY: Current evolutionary? Oh,
18 okay.

19 COMMISSIONER ROGERS: Just what we think
20 we need to look at. I know you've talked about the
21 control room. Just how do you see this kind of
22 prototype testing --

23 DOCTOR MURLEY: Let me ask Bill Russell to
24 talk about his thoughts, but also particularly the
25 validation and verification.

1 MR. RUSSELL: Bill Russell of the staff.

2 As it relates to the control room and the
3 I&C areas and validation verification, a number of
4 issues immediately come to mind and I have the staff
5 working on this as a separate topic which we expect to
6 bring to the Commission.

7 The first one is that you cannot do this
8 review at the more global level, that is a commitment
9 to a standard. You can make commitments to do a
10 control room design using good human factors, but if
11 we want to actually see how it's being laid out, what
12 the displays are, they're going to be so different
13 from what we see in the current generation. If you're
14 going to go to a desk top without having distributed
15 controls using a computer interface rather than
16 switches and controls, there's a fairly good potential
17 that we will need to have some type of further
18 developed design and potentially a control room
19 simulator as a prototype to do such things as
20 procedures, licensing operators on these new designs,
21 et cetera. The whole scope of that is being reviewed
22 now.

23 The issue with validation verification --

24 COMMISSIONER ROGERS: Just on that, before
25 you move off it, what's the state of the dialogue

1 between the staff and the potential vendors on this
2 issue?

3 MR. RUSSELL: We've had some dialogue with
4 Westinghouse. It appears that -- and it's very
5 preliminary. It does not appear that there is a large
6 difference between what the staff is considering and
7 what Westinghouse is considering. But that's very
8 preliminary. What you find is when you get into the
9 details, there's usually difference and sometimes the
10 staff expects more than what the vendor is.

11 But we need to develop this, identify the
12 areas of concern and I've identified this as work that
13 the staff is working on and we'd be proposing to bring
14 this to the Commission similar to the way we brought
15 the other 15 technical issues to you.

16 In the area of validation and
17 verification, there's two levels that I'd like to
18 discuss. One relates to the control room as it
19 relates to all the controls for the control panels.
20 If you go to a central computer using software to run
21 your controls with an interface through a CRT screen
22 and a keyboard, you have a very different situation
23 potentially with validation and verification because
24 of complexity of the architecture of the software
25 that's basically running the plant. As compared to a

1 situation where you have a protective function that
2 you want to have run by software where you essentially
3 have one input and one output. That is you sense a
4 plant parameter and when that parameter is adverse the
5 computer with the software causes an output of
6 scrambling the reactor.

7 So, depending upon what application you're
8 using it for, whether it's a protective system or it's
9 a control system and the complexity of the
10 architecture of the software itself creates a great
11 variety of review problems and review depth for the
12 staff.

13 We have been dealing with the Canadians
14 who are fairly far along in validation and
15 verification for safety systems and we've been having
16 dialogue with the British and we have pulled this
17 issue sort of aside and we have a senior individual
18 reporting directly to the branch chief, Joe Joyce,
19 who's been involved with this for some time, who is
20 looking at both the validation and verification
21 aspects to keep current with what's going on.

22 We're also developing other engineers with
23 that capability. So, we're working on the problem.
24 It has a long ways to go. We don't have standards
25 yet. We've done some reviews for replacements of

1 analog systems with digital systems, essentially black
2 box type replacements, but we have not yet gotten to
3 the point of a sophisticated software program that has
4 multiple inputs and multiple outputs and you're
5 looking for how well it's done.

6 So, it's a significant piece of work that
7 the staff has and that we're working on developing.

8 COMMISSIONER ROGERS: Okay. Good. That's
9 very important.

10 Well, I just want to say that I think the
11 staff has done a very fine job here. These are tough
12 questions. We know that. I don't think we should be
13 dismayed that to some extent we're still groping
14 around here because it's a brand new business. I just
15 urge us to, while moving expeditiously, not be
16 stampeded in any way. I think that it's very
17 important that we all understand where we are and
18 where we're going as we move along. I think we're
19 still in the process of doing that. Each time we meet
20 with the staff and each paper we get, we have new
21 issues to explore and new questions that have to be
22 answered and that's entirely proper. I don't think we
23 should in the least bit be chagrined that everything
24 isn't flying right off the drawing board. It's a new
25 business for us and we have to do it right.

1 I commend the staff for the very fine
2 efforts, even though I may differ a little bit on some
3 things that are in the reports. Thank you.

4 CHAIRMAN CARR: I think I got most of my
5 comments in earlier on. I would like to comment that
6 I think that we want to be sure that final
7 determination is the important thing before we certify
8 and that we don't expect any design issues to be left
9 open at design certification except for those that are
10 site specific perhaps. Also, I think it's important
11 to note that I don't think we ought to leave it up to
12 ITAAC to make those final design determinations
13 either. My impression of ITAAC is that's going to
14 make sure that it was built like it was designed and
15 works like it was designed. So, I would hope that
16 when we get ready to certify, we're certifying a
17 design that we know what we're certifying.

18 Are there any other questions?

19 Well, I'd also like to thank the staff for
20 this very informative presentation. It's obvious
21 there's been a great deal of thought on the subject
22 and the staff is commended for this effort.

23 I've noted that severe accident issues
24 raised in SECY-90-016 have not been further mentioned
25 in either SECY-90-241 or in SECY-90-377. I urge the

1 staff to integrate severe accident considerations into
2 the review of other aspects of design certification
3 and remind the staff, as the Office of the General
4 Counsel did relative to SECY-90-016, that the question
5 of the desirability of additional severe accident
6 mitigation measures still needs to be addressed under
7 the National Environmental Policy Act or NEPA either
8 in design certification or in some preliminary
9 rulemaking.

10 My view is that the staff's approach is
11 going in the right direction and is consistent with
12 what the Commission intended in promulgating 10 CFR
13 Part 52. I agree with the staff's conclusion that the
14 level of detail should be adequate to enable the staff
15 to reach a final conclusion on all safety matters
16 considering that there will be no physical plant to
17 examine and there should be no open items except for
18 site specific features at the time the design is
19 certified.

20 It is important to keep in mind that for
21 the first time the NRC using this process will give
22 final approach on all features of the plant necessary
23 for safe operation except for site specific elements.

24 I believe the staff should view the
25 implementation of ITAAC as confirmatory only. Design

1 issues should not be left open at design certification
2 with the expectation that ITAAC implementation will
3 resolve those issues.

4 If the staff's recommended approach is
5 approved, the staff should ensure in developing the
6 regulatory guide that the level of detail is
7 sufficient such that the insights from the design
8 specific PRA are implemented in the design. The staff
9 should also ensure that the change process parallel to
10 Part 50.59 be incorporated into the combined operating
11 license adequately addresses the risk levels assumed
12 in approving the plant design.

13 When the level of detail in the design
14 certification is adequate for the staff to reach final
15 conclusions concerning the safety of the design from
16 the traditional standard review plan point of view, as
17 well as risk and severe accident issues, we will have
18 achieved a great deal of standardization. The
19 industry and the nation will gain in the additional
20 safety benefits of this standardization which is an
21 appropriate focus for this agency.

22 I would urge the Advisory Committee on
23 Reactor Safeguards to provide their comments on SECY-
24 90-377 regarding the staff's recommended approach as
25 soon as possible. The Commission would be interested

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1 in further detailed comments during development of the
2 proposed regulatory guide if that is approved.

3 Do any of my fellow Commissioners have any
4 closing comments they'd wish to make?

5 I would hope we could close this out this
6 month, if possible, but we'll make every effort.
7 Again, my thanks to the staff and we stand adjourned.

8 (Whereupon, at 11:54 a.m., the above-
9 entitled matter was concluded.)
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CERTIFICATE OF TRANSCRIBER

This is to certify that the attached events of a meeting
of the United States Nuclear Regulatory Commission entitled:

TITLE OF MEETING: BRIEFING ON LEVEL OF DESIGN DETAIL FOR PART 52

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: DECEMBER 7, 1990

were transcribed by me. I further certify that said transcription
is accurate and complete, to the best of my ability, and that the
transcript is a true and accurate record of the foregoing events.

Carol Lynch

Reporter's name: Peter Lynch

STANDARDIZATION AND PART 52 LICENSING

DECEMBER 7, 1990

**THOMAS E. MURLEY
MARTIN J. VIRGILIO**

**CONTACT: M. VIRGILIO
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OVERVIEW

- * GRADED APPROACH TO DESIGN FINALITY**
- * CONTENT OF THE APPLICATION AND CERTIFICATION**
- * CHANGE PROCESS FOR MATERIAL IN APPLICATION, CERTIFICATION AND HELD FOR AUDIT**

SECY 90-241

- CONTENTS OF THE APPLICATION
TIER 1 & TIER 2**
- CERTIFICATION - TIER 1**
- MATERIAL AVAILABLE FOR AUDIT**
- LEVELS 1, 2, 3, & 4**

FOUR LEVELS FROM SECY 90-241

- 1. IDENTICAL PHYSICAL, FUNCTIONAL & PERFORMANCE CHARACTERISTICS**
- 2. PHYSICALLY SIMILAR / IDENTICAL FUNCTIONAL & PERFORMANCE CHARACTERISTICS**
- 3. IDENTICAL FUNCTIONAL & PERFORMANCE CHARACTERISTICS**
- 4. FUNCTIONALLY IDENTICAL / SIMILAR PRINCIPAL FEATURES**

STAFF PROPOSAL - DETAIL

- LEVEL OF DESIGN DETAIL**
 - * GRADED APPROACH BASED ON SAFETY**
- APPLICATION**
 - * FSAR MINUS AS-BUILT & SITE INFORMATION**
 - * ORGANIZED INTO TWO PARTS/TIERS**
 - * SUPPORTS SAFETY DETERMINATION**
- AVAILABLE FOR AUDIT**
 - * FROM PROCUREMENT & C&I SPECS**
 - * CONFIRM TRANSLATION OF SAFETY CRITERIA INTO DESIGN**

STAFF PROPOSAL - DETAIL

- GRADED APPROACH BASED ON SAFETY

- * > LEVEL 2 FOR CERTAIN NUCLEAR ISLAND FEATURES**
- * LEVEL 2 FOR KEY NUCLEAR ISLAND FEATURES**
- * LEVEL 2 FOR KEY TURBINE ISLAND FEATURES**
- * LEVEL 4 AT CERTIFICATION AND LEVEL 2 AT COL FOR SITE SPECIFIC FEATURES**

STAFF PROPOSAL - FLEXIBILITY

- CERTIFIED PORTION OF THE DESIGN/TIER 1**
 - * RULEMAKING TO AMEND CERTIFICATION**
 - * EXEMPTION PER SECTION 52.63**
 - * WAIVER PER SECTION 2.758**

STAFF PROPOSAL - FLEXIBILITY

- IN APPLICATION BUT NOT CERTIFIED/TIER 2**
 - * BETWEEN DESIGN CERTIFICATION AND COL
AMENDMENT RULEMAKING, EXEMPTION, WAIVER**
 - * BETWEEN COL AND AUTHORIZATION TO OPERATE
PROVISIONS PARALLELING SECTION 50.59**
 - * FOLLOWING AUTHORIZATION TO OPERATE
SECTION 50.59**

STAFF PROPOSAL - FLEXIBILITY

- INFORMATION AVAILABLE FOR AUDIT

- * 10 CFR PART 50, APPENDIX B**
- * TIER 1 & 2**
- * COST OF REDESIGN**

RECOMMENDATIONS

— AGREE WITH THE GENERAL APPROACH ON:

- * GRADED APPROACH TO DESIGN
FINALITY**
- * CONTENT OF THE APPLICATION
AND CERTIFICATION**
- * CHANGE PROCESS FOR MATERIAL IN
APPLICATION, CERTIFICATION AND
HELD FOR AUDIT**

— AUTHORIZE DEVELOPMENT OF REG. GUIDE