

UNITED STATES OF AMERICA NUCLEAR REGULATORY COMMISSION

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PROGRAM (OTHER THAN MARK I)

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UNITED STATES OF AMERICA

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NUCLEAR REGULATORY COMMISSION

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PUBLIC MEETING

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BRIEF ON CONTAINMENT PERFORMANCE

IMPROVEMENT PROGRAM

(OTHER THAN MARK I)

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Nuclear Regulatory Commission
1 White Flint North
Rockville, Maryland

Thursday, April 26, 1990

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The Commission met in open sessions, pursuant to notice, at 2:00 p.m., Kenneth M. Carr, Chairman, presiding.

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COMMISSIONERS PRESENT:

KENNETH M. CARR

KENNETH C. ROGERS

JAMES R. CURTISS

FORREST J. REMICK

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STAFF AND PRESENTERS SEATED AT THE COMMISSION TABLE:

SAMUEL J. CHILK	Secretary
WILLIAM C. PARLER	General Counsel
JAMES M. TAYLOR	EDO
THOMAS MURLEY	Director, NRR
WILLIAM BECKNER	RES
ERIC BECKJORD	Director, RES
THEMIS SPEIS	RES

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P R O C E E D I N G S

(2:00 p.m.)

CHAIRMAN CARR: Good afternoon, ladies and gentlemen. Commissioner Roberts will not be with us this afternoon. This afternoon the Commission will be briefed by the NRC Office of Research and Closure of the Containment Performance Improvement Program.

The Containment Performance Improvement Program is one element of the severe accident and master integration plan. Other elements include the individual plant examination effort, improved plant operations, the severe accident research program, examination of external events and an accident management program.

This is an information briefing and no Commission vote will be taken at this meeting. However, the Commission is expected to vote following this meeting, and staff's recommendation for closure of the Containment Performance Improvement Program which includes issuance of a generic letter to reactor licensees identifying potential vulnerabilities to containment and improvements to be evaluated on a plant-specific basis as part of the individual plant examination effort.

Copies of the staff's slide presentation are available at the entrance to the meeting room. Do any

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1 of my fellow Commissioners have any comments they wish
2 to make before we begin? If not, Mr. Taylor, please
3 proceed.

4 MR. TAYLOR: Good afternoon. With me at the
5 table are Eric Beckjord, the director of Office of
6 Research; to my right, Themis Speis, the deputy director,
7 Office of Research; Bill Beckner, Office of Research, and
8 Tom Murley, director of NRR.

9 Mr. Beckjord has some opening remarks.

10 MR. BECKJORD: Mr. Chairman, the purpose of the
11 meeting today is to present the recommendations of the
12 Containment Performance Improvement study for the plants
13 with Mark II, Mark III, ice condenser and large dry
14 containments. The staff previously presented
15 recommendations for the Mark I containments in the paper
16 SECY-89-017.

17 The staff is proceeding to implement the
18 hardened vent for these plants, which was described in
19 Supplement 1 of the generic letter 88-20 dated -- the
20 supplement was dated August 29, 1989. In this present
21 study for the other containment types the staff has made
22 use of the latest results from Nureg 1150, from other
23 PRAs, recent PRAs available to us, from research
24 performed in the severe accident research program and the
25 accident management program and other sources to identify

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1 challenges to containment integrity.

2 We have found a number of possible
3 improvements, but we have not identified any generic
4 improvements that would be applicable to all containments
5 of a given type. We recommend that the information
6 developed on insights and improvements be forwarded to
7 all licensees as a supplement to the individual plant
8 examination letter for their use.

9 We will present all of this information in
10 published reports and we expect to have them available
11 for issue at the same time as the supplement to the
12 generic letter. And I think with that I would ask
13 Dr. Speis to give you the presentation on those findings.

14 DR. SPEIS: Mr. Chairman, Commissioners. May
15 I have the second viewgraph, please? After we already -
16 - Mr. Chairman, as Mr. Beckjord talked about the purpose
17 of briefing, the only thing I would like to add is that
18 our studies have been reviewed by CRGR as well as the
19 ACRS. We have a letter from the ACRS which is attached
20 to the Commission paper and basically the ACRS agrees
21 with the staff that we should provide these insights to
22 the licensees for their folding into the IP process.

23 I think they also caution us to make sure that
24 -- they are telling us to caution the licensees to make
25 sure that they don't focus exclusively on the specific

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1 recommendations that we have made, but they retain a
2 broader perspective.

3 The next viewgraph, please. Yes?

4 COMMISSIONER REMICK: Does the staff correspond
5 with that?

6 DR. SPEIS: Yes, in the generic letter that we
7 have also attached to the Commission paper, that
8 cautionary statement is included there. So we have no
9 problem. I think it's a good recommendation. In the
10 outline of the briefing we'll talk to you about the
11 approach and the basis for our evaluations. We then will
12 describe the staff conclusions on each containment type
13 separately.

14 I will summarize the impact of our
15 recommendations on the individual plant examinations
16 which are presently being pursued or in the planning
17 process, and then we'll again summarize the staff
18 recommendations.

19 The next viewgraph, please. Some of these
20 things have been said already. For background to the
21 paper, the Mark I paper which Mr. Beckjord mentioned
22 already, I have listed here the recommendations that were
23 included at that time. The reason that we have listed
24 them here is that we are also recommending that the
25 licensees with the Mark II's, Mark III's, ice condensers

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1 and large dry ice will also consider the same ensemble
2 of recommendations on a plant-specific basis.

3 At the time that we came forward with our
4 specific Mark I -- precise Mark I recommendations, of
5 course we did a detailed cost-benefit analysis as part
6 of the backfit rule. The next page, please.

7 Again, the next page is -- we all know the
8 history where the Commission told us to fold them into
9 the IP process, except the hardened vent issue and our
10 latest count as I think we've told you last time was that
11 19 of the 24 licensees would be implementing the hardened
12 vent voluntarily.

13 I am to have performed regulatory analysis on
14 the other five. The other five, four of those plants are
15 the Mark I's with isolation condensers. Oyster Creek,
16 Dresden 2/3, Millstone and the fifth plant is
17 Fitzpatrick, which they have some questions about our
18 backfit methodology and also they thought that even this
19 issue should be part of the IP process. But we have to
20 include it, the regulatory analysis, and it is about to
21 be the utilities.

22 Yes?

23 COMMISSIONER REMICK: Did I hear you say that
24 this would be coming out soon?

25 DR. MURLEY: Yes, we believe that it's still

1 justified. The detailed plant-specific cost benefit
2 analysis confirmed the generic analysis that we did last
3 year and we should be ready probably as early as next
4 week to send letters out to the five plants saying that
5 we intend to issue an order unless they change their
6 mind. So we're prepared to do that.

7 COMMISSIONER REMICK: For all five?

8 DR. MURLEY: All five.

9 DR. SPEIS: With those introductory remarks I
10 will turn over the presentation to Dr. Beckner.

11 DR. BECKNER: Okay, if we can go to slide five,
12 please, I'd like to discuss briefly how our approach for
13 the other containment types differed from what we did
14 under the Mark I's and how it was similar.

15 First of all, we only really did a first cut
16 or a screening type look at cost benefit basically to see
17 if there was anything we might want to carry forward.
18 In general though, most of the effort primarily was
19 directed toward simply looking at insights,
20 vulnerabilities and potential improvements that might be
21 of usefulness to the utilities in the course of their
22 IPE.

23 The reason for this revised approach was
24 basically twofold. First of all when we went through
25 with our first-cut-type regulatory analysis we didn't see

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1 anything that was obviously cost-beneficial that we would
2 recommend backfitting to all plants of a given type.

3 And the second reason, of course, is that we
4 had the recommendations of the ACRS for the Mark I
5 improvements, where they strongly recommended that this
6 effort be considered in the IPE. And of course this is
7 consistent with the Commission direction as far as the
8 Mark I effort, too. And so we primarily directed this,
9 as I said before, towards looking at insights that might
10 be useful as the licensees go through their IPEs.

11 Going to slide six, this is really the basis
12 for the recommendations, or what we specifically did.
13 Again, this level of detail, it is similar to the type
14 of thing that we did with the Mark I's. We basically
15 took a look at existing PRAs. This was primarily 1150
16 PRAs, but we did look at other PRAs that were available,
17 particular for Mark II's since there was not a 1150 plant
18 for a Mark II.

19 We also took the 1150 containment event trees,
20 the information which was generated under that program,
21 and made use of them to evaluate different types of
22 improvements to try to determine the benefit and of
23 course to get the overall picture of how an improvement
24 might impact the plant risk.

25 We also performed supplementary calculations

1 of containment response, again primarily looking at
2 supplementing some of the calculations that were
3 performed in support of the 1150 area and again
4 particularly for a Mark II plant since there was not Mark
5 II plant.

6 As I indicated before, we did very limited
7 cost-benefit analysis, again primarily taking a first cut
8 to see if there was anything that we'd want to pursue
9 further.

10 COMMISSIONER ROGERS: Just before you leave
11 that, what do those supplementary calculations deal with?
12 What issues were they?

13 DR. BECKNER: Basically doing calculations of
14 containments, temperature and pressure during the courses
15 of accidents. Primarily looking and also looking at the
16 effect of various improvements, for instance, back-up
17 power to fans for ice condensers, this type of thing,
18 looking at venting, how that affects containment pressure
19 and so forth.

20 COMMISSIONER ROGERS: Were there any issues
21 there that were very difficult to deal with from an
22 analytical basis?

23 DR. BECKNER: Yes there were. There was one
24 in particular that I'm going to deal with later on and
25 I'll show you in the Mark II presentation.

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1 COMMISSIONER ROGERS: All right, good.

2 DR. BECKNER: If we want to move to slide seven
3 these are a summary of the basic recommendations and our
4 findings. As has been indicated here, we did not see
5 anything that we felt we should recommend on a generic
6 basis. We did, however, find a lot of very interesting
7 things, a lot of insights that we feel the licensees
8 should be aware of and should consider as part of their
9 IPE.

10 In addition, we did generate a lot of useful
11 technical information. We have about 10 contractor
12 reports that are coming out. We think that this
13 information will potentially be useful to licensees as
14 they do their IPEs.

15 One thing that we had indicated is that you do
16 -- to the licensees to the IPE is that we didn't want
17 licensees to be redoing calculations if they had already
18 been done. And this will increase the database out there
19 that's available.

20 There were a number of other things that we
21 found that we did not make specific recommendations,
22 either because there was an ongoing research program in
23 that area or because things were already being considered
24 under the accident management program. There is of
25 course an overlap with the accident management program

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1 and we've had to coordinate very carefully with them.

2 Many of the things that we've found have
3 already been issued under Supplement 2 to the IPE generic
4 letter that were issued as the strategies put out by the
5 accident management program. Slide 8 gives more
6 specifics now about some of the specific items that we'd
7 like licensees to look at as part of their IPEs.

8 The first containment type I'll talk about is
9 the Mark II's. What we are recommending is that
10 basically Mark II's consider the same improvements that
11 we recommended for the Mark I's. They are generally
12 applicable for basically the same reasons. There is one
13 specific difference: we are not recommending for the
14 Mark II's specifically a hardened vent; rather, we'd like
15 them to take a look at it in the course of their IPEs.

16 And there's a number of reasons for this.
17 First of all, the existing hardware that's out there for
18 the Mark II's is highly variable and varies from plant
19 to plant and I'll show you an example of that in a
20 moment. And in addition, some of the licensees have
21 alerted us to the fact that there are also alternate ways
22 that could be used to potentially cool the suppression
23 pool as a potential alternative venting, and they'd like
24 the option to evaluate them.

25 I'm going to come back to the slide in a moment

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1 for the other containment types, but if we move to slide
2 9, this is just a general picture of a Mark II
3 containment. While there are only a limited number of
4 Mark II containments they are almost all different.
5 We found as far as a hardened vent some Mark II's already
6 had that capability and some did not. It was highly
7 variable.

8 As far as the benefit of venting for a Mark II,
9 the primary benefit again is in a preventive mode,
10 preventing the TW sequence, although the likelihood of
11 a TW sequence may be less in a Mark II reactor based on
12 the PRAs we saw. However, I want --

13 COMMISSIONER REMICK: Excuse me, question.
14 You've made the statement that some Mark II's had the
15 capability --

16 DR. BECKNER: Yes.

17 COMMISSIONER REMICK: -- of a hardened vent.
18 By capabilities do you mean they have it installed or
19 it's easy to install?

20 DR. BECKNER: Some utilities -- at least one
21 utility possibly has a hardened path that could be used
22 by changing procedures. There's other questions from
23 another utility as far as it's not a hardened vent but
24 they feel it would not fail. And so again there's a
25 variability of hardware out there.

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1 Venting under the --

2 COMMISSIONER REMICK: Excuse me, I have a
3 related question. Is there any reason to believe that
4 any Mark II could not be fitted with the hardened vent
5 if one wished to do it? Is there any technical reason
6 why it could not be done?

7 DR. BECKNER: We don't know of any reason, but
8 we have not looked. We have not looked at various
9 plants.

10 For the other case of venting following a core
11 melt to prevent containment failure this is a more
12 complex issue. It's complex both because of
13 phenomenology and also because there are variations in
14 the containment designs. If you want to focus on the
15 area below the reactor vessel and the downcomers and then
16 move from page 9 to page 10, you can see we have three
17 basic variations in containment design.

18 And even within the center design there are two
19 variations there. The one design has water directly
20 beneath the pedestal and one does not. These basic
21 designs of the containment greatly impact the response
22 to the containment following a core melt and following
23 a breach of a vessel where the corium basically would
24 be deposited on the floor of the containment.

25 The center design basically contains a cavity

1 that would be expected to retain the chorium, not
2 interact with the water at least for a long period of
3 time until the concrete was eaten away. The two designs
4 on either side, it's quite different.

5 One design, the Shoreham-Nine Mile Point design
6 has downcomers directly below the vessel. Chorium could
7 potentially flow down the downcomers into the water.
8 Likewise, on your far right the Limerick-Susquehannah
9 design has X-pedestal downcomers, but chorium could flow
10 along the floor and go down the downcomers into the
11 suppression pool.

12 Now, this introduces two areas of uncertainty.
13 First of all there's a phenomenological uncertainty as
14 to exactly how much steam is produced when a given amount
15 of chorium goes down the downcomers and that impacts the
16 pressurization of the containment. The other area of
17 uncertainty is what the chorium going down the downcomers
18 would do to the downcomers themselves. They may well
19 fail.

20 If the downcomers fail, of course then you have
21 a suppression pool bypass and if you had a vent it would
22 be unscrubbed. All these issues impact the venting
23 following a core melt, both because they impact how much
24 the containment is pressurized and also they impact
25 whether or not their release would be scrubbed.

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1 But again this is, let me emphasize, these
2 uncertainties are for the less likely case of venting
3 occurring after core melt. But these are areas that
4 there is indeed continuing research and it may be some
5 time before we solve these very difficult problems.

6 But this highlights one of the major reasons
7 why there is phenomenological uncertainty for Mark II's
8 and also there's large differences between designs and
9 that's why we did not make specific generic
10 recommendations.

11 COMMISSIONER REMICK: I have a question. It's
12 not directed specifically at what we're discussing today,
13 but with the EDO and Research and NRR represented here,
14 when I look at our design certification process is it
15 going to permit such variations in the future of a class
16 of reactor where we have a Mark II with all different
17 kind of designs?

18 I just throw it out. You need not address it
19 now. I couldn't resist raising it.

20 COMMISSIONER CARR: We'll deal with some of
21 that tomorrow. He's rephrased the essentially complete
22 design question.

23 DR. BECKNER: If there's no further questions
24 on the Mark II's, I'd like --

25 DR. MURLEY: Point of clarification, Bill.

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1 Isn't it true that the Mark II's do have venting in their
2 emergency operating procedures?

3 DR. BECKNER: That's correct, yes.

4 DR. MURLEY: So part of the concern that we had
5 on Mark I's, which was if you did vent as part of your
6 emergency operating procedures, you could cause steam or
7 perhaps even some radioactivity out into the reactor
8 building. That would still be a concern on my part, for
9 example. When the IPEs come in, I'm going to be looking
10 to see whether they looked at that question.

11 DR. BECKNER: We can return to slide 8 now and
12 I'll discuss the Mark III's. Again, we are recommending
13 for the Mark III's that they look at again the same set
14 of improvements. Again venting is even less of an issue
15 for the Mark III's primarily because they have a much
16 larger volume and the likelihood that venting would be
17 required is believed to be much less. However, we still
18 think it's worthwhile looking at it.

19 There is an additional issue, however, for the
20 Mark III's we'd like the licensees to look at. The only
21 available PRA that we have for a Mark III is the 1150
22 Grand Gulf effort. That effort found that the dominant
23 challenge to the containment of the Mark III was
24 basically from station blackout and basically from a
25 threat due to hydrogen detonation.

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1 Now, let me back up a second. The Mark III's,
2 unlike the other two boiler type of containments are not
3 inerted to control hydrogen. They make use of igniters
4 and during a station blackout accident the igniters would
5 not be available, and that's where the principle threat
6 came from 1150 because of course station blackout was the
7 dominant threat for 1150.

8 Again, 1150 gave a very, very low number for
9 that sequence even though it was dominant. But we'd like
10 to have the Mark III utilities basically take a look at
11 the benefit and feasibility of back-up power to the
12 hydrogen igniters as part of their IPE.

13 The same issue exists for ice condensers.
14 Again, ice condensers make use of igniters to control
15 hydrogen. They are not functional during a station
16 blackout and would like the ice condensers to take a look
17 at the benefit of backup power to the igniters.

18 As far as the large dry containments, we are
19 much less concerned about these containment types,
20 basically that the 1150 study looked at two large dry ice
21 containments and they did not find hydrogen to be a
22 significant challenge to the containments. However, we
23 do have a generic issue 121, which is a mortgage that we
24 owe coming -- rather TMI and looking at hydrogen for the
25 other containment types.

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1 We have to decide whether or not any
2 modifications are needed for this containment type to
3 control hydrogen. Again, as I said before, the 1150 did
4 not find it to be a challenge, but we don't know whether
5 we can extend the 1150 assumptions for those two
6 containments to all the dry containments and so what
7 we're recommending is that the other containments as part
8 of their IPE basically take a look at the hydrogen issue
9 for the containment.

10 The issue here is a local detonation of
11 hydrogen that may damage important equipment and what
12 we're recommending is a relatively straightforward
13 screening type of approach that was used in 1150 just to
14 indicate potential areas where detonation could occur and
15 to see if there's any important equipment in that area.

16 Again, as I indicated before, there is a
17 generic issue. It would be our intent to go ahead and
18 recommend the resolution of that generic issue based on
19 the 1150 studies and of course looking on a plant-
20 specific basis in the IPEs.

21 That concludes the specific recommendations
22 that we'd like the utilities to look at as part of the
23 IPE. If we can move to page 11 I'd like to briefly just
24 talk about what's the impact of this on the IPE. Well,
25 first of all, we had indicated in our original IPE

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1 generic letter 88-20 that we would be providing some
2 information to them as part of the Containment
3 Performance Improvement.

4 What this does basically is it puts the burden
5 on the licensees to at least make the initial
6 determination as to whether or not these improvements are
7 cost-effective and worthwhile doing for their plant.
8 This of course is consistent with other aspects of the
9 IPE. The other aspect though I think that's important
10 is that we will also have given the utilities some help
11 on making this decision in that we've recommended some
12 things that we think they should look at and we've also
13 increased the database -- the technical database that
14 they can make use of.

15 The other point I want to make is, again the
16 IPEs are in process, in the process right now, and we
17 need to get this information out very quickly to the
18 licensees. Going to the last slide, the specific
19 recommendation is to issue a generic letter. This would
20 be, I guess, Supplement 3 to the IPE generic letter.

21 It would indicate three things. First of all,
22 it would indicate a completion of the CPI program that
23 there would be no further requirements. In effect, they
24 can get on with their IPEs and not wait for anything
25 else. Second of all it would contain the previous list

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1 of potential vulnerabilities and improvements that I've
2 just read that we would like licensees to look at.

3 And the last item, we would indicate that we
4 will be providing technical information in the form of
5 contractor reports that may be of usefulness to them.
6 And I'd like to briefly indicate that we are attempting
7 to get these reports out as quickly as we can so they'll
8 come out in about the same time frame. The first report
9 is probably in the gate right now, it's in publishing.

10 The bulk of the reports we hope we can get out
11 by June. We've got one problem report that is running
12 late, but we're going to try to speed that up the best
13 we can. So the intent would be to have most of this
14 information out about the same time as this generic
15 letter would be issued.

16 That concludes my presentation.

17 CHAIRMAN CARR: Questions from the
18 Commissioners?

19 COMMISSIONER REMICK: Several questions, one
20 related to the last slide. It's a two-pronged question.
21 One, is the staff aware of other issues that might be
22 incorporated into the IPE process? Do we have anything
23 out in the wings that we know of? And specifically, how
24 about generic issue 121 on hydrogen control for large dry
25 PWR containers? Will that be finished in time to be

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1 included or not, or we're not intending?

2 DR. BECKNER: We're proposing.

3 COMMISSIONER REMICK: We will propose that this
4 would be our resolution of 121? Consideration in the IPE
5 would --

6 DR. BECKNER: This would constitute --

7 COMMISSIONER REMICK: This would constitute it?
8 Oh, I see.

9 DR. SPEIS: Yes, this would close.

10 COMMISSIONER REMICK: Okay, then the broader
11 question: Do we know of anything else in the wings that
12 we --

13 DR. SPEIS: No.

14 COMMISSIONER REMICK: -- currently are
15 anticipating putting in the IPEs? So this should be --

16 DR. BECKNER: With the exception of external
17 vents, which is coming within a month or so.

18 COMMISSIONER REMICK: External vents, yes. And
19 a question, I guess, that's for our general counsel, just
20 for my own edification. Going back to Dr. Murley's
21 indication that a letter will just go out to five
22 licensees asking them why we should not issue an order
23 implementing vents, I would assume that they have a
24 possibility of requesting a hearing if they want to
25 pursue it further, is that correct?

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1 MR. PARLER: Yes, that's right. And that
2 possibility was raised in one of the initial papers in
3 this area, I believe 89-017. There was discussion about
4 the rulemaking approach, the order approach. And in
5 connection with the order approach the possibility of
6 hearings was mentioned.

7 The answer to your question is yes.

8 COMMISSIONER REMICK: Okay, fine. And just in
9 summary I certainly favor making the staff's insights
10 from the CPI program available to licensees in the IPE
11 process. I appreciate the job you've done and I endorse
12 the cautionary advice that ACRS gave you, and you
13 indicate you agree with that.

14 That's all I have, Mr. Chairman.

15 CHAIRMAN CARR: Commissioner Rogers?

16 COMMISSIONER ROGERS: No question, just a
17 comment that it seems to me that this whole program has
18 a certain degree of crispness and completeness to it that
19 is somewhat unusual, and I want to really complement the
20 staff on bringing this whole thing together and looking
21 -- looks as if we're going to finish something and move
22 on. And that's really very gratifying.

23 CHAIRMAN CARR: Commissioner Curtiss?

24 COMMISSIONER CURTISS: Just two questions. On
25 the Mark I plants, the 19 that have committed agreed to

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1 make the changes. Can you tell me what the schedule is
2 going to be for actually implementing the hardware
3 modifications?

4 DR. MURLEY: I don't have the schedules with
5 me. My impression is that -- anyway, I'll get them for
6 the Commission later -- but I think most of them agree
7 to the time that we asked. Perhaps Ashok Thadani can
8 give you the exact --

9 MR. THADANI: Most of the licensees that have
10 volunteered to implement the hardened vent, the general
11 schedule is to get it done by early 1993. It's
12 approximately a three-year period. As Dr. Murley said,
13 once we get our backfit packages out, we're going to try
14 to stick to similar schedules for these five units as
15 well.

16 COMMISSIONER CURTISS: So the five that have
17 resisted if, absent a request for a hearing and a delay
18 for that reason, they'd be expected to meet pretty much
19 the same schedule then?

20 MR. THADANI: That's our expectation.

21 COMMISSIONER CURTISS: Okay, that's all I have.
22 One final question -- folding these recommendations into
23 the IPE program, would that affect the schedule
24 significantly on the IPE program?

25 DR. BECKNER: It should not.

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1 COMMISSIONER CURTISS: Okay, that's all I have.

2 CHAIRMAN CARR: I'm still puzzled here. This
3 is going to take care of containment performance, is that
4 what we're saying?

5 DR. BECKNER: Yes, sir.

6 CHAIRMAN CARR: Well, you say no
7 recommendations at this time on other containment
8 vulnerabilities going to ongoing research such as
9 recommended heating and depressurization. And then you
10 say well, there's no further requirements. What if those
11 research actions require something, I mean?

12 DR. SPEIS: This is an ongoing process. Every
13 plant will have a management program and if a method is
14 developed that it makes sense for them to implement in
15 the future, then we will bring it to the Commission on
16 a case-by-case basis. But it should be part of the
17 continuing accident management program that every plant
18 will be developing.

19 CHAIRMAN CARR: So I guess we really haven't
20 put the containment problems to bed yet, you're saying?

21 DR. SPEIS: Well, --

22 CHAIRMAN CARR: We put it to bed generically
23 and everything else is going to be plant-specific?

24 DR. SPEIS: There could be issues like the
25 direct containment heating the pressurization, but as we

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1 have said before we are not sure how real this issue is.
2 And before we ask somebody to do something we make sure
3 that it is a real issue.

4 MR. TAYLOR: I think we've put it to bed with
5 the state of knowledge that we have about these phenomena
6 with the feeling that there may be other ways should
7 these turn out to be problems on a case-by-case basis.

8 CHAIRMAN CARR: Well, on those two specific
9 issues do you have any feel for the time frame before we
10 can put those to bed?

11 DR. SPEIS: Well, the direct containment
12 heating, it is our intent, it's one of the highest
13 priority efforts in our office to close in in the next
14 two years, by the end of calendar 1991.

15 CHAIRMAN CARR: Okay. I also would like to
16 join the other Commissioners in thanking you for this
17 briefing and commend you on the progress that has been
18 made to enable you to recommend closure of the
19 Containment Performance Improvement Program. It's
20 certainly consistent with my views that potential
21 improvements to reduce containment failure vulnerability
22 should be considered in the individual plant examination
23 efforts along with other potential improvements.

24 As you mentioned, there are still some
25 recommendations to the Commission. You owe us external

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1 events and accident management. And we would encourage
2 you to work expeditiously on those so that the utilities
3 can get those out of the way as well.

4 I agree that the licensees should have the
5 benefit of our continuing research on severe accidents
6 and we should ensure our research results are made
7 available in a timely manner so that they can consider
8 them. I would encourage my fellow Commissioners to vote
9 on the staff's recommendation in this paper as soon as
10 possible so that we can come to closure on the program.

11 Any other comments? If not, we stand
12 adjourned.

13 (Thereupon, at 2:35 p.m., the hearing was
14 adjourned.)

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

TITLE OF MEETING: BRIEFING ON CONTAINMENT PERFORMANCE IMPROVEMENT
PROGRAM (OTHER THAN MARK I)

PLACE OF MEETING: ROCKVILLE, MARYLAND

DATE OF MEETING: APRIL 26, 1990

were transcribed by me. I further certify that said transcription
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COMMISSION BRIEFING ON

**RECOMMENDATIONS OF THE CONTAINMENT PERFORMANCE
IMPROVEMENT PROGRAM FOR PLANTS WITH MARK II,
MARK III, ICE CONDENSER, AND DRY CONTAINMENTS**

**THEMIS SPEIS
WILLIAM BECKNER
OFFICE OF NUCLEAR REGULATORY RESEARCH**

APRIL 26, 1990

PURPOSE OF BRIEFING

**TO SUMMARIZE THE RECOMMENDATIONS OF THE
CONTAINMENT PERFORMANCE IMPROVEMENT
PROGRAM (CPI) FOR ALL CONTAINMENT TYPES
OTHER THAN MARK I.**

OUTLINE OF BRIEFING

- * BACKGROUND**
- * APPROACH FOR NON-MARK I CONTAINMENTS TYPES**
- * CPI PROGRAM RECOMMENDATIONS**
- * IMPACT ON INDIVIDUAL PLANT EXAMINATIONS (IPEs)**
- * STAFF RECOMMENDATION**

BACKGROUND

- * SECY-89-017 PRESENTED RECOMMENDATIONS FOR MARK I CONTAINMENT IMPROVEMENTS.**

- * RECOMMENDATIONS INCLUDED:**
 - HARDENED VENT**
 - ALTERNATE WATER TO CONTAINMENT AND VESSEL**
 - DEPRESSURIZATION SYSTEM IMPROVEMENTS**
 - IMPROVED PROCEDURES (REVISION 4)**
 - ACCELERATE STAFF ACTIONS ON STATION BLACKOUT RULE**

- * DETAILED COST-BENEFIT AND REGULATORY ANALYSES.**

BACKGROUND (CONT.)

- * COMMISSION DIRECTED THE STAFF TO IMPLEMENT THE HARDENED VENT THROUGH PLANT-SPECIFIC BACKFITS FOR ALL PLANTS NOT VOLUNTARILY MAKING THIS IMPROVEMENT.**
- * GL-89-16 (9/1/89) INITIATED IMPLEMENTATION OF THE HARDENED VENT.**
- * PLANT-SPECIFIC BACKFIT ANALYSES COMPLETED FOR FIVE PLANTS NOT VOLUNTEERING TO IMPLEMENT THE HARDENED VENT. ANALYSES ABOUT TO BE ISSUED TO UTILITIES.**
- * DRAFT ENVIRONMENTAL ASSESSMENT OF HARDENED VENT COMPLETED.**
- * SUPPLEMENT 1 TO IPE GL-88-20 (8/29/89) REQUESTED EVALUATION OF OTHER MARK I IMPROVEMENTS AS A PART OF THE IPE.**

APPROACH FOR NON-MARK I CONTAINMENT TYPES

- * REDUCED EMPHASIS ON DETAILED COST-BENEFIT TO JUSTIFY SPECIFIC GENERIC REQUIREMENTS.**
- * DIRECTED PRIMARILY TOWARD INSIGHTS ON VULNERABILITIES AND POTENTIAL IMPROVEMENTS.**
- * THIS REVISED APPROACH RESULTED FROM:**
 - NO IMPROVEMENTS OBVIOUSLY COST-BENEFICIAL ON A GENERIC BASIS.**
 - DIRECTION OF THE COMMISSION AND ACRS RECOMMENDATIONS REGARDING THE RECOMMENDED MARK I IMPROVEMENTS.**

APPROACH FOR NON-MARK I CONTAINMENT TYPES (CONT.)

*** BASIS FOR STAFF RECOMMENDATIONS:**

- REVIEW OF EXISTING PRA INSIGHTS.
- SIMPLIFIED CONTAINMENT EVENT TREES
EVALUATING IMPACT OF IMPROVEMENTS.
- SUPPLEMENTARY CONTAINMENT
CALCULATIONS EVALUATING CONTAINMENT
RESPONSE/IMPACT OF IMPROVEMENTS.
- VERY LIMITED, QUALITATIVE COST ANALYSIS
BASED ON EXISTING INFORMATION.

CPI PROGRAM RECOMMENDATIONS FOR
NON-MARK I CONTAINMENTS

- * NO GENERIC REQUIREMENTS RECOMMENDED.**
- * IDENTIFIED POTENTIAL VULNERABILITIES AND IMPROVEMENTS SHOULD BE EVALUATED ON A PLANT-SPECIFIC BASIS AS PART OF THE IPE.**
- * MAKE TECHNICAL REPORTS FROM THE CPI PROGRAM AVAILABLE TO LICENSEES TO ASSIST IN IPE EVALUATION.**
- * NO RECOMMENDATIONS AT THIS TIME ON OTHER CONTAINMENT VULNERABILITIES DUE TO ONGOING RESEARCH (EG., DCH AND DEPRESSURIZATION).**

**VULNERABILITIES/IMPROVEMENTS RECOMMENDED FOR
CONSIDERATION IN THE IPE**

MARK II

- VENTING AND ALTERNATE WAYS TO COOL SUPPRESSION POOL.
- OTHER MARK I IMPROVEMENTS.

MARK III

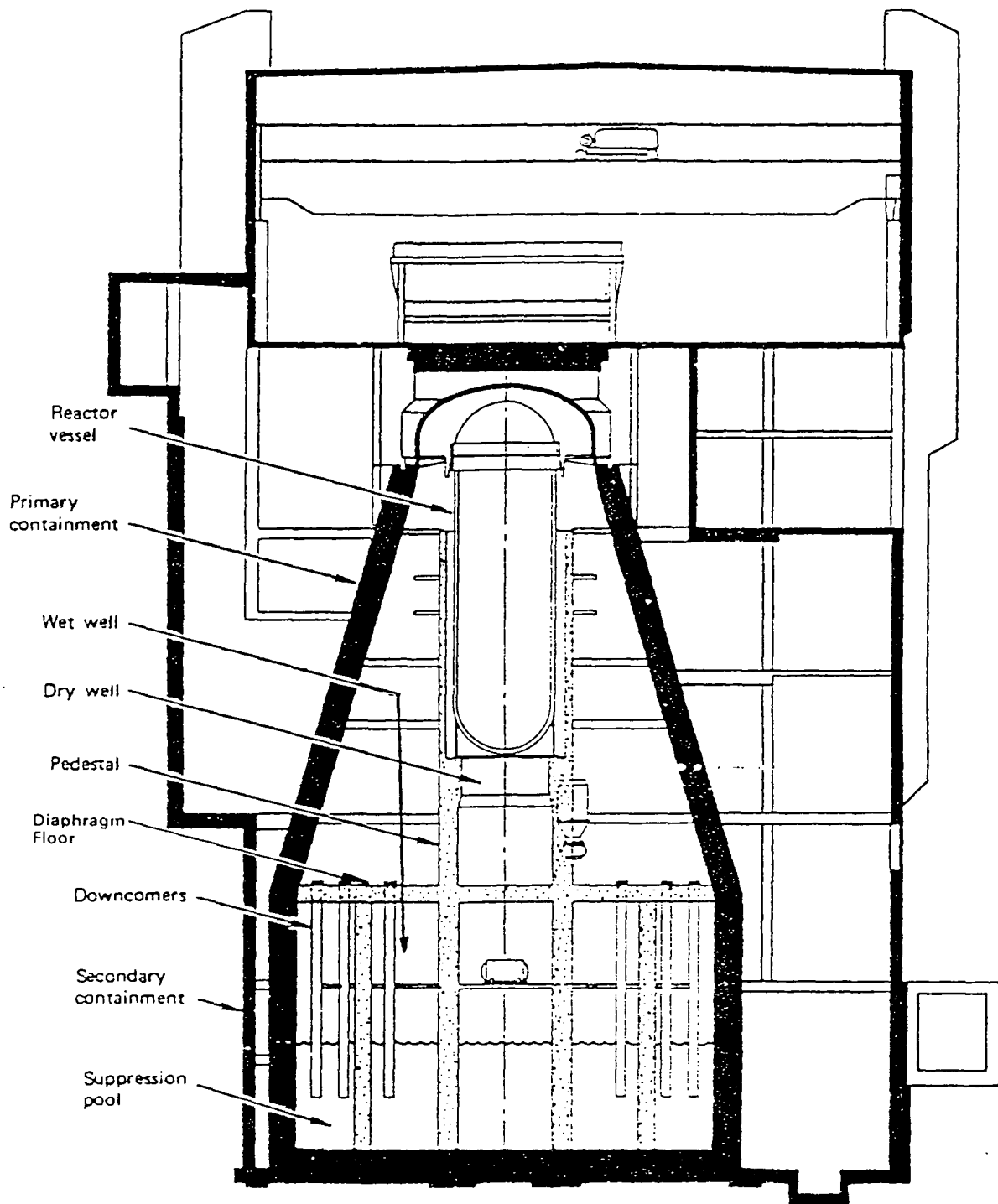
- BACKUP POWER TO H₂ IGNITERS.
- VENTING AND ALTERNATE WAYS TO COOL SUPPRESSION POOL.
- OTHER MARK I IMPROVEMENTS.

**ICE
CONDENSER**

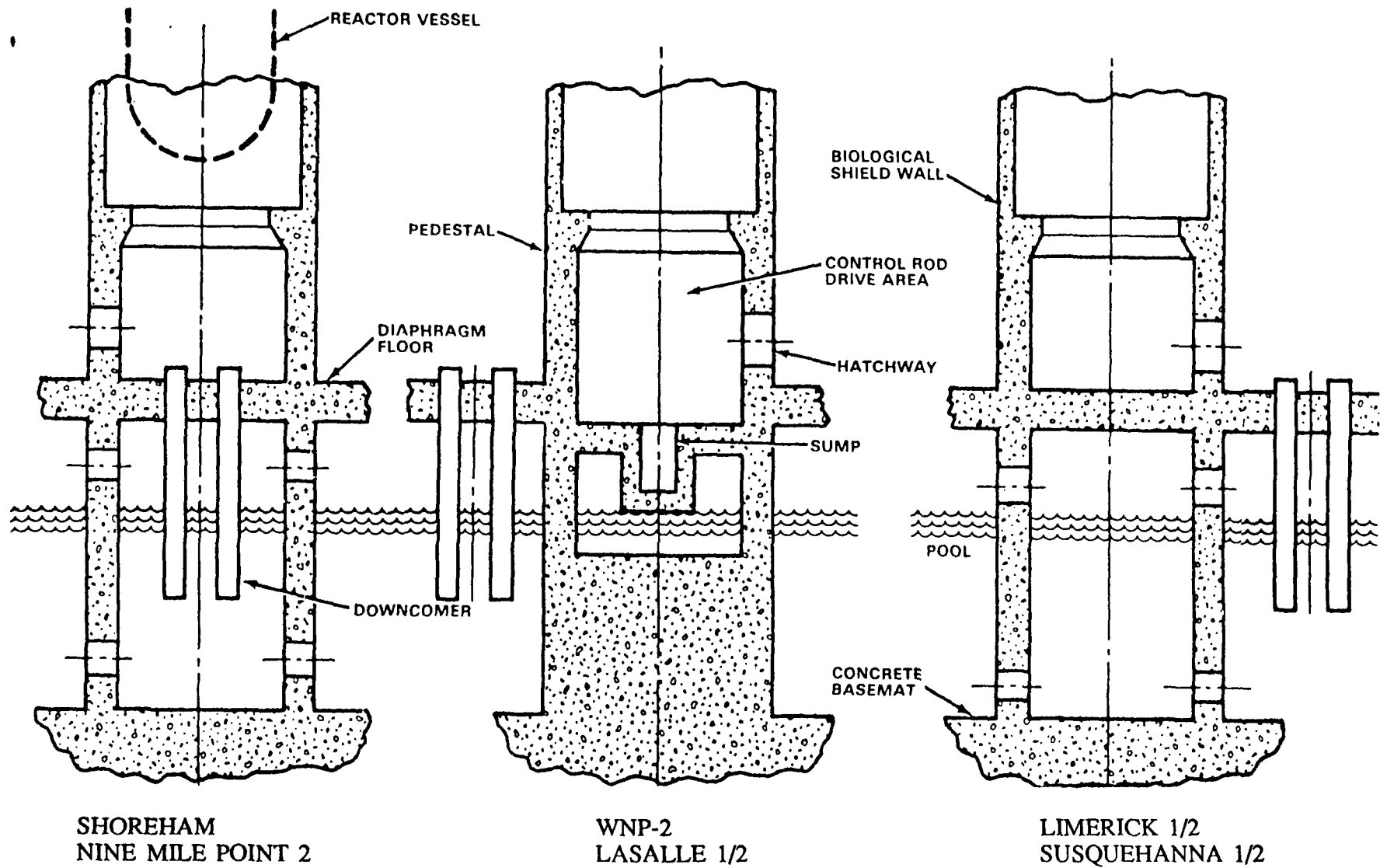
- BACKUP POWER TO H₂ IGNITERS.

**DRY
CONTAINMENT**

- H₂ DETONATION (NUREG-1150 SCREENING METHOD SUGGESTED).



MARK II CONTAINMENT



VARIATIONS IN MARK II PEDESTAL CONFIGURATIONS

IMPACT OF REVISED APPROACH ON IPE

- * DETERMINATION OF THE NEED FOR CERTAIN CONTAINMENT IMPROVEMENTS IS TO BE MADE ON A PLANT-SPECIFIC BASIS BY EACH LICENSEE, CONSISTENT WITH OTHER ASPECTS OF THE IPE PROCESS.**
- * THIS INFORMATION NEEDS TO BE COMMUNICATED TO LICENSEES QUICKLY SINCE THE IPE PROCESS HAS ALREADY STARTED.**

STAFF RECOMMENDATION

ISSUE A SUPPLEMENT TO THE IPE GENERIC LETTER INDICATING:

- * THE COMPLETION OF THE CPI PROGRAM:**
 - NO FURTHER REQUIREMENTS RESULTING FROM THIS PROGRAM, AND**
 - LICENSEES CAN PROCEED WITH THEIR IPEs.**
- * CERTAIN POTENTIAL CONTAINMENT VULNERABILITIES AND IMPROVEMENTS THAT WOULD BE EXPECTED TO BE CONSIDERED IN THE IPE.**
- * AVAILABILITY OF CONTRACTOR REPORTS DOCUMENTING THE WORK PERFORMED.**