T-1248

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the matter of:

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS — Docket No.

Subcommittee on Limerick Generating Station Units 1 & 2

Location: Pottstown, Pa. Pages: 1 - 252

Date: Friday, October 7, 1983

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

SUBCOMMITTEE ON THE LIMERICK GENERATING STATION

Holiday Inn at Pottstown
Route 100
West King Street
Pottstown, Pennsylvania

Saturday, October 7, 1983

The subcommittee convened, pursuant to recess, at 8:35 a.m., William Kerr, Chairman of the Subcommittee, presiding.

ACRS MEMBERS PRESENT:

W. KERR, Chairman
J. EBERSOLE
C. MICHELSON
D. MOELLER

ACRS CONSULTANTS PRESENT:

M. BENDER
P. DAVIS
A. GARCIA
P. POMEROY
J. MAXWELL

ACRS FELLOWS PRESENT:

S. SETH
L. WAINER

DESIGNATED FEDERAL EMPLOYEE:

R. SAVIO

NRC STAFF AND PRESENTERS PRESENT:

R. MARTIN
J. SEARS
B. HARDIN
P. CARTON
H. TRAVER
G. FOGARTY
G. LEITCH
B. MOORE
R. STAROSTECKI
J. WIGGINS
S. VAIL
D. HELWIG
R. ATKINSON
P. TUTTON
R. GEROGE
R. LOGUE
V. BOYER
W. BRADY
M. COONEY
W. ULLRICH
E. SPROAT
R. MULFORD
T. SHANNON
W. BOWERS
R. KANKUS
R. ZONG

P R O C E E D I N G S

MR. KERR: The meeting will come to order.

This is a meeting of the Advisory Committee on Reactor Safeguards, the Subcommittee on the Limerick Generating Station.

My name is William Kerr and I am Subcommittee Chairman. The other ACRS Members present are Mr. Ebersole, Mr. Michelson and Mr. Moeller. As consultants we also have Mr. Bender, Mr. Davis, Mr. Garcia, Mr. Maxwell and Mr. Pomeroy and, in addition, two ACRS Fellows, Mr. Seth and Ms. Wainer, are in attendance.

The meeting is being conducted in accordance with provisions of the Federal Advisory Committee Act and and the Government in the Sunshine Act. Mr. Richard Savio is the Designated Federal Employee.

The rules for participation in today's meeting have been announced as part of the notice of the meeting published in the Federal Register of Monday, September 19th, 1983.

A transcript of the meeting is being kept and it will be available as stated in the Federal Register notice. I request that each speaker identify himself or herself and use a microphone. We have received no written statements from members of the public, nor have we received requests for time to make statements from members of the public.

We will proceed with the meeting, and I ask any members of the subcommittee or consultants if they have any particular requests or comments to make before we get into the formal presentation?

(No response.)

MR. KERR: I see none. I will therefore call upon Mr. Robert Martin of the NRC Staff to begin the NRC presentation.

Mr. Martin.

MR. MARTIN: Good afte[illegible], ladies and gentlemen. I am Bob Martin, the NRC Licensing Project Manager for the Limerick Review in the Office of Nuclear Reactor Regulation.

We have additional members of our staff here with us today, Mr. Tom Novak, my Assistant Director, our Instrumentation and Systems Reviewer, Marty Virgilio, and John Sears in the emergency planning area.

We will be joined by other members of the staff throughout the meeting as the appropriate subjects in the area come up.

With respect to the first item on the agenda, I would like to go through a brief discussion of the chronology of our review.

(Slide.)

The application was tendered March 1981. Shortly thereafter the acceptance review was completed and the

application was docketed. The draft environmental statement, and I jumped a little bit there between those two dates, a lot happened between those two dates, but the draft environmental statement has recently been published in June, Part 1 of that statement. Part 2 of that statement is to come in the near future.

Recently in August 1983 we finished work on our safety evaluation report and published it. The remaining outstanding items in our safety evaluation report, confirmatory items and so forth, will be the subject of my later presentation.

Finally, here we are today arrived at the ACRS meeting.

(Slide.)

That is a description of where we have been up to now. A general projection of where we are going from now is going from this meeting into the full committee meeting. Then from there this winter and early spring of next year into the Atomic Safety and Licensing Board hearings and on to a projected decision date for issuance of the license.

One thing I will note about the date that is up there is that the projection of this date recognizes a certain amount of uncertainty. The uncertainty is based on assessing the potential number and scope of the issues

to be addressed in the hearing process.

(Slide.)

Please stop me if you have questions or otherwise I will proceed.

(No response.)

I thought I would put on a synopsis of those conclusions that appeared in our SER recently issued. These are our essential conclusions that upon the resolution of the issues identified in the SER, we will be able to conclude that the application for a license complies with the NRC requirements, reasonable assurance that the facility construction will be completed and the plant will be operated in conformance with the requirements. There will reasonable assurance that activities authorized by the OL can be conducted incompliance with the regulations and without endangering public health and safety. We will find that the applicant is technically qualified and that the issuance of the license will not be inimical to common defense and security.

That concludes my remarks on the first item on the agenda with respect to where we are at this time in the review.

Are there any questions?

MR. KERR: Are there questions?

Mr. Moeller.

MR. MOELLER: The date that you put up there for the decision was March or something of '85.

MR. MARTIN: March 1985, yes.

MR. MOELLER: I believe I have heard a statement that the applicant thought they might be ready to load the fuel in Unit 1 by the Fall of '84. Are these dates compatible, or could you comment on that?

MR. MARTIN: The applicant's currently announced date for completion of construction is August of '84. Yes, that is correct. The date of March '85 is the ASLB Panel's estimation of how long it could take the proceedings given their number and their complexity to come to a conclusion.

We are at this point very active in defining with the various parties and with the Hearing Board these issues and there is much to be done in the near future before a clear picture really evolves which can be related and interpreted into a schedule.

MR. KERR: Other questions?

(No response.)

MR. KERR: Please proceed.

(Slide.)

MR. MARTIN: In response to the next item for a comparison of the Limerick and the site with similar plants and sites reviewed by the NRC staff, I will note that there are various places in the safety evaluation

report where comparisons have been made. Of course, the general comparison in the front of the report compares it with three other reactors, it presents a number of parameters applicable primarily to the NSSS.

A more detailed review of the thermohydraulic characteristics of the Limerick core compared to Hatch 2 is found in Table 4-2 of the SER, and a comparison in general of the containment type used in this reactor to others is found in SER Table 6-1. We find in general that the NSSS is fairly similar to others of the same general design reactor. It is very similar to Susquehanna and of course a comparison with Hatch 2 reveals that it is very close in relative parameter values to Hatch 2 with the exception of the core power level, for example. The Limerick containment has been described to be very similar to that of Susquehanna.

Are there any questions on the plant comparison?

MR. KERR: Mr. Martin, you have compared the plant I presume in terms of the power plant itself and its containment and it occurs to me that there are other parts of this consideration that have some influence on safety. Other parts of the NRC staff have talked about this location as being one that has the potential for higher risk and you say nothing about that in your comparison. It also seems to me that in looking for those things that

might bear on safety that ones looks at the operational capability of an organization. You haven't said anything about that in your comparison. Perhaps these things are going to be treated later on in the staff presentation, but it seems to me that it would be appropriate to not necessarily make comparisons, but at least have comments on those items.

MR. MARTIN: Well, my next slide was to be a comparison. The first one was a comparison of plant related characteristics and the next one is a qualitative comparison of the chief site related characteristics.

MR. KERR: Go on to the next slide.

(Slide.)

In comparing qualitatively the five areas listed here, the meterology, industrial and transportation hazards and so forth, the meterology we have found that the Limerick site is consistent with other nearby sites. We did not find anything that in general required an appraisal of being unique or different from other sites in this part of the country which have been recently reviewed.

Industrial and transportation hazards, while there are a number of them in connection with the Limerick site, we have reviewed these and we have given substantial attention to these and we have found that the plant has been designed to accommodate the effects of these. These

are discussed in some detail in our safety evaluation report Section 2 and includes the petroleum products pipeline, the consideration of the effects of explosions of several types of pipelines in the vicinity of the site, the nearby quarry with respect to the effects of explosives in that quarry on the site and on the plant itself. We have considered the existence of a nearby airport and what that would mean as far as aircraft hazards to the plant. We have cnsidered the existence of potential toxic chemicals principally from a plant located just across the river. We have looked at the control room with respect to its ability to detect and isolate in response to those chemicals. We have looked at the potential for explosives being conveyed on the nearby railroad and have reviewed the applicant's justification that were that to occur safety related structures, their function would not be affected.

MR. MICHELSON: Do you intend later on during the presentations to cover more fully the railroad question?

MR. MARTIN: Not in particular, no.

MR. MICHELSON: I had some difficulty reading the SER because it seemed to refer to a section. The reader was referred to it but there was no discussion when I went back to the section that was referred to. On page 2-6 you say that the details of the NRC staff evaluation of blast and pressure on structures are in Section 3.8.1

of this report. I went to 3.8.1 and I found no real discussion of it. So is that reference incorrect that is made here or what?

MR. MARTIN: I think the statement that we make in 3.8.1 that the containment has been designed to withstand the design basis accident loads, it includes a consideration of that railroad car explosions, but I grant it is not stated explicitly as such, yes.

MR. MICHELSON: I have difficulty believing that is what I would call details.

MR. MARTIN: I can understand your point.

MR. MICHELSON: So sometime during this period I would like to discuss a little bit the railroad explsion, particularly as it relates to cooling tower failures and this sort of thing and the effect of the cooling tower failures.

MR. MARTIN: Okay. I would note that in our evaluation of the applicant's analysis of this we found that the diesel generator building turned out to be the limiting building in this regard.

MR. MICHELSON: It was never clear. Did you ever look at the cooling towers?

MR. MARTIN: I do not recall that they were looked at.

MR. MICHELSON: Sometime we need to pursue it.

So leave a little time before the end of the meeting.

MR. MARTIN: Okay.

MR. MOELLER: In terms, Mr. Martin, of the toxic chemicals, the report stated that the Hooker Chemical Company I believe dealt with some 20 different chemicals that might be released and become airborne, one of which was phosgene as I recall, or that might be produced by certain accidents at the plant.

To what extent did you review this? Did you look at all the possible chemicals that perhaps might become airborne in terms of whether the applicant is proposing to have monitors on the air intakes for the control room?

MR. MARTIN: We looked at a range of chemicals. The ones discussed in the safety evaluation report tend to be the ones that surfaced as being the most important. We did not focus just on phosgene.

MR. MOELLER: You looked at all that you considered to be important?

MR. MARTIN: Yes.

MR. MOELLER: And they have guarded against these or they have detectors for them?

MR. MARTIN: To the best of my knowledge, yes.

MR. MOELLER: Now for the control room, as I recall, they will have two air intakes. So that supposedly in an accident where there are releases from the plant itself

if the one intake becomes contaminated they can switch over to the other one. Was there any evaluation of the two air intakes to see whether they are best located to avoid both being contaminated say from a release from the Hooker Chemical Company, or is this not even possible?

MR. MARTIN: That would seem like a reasonable thing for us to do. I cannot answer that I know for a fact that it was done.

MR. MOELLER: Could someone tell us later whether it was done?

MR. MARTIN: We will look into that, yes.

MR. MOELLER: On the meteorology which you have already covered, you point out that the applicant has underestimated atmospheric dispersions conditions. What did you find wrong or what was it they were doing?

MR. MARTIN: There are several technical issues which are discussed within the meteorology section. In looking at the applicant's estimation of meteorological parameters for determining the design basis accident doses, we customarily make our independent calculations and base our findings on those in any event. We usually look at the applicants and at least acknowledge that he did it, that he made a calculation, but the numbers which appear in the SER are based on our own independent evaluation.

MR. MOELLER: You found his to be nonconservative,

or not as conservative as yours.

MR. MARTIN: That is true.

MR. MOELLER: What was it that he did that you didn't like?

MR. MARTIN: I don't believe I have the specific information on that.

MR. MOELLER: Of course certainly I wouldn't expect you to have the answers to all these questions, but maybe when the applicant covers that particular aspect if they could review the area of disagreement and why they disagreed, that would be helpful.

MR. MICHELSON: One further question on the railroad. Is there is going to be a discussion at any time on the type of freight that could be reasonably anticipated?

MR. MARTIN: I had planned no further discussion on that, no.

MR. MICHELSON: I could only find the one thing listed in the SER and that was the 56 tons of TNT I believe it was. Can this be put on in a little more substantive basis maybe for the main committee meeting ---

MR. MARTIN: Certainly we will look at it.

MR. MOELLER: --- which will give us a little more detail. What do we expect to be carted by the site, because this is a little bit unusual site from the standpoint

of having such a heavily used railroad at its doorstep.

MR. MARTIN: Of course the evaluation appearing in the safety evaluation report is that of the information appearing in the FSAR which is much more extensive and much more lengthy.

MR. KERR: Mr. Michelson, did you particularly want the staff to discuss this, or do you just want the information? I mean it is just possible that the applicant has some information.

MR. MICHELSON: I really wanted the information and then whether it leads to a discussion depends on what the information is.

MR. KERR: Are there other questions?

Mr. Ebersole.

MR. EBERSOLE: Mr. Martin, I understand that early on there was a consideration for several reasons here that this plant adopt a method of containment venting as an approach to core cooling and that that has been subsequently cancelled and you don't contemplate that now.

I would just like to ask you the question at this time, was that process looked at by the staff and discouraged by the staff, or do you have any comment to make on why it did not continue to be considered?

MR. MARTIN: I understand that that did take place quite some time ago. I have no knowledge of whether

it was discouraged or encouraged by the staff.

MR. EBERSOLE: You have not been a party to evaluation of that per se, have you?

MR. MARTIN: I was not in particular.

MR. EBERSOLE: Thank you. We will pursue it then at another time.

MR. MARTIN: Okay.

MR. KERR: Other questions?

(No response.)

MR. KERR: Continue, please, Mr. Martin.

MR. MARTIN: Going on with the geography and demography considerations, the most noteable item there is that the population density surrounding the site is relatively high when compared to other sites.

The geology and seismology aspects comparing the Limerick site to others, we find that a qualitative judgment is that it is comparable to other sides in the eastern U. S. that have been licensed in recent years. We found no unusual features noting, however, the recent attention paid to the New Brunswick earthquake which we have discussed at some length in the SER. The New Brunswick earthquake concern of course is generic to other sites in the New England Piedmont tectonic province.

This issue I believe appears later on the agenda.

With respect to the hydrologic characteristics

of the site, it is most noteable in that it is relatively free from flooding hazards. We consider it to be a dry site with respect to its potential for flooding.

Do you have any further questions on this?

MR. KERR: I see none. Continue.

(Slide.)

MR. MARTIN: I will now into the next agenda item being a summary of the principal review issues, to include a summary of the opens and their likely resolution, an summary of dissenting NRC staff opinions and a summary of the safety issues which the staff believes were or will be the most different to resolve.

First, let me say I have no knowledge of any NRC staff dissenting opinions with the information in our SER that we have recently published.

Since publication of the SER, with its 24 open issues, we have clearly resolved 8 of those issues bringing us down to 16. We anticipate resolution in the near future meaning a month to two months of several others.

The ones that we have resolved are items, and since you have your handouts, I will just go through these very quickly. instrument line vibration monitoring program, No. 5; No. 8, airborne particulate radioactive monitoring system; No. 9, second isolation valve for the hydrogen recombiners -- and I see I will have to use another slide here.

No. 10, the pressure drop measurement across the ESF HEPA filters. Going to the bottom, No. 16, effects of hydrogen explosion on the off-gas system; No. 17, administrative procedures addressing applicable TMI action items; No. 19, reclassification of transient events is closed; No. 20; ODEN Code transient analysis calculations are also closed.

MR. MOELLER: Can we ask about some of those?

MR. MARTIN: Certainly.

MR. MOELLER: On the airborne particulate monitor No. 8, I didn't understand that, and again, maybe the applicant can clarify it. My question is as follows. The item refers to an airborne particulate monitor, and yet its purpose is to detect a leak in the reactor coolant pressure boundary. Now I presume that leak would be one of steam or water, and why wouldn't you have depended primarily on a gaseous airborne monitor rather than a particulate monitor? Can you help me with that?

MR. MARTIN: We have a regulatory guide, Regulatory Guide 1.45 addressing detection of leakage as you mention. Some plant designs rely on both airborne participate and gaseous type monitors. The issue here on Limerick was that as is customary in our reviews we address the issue of why didn't Limerick have an airborne particulate monitor?

Limerick met with us and discussed this and described some of the problems inherent with trying to detect leakages, increases in leak rates of one gpm, one gpm per hour I believe the value is. When you have a background at any one given time and expect to have a background of something like on the order of one to three, and your tech spec limiting value is five, the sensitivities of airborne particulate monitors to be able to measure things that accurately are discussed at some length in the SER which provides a rationale and a basis for the applicant's position.

MR. MOELLER: My question is do they have a gaseous monitor? Could someone from the applicant tell me that? Why the particulate monitor? Do you already have a gaseous monitor and they are making you put in a particulate also?

MR. LOGUE: Yes, sir, we can respond. Dave Helwig will respond for the applicant.

MR. HELWIG: Dave Helwig, Mechanical Engineering.

We employ three diverse means of detecting primary fluent leakage in the dry well. One of them is noble gas activity. The others are at some level.

MR. MOELLER: So we are really talking about a gas monitor?

MR. HELWIG: Yes, sir. We have a gas detectivity

monitor. The problem was that the reg guide specified that one of the required means of detection be airborne particulate, which we disagreed about its effectiveness.

MR. MOELLER: I would support you.

(Laughter.)

MR. MOELLER: Okay, that is very helpful.

Could we go to another item, the one about the pressure drop, No. 10. Did the applicant just agree then to show the pressure drop in the control room, the need to give an indicator there? How was it resolved?

MR. MARTIN: This is one that we had a lot of activity on very recently. The applicant has provided information to us which supports a finding that certain of the functions that would be met by such pressure drop instrumentation are met by alternatives in the Limerick design and the other functions aren't needed to support safety concerns. We have reviewed this at some depth with them and have come to a concurrence with them.

MR. MOELLER: Could someone from the applicant tell me why you did want to record the pressure drop and what you are doing as an alternative to it?

MR. ATKINSON: Yes. I am Bob Atkinson with Philadelphia Electric Company. We looked at this requirement to have the recorded pressure drop indication and we did not see any real need to have that in our design. The way

our systems are set up, we would have a flow switch. If we start losing flow, if we get about 80 percent of system flow, it automatically transfers to the standby unit. The main purpose for pressure drop would be to enable the operator to see if his filters are being contaminated and then to manually take that action.

MR. MOELLER: Okay, so you look at the flow rate.

MR. ATKINSON: Yes.

MR. MOELLER: Okay. Well, I guess though the Delta P would tell you that degree to which the building would be becoming flooded up, but I can also understand that the flow rate would be useful.

MR. ATKINSON: Yes, and normally our systems aren't operated only in the accident mode. W do have an alarm on the total pressure drop coming up in the control room when we exceed about eight to nine inches.

MR. MOELLER: All right. Thank you.

MR. KERR: Are there other questions?

MR. MOELLER: I guess I have one on No. 16 or it is related to it, at least in the discussion of the effects of the hydrogen explosion on the off-gas system.

There is a discussion in the SER that tells what will be the major sources of airborne releases from this plant. This is on page 11-7 of the SER, and I didn't even see the steam jet air rejector listed. Am I missing

something at this plant? Could the applicant tell me, don't you anticipate that one of the majaor sources of airborne releases of radioactive gases will be through the steam jet air rejectors?

MR. HELWIG: Yes, sir. Our steam jet air rejectors discharge through some charcoal filters.

MR. MOELLER: But as a source prior to the charcoal filters, you certainly expect them to be a major source?

MR. HELWIG: The table you are referring to is?

MR. MOELLER: Well, I was reading on page 11-7 of the SER and there is no mention. On page 11-7 it is talking about the off-gas system and it tells somewhere -- oh, here. If you got to the next to the last paragraph, "The major source of gaseous rad waste in the normal plant operation will be the off-gas from the main condensers." Well, does that mean the steam jet air rejector, or is that simply another word?

MR. HELWIG: The steam jet air rejectors discharge through our high gaseous rad waste system. They are not bypassed.

MR. MOELLER: And they are the off-gas from the main condensers?

MR. HELWIG: That is correct.

MR. MOELLER: Okay, thank you. That straightens me out.

MR. KERR: Are there other questions?

(No response.)

MR. KERR: I have several.

Concerning the Q list there is a letter undated, at least on the copy I have, from Mr. Swencer to Mr. Bower which has to do with the Q list. When I read the letter I wasn't sure that I could understand what the NRC was asking the applicant to do. Perhaps the applicant can interpret the letter better than I can. For example, I read that PE Company states that site grading is not Q listed. Then I read but the staff position is that modifications of the site drainage system, including wolf scuffers, parapet openings, grading, covers channels and so forth during the operations phase shluld have the pertinent QA requirements of 10 CFR 50, Appendix B applied in order to provide continuous assurance that storm water flow and so on and so on.

Is the staff saying that site grading is Q listed or it isn't?

MR. MARTIN: It is not.

MR. KERR: But it should be?

MR. MARTIN: Yes.

MR. KERR: So that in the future any time anybody does anything to the site grading, it has to go through

a Q process as specified by Appendix B? Is that the intent?

MR.MARTIN: For those things that are important to safety, the effects of local intense precipitation were included in our review and based on the design as presently described, we reached certain conclusions.

MR. KERR: What about cutting grass on the side?

(Laughter.)

MR.MARTIN: I don't believe we had a problem with that.

MR. KERR: It seems to me that that might get into the drainage system to interfere with the water flow.

Then also, PE Company states that emergency lighting systems are not Q listed because they perform no safety function. I was curious as to why emergency lighting systems don't perform a safety function. Maybe I don't understand what emergency lighting systems are, but somebody from PE Company explain to me why?

MR. BOYER: Yes, Ward Sproat can answer that question, sir.

MR. SPROAT: My name is Ward Sproat. I am the Electrical Project Engineer for Philadelphia Electric on the Limerick Station. Our position is and has been that the lighting systems in and of themselves are not active safety systems, and that is what that response states.

MR. KERR: It says it doesn't perform a safety function.

MR. SPROAT: It does not perform a nuclear safety function. It may perform a personnel safety function, but not a nuclear safety function.

MR. KERR: I can understand why you might want to keep it off the Q list. I guess I would want to keep anything off the Q list I could also, but it certainly seems to me a bit farfetched to say that it doesn't perform a safety function, but that is probably a small point.

MR. SPROAT: Well, we have designed the emergency lighting system in the plant in the control room especially with several features and redundancy such that they are essentially treated almost as a nuclear safety system, but we haven't gone through a complete environmental qualification and seismic qualification program for them.

MR. KERR: Okay.

MR. EBERSOLE: May I pursue this a little bit? I just want to follow that up a little bit. To say that the lighting is not a safty function is in a way just saying that the operators are not safety elements of the plant concept, and then that goes next to the concept that operators could operate in the blind.

Let me put it this way. Is it a fact that you provide emergency lighting which ensures that the operators,

if they are identified as elements of the safety functions, can in fact look at the necessary equipment they are supposed to operate and operate, and therefore lighting is a safety function?

MR. SPROAT: The operators can perform their function in the control room. What their function in the control room is varies depending on the accident or operating scenario. Under a design basis accident, as you know, the operators do not have any functions to perform for the first ten minutes in the control room and everything occurs automatically.

During that time there is enough redundancy in our emegency lighting system and we do have the capability of hand-held battery powered lights that after that first ten minutes, if there is some operator action required, they could perform that with the hand-held lights if all of the other redundant emergency lighting system failed.

MR. EBERSOLE: So you are saying the operators are competent with flashlights. Thank you.

MR. KERR: Also, Mr. Martin, as I think the last paragraph in the Swencer letter to Mr. Bower, and I am sorry but I can't see a date, but I find that the Philadelphia Electric Company response to RAI-26.57, whatever that is, is not in conformance with Regulatory Position C-3 and C-4 of Regulatory Guide 1.29, and I will read it.

The last sentence says "The staff position is that these requirements." Now the staff position in the past has been that regulatory guides are not requirements. Have they become requirements recently?

MR. MARTIN: No, they have not.

MR. KERR: Then I guess I don't understand this language.

MR. MARTIN: That is an unfortunate choice of words. The regulatory guides themselves are not requirements. They are guidance for our review.

MR. KERR: So PE Company can probably ignore that paragraph.

MR. MARTIN: They can understand requirements to mean guidance versus ignoring.

MR. KERR: Are we plahing games here? I mean are they requirements or not?

MR. MARTIN: They are a reference point from which we start in the review. They are not explicit requirements which are non-negotiable per se.

MR. KERR: Okay. So this is still in the process of negotiation?

MR. MARTIN: Yes.

MR. MICHELSON: I do not see on the open item list any reference to fire protection. Is it maybe disguised in a little different way or is fire protection

fully resolved?

MR. MARTIN: We have two items on the list related to fire protection. They are numbers 14 and 15, 14 being the three-hour fire rated barriers for structural steel and 15 being electrical cable and cable tray protection.

MR. MICHELSON: On Item 15 is there any particular area that you are looking at or in general?

MR. MARTIN: The concern is for areas where there are concentrations of cables such as six cable trays in close proximity to each other and whether such situations should be protected by or should be enunciated by line type heat detectors or protected by sprinkler systems.

MR. MICHELSON: Will there be any discussion of fire protection in the next two days?

MR. MARTIN: Not beyond my discussion of what the open issue constitutes, which I was going to get into later on.

MR. MICHELSON: You are going to discuss that issue a little later on?

MR. MARTIN: When I went through the open issues themselves.

MR. MICHELSON: Well, I will ask my question then.

MR. MARTIN: Okay.

MR. BOYER: I might add, we can add a little bit and provide some answers to questions that might have been

raised this morning if you would like.

MR. EBERSOLE: Bill, may I ask a question?

MR. KERR: Yes, sir.

MR. EBERSOLE: Mr. Martin, I see that there has been added to the plant an auxiliary shutdown panel I presume in response to Appendix R and other requirements. However, it has been buried in the plant rather deeply in the area of relay cabinets, cables et cetera, and it presents at this time a tremendous challenge toward further obtaining of isolation of that room as well as the incoming and outgoing circuitry from it to make it a truely functional shutdown system.

What is the staff status in examining this concept and the presumed hope of making it effective in its present location?

MR. MARTIN: I would like to call on Mr. Virgilio possibly for a comment on that.

MR. VIRGILIO: Marty Virgilio, Instrumentation and Control Systems Branch. In Chapter 7 of our SER we discuss the relay shutdown system and we talk about a conditional finding of acceptability based on their demonstration of the capability to shut the plant down safely using the remote shutdown system. It is a confirmatory item.

MR. EBERSOLE: Shutting it down safely is one

thing, but shutting it down with extreme damage on the outboard side of what I think is as yet not installed, a three-hour fire rating, is something else again.

Do you include in shutting it down the thesis that the surrounding spaces are in open conflagration?

MR. VIRGILIO: Sir, the panel which I am discussing is the remote shutdown panel provided to satisfy the requirements of GDC-19

MR. EBERSOLE: We are both talking about the same thing.

MR. VIRGILIO: For the instrumentation and control in GDC-19 we look at remote shutdown independing of damage in the control room. We don't postulate damage in the control room. The provisions for fire protection in Appendix R are somewhat different, and I am not prepared to speak on that issue.

MR. EBERSOLE: I guess that answer leaves me totally confused.

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MR. EBERSOLE: The remote shutdown panel is for the presumed loss of plant features for shutdown elsewhere in the plant due to, principally, fire.

MR. VIRGILIO: No, sir. The remote shutdown panel panel is provided for GDC 19 as a crontrol room evacuation. There are two, I guess, postulated events. One is the evacuation of the control room, another is a postulated fire. One may use the same panel to serve both purposes but that is not necessarily our requirement.

MR. EBERSOLE: Oh, are you telling me the shutdown room that I saw is operated in the context of fulfilling the requirements of GDC 19?

MR. VIRGILIO: I am not sure which one you saw, sir.

MR. EBERSOLE: It is the one in the relay room. Are there two remote shutdown panels? I thought there was only one.

MR. SPROAT: If I may, maybe I can help. This is Ward Sproat again from Philadelphia Electric.

There is only one remote shutdown panel per unit within the auxiliary equipment room which you saw this morning on your tour. We are using that panel for both satisfying GDC 19 and the Appendix R requirements for safe shutdown capability for a fire in any given fire area in the plant.

For a fire in the auxiliary equipment room we will depend on that remote shutdown panel to safely shut down the plant. How we are able to do that is that the circuits in the cables from the systems or the components of those systems that are out in the plant, those cables come directly to the remote shutdown panel first. Wherever those cables pass through the auxiliary equipment room, they will be encapsulated within a three-hour fire barrier.

At that point where those cables then leave that panel and go back to the control room, they are isolated from the control room cables at the remote shutdown panel. So that for a fire, given that we wipe out the entire eqipment room, we could still achieve a chold shutdown from the remote shutdown panel without any difference to what happens in the aux equipment room.

MR.EBERSOLE: So, you have fire-protected cablings that traverse the relay room.

MR. SPOAT: That is correct.

MR. EBERSOLE: And you will tell us about the heat balance you will get obtaining in a fire, I guess.

MR. SPROAT: Well, we have not done heat balance. What we have done is, the material which we have selected to use to encapsulate those raceways has been tested in accordance with the NRC and industry criteria which is the ASTME-119 three-hour fire test. We have shown that using

material that we have selected, that the temperatures inside the barrier remain below a certain target temperature which is below the rated temperature of the cable.

MR. EBERSOLE: Is this true even though there is no heat sink inside the raceway?

MR. SPROAT: The encapsulation acts as the heat sink. It is a semi-ceramic material which actually gives off gases or a liquid during the fire and actually acts to cool the cables inside the envelope.

MR. EBERSOLE: Thank you.

MR. MOELLER: On that remote shutdown panel, what is the air supply? I am assuming a case in which the main control room is uninhabitable due to, say, airborne contamination. Is the remote panel provided with an emergency air system?

MR. SPROAT: I would like to defer to Mr. Bob Atkinson from our Mechanical Engineering Division.

MR. ATKINSON: This is Bob Atkinson.

The auximiary equipment room is fed off its own equipment HVAC system. We do not have any provisions for radiation protection on that airconditioning system.

MR. MOELLER: OK, then if you had a circumstance in which the air in the control room was contaminated and unacceptable, that it might even be radioactive material or one of these chemicals that we are talking about, the

presumption would be that the same airborne contamination would probably be present in the area of the remote shutdown panel; am I correct?

MR. ATKINSON: Yes, that would be correct.

MR. MOELLER: Has the staff looked at that and you found it acceptable?

MR. MARTIN: I don't have the answer to that.

MR. MOELLER: Could you perhaps, between now and the full committee meeting get us that information?

MR. MARTIN: We can.

MR. MOELLER: Thank you.

MR. ATKINSON: Sir, one further ting on that question. We do have air packs in the control room and if we ran into that situation, the operators would have to put them away.

MR. MOELLER: Then you have them in the remote control panel, too?

MR. ATKINSON: I am not sure of that. Maybe someone has the answer to that.

MR. MOELLER: I don't believe that you do, and that would worry me.

MR. MICHELSON: Could you remark just briefly, also on how you remove the heat from the control and from the remote control room in the event of a fire somewhere in between?

MR. KERR: Do you understand the question?

MR. ATKINSON: No. Could you repeat the question?

MR. KERR: Good, I don't understand it either.

MR. MICHELSON: You have to environmentally control the atmosphere in the control room at all times and be capable of controlling it in the remote control room if you need to use it.

MR. ATKINSON: Correct.

MR. MICHELSON: Now, how do you cool both of these in the event that there is a fire somewhere in the building that might engulf the equipment that perhaps you are counting on?

MR. SPROAT: OK, if you had the fire up in the equipment room or ACAC system for the control room -- it is a separate system, they are not related at all. There are no inter-ties. We have three outer fire barriers between the floors and we would not anticipate any problems with that.

Similarly, if you had the fire in the aux equipment room, the control room should be habitable.

MR. MICHELSON: Well, how are you cooling the auxiliary control room?

MR. SPROAT: It is the recirculation of the HVAC system.

MR. MICHELSON: All self-contained in the room?

MR. SPROAT: No.

MR. MICHELSON: Are you using the common chiller that goes to the control room?

MR. SPROAT: We do use the common chiller.

MR. MICHELSON: Now, I am going to put the fire at the common chiller, I am going to burn up the chiller room. What does that do to the control room and to the auxiliary room?

MR. SPROAT: Well, we have the provisions on --

MR. KERR: Excuse me, I want to find out if the control room and the auxiliary room are also burning.

MR. MICHELSON: No, the fire is in between.

MR. KERR: OK.

MR. SPROAT: We do have the provisions on both the auxiliary equipment room and the control room system to put our airconditioning systems on one-hundred percent outside air, so we may design our design 76 degree, 50 percent relative humidity, atmosphere that we normally obtain. If we did lose the chiller, we could ventilate it with outside air and we would be in a fairly reasonable situation.

MR. MICHELSON: Have you estimated the temperature you would rise to with just outside air?

MR. SPROAT: No, we have not.

MR. MICHELSON: That would be maybe for the main committee meeting, you could tell us.

MR. SPROAT: OK.

MR. KERR: What is it you want him to tell you because he answered your question which was, no, they have not estimated it. You would like for them to calculate that?

MR. MICHELSON: Yes, I think they have to.

MR. KERR: What is it you want calculated?

MR. MICHELSON: It is simply, if you lose the entire chiller system for any reason, what temperatures do you reach in the control room and in the auxiliary control room for the case of using just outside air as the cooling medium?

MR. SPROAT: Yes, sir; we will do it.

MR. EBERSOLE: Do you intend to positively pressurize the auxiliary control room?

MR. SPROAT: The control room is normally pressurized to an eighth of an inch water gauge.

MR. EBERSOLE: The auxiliary shutdown room.

MR. SPROAT: The auxiliary shutdown room is controlled approximately -- I am not sure what the set point is but it is a little bit less than in the control room. We always try to keep the control room pressurized. So, it is a cascading-type thing. The control room is most important, the the auxiliary equipment room, and then the surrounding areas.

MR. EBERSOLE: The auxiliary equipment room?

MR. SPROAT: Yes.

MR. EBERSOLE: Well, under the circumstances of a fire, do you maintain a positive pressure in the emergency shutdown center?

MR. SPROAT: Right now we have just decided to encluse the room in a three-hour fire barrier. This has not been comp eted yet. We are in the design stage of getting the three-hour fire wall and putting in HVAC systems, and we have not come up with a total design yet.

MR. EBERSOLE: Thank you.

MR. SPROAT: You are welcome.

MR. KERR: Please continue, Mr. Martin.

MR. MARTIN: I had concluded with the summary of the ones that we have resolved. I would note, of course, that you do not have the benefit of our basis for these resolutions because since the SER was issued on August 30, we have not put these bases down and issued them in a supplement. That will be done shortly.

There are several in addition to the ones that have been resolved for which the prognosis is good for their early resolution, and those are Items No. 3, pipe breaks outside containment; 4(b) isolation check valves, 18, the size of the Independent Safety Engineering Group and the last one, 24, containment emergency sump reliability.

A brief comment on those. Number 3 involves the provision of additional information, drawings, tables and so

forth for us to complete our review.

Number 4 likewise involves the provision of what is apparently the last bit of documentation necessary for the staff to reach its conclusion on the feedwater isolation check valves.

Number 18, the Applicant has very recently provided some information regarding his meeting the five-man requirement for size of the ISEG with the combination of people from several other organizations, and we have that under review. The potential for that is faIrly good to be resolved in the near future.

Number 24, while the containment emergency sump reliability of course is an unresolved safety issue, we have looked at the Limerick design in connection with our learing of their using some materials other than metal-jacketed insulation. We requested some additional information from them regarding what they are using, the potential for it as a result of pipe breaks to form debris, the potential to use depression pool strainers and so forth. That review is going forward reasonably well. I would anticipate its resolution within the next month or so.

If there are no comments on those, then I will go into the category of those that are open.

MR. MICHELSON: Before you do that, I did not see on the agenda any place where you would discuss further, for

for instance, the resolution of a pipe break outside the containment. So, I guess I will have to ask the question I have now and maybe you can provide the answer later.

The plant has a somewhat unique design in that the essential pump rooms and turbine rooms at the bottom of the reactor building all have bulkhead doors. In other words, they are rather tightly-sealed rooms. When can we hear a little bit about how these rooms are vented for the unusual cases of, let's say, a steamline break inside the room, or that sort of thing? Is that going to be covered later?

MR. MARTIN: I had not planned on doing so, no. How they are vented?

MR. KERR: Do you understand the question, Mr. Martin?

MR. MARTIN: I am not sure I do.

MR. MICHELSON: OK, very simply, if you break a pipe inside of a box it will blow the box apart unless there is a vent valve somewhere to let the pressure you. How is this done for these corner rooms, how are they vented so that you don't blow them apart, either with hydrostatic pressure or with steam pressure?

MR. MARTIN: I appreciate your elaborating on it. I can't answer it today. We will have to get some more answers.

MR. MICHELSON: I am sure the applicant looked at

it. In particular, since we don't have a lot of time, just address it for the case of the RXI and HPSI turbines since steam generally is a little bit more of a problem.

MR.POLYHAR: My name is Steve Polyhar with Bechtel. The HPSI and RXI compartments the the potential for steamline breaks, and there are panels in the ceiling of the compartments which would lift with blow if you get a line break. The steam would be vented through a valve gallery at a higher elevation and would ultimately be vented through a panel, a large panel in the wall --

MR. MICHELSON: After the steam leaves the room up through the panel in the ceiling, I guess, that opens, where does the steam go through in the balance of the reactor building before it is finally vented?

MR. POLYHAR: It goes vertially in a chamber, a valve -- area around the drywell.

MR. MICHELSON: Is it also bulkheaded so that it does not start going outdoors, or that sort of thing at that point?

MR. POLYHAR: That is right. In fact, it goes through the same compartment where the steam lines go down to the turbines. So, if there is a line break either in the pump department or in the valve area, it would went through the same blow-out.

MR. MICHELSON: Does this vent all the way up to the

refueling floor, then, to get out, or were these panels lower than that?

MR. PLOYHAR: The panel is lower. It is not terribly high above grade, it is about elevation 240 which is 20, 30 feet above grade. There are panels in the pump compartment, a one-way panel, so that if you had a rupture on one compartment it would not return to the other compartments.

MR. MICHELSON: So, it is vented outside through a rather direct route, you are saying.

MR. PLOYHAR: Yes.

MR. MICHELSON: As long as I have an expert, maybe you could tell me how you handle the case of a water line break in one of these rooms, maybe it is service water or whatever, which proceeds to fill the entire room. What is the route?

MR. PLOYHAR: The room is watertight. If you had a line break in the room it would fill up the room, depending on the size of the break. However, we can take a loss of a single pump room --

MR. MICHELSON: I am sure you can take the loss of the room, but you can't take the loss of the walls, you have to vent it somehow.

MR. PLOYHAR: Oh, yes. No, the walls are designed to take hydrostatic pressure.

MR. MICHELSON: At 150-pounds pressure? I am going to pump it up with a water pump, I am going to hydro the room.

MR. PLOYHAR: The subject has been looked at and I believe the answer is that the line would be isolated.

MR. MICHELSON: So, you are depending upon identification and isolation before the water exceeds the ratings of the walls; is that correct?

MR. PLOYHAR: We also have drains from those compartments.

MR. MICHELSON: They won't do you any good. They are not big enough for this, I am sure. I did not see any.

MR. PLOYHAR: Orange drains.

MR. MICHELSON: Yes, but we are talking about a large break now.

MR. PLOYHAR: I think all those lines have been analyzed.

MR. MICHELSON: But do you depend upon identification of the break in isolation before the room is too full, or is there some kind of a final vent that carries the water outside?

MR. GARCIA: Would not the same vent that carries steam out carry the --

MR. MICHELSON: No, the hydrostatic pressure would be way too great before it got up that high.

MR. PLOYHAR: In most cases, I believe, the compartments would be vented through a grating to a higher elevation.

MR. KERR: Let me suggest, if you are not sure, that you look.

MR. EBERSOLE: Mr. Chairman, before this expert gets away, apparently you have given more thought than others to the matter of steam vents. Let me just get a point of clarification.

I take it this is based on the thesis that in time you will close the steam pipe, execute valve closures; or is it based on the thesis that your valves because of the absence of any real testing at emergency close, that they may stay open? What is the rationale?

MR. KERR: Do you understand the question?

MR. PLOYHAR: I am not sure I do.

MR. EBERSOLE: Well, do you count on maintenance, that is failure of the valves to close in designing these steam vents, or do you simply base this on a time to discharge at which you will get a closure?

MR. PLOYHAR: The vent would, if the valve failed to close, if both valves failed to close, the vent would maintain the pressure.

MR. EBERSOLE: And the structure would stand the differential, would it?

MR. PLOYHAR: I believe so. I would have to verify that.

MR. EBERSOLE: That is the most pessimistic view, of course.

Now, let me ask you this, are these spaces isolated in the context that the steam will not feed into areas containing general purpose electrical appartus which will proceed to condense and short out all over the plant?

MR. PLOYHAR: The path from the compartments would not go into general access areas where other electronic or electrical equipment is located.

MR. EBERSOLE: You have isolated these areas which are subject to these pressured steam inputs so that they do not include sensitive electrical apparatus; is that what you are telling me?

MR. PLOYHAR: I don't know whether I could claim that that is true in all cases.

MR. EBERSOLE: Can anybody?

MR. ATKINSON: I think I can clarify that. Bob Atkinson again.

In the areas where we postulate the breaks we looked at the airconditioning ducts which could be a pathway to other areas of the plant. Any place that we have a ductwork penetrating that wall, we have provided steam flooding dampers. What these basically do is, they sense a

pressure rise in the room and they close. They are essentially gas-type dampers. The reason we put them in, so we could not spread these environments throughout the plant.

MR. EBERSOLE: And then you excluded sensitive equipment from that particular closed space? You did not let electrical apparatus put inside the space that you so enclosed?

MR. ATKINSON: I am not sure of exactly what is in each space. I would assume there is redundancy, though.

FROM THE FLOOR: We had better look at that.

MR. MICHELSON: While you are looking at it, would you also make sure to look at it in the case where it is water instead of steam and your dampers are not particularly effective any more?

In other words, if you are going to tighten up a room as thight as those appear to have been made, what happens when you fill the room with steam or with water?

MR. KERR: Please continue, Mr. Martin.

MR. MARTIN: The first item on the issues which remain open is emergency preparedness. I will discuss two subjects within this area, one being the meterological program, the other being the emergency planning itself.

The meteorological program is Adjustment 3 of the SER. We have reviewed the information on the program provided to date and we have concluded that as described

it appears to meet the criteria for upgraded meteorological measurements as part of the emergency response capability. The upgrading must be completed in accordance with the schedule of 3A2 of Supplement 1, 20737.

The staff has conducted a post-implementation review of that upgrading and the incorporation of current meteorological information into a real time atmosphere dispersion model for dose assessments will also be considered as part of the upgraded capability.

As indicated in the SER, we reviewed the information on metereology provided with respect to the design basis accident consideration, and we have concluded that those issues have drawn to a close.

But with respect to the meteorology as it realtes to the operational meteorological program, our review has concluded to this point that sufficient basis has not been provided for showing that an acceptable percentage of data recovery can be expected from the program.

We discussed this at length with the applicant. The applicant identified a program to collect that data, to demonstrate the acceptable percentage of data retention. The program is scheduled to begin the 15th of October. We plan to review, relative to that program, in February when we participate in the emergency planning implementation appraisal, we plan to review the procedures for data taking which the

applicant will use. We are planning to review the training of the maintenance personnel involved, and perhaps also to take a look at the data taken through February.

We will look at the data taken through a six-month period from October 15, which puts it at about April 15, to see whether the program is on track to meeting the requirements which we feel it must meet. At that time, we would make decisions, we would consider whether a decision waS needed to either agree that the program is on track or other decisions need to be made relative to the licensing of the plant.

It is possible that we would look at it again at a nine-month interval if we thought we needed to.

MR. MICHELSON: On the question of emergency preparedness, are you making any particular or requiring any particular plans in the unlikely event that you should experience a major railroad disaster at this site, and what does the site now do?

MR. MARTIN: I don't have that information. John Sears, are you aware of that?

MR. SEARS: No, sir; we have not considered that.

MR. MICHELSON: Is that the sort of thing you would normally include -- and keeping in mind the very close proximity of that disaster to the site.

MR. SEARS: We start with emergency planning, with

damage to the core and go from there. So, if indeed because of a railroad accident there was damage done on the core, that is the one, that is the point --

MR. MICHELSON: At that point, you normally start out with everything clean around the site and you now have a core that is in trouble. What do you do when you both have a core in trouble and surnoundings that are perhaps in very serious trouble? In other words, access to the site is even becoming kind of restricted.

MR. SEARS: What would the context of emergency preparedness be --

MR. KERR: Excuse me, let me make sure I understand the question. Are you postulating a railroad disaster and at the same time a molten core, one caused by the other; or what?

MR. MICHELSON: Yes. The railroad disaster is the thing, of course, that is the initiator. Now it is a question of what that may do to the site. Now, that has not been clearly established in my mind, at least from what I was able to read -- it is going to be, I assume, later.

But if the core gets in trouble from the railroad -_

MR.KERR: A railroad disaster being what?

MR. MICHELSON: Well, the postulated one was 56 tons of TNT being set off near the diesel building, about 500, 600 feet from the diesel building. Pressures rise to 10, 12 pounds

per square inch on the strutures. It is not clear what happens in the cooling tower and so forth.

MR. MARTIN: As I stated, in the SER we did review that and found as far as the impact on safety-related concerns for the plant's operation it is acceptable. We did not Arrive at a conclusion that damage to safety-related aspects of the plant would result particularly in anything relating to degraded core.

MR MICHELSON: I am sure that is words, these are the words that are written. You have to postulate loss of off-site power, this sort of thing. That this disaster is going on right next to the switch yard, there is debris flying in every direction. It is highly unlikely that you will have even have on-site power.

MR. KERR: Maybe Mr. Martin understands what you are asking. I am sorry, I don't understand what it is you are suggesting that staff do.

MR. MICHELSON: Well, the first suggestion -- that was somewhat earlier -- was, where is the discussion of the kinds of railroad events that we are really postulating the the true consequential effects of the railroad incident.

Now I am asking, is there any emergency plan to accomodate a combined railroad incident plus a nuclear problem.

MR. SEARS: Sir, I can address that. The operating staff who is on duty are so sufficient to do the immediate

things that have to be done to alert people off-site if indeed -- we will even postulate that communications is lost because of this accident on the railroad, there is radio communication off-site which would still permit the operators on duty who have the authority and responsibility to alert people off-site and they can do that.

The operators will be self-sufficient to take care of the core and to alert people off-site.

MR. KERR: Please continue, Mr. Martin.

MR. MARTIN: The other aspect of this first area would be the emergency planning, the review of the emergency plans themselves. In this regard some time ago, in '68 or so, requests for additional information were identified. The answers to most of them are scheduled for approximately the end of December, January of '84.

In the meantime, the plan is being reviewed by the Pennsylvania Emergency Management Agency which expects to produce its findings by the latter part of November. Those findings would then go to the Federal Emergency Management Agency which would conduct its review and their conclusions are expected sometime around the end of February.

Our review will proceed somewhat concurrently with those activities, beginning about the beginning of January. We will be arriving at conclusions of our review in the spring of next year, mid to late spring of next year.

MR. MOELLER: And then there will be a supplement to the SER?

MR. MARTIN: There would be, yes.

The supplement would add to what we have said in 133 of the SER, which at this point in time, 133 provides a plan for the future activities in this area.

MR. KERR: One of the rules of operating in front of this committee is that you never pause, otherwise you get a lot of questions.

(Laughter)

MR. MARTIN: Moving right along, then.

(Laughter)

MR. MARTIN: The next one being the effects of Tornado Missiles on the ultimate heat sink. The ultimate heat sink, as you saw during your tour this morning, is not protected from postulated Tornado Missiles. We questioned the applicant on this. In response, the applicant has presented information which is based on a probabilistic approach, the probability of having a tornado, the probability of having a missile with sufficient energy to do an unacceptable amount of damage, and so forth and so on.

The quantification of the probabilistic argument has not been sufficient to answer all of our concerns in this area. We have met with them and discussed it extensively. We have put our position in a letter to them. They are

currently doing some studies. They plan to meet with us fairly soon for a mid-study review to see where we are, discuss where we are. I understand the results of their work is supposed to be available sometime in the November-December time frame.

MR. KERR: Is it possible in principle that the probabilistic argument could be acceptable to the staff?

MR. MARTIN: It is in principle, yes. It follows guidance of the standard review plan, of the basic review approach.

MR. KERR: I was trying to imagine how one would protect against tornado-generated missiles and I suppose one can put a roof on it. But then I decided that would not work very well. So, maybe we do not need to pursue this. This would be rather difficult.

MR. MARTIN: Yes. I will move on, then, to Area No. 6, seismic, dynamic and environmental qualification of equipment.

Basically, there are five sub-topics within this area. Qualification of the ABS accumulators, this is as per TMI Action Plan 2, page 228. The staff has recently produced a letter to the applicant on that.

The qualification of the purge and vent valves, the basic qualification requirements on that subject were transmitted to the applicant some time ago. They have recently

sent us a response which will be under review.

The seismic qualification and review team efforts -- well, really there were three review team efforts which I will describe in one way: they are the seismic and qualification review team efforts, the pump and valve operability review team, and the environmental qualification effort.

For each of these areas, each of these three areas, the basic regulatory requirements, the information needed and so forth, has been communicated to the applicant. The applicant is developing a program to respond to these needs.

We are planning to meet with them and conduct audits. We have review teams, of course, on our staff which will in some cases go to the plant, to the applicant's offices and conduct detailed audits. These are about to begin. We will be active in this area October through, I estimate, into early next year on this.

MR. KERR: There is nothing unique about this plant, this is something one would require of any plant of this type. It is just a matter of getting the documentation for this plant; is that the case?

MR. MARTIN: That is a true characterization. We have not identified anything unique about this case.

MR. EBERSOLE: Mr. Chairman?

MR. KERR: Yes, sir.

MR. EBERSOLE: Mr. Martin, I see you mention

qualification of accumulators and that caught my attention. What are you talking about, environmental qualifications accumulators. They are just pressure tanks, are they not?

MR. MARTIN: The ADS accumulators, yes.

MR. EBERSOLE: So, what is the question about environmental capability?

MR. MARTIN: The question is the information required to reach a conclusion that 2k328 has been acceptable to the county court.

MR. EBERSOLE: What's that?

MR. SEARS: The qualification of ADS accumulators, a TMI-2 requirement.

MR. EBERSOLE: In an environmental context?

MR. KERR: I have a whole list.

MR. EBERSOLE: I mean, is there an environmental problem with these accumulators?

MR. NOVAK: Tom Novak from the staff. Let me correct that one point. There has been some experience recently with rusting and things on the inside of the accumulators due to this corrosion. So, if you want to take it in that --

MR. EBERSOLE: This corrosion -- that's OK.

MR. NOVAK: I would just pose that as one potential reason why we are interested.

MR. EBERSOLE: While you are on the topic, the

real environmental problem is qualification of the ADS valve, whether it can tolerate the hostile conditions and keep those valves propped open.

I understand this plant has two solenoid valves, two solenoid cores per valve and the intent, of course, is when you need these valves open you get them to open.

Could you explain to me how those two solenoids work,are they in parallel, do they work as separate systems or what?

MR. KERR: Do you want the staff to explain that specifically or do you just want to understand how it works?

MR. EBERSOLE: I want to understand how you --

MR. KERR: Let me suggest that the applicant has someone.

MR. HELWIG: David Helwig.

First I will address that issue and then I would like to go back to one environmental qualification of the accumulators, if I might.

We use parallel solenoids.

MR. EBERSOLE: They are parallel solenoids.

MR. HELWIG: Yes, sir.

MR. EBERSOLE: And each is connected to, then, the same AC system?

MR. HELWIG: No, sir, one is DC and one is AC.

MR. EBERSOLE: Well, then they can't be parallel.

Are you there talking about mechanically parallel?

MR. HELWIG: Yes, sir.

MR. EBERSOLE: And you require both of those to be energized for the function?

MR. HELWIG: No, sir, any one of them.

MR. EBERSOLE: Oh, either the AC or the DC solenoid will kick the valve open?

MR. HELWIG: That's correct, they are three-way solenoids located in parallel --

MR. EBERSOLE: Are they maintaining position once they are pulsed?

MR. KERR: We will accept "I don't know but I will find out" as an answer.

MR. HELWIG: They are maintained, they have to be maintained.

MR. EBERSOLE: They have to be. So, you have to maintain these hot, whatever source of electric power you are using, in the presence of the hostile condition.

MR. HELWIG: Yes, sir.

MR. EBERSOLE: So, they have to then survive over the entire duration of the hostile condition, et cetera, to remain open.

There are no other ways to open the vessel other than these valves, which are safety grade; am I correct?

MR. HELWIG: Well, I don't think that would be

quite literally true. I think the main steam valve certainly would --

MR. EBERSOLE: But they are prohibited under emergency conditions.

MR. HELWIG: Under certain emergency conditions.

MR. EBERSOLE: Besides, will they open when there is a differential across them?

MR. KERR: Why don't you say, "We'll stipulate that. What is your next question?"

(Laughter)

MR. EBERSOLE: Let me tell you what I heard. These valves are the only way to keep the vessel open. They are operated by either of two DC sources, but both of those or either one of those has to be maintained, the potential has to be contained while it is kept open.

MR. KERR: Now, wait a minute, I heard one AC and one DC.

MR. EBERSOLE: OK, but either electric source. Either one or the other has to be maintained hot.

MR. HELWIG: Yes.

MR. KERR: What is the question?

MR. EBERSOLE: I was just confirming that.

MR. HELWIG: Let me correct my electrical engineering counterpart who has corrected me. We have air both DC and air on separate channels.

MR. EBERSOLE: And they are both DC. Thank you.

MR. HELWIG: They do have to be maintained.

MR. EBERSOLE: Thank you.

MR. MARTIN: Let me move on to inadequate core cooling.

MR. MOELLER: Mr. Martin, could I ask one quick question on emergency preparedness?

Will the current effort of the NRC staff to re-evaluate the source term, will that be completed and will it be possible for you to factor that into the emergency preparedness for this plant?

MR. MARTIN: Mr. Cantor, can you speak to that?

MR. MOELLER: In other words, what are your anticipations?

MR. CANTOR: We do not anticipate at the present time that there will be any results forthcoming from the accident source term investigation, that all impacts are emergency preparedness requirements in the context of Limerick.

MR. MOELLER: And the second question is, General Electric, of course, is doing research on the cleanup of fission products anticipated by the scrubbing of the suppression pool. Do you anticipate any impact from that research prior to reaching your conclusions on emergency preparedness?

MR. CANTOR: No, sir; we do not.

MR. MOELLER: Thank you.

MR. KERR: Mr. Davis?

MR. DAVIS: Mr. Martin, may I ask a question on the seismic qualification area?

Appendix E of your SER, and particularly on page A-2 the statement is made that it is the NRC staff position that facilities should be designed to withstand the recurrence of an earthquake the size of the 1886 earthquake in the vicinity of Charleston.

Is this now the design requirement for all plants in the east? That is what this statement implies.

Could you clarify that for me?

MR. MARTIN: I would offer that the staff in support of that issue planned to be in attendance tomorrow. I am not familiar with the complexities of the issue.

MR. DAVIS: Thank you.

MR. MARTIN: I know the statement is written, particularly as it relates to Limerick there in Appendix E.

MR. DAVIS: All right, thank you.

MR. KERR: Plase, continue.

MR. MARTIN: Our SER noted where we were at this point in time in reviewing the two BWR Owners Group reports on this subject and indicated three areas that should be accounted for. The first area being that the applicant should

consider the BWR Owners Group recommendations for upgrading the water level instrumentation to reduce the errors caused by high drywell temperature.

The second issue was with respect to determining if operator action is needed to mitigate the consequences of a break in a referenced leg in a single failure in a protection channel. That issue is discussed further in Section 722 of the SER.

The third item was that the applicant should identify the type of water level indication equipment used for Limerick. The concern there was with respect to whether or not mechanical level indication equipment is used.

The applicant responded in a letter dated August 23. He responded indicating with respect to Item 3, mechanical level indication was not used.

With respect to Item 1, they provided their justification as to why their present water level instrumentation is sufficient in the Limerick plant.

As far as I can say at this point, we have that report, we have it under review. We will be working on it in conjunction with our review of the BWR Owners Group report. As far as an estimation of the time this issue will be resolved, I think that will be early next year.

MR. KERR: Is this sort of question likely to be resolved in a plant by plant basis rather than a generic

one for BWRs at this time?

MR. MARTIN: I believe the staff position related to the BWR Owners Group report is going before our CRGR committee. The scheduling of those activities is what leads me to arrive at a January, early next year, schedule.

MR. KERR: Thank you.

MR. EBERSOLE: Mr. Martin, on this matter of the level indication, if you don't have a proper level, the thesis must be you want to do something about it.

The valves we previously discussed with the two solenoids on them which are voltaged by DC, how many batteries does this station have for feeding the critical DC-supplied equipment; is it two?

MR. EBERSOLE: There are four batteries, but that can be a little confusing if, in fact, buried under the four there are really two.

MR. VIRGILIO: With regard to the ACS valves, if that's what you're referring to in separate divisions, that would feed the ADF solenoids.

MR. EBERSOLE: Are there two, then?

MR. VIRGILIO: Essentially, yes.

MR. EBERSOLE: Are these the same batteries that feed the high pressure coolant injection system --

MR. VIRGILIO: We have reviewed --

MR. EBERSOLE: What about separation? I just want to know about the number of sources.

You have two batteries.

MR. KERR: He said there were four.

MR. EBERSOLE: I know. But are these four reduced to two in certain critical safety functions?

MR. VIRGILIO: No, I believe on this plant -- and the applicant can confirm this -- that the high pressure coolant injection system would be the third division. So it's not the same division.

MR. EBERSOLE: Could the applicant say something about the DC logic? Is it one out of two that he must have, or does he have one out of three or one out of four?

MR. KERR: Do you understand the question?

MR. SPROAT: I believe so, I'll give it a try. In my presentation later this evening, I'm going to be giving quite a lot of details on the electrical distribution system.

MR. KERR: We can defer that then, if you wish. Unless you can answer it in 30 seconds.

MR. SPROAT: We have four electrical divisions, both AC and DC, complete separate. As far as HPCI is concerned, that's powered mainly from DC division 2. RCIC is powered mainly from DC Division 1.

MR. EBERSOLE: What about the semi-automatic release?

MR. SPROAT: The two ADS channels are divisions 1 and 2.

MR. EBERSOLE: The same divisions?

MR. SPROAT: Same divisions, but you only need one out of two divisions to actuate an ADS valve.

MR. EBERSOLE: But if I lose one DC system, I lost 50 percent of these; I lose one or the other.

MR. SPROAT: No. You would still have complete control over all your ADS valves, but you would lose RCIC, but you would still have HPCI.

MR. EBERSOLE: I see, thank you.

MR. KERR: Please continue, Mr. Martin.

MR. MARTIN: I will move on to manual initiation of the safety systems, Item 11 on the agenda.

(Slide.)

Basically, the applicant has stated that the individual subsystems of the ECCS were not designed to satisfy the single failure criterion, and that the ECCS function will be met with any one of the subsystems inoperable. The staff recognizes that interlock logic failure in just one of several failures can be postulated to defeat the successful operation of the containment spray, or single trains of containment spray, RHR or LPCI.

However, it is our position that the remote manual control should be provided at the component level, independent of interlocks.

The position in the SER has been communicated to the Applicant, there have been extensive discussions on it. We're currently awaiting a documented response from them justifying the present design.

Our requirement is -- our position is that we will require that they propose plant modifications that would provide interlocks for remote manual operation at the component level for the containment spray, contrainment spray/RHR and LPCI injection valve.

MR. EBERSOLE: Do I understand that you found that the interlocks invalidated the single failure criterion thesis?

MR. MARTIN: It's a question of whether you need -- remote manual control should be provided at the individual component level.

MR. EBERSOLE: But without remote manual control, did you find that the interlock system defeated the single failure criterion? That is, they were subject to single failure?

MR. VIRGILIO: What we found is that the ECCS on the -- this design of BWRs -- is considered a network. And single failures within portions of the network might cause you to have rely on another portion of the network. What the staff is working with the Applicant now on is that we have regulatory guidance that says where you have a safety system you automatic initiation circuits and your manual initiation circuits share the minimum number of common components.

What we have found is that there are interlocks on certain valves that need to operate in order to have either manual or automatic system operability. Now, that may cause you loss of one of these interlocks and may cause you to have to rely on another safety system.

MR. KERR: Is your answer to Mr. Ebersole yes or no?

MR. VIRGILIO: The answer is yes, there are single failures within individual portions of the ECCS network, but it isn't -- a single failure would not preclude the operation of the ECCS system.

MR. EBERSOLE: I've been concerned about interlock potential to create single failure potential for a long time on a generic basis. Is this unique to this plant?

MR. VIRGILIO: No, sir, it's not unique to this plant. We have reviewed this on a number of plants, and certain modifications have been proposed on other dockets.

MR. EBERSOLE: Are you invoking the operator going and actually breaking the interlock at the component?

MR. VIRGILIO: No, sir. What we're proposing is that separate interlocks be provided; possibly sensing other parameters. There are certain interlocks that serve as a safety function; for example, at high pressure/low pressure system interfaces.

MR. EBERSOLE: Is there a document that you can identify that discusses this matter, both on the specific and general context?

MR. VIRGILIO: It is included in our Safety Evaluation Report, Section 7.

MR. EBERSOLE: Section 7, thank you.

SPEAKER: Dr. Kerr, I think we can add something to this discussion. Mr. Edwards?

MR. EDWARDS: My name is Gary Edwards. I believe in answer to your question, the system stillmeets the single failure criterion with sharing these interlocks. That's our position. That's why believe that even though -- we even believe we meet the intent of the Reg Guide that's been specified. I think it's 1.68. So we believe that we meet the single failure criterion.

MR. KERR: Thank you, sir. Please continue.

MR. MARTIN: On to the post-accident monitoring instrumentation. This is the information addressed by Regulatory Guide 1.97. The Applicant has responded to those information requirements. The staff is currently reviewing this information to determine the degree of conformance to Reg Guide 1.97 and the adequacy of the post-accident monitoring instrumentation. And on completion of our review, we'll report the results in a supplement to the report.

However, this is anticipated to go on for perhaps into early next year, December, January timeframe.

MR. KERR: Referring to my schedule, we're now about five minutes behind the ending of your presentation. I realize you can't immediately end it, but let's all try to speed things up a little.

MR. MARTIN: Okay. I would simply characterize where we are on these reviews.

The next one, Item 13, deals with several related issues, one of them being addressed by I&E Information Notice 79-22 with respect to control rooms being exposed to adverse environment caused by high energy line breaks.

The other issue was a concern with respect to several control systems or control and safety systems that are being supplied information from common sensors or supplied from a common power source. What happens if the power source

or sensors could cause multiple control system failures not bounded by the safety analysis.

The Applicant is well aware of this concern from extensive communications with us. They plan a response to the issue in the latter part of October.

I'm going to move on to Item 14, the three-hour five-rated barriers for structural steel. The guidelines for fire protection which review plants to require protection of the structural steel. We have not learned of a sufficient basis from the Applicant to this date for doing otherwise. We understand the Applicant has the concern under evaluation and plans to come to us sometime in the near future with a proposed resolution.

The Applicant is also addressing the issue in connection with the Peacy Bottom plant. Communications are taking place with the staff on the Peach Bottom docket as well.

MR. EBERSOLE: When you get a fire rating of an insulating material, one of the strongest aspects of getting that rating is the character of the heat sink on the cool side. If you have zero heat sink there and it's an enclosed box, then you have much more critical problem that if you have a very good heat sink like a fan-cooled wall.

And maybe one of the worst things you have is when wrap a bunch of cables with so-called fire-rated material

and you have only the mass and the specific heating substance inside to accommodate the in-leakage of heat. How do you interpret the adequacy of fire ratings when there's virtually no heat sink on the cool side?

MR. KERR: Is that a question on this particular issue, Mr. Ebersole, because it doesn't seem to me it has a great deal to do with protecting structural steel.

MR. EBERSOLE: He was talking about structural steel. Structural steel completely wrapped in insulation submerged in the heat source is one thing. A piece of structural steel which has a cold side is another, and how do you interpret whether you've done a good job or not? And it's equally applicable to cabling.

MR. MARTIN: I don't believe I can answer your question. We could have someone address it at the full committee meeting, perhaps.

MR. EBERSOLE: Does the Applicant understand my question?

SPEAKER: Could you, at sometime answer that?

MR. KERR: He would be hard put to tell you how the staff interprets it, I think.

(Laughter.)

MR. EBERSOLE: I'd just like to get a practical answer to that question. A fire rating, in other words, has conditional requirements which I don't hear expressed here.

MR. REED: Gary Reed, Mechanical Engineering. Our evaluation -- we agree with you. I think the point of the staff is that we will reach the structural limit of the steel if it is not protected. If it is protected, it may very well not reach that critical temperature at which it would yield. We're confident that it won't yield without the protection.

MR. EBERSOLE: And you did a time-dependent study on how hot it gets?

MR. REED: Exactly.

MR. EBERSOLE: Considering the available heat sink?

MR. REED: Exactly.

MR. EBERSOLE: And is that based on the so-called fire source, the inventory that's in the room that's the source of the fire?

MR. REED: Generally, cabling we have for burn-rated specified or resulting from tests from on Sandia, all over, we can assume that we have an ignition source, an external ignition source, and from there on -- we do the burn rate based on these test results and evaluate the heat in both.

MR. EBERSOLE: All I'm really looking for is somebody to say yeah, I did a thermal analysis, not just a fire rating.

MR. REED: Yes, and we have submitted that analysis to the NRC on the Peach Bottom docket.

MR. EBERSOLE: Did you have any trouble with the

cables that are simply wrapped with some sort of a fire-rated --

MR. REED: To tell you the truth, we took those cables out of our heat load because they're wrapped and protected and should unite.

MR. EBERSOLE: What I'm asking is, did you have any trouble -- did you completely encapsulate a cable run in insulating material?

MR. REED: Our test results indicate that we will not have a derating problem, if that's your question.

MR. EBERSOLE: Thank you.

MR. KERR: Please continue, Mr. Martin.

MR. MARTIN: The 15th item on electrical cable and cable tray protection; we discussed that to some degree before. The staff's emphasis is on anywhere from numbers such as 6 or more cable trays that are in close proximity to each other, then a combination of automatic sprinklers or line type detectors should be employed. The Applicant informs us they are doing a study at the present time to define the occurrences of groups of trays in close proximity to each other, and their basis for providing or not providing such indication or protection. The Applicant anticipates that their response to the staff will be consistent with their schedule for Item 14.

MR. MICHELSON: Is this a good time now to ask

about the cable trays in the control room which are above the control panel? There's a number of trays there that are fairly loaded with cabling, and I was wondering what is your plan for protection of the cabling, or fire protection or what?

MR. KERR: The issue is still open. Are you asking him to predict what the Applicant is trying to --

MR. MICHELSON: It isn't clear from the statement that that issue is open. The issue that's open is whether six or more trays -- there aren't six trays in there,but one or two vertical trays. So I wondering if that's already been passed on and approved, as opposed to six.

MR. MARTIN: I think the answer lies within the fact that we have not taken our fire protection site visit yet, so we have not examined on a direct basis those kinds of consideration. Plus we have not received the Applicant's response to the issue yet.

MR. SPROAT: If I may, the specific issue of the raceways and cable trays above the suspended ceiling in the control room was, in fact, an open issue. It has been closed on the docket.

What we were doing in response, all of those trays that are above the ceiling in the control room will be completely enclosed with steel tops and bottoms on the trays and wherever the cables drop out of the trays, the openings in the tray covers will be closed with ceramic fiber and a

flame-retardant material. The staff has accepted that position and the item is now closed.

MR. KERR: Please continue, Mr. Martin.

MR. MARTIN: We have discussed 16, 17 and 18 at an earlier time. I would move on to 19. We've resolved also 20, 21 on the subject of ATWS; relates not to the ATWS subject that we've known for several years but to the recent generic letter 83-28, which the Applicant received, I believe, mid-last July. We requested a response by mid-November, and the Applicant will respond to part of that information by mid-November. Inconjunction with their efforts with the BWR owners group, they requested an extension to respond to the remainder of the information at different times, going up to about April of next year.

I would move on to the Q list, then. We have reviewed -- had a number of iterations of review of the Q list, with respect to determining those structures, systems and components that should be under the control of the QA program. We've gotten the subject down to the list of items which were communicated to the Applicant in our recent letter, which should have been dated September 12th. We apologize for not having the date on it. We are awaiting the Applicant's response on those.

The basic reason that those issues are still of concern is that they were things that, in our opinion, were

significant with respect to our findings, or safety-related findings, when we reviewed the present design of the plant, and we feel they should be controlled during the operation phase of the plant.

I'd move on to the control room design review, TMI Task Action Plan I.D.1. The Applicant submitted a program plan outlined to us sometime before the SER reported the results of our review of that in the Safety Evalution Report. Subsequently, the Applicant upgraded that with a program plan dated August 31. We are reviewing that program plan and we will make a decision as to whether or not an in-progress audit is needed of what they are doing.

We anticipate our making a decision by the 1st of November. The Applicant plans to submit a summary report in response to the issue early April. If a pre-implementation audit is needed, that decision will be made by mid-April.

We anticipate a staff SER in late May to early June.

MR. MOELLER: As usual, that task action plan on the control room design is primarily a review of the human factors aspect; is it not?

MR. MARTIN: Yes, it is. As I understand it, yes, it is.

MR. MOELLER: The staff is currently initiating a study of habitability questions for control rooms, and I would

presume that if they find anything of concern they would make it known to you, or it would be factored into the consideration for this plant. I'm just making a statement.

MR. KERR: That's not a question, that's an assumption.

MR. MARTIN: I have highlighted some of the steps that would be significant in the emergency planning review on a slide. These are consistent with things that were discussed in our SER section on emergency planning. I won't go into those any further.

I have also highlighted the open TMI items which, although they are reflected in other issues we have discussed, this collects the open TMI items in one place.

MR. MOELLER: On the emergency planning, when roughly will the first exercise of tests be conducted?

MR. MARTIN: Mr. Sears?

MR. KERR: Did you hear the question?

MR. SEARS: I heard the question. I'd appreciate the Applicant giving the answer, since they have to schedule it.

SPEAKER: We had a date in late February which we're in the process now of changing to July 25th. FEMA and the counties have agreed to that.

MR. MARTIN: I will not go into the confirmatory items, I will not go into them individually except to note

what the context of the confirmatory item is. That is, it is characterized by staff essentially as agreeing with the Applicant's approach to the issue. What is needed to complete is one of several things; those being documentation or to verify implementation at the site of the Applicant's response, or analyses may be nearly complete and some final touches are not expected to significantly change the results of those analyses, or the staff desires to inspect the test results to assure ourselves of understanding of the issue.

If there are no questions, this will conclude my discussion.

MR. KERR: Any further questions? Thank you, Mr. Martin.

MR. MICHELSON: I was trying to read real fast this list. I can't do it that fast. One of the proposals I found in the SER is the proposal to boil the fuel pool in the unlikely event that you would lose the ability to normally cool it. This talked about running the pool to 212°, and apparently still running standby gas treatment within the proper effectiveness. Could you tell us just briefly what work has been done to verify that the standby gas treatment filters and so forth will function effectively when saturated with liquid? I mean, air with liquid saturation to 212°, and what effect does this have on the loading of the fans and things of that sort in the system?

MR. MARTIN: I'm not sure I can respond to the specific details of that. I am aware that we have reviewed this filters with respect to the guidance contained in Regulatory Guide 1.52. This was a very active item of the review back during the summer. We had numerous discussions, meetings and so forth with the Applicant, a lot of which was directed toward their basis for effectiveness of the filters considering different moisture levels.

MR. HELWIG: If I might clarify for the Applicant, under such a situation, our standby gas treatment system would not be handling the ventilation.

MR. MICHELSON: I thought the Safety Review said that that is how you would evacuatethe air from the refueling floor, is through the standby gas treatment. Isn't that correct?

MR. HELWIG: Our secondary containment, when the reactor is in operation our secondary containment does not include the refueling floor.

MR. MICHELSON: Yes, but during the time when you have to revert to boiling the pool, are you going to evacuate the floor now through standby gas treatment, or through normal ventilation?

MR. HELWIG: It would not get the standby gas treatment.

MR. MICHELSON: It would not? The Safety Evaluation

led me to believe that that's why we didn't need to worry about releases or whatever, because it went to standby gas treatment.

MR. HELWIG: No, sir, we have analyzed direct releases from the boiling fuel pool as part of our Chapter 15 analysis.

MR. MICHELSON: And during the boiling you're going to evacuate through the normal ventilation.

MR. HELWIG: One second.

(Pause.)

No, sir. We're relieving directly to the outside.

MR. MICHELSON: Is there any kind of dynamic equipment at all required to relieve this boiling water to the outside?

MR. HELWIG: No, sir.

MR. MICHELSON: Andthe ventilation ducts or whatever and the valves are all in the correct position so that the high humidity now will not cause them to close somehow through electrical faults or whatever?

MR. HELWIG: That's correct.

MR. MICHELSON: So you don't have to environmentally qualify any of this equipment for this 212^{o} atmosphere?

MR. HELWIG: That is correct, and our relief to the outside will be through the flow-out panels.

MR. EBERSOLE: What was the basis for invoking this atmospheric boiling? Was it the fact that you found

coolant fire supplies -- predominant or safety grade or what? Why did you have to claim it?

MR. MARTIN: I'm not sure I can answer you at this time.

MR. EBERSOLE: Well, why did you invoke boiling? What drove you to that?

MR. KERR: To whom is the question addressed? The Applicant?

MR. EBERSOLE: I'll ask the Applicant.

MR. HELWIG: At the Limerick plant the design is such that our fuel pool cooling system is not ASME Section 3 safety grade. Our immediate heat sink for the fuel pool heat exchange is also not safety grade.

MR. EBERSOLE: All right. If you would invoke that, once you take the lid off and let's say you're in a big hurry, does the boiling of the pool now include boiling in the open vessel? Would the core, which is shut down five days before or two days or whatever it takes to get the lid off?

MR. HELWIG: No, sir. The vessel itself is certainly cooled by the emergency core cooling system.

MR. EBERSOLE: So you do have conditions of operation where the vessel is coupled to the pool, correct?

MR. HELWIG: During refueling outages, that would be correct. Under that situation, our emergency RHR system

can be dedicated to cool the combination of the open vessel and its --

MR. EBERSOLE: So you would not invoke it in that coupled mode?

MR. HELWIG: Absolutely not.

MR. EBERSOLE: Thank you.

MR. KERR: Other questions? Please continue, Mr. Martin. Does that complete your presentation?

MR. MARTIN: If that is the completion of the questions, yes.

MR. KERR: I rule that it is.

(Laughter.)

Thank you, sir. This brings us, then, to a report on significant plant experiences given by representatives of Region I, I believe, or a representative -- I don't know how the recitation is planned.

MR. STAROSTECKI: I've got some representatives from Region I here, and I recognize the pressure for time, so I will just dive right into this presentation. If there are questions, I would certainly appreciate them as they come up.

Region I and who we are is very briefly shown in the viewgraph. I understand you were given our background information briefing package after your site tour. What I'd like to do is very briefly give you an overview of what's in

there and rely on that package for some of the details that we have.

The package consists of two parts; the first part is a narrative, and the second part is a distillation of all the inspection reports that have been conducted for Limerick to show the principal areas of the inspections and highlights of the inspections. So I'm not going to be here to give you very detailed information that's already in there; I would just like to give you our perspective of what we put into that narrative report and the highlights that we see from it.

In Region I we talk resident inspectors and region-based inspectors, so what I want to do is very clearly upfront indicate that what we have at Limerick is, right now, two resident inspectors. They work for an individual who then reports to a branch chief, who then reports to me and I report to Tom Murly.

There are counterparts in the region that we call specialist/inspectors. These are individuals who work for Tim Martin in the Division of Engineering in Technical Programs, and I'd just like to very briefly go through what all those terms, EPB, TPS, mean, since they always confuse me.

Basically, we have an Engineering Programs Branch where we have engineers who are knowledgeable in test programs That's individuals in the electrical engineering field,

instrumentation, monitoring, startup, pre-operational test programs. That's PTS. We have a Materials and Processes Section where we have people with knowledge in non-destructive examination, metallurgists, valve designers, things of that nature. And they support in Region I also non-destructive examination a mobile van.

There's a Management Program Section which looks at quality assurance, management procedures and programs of that nature. Then we have a Plant Systems Section, which is primarily engineers looking at fire protection systems or any other questions that may come up related to reactor engineering.

MR. KERR: Mr. Starostecki, I'm quite interested in the way Region I functions, but I thought maybe you'd really tell us something about Philadelphia Electric.

MR. STAROSTECKI: Fine, let's go to the next viewgraph.

(Slide.)

Philadelphia Electric started construction in 1970. This slide just gives a brief highlight of some of their experience and our experience with them. Our experience with them has been on Peach Bottom, more extensively on Peach Bottom 2 and 3 and, of course, Limerick since July of 1970.

The architect engineer is Bechtel, and I think that's an important point to bring out; that Bechtel out of

the San Francisco office has been supporting both Limerick and Susquehanna, and we have noticed that there has been an exchange of expertise between those units as Susquehanna has been coming up and there have been people transferred to Limerick.

So there has been a random sample that we draw to look at how much previous experience there is on the part of Bechtel at Limerick, and this viewgraph is intended to show the wealth of experienced people who are supporting Bechtel at Limerick.

(Slide.)

There are some evaluations that Philadelphia Electric has done on their own, in support with INPO, and the next viewgraph is simply intended to highlight that INPO self-evaluation has been done. The areas that they've looked at are identified; no major problems are identified.

Similarly, independent team evaluations were conducted in July of 1983, and I believe Philadelphia Electric Company used Gilbert Associates to help them conduct that joint utility/management audit. The point can be made here that there have been independent evaluations that have been done. We do look at it with a view of better understanding the processes that the Licensee uses to construct the facility, and we use this as a tool to help us focus our inspection efforts. If there are several areas where we see these

independent evaluations are coming up with no problems and they are successful and we can verify it, we're going to cut back out inspection effort.

(Slide.)

The next one I'd like to cover is the inspection history. The initial inspection with Limeric, in essence, was a meeting to discuss quality assurance before the start of construction in 1970. Two points have to be made here. This was in the very early days of quality assurance/quality control, and yet, Philadelphia Electric Company was thinking about the issue at the time, and there was a structured program put into place and it was reviewed by the region staff at that time. And as Appendix B came into being, Philadelphia Electric was able to make sure their program complied.

The construction activities that were monitored and are still being monitored are listed. Today, we've got 149 inspections, or really 150 inspections, that have been conducted now. The inspections, as I say, are conducted through a variety of means, both individual inspectors from the region, resident inspectors and team inspections.

We've spent approximately 7800 hours at Limerick, and we have listed Shoreham and Susquehanna as two of the plants for comparison. Yes, sir?

MR. BENDER: What is the average inspection time for a typical boiling water reactor? That shows a range of

1300 hours between the lowest and the highest, but what would be a nominal number?

MR. KERR: Let me guess 7000.

MR. BENDER: Well, that's halfway between.

MR. STAROSTECKI: Let me answer in the following way. The hours you have here are high for all three plants. I'd normally expect to see the hours lower than any of these. Shoreham also has been under construction for quite a long time and it has had a large number of hours.

MR. BENDER: Then tell me why the numbers are so high. It seems like a lot of hours, actually.

MR. STAROSTECKI: Time of construction and -- I have not yet looked at the distribution of hours over the 13 years. I can hazard a guess and my guess would be that in the earlier days, Limerick was very close, and they got an awful lot of attention to a lot of the concrete work -- site preparation activities. It is only a half hour drive from the regional office to --

(Laughter.)

The reason I say that is because I think the record most probably will be biased.

Let me ask my staff to see if we've got a number for the last few years, which I think may be more representative, and I'll answer it in the following way before they even answer it. When you look at our SALP records, you will

see the inspection hours for the last three years are averaging between 1500 and 1800 hours on that timeframe, which is a fairly large amount of hours.

MR. BENDER: That's enough answer. I don't think you need to go any further.

MR. STAROSTECKI: The point is simply to show that the hours, in our view, are high. Later on we'll address SALP and the number of hours we've covered there, to give you some perspective.

(Slide.)

The enforcement record is simply that we looked at it to see can we learn anything from it. Notices of violations are issued for every item of non-compliance, the Applicant responds to that and the staff then goes on and monitors the corrective action. The numbers in and of themselves indicate that by comparison with Shoreham and Susquehanna, Limerick is not unusual in either direction. We've never had any escalated enforcement actions, or any kind of civil penalty at Limerick. That's another data point.

(Slide.)

The more important question in my mind is what do we in Region I do to satisfy ourselves that what's happening at Limerick is acceptable to us. One of the first things we've done is in late 1982, we developed a regional construction team effort. We, in essence, said the plant has

been under construction so long, we didn't know the distribution of inspection hours, so we pulled together a combination of specialist/inspectors, resident inspectors and management staff from the office and dedicated them for about a month to look solely at Limerick.

There's an awful lot of synergistic effects that are gotten from this kind of team effort, and we simply said let's look at some key critical components and find out what's going on. So in that short timeframe, we've gotten 520 hours, and that really indicates that you really had a concentrated effort from dedicated people to look at what I would call a window in time of the activities of this plant.

The strengths and weaknesses that we've listed we've tried to extract and summarize from the inspection report itself. Inspection reports are voluminous; we can make them available if you wish. We have some more words in the narrative of our briefing paper as to what we're trying to convey.

The weaknesses listed were drafted and corrected, so they're not problems today.

(Slide.)

In addition to that, in March of 1982, we moved our van to the site, and this viewgraph lists the type of examinations we do. Now, this is an effort by the NRC regional inspectors plus contractors where we actually obtain

the data ourselves and then do our own examinations and compare our results after we've analyzed them with the results of the analysis by the Applicant. It gives us a lot more confidence in the way we can do this and have a satisfactory answer.

The point to be made here is that's quite a substantial effort and we did, in fact, come out in agreement with the Applicant's determination. That gives us a lot more confidence in their program and their quality assurance and quality control activities as well.

Again, let me indicate that this is a complete independent effort from start to finish in terms of we selected the welds we want to look at, we selected the pipes we want to look at and we went out in the field and obtained the data.

MR. BENDER: This tells me a little bit about the methods that were used but not much about the systems that were looked at. Where did the regulatory staff concentrate its intent? Are these inspections done on the primary system or are they inspected down on the secondary system? Or would they be inspections of structural welds and cable tray hangers or cable tray supports? How would I know what you're looking at?

MR. MARTIN: We can get you a detailed listing, first of all.

MR. BENDER: Can you just tell me about what it is?

MR. STAROSTECKI: The emphasis is pretty much on the primary system and the welds that connect -- of the systems that connect directly to the primary system. RHR connections that come into a recirc loop, recirc loop connections to any of the primary system taps. Not much if anything in the secondary system. I've never heard of us doing anything in the secondary system. Some occasional structural examinations -- I can't remember exactly what was done at Limerick.

The focus, in general, to answer your question, has been on the primary system and systems inside the containment isolation valves.

MR. BENDER: Well, is there some logic to that decision to concentrate on the primary system?

MR. STAROSTECKI: Let me ask Jim Wiggins who has some additional comments he'd like to make.

MR. WIGGINS: My name is Jim Wiggins, I'm the senior resident inspector for Operations at Limerick, and I was part of the group that put together the presentation.

As far as what the NDE van looked at, it may very well have concentrated on the NSSS systems and pipe welding, but that shouldn't be taken to mean that that's what Region I emphasizes or concentrates on solely for the inspection. The review and inspection history will show you, as it shows in the enclosure to our presentation which you have, that the

construction inspection program, particularly in the area of welding, looks not only at NSSS systems, but what in their supporting systems -- and it does do an extensive amount of work looking at structural steel. There are records of a number of inspections looking at structural steel in various buildings for the plant.

As far as what the NDE van shows, they may not -- I believe they did not check in each structural steel --

MR. STAROSTECKI: The NDE van itself focuses on the NSSS because we just don't have the resources. This van is used nationwide, and we just don't have the time to focus on systems other than those within the containment isolation valves.

MR. KERR: I think there's not an answer to your question, Mr. Bender. Why don't you continue, Mr. Starostecki?

(Slide.)

MR. STAROSTECKI: Review of the construction deficiencies are required by the regulations, and this is a program that the Applicant has to have in effect to review non-conformances. We did not intentionally prepare a listing of non-conformances or construction deficiency reports.

Rather, what I wanted to do was focus on the process that is used. Philadelphia Electric uses a multiple-tiered approach where they have people identifying the

non-conformances and reviewing them for applicability and reportability. They've got committees established to look at them onsite which include Bechtel as their constructor, and then they are furthermore reviewed in the corporate office by their QA organization.

So this kind of process gives us confidence that they have a viable working syste They have had 92 that have been resolved and 10 are under investigation, and that gives rise to 102 construction deficiency reports. Of those 102, 41 are considered reportable.

In the briefing paper that we have prepared for you, we have given three examples to demonstrate how the process works, and the three examples include a problem that occurred several years ago, a recent problem and a problem that was different than the other two that we give for variety solely as an example of why this process is workable and is, in fact, working.

MR. MOELLER: On the 102, would all 10 that are under investigation be reportable to NRC? I mean, could I use that as an indication?

MR. STAROSTECKI: No. They've got 10 under investigation and we don't know whether they are reportable or not. They have to go through the review chain before they are determined to be reportable.

MR. MOELLER: And what constitutes a reportable

item? Is it one that is considered significant, or is it trivial? Or what are the criteria?

MR. STAROSTECKI: It is a significance aspect of it, and I can get into some --

MR. MOELLER: No. That's one of the primary things, then, how significant is it.

MR. STAROSTECKI: Yes, sir.

MR. MOELLER: And, I guess, how much it relates to the health and safety, or could relate to that.

MR. STAROSTECKI: Yes.

MR. EBERSOLE: I was just going to give an example. Suppose that you go on the roof, Mr. Starostecki, and you saw a big tank up there and it was the domestic water storage tank, and therefore, it wasn't a safety function. And it didn't need to be QA'd in the usual context. Would you be the one that would pick up the fact that in a seismic event it would roll of its foundation and go down through the several floors and call for something to be something to be done about that?

MR. KERR: Please answer that yes.

(Laughter.)

MR. STAROSTECKI: I would qualify something in front of that yes, because the process would have failed if we had to rely on it. But yes, in fact, we in the region do look for items that may have been previously missed, and do,

in fact, raise them as issues to NRR and say we have concerns; please resolve these, and you let us know how they come out.

MR. EBERSOLE: I only use that as one example of --

MR. STAROSTECKI: I can give you more.

MR. EBERSOLE: I'm sure.

(Laughter.)

MR. STAROSTECKI: I'll go on.

Allegations -- I think these are important items to address, and the fact that we do get allegations on this plant and they do occur especially during construction. Allegations come from various sources, obviously people at the plant site, the general public. We get them through letters, telephone, personal contact individually, I'll sometimes get a call from somebody telling me they have a problem.

We review these to assess safety significance and credibility, and these are not reviewed to assess credibility and safety significance to dismiss them, but to identify whether we need to take prompt action. So the regional management review is taking place to say, do we need to immediately get somebody to resolve the issue.

Then we have the review process where either the Region I inspectors conduct the technical review -- we have asked NRC headquarters offices to do technical reviews for us. Sometimes we'll get allegations involved with single-

sy3,sy33

failure criteria not being properly applied on various systems. So NRR would, in fact, become involved.

All of these are documented in one fashion or another, either through reports or letters. We've had 16 allegations total on record at Limerick. All of them have been investigated. We have not found any to have had an adverse effect on safety. I expect that we'll continue to get allegations that we will resolve.

The point to note here is that the 16 is over the period of interest, which is 13 years, and that's not many allegations during that time period.

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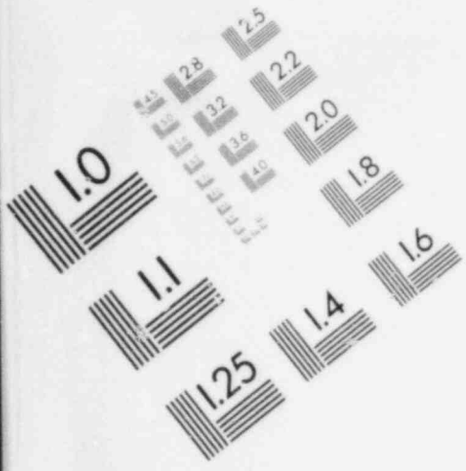

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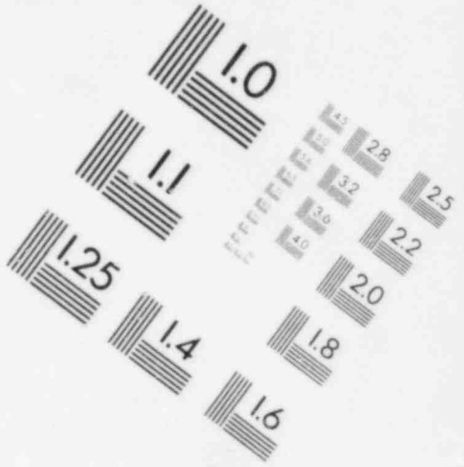

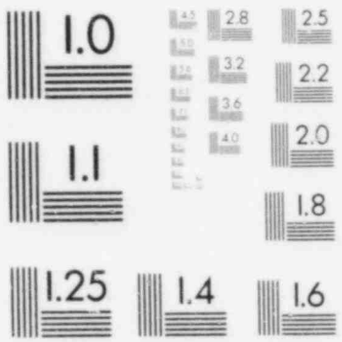

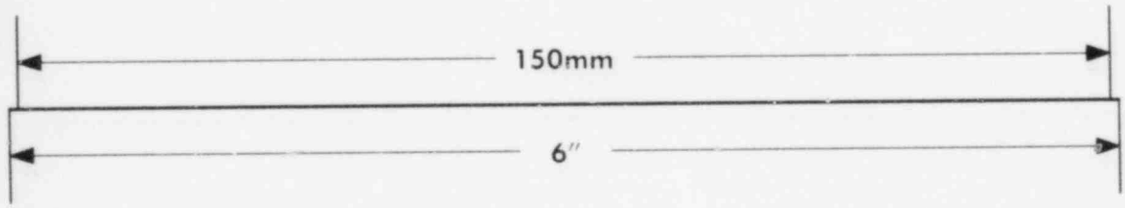

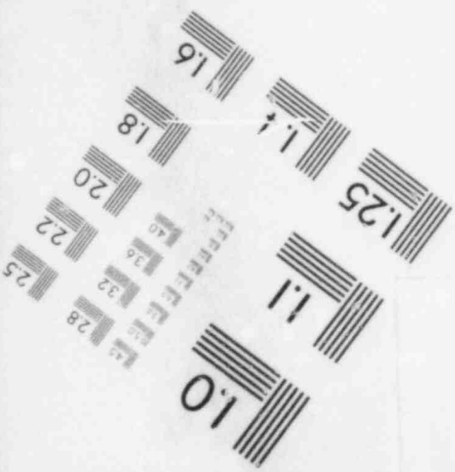

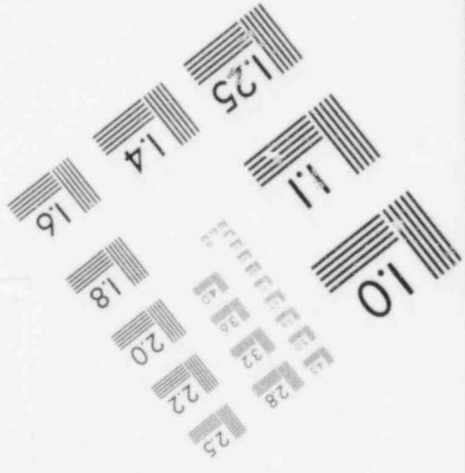

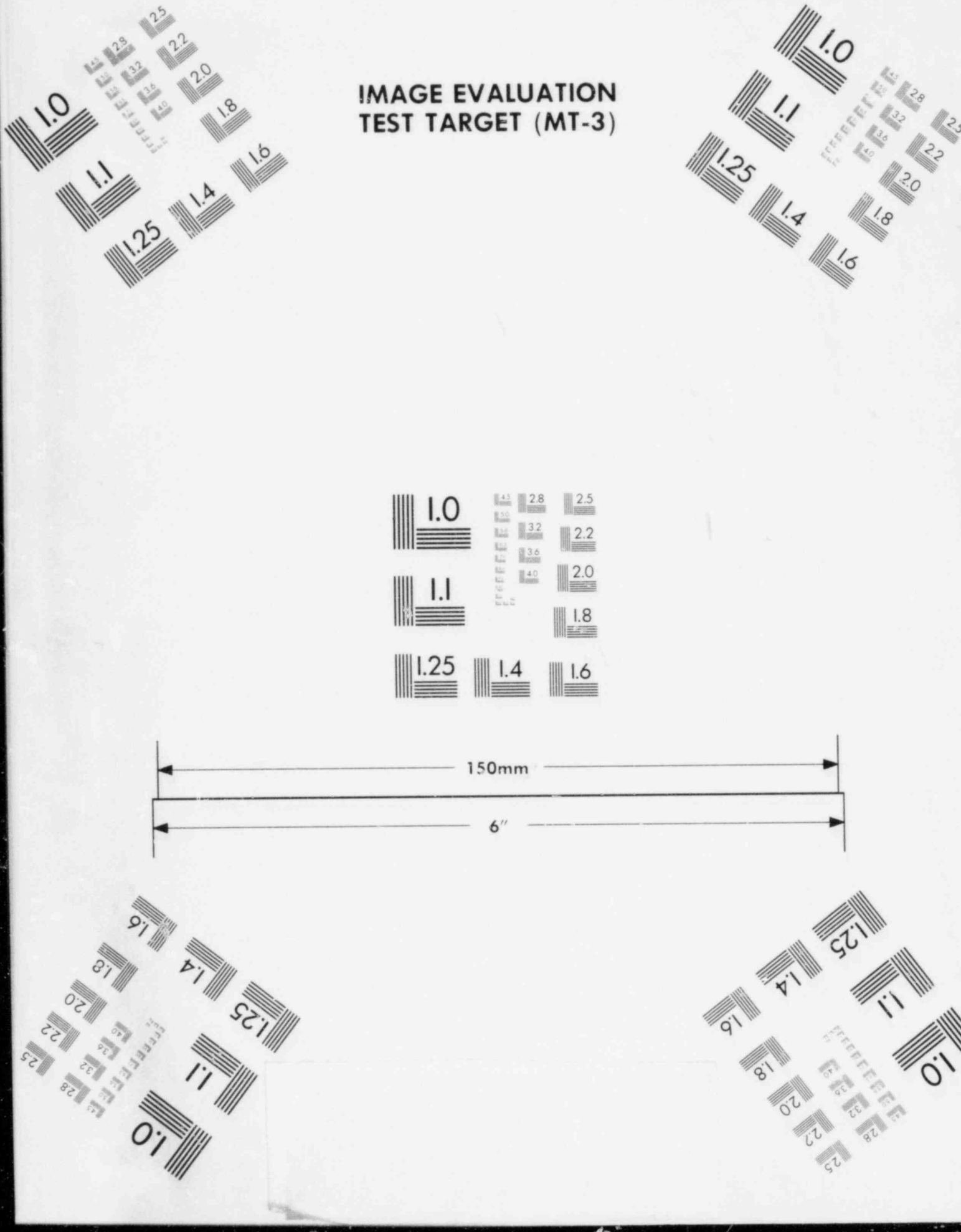
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The SALP process as it is conducted in Region 1 is used primarily for us to help us allocate resources and we have used inputs and do use inputs from everybody who is associated with the utility, an inspection program or licensing program. So various inspectors and various headquarter staff provide inputs.

Three SALP reports have been prepared to date for Limerick. The initial one was 1980 and you can see the time period it covered. 1171 inspection hours indicates the total regional effort during that period of interest.

The Category 3 that was assigned in the quality assurance ---

MR. KERR: Is the 1171 hours about the time that the SALP inspection, or whatever you call it, normally takes?

MR. STAROSTECKI: The 1171 hours referred to the inspection hours that were conducted during these time intervals and that is a fairly low number, but you consider that was 1980. The 1171 doesn't reflect the hours to prepare the SALP. The 1171 refers to the ispection hours that were done during the time period of interest.

MR. BENDER: That is in the 7800, or I think it was, that you gave us earlier?

MR. STAROSTECKI: Yes, sir. These numbers should give you a much better perspective of what has been happening

within the last three years.

Now the Category 3 in the quality assurance quality control area resulted in additional meetings and corrective action on the part of the licensee, and it wasn't necessarily the licensee. It was more the sub-contractor's effort at that time, and we can address it in more detail if you wish. It has since been corrected.

The 1981 SALP again covered the period of July 1980 through June 30th of '81. The inspection hours again are indicated. Those again are the inspection hours that were committed during that time period of interest.

(Slide.)

The more recent SALP we conducted because it had had a six month delay or what we would call a gap, and it covered the entire calendar year. Rather than artificially continue the SALPs with an overlap or a little bit here or a little bit there, we had priorities in the regional office that required an awful lot of inspector effort outside this particular plant and we wanted to get a much better appreciation for what was really happening at Limerick.

We in fact did devote 1800 hours at Limerick, and I would expect the same, if not more, to be devoted to Limerick this year and in the years until they do load fuel.

(Slide.)

In 1984, or really next year's SALP, we will also be devoting more areas to look at. We have only looked at eight areas under the construction regime, but we recognize that foundation preparation is done that we no longer will evaluate it and we will starting looking at those activities that involve preparation for operation, the surveillance testing and the maintenance. So we will start adding categories to examine.

Yes.

MR. BENDER: The team that looks at the pre-operational testing, is that the same team that has been doing the inspection or is that a different group?

MR. STAROSTECKI: We have got a team of regional specialists that routinely look at pre-op testing at all plants under construction. Those people that are looking at Shoreham for last year will be looking at Limerick.

In addition, we will also have a resident inspector devoted to solely looking at that area at Limerick and he has been there since September. That is Mr. Wiggins.

A third team type effort that we will initiate is during this pre-opdrational testing stage we will also get additional inspectors to form a team from other sites and other branches in the regional office to supplement and give us another perspective on really what has been going on in terms of pre-operational testing and the readiness

for fuel load. I hate to give a drawn out answer, but that is in fact what we do.

MR. BENDER: Thank you.

MR. MOELLER: On the resident inspector, is he there primarily out of the region? He is not there out of headquarters?

MR. STAROSTECKI: No, the resident inspector is out of the region. He reports to the regional office and we communicate with him every day.

(Slide.)

In an overview sense, what have we found at Limerick? We found that PECo has an aggressive management that does pay attention to NRC concerns and the way we identify concerns and the way those concerns are corrected.

They have got an improving QA/QC program and they are increasing the amount of QA/QC manpower. That is an important item to us as they start turhing over systems to the operations staff and as they start doing more preoperational testing and start-up testing. They have had a good recognition of paying management attention to the quality of the plant.

They had an evident management review. It is not just being delegated to some third party, and they have site and corporate management involved in the decision making. Again, thisis the area where the construction deficiency reporting is very important to us.

Records are generally complete, well maintained and readily available. There has been increased engineering expertise on the site in the last 15 months and I would expect to see more as the plant nears fuel load.

The conclusion I have is straightforward. What they have done to date is very acceptable. We are going to continue to spend more man-hours to confirm that what they have got in place continues to work as they near fuel load. We are going to have as of last month two resident inspectors and I would expect the hours this coming year and until fuel load to average on the order of 2000 to 3000 inspection hours per year.

May I ask a couple of quick questions. Could you comment on the way in which the PE Company and the architect/engineer contract organization quality assurance activities fit together, and, secondly, could you say, or do you have any feeling for what the build-up rate ought to be in terms of QA since it seems to need to grow as the operator takes over operation of the plant?

Do you understand those two questions?

MR. STAROSTECKI: The latter question I understand is how do we determine the build-up rate.

MR. BENDER: Yes, because you said you were pleased with it and I thought maybe you had some feeling for how fast it ought to be what types of things are needed.

MR. STAROSTECKI: I will let our resident inspector give you some numbers, but basically they have recognized the need for more QA/QC effort. They have increased their budget for it and have been staffing up. They haven't been staffing up as fast as we would maybe like, but the exact numbers I don't have at my finger tips right now. I can get them for you if you would like in terms of the number of QA/QC inspectors they have got.

MR. BENDER: I don't personally need them, but it seems to me that it would be a piece of information that would be useful for evaluation purposes to know whether there is some kind of standard for build-up, what capability is needed and at what rate so that you could make some judgment as to whether an applicant is doing the job in the way he should be doing it.

MR. STAROSTECKI: There obviously is not a standard and we exercise that really as a judgment call based on the manpower loading that the utilities present to us as to what they are doing in terms of staffing on site. Our next question is all right, what are you doing in terms of QA staffing and inspector staffing on your part.

When you see how that is being done among various plants, you have some reasonable basis for judging it based on successes at some plants and failures at others.

MR. BENDER: What I am asking you is why don't

you make the comparison so that it is understood a little bettter?

MR. BOYER: I might add that that rate or number of build-up would vary with the number of construction workers at the site and what the ongoing activity is. So in making a comparison between one site and another you would have to be careful to also look at the construction activity.

MR. KERR: Does that response answer your question?

MR. BENDER: Well, I wondered if you would respond to the other question. What is the relationship between the applicant's inspection force and the architect/ engineer constructor's inspection force?

MR. KERR: Do you understand the question, Mr. Starostecki?

MR. STAROSTECKI: I understa. the question. Do you want our regional perspective of the issue?

MR. BENDER: Yes.

MR. STAROSTECKI: Let me get Suresh Chaudhagy. He is the resident inspector for construction and let him give you his firsthand observation since he is there every day.

MR. CHAUDHAGY. I am Suresh Chaudhagy. I am Senior Construction Resident Inspector at Limerick. The way that the QA/QC works at Limerick is the licensee has

an overall quality assurance audit function under which the architect/engineer, Bechtel had its own QA program and they also have a quality control inspection program.

Currently I believe there is a manpower of about 230 plus or minus a few people in the QA/QC program of the architect/engineer who do the first level of quality verification and non-conformance identification of all the primary inspection. Their work is monitored by the architect/engineer QA/QC evaluation which is under a private QA engineer of Bechtel and they conduct the audit and try to keep tabs on the problematic aspects of their commitment and the QA program is being fulfilled for Bechtel and for Philadelphia Electric.

The third level is Philadelphia Electric's own QA evaluation which in my person view verifies control over the operations of the architect/engineer's QA/QC evaluation. Presently Philadelphia Electric has 16 QA engineers assigned off-site which is about three or four more than they had last year. The reason in my perception is because the plant is nearing completion and they have more pressures to close the open items than before and they need to put more attention on all the items which have been left open for years and there is smaller work taking more attention from other people.

So they have increased their manpower. Currently

Bechtel has about eight QA engineers who are engaged in overall surveillance. So that is the effort that is being put into the QA/QC.

MR. BENDER: Thank you.

MR. KERR: I thought early on you said something about 230.

MR. CHAUDHAGY: It is 230 people are the qualty control engineers and inspectors employed by Bechtel for direction inspection and verification.

MR. KERR: Okay. Thank you.

Mr. Ebersole.

MR. EBERSOLE: Mr. Starostecki, in touring the plant I noticed something I would just like to ask you about as a generic sample. All plants have various modifications put on them as they go along. This happened to be a spreading room that I was in and they put in a tremendous manifolding system for sprinkler heads. It had obviously been added after the original design had been completed.

We looked that and then we looked at a few drains that we could find. Who is it that says when this room, and it had been gas protected, whenit is closed up tight and it is subject to manual initiation of the water system, how does one be sure that the room is not completely filled up with water the the floor collapses and all sorts of horrible things happen? Are you the party that looks at

at the compatibility of the drains to the sprinkers?

MR. STAROSTECKI: We would raise that issue and elevate it for resolution to NRR for consistency of approach.

MR. EBERSOLE: But you would raise it ---

MR. STAROSTECKI: I would raise it and identify it. For example, if the resident inspector raised it and says I have a concern with flooding in that room because there are drains and they are plugged because of the confinement requirements for the gas.

MR. EBERSOLE: With debris from thefire.

MR. STAROSTECKI: Yes, with debris from the fire and the resident can raise that on that issue or any other issue when the resident is due. That then is surfaced within the region for resolution with out specialists who apply the consistency throughout the region. If he is satisfied that, yes, this needs further evaluation, then another inspector from the region will come out and look at it. If we are not satisfied, then we go to headquarters and get NRR assistance and get a resolution and say we have done this and the licensee says this, and we think this ought to be done and we request your direction.

MR. EBERSOLE: So you follow this matter up.

I would like to ask the licensee, you have a process in place I guess that also looks at this even before he does. Am I assured of that?

MR. KERR: Do you understand the question that Mr. Ebersole is raising?

MR. BOYER: Yes.

MR. EBERSOLE: It is a system interaction problem. I heard the answer yes. That is all I need to know.

MR. KERR: Other questions?

(No response.)

MR. KERR: Mr. Starostecki, I personally found your presentation to be really thorough and quite informative. It also occurs to me, however, that the operation of this plant is some time in the future and that an operating plant may have more opportunities for presenting risks than one that is under construction.

I am curious as to what the region's evaluation is of Philadelphia Electric Company's ability to operate a plant safely on the basis of what they have observed in operating Peach Bottom plants? I note, for example, in a new release from headquarters dated April 5th, 1983, and I don't have a later new release to find out what happened to this, but the NRC staff proposed to fine the PE Company $140,000 for about four different items of compliance that were serious enough that the fines were proposed.

Now they went on to say that there were no safety items involved in here, but that these violations

demonstrate the need for improvements in the control of operational activities at Peach Bottom, and there are several of these.

Now my question is does this mean that PE Company really has difficulty operating these two plants, or is it to be expected that an operating company will get a fine like this every now and then just to sort of keep them honest or how do I interpret the PE Company's capability as a plant operator in the light of this rather recent experience?

MR. STAROSTECKI: Well, first of all, the enforcement policy sets a fairly high standard for escalated enforcement. For example, violations of limiting conditions of operation have to be considered for civil penalties. So on the one hand I immediately don't want to say that there is an immediate health and safety threat when we have a civil penalty.

It means that there is some trend developing or there are some serious matters taken coolectively that we are very distrubed about because it indicates potential problems, potential problems such as the degree of involvement of corporate versus site in the area of let's say health physics. Somebody has got to produce an ALARA program and somebody has to implement it if the two aren't talking together and some occurrences result where somebody gets exposed

unnecessarily, that creates a concern and we say that is a potential civil penalty.

I think you have to look at it in a little bit broadher perspective, and let me say the Philadelphia Electric Company has been operating Peach Bottom very acceptably. The Philadelphia Electric Company, however, also has been through a period of time diverting operational resources from Peach Bottom to staff Limerick. The NSSS's are the same, and I think that is a very smart thing to be thinking about years in advance. But you have gotten key people in the operating area from Peach Bottom who are now trying to help the Limerick Station prepare for its operations.

Doing that is going to be a pertubation on Peach Bottom, and our inspections felt that maybe some of that was having an adverse effect. In fact, we did find some violations that in our judgment warranted civil penalties.

MR. KERR: I still don't know whether you are telling me that PE Company is really an extraordinarily good operator and quite competent and that even so they can expect to get fines, or whether you are telling me that they have been in the past fairly good but they slipped up recently because they were trying to do too much. I am trying to understand what sort of judgment. This is an unusual situation.

We have looked at a lot of companies that have gone on line with their plants for the first time. PE Company is not in that category. It has been in this business a long time, and I therefore think we ought to able to learn something from their previous record about their capability to operate this plant.

In light of the fact that questions have been raised about this plant, its siting and other things, it seems to me it is fairly crucial that we have some confidence that they either will or are likely to be handle this. You people are closest to this and I am curious about what you think.

MR. STAROSTECKI: Let me, first of all, give some perspective on the civil penalty. We don't give civil penalties out randomly. The civil penalty the Peach Bottom facility received in April was the first one they had received since they started operation, and I think that is important to note.

The reason I did explain what I was trying to convey was the fact that there was a drain in my mind of resources away from Peach Bottom to Limerick. That combined with the status of the physical plant at Peach Bottom with the violations that we had caused us to recommend a civil penalty that was in fact imposed.

So I would say yes, Peach Bottom is a good operator,

and they have had to face the issue of how do they staff up for Limerick. They haven't completely drained Peach Bottom, but yet what they have done at Peach Bottom causes me some concern, but it is not unacceptable to what has happened so far.

MR. KERR: In your view are they overextended at present?

MR. STAROSTECKI: In my personal judgment, they are not overextended, no. I recognize that they have to staff up for Limerick. I also recognize that have a simulator. I also recognize they have a lot of experienced people at Limerick.

My concern, quite frankly, is more towards Peach Bottom because that is where the risk is. I am happy with what corrective actions they are taking at Peach Bottom and they have taken the right steps at Peach Bottom.

Now I would have to go back five or six years and talk to a lot of people five or six years ago who maybe have differing views of Peach Bottom before they started staffing up Limerick, and I am not prepared to discuss that.

MR. KERR: I am much more interested in the way things are now, but I see something here happened in April of '83 which would appear possibly to reflect on the corporation's capability. I don't know how much it reflects because I still don't quite know how to interpret these fines.

MR. STAROSTECKI: That was not one individual fine. There were a series of areas that we were concerned with.

MR. KERR: I agree. There were four different ones.

MR. STAROSTECKI: The combination of those areas was our way of indicating that there is a trend dweveloping that wararnted more corporate attention to resolve them before they became unmanageable.

In particular the one that sticks out in my mind, for example, is the one related to health physics and the problems that the Peach Bottom site was having with health physicists. We recognize that there is a need for strong corporate tie with the stations because it was corporate policy that set out how the work was to be done, and it was lacking in our mind and that interface I think since then has been improving.

MR. KERR: Are there other questions or comments?

MR. MOELLER: Well, in his bottom line on the final page he says that he believes Philadelphia Electric Company and its contractors and subcontractors are committed to and capable of building a quality nuclear plant. I guess I would have been happier if it said not just that they were capable of, but he was confident that they would build a quality nuclear plant.

How many nuclear plants are in Region 1? How many units.

MR. STAROSTECKI: We have got 23 operating plants, 9 under construction, plus Three Mile Island 2.

MR. MOELLER: And how many utilities are involved?

MR. MOELLER: On the order of 11 or 12.

MR. MOELLER: And where roughly would you place Philadelphia Electric?

(Laughter.)

MR. MOELLER: Well, are they in the upper 50 percent or the bottom 50 percent? That would help it.

MR. STAROSTECKI: Can I divide it 25/50/25?

MR. MOELLER: Yes, that would be fine.

MR. STAROSTECKI: I would say in the middle 50.

MR. MOELLER: Okay, thank you.

MR. KERR: Mr. Bender.

MR. BENDER: Is there anybody in the upper 25?

(Laughter.)

MR. STAROSTECKI: Yes. Region 1 has been in fact criticized by several people for being lenient because we do have some people in the upper 25.

MR. KERR: Other questions or comments?

(No response.)

MR. KERR: Thank you, Mr. Sarostecki.

MR. STAROSTECKI: Thank you.

MR. KERR: This bring us into any comments from the applicant at this point? Mr. Boyer or whoever.

MR. LOGUE: As the applicant's licensing engineer responsible for maintaining schedules for this license, I would like to also maintain schedules for the ACRS meeting.

Most of what I would be saying in this time frame has been said by our answers to your several questions. We have been working extremely closely with the NRC licensing people. We are in contact with them daily either in person or by phone. I am quite pleased that within the past six months we have reduced the open items in the SER down from something like 115 to the 24 that you have in the SER now.

As you were told this afternoon by Mr. Martin, they are now down to 16 open items, and it is our goal to reduce that down to zero as soon as we can.

We and the NRC have no argument about the open items that are lacking.

MR. KERR: Thank you, Mr. Logue.

Are there questions?

Mr. Moeller.

MR. MOELLER: I had one going back to something we were talking about earlier, and that is the capability of the off-gas treatment system and its capability relative

to the quality, the temperature and the moisture content of the incoming air to be treated. Of course, the off-gas system has a pre-heater recombiner after condenser hold-up pipe cooler condenser guard bed and so forth before the charcoal it absorbers.

Is the off-gas system at Limerick capable of taking steam in at 212 degrees and removing the moisture adequately enough so that the charcoal itself can remain efficient?

MR. KERR: Do you understand the question?

MR. HELWIG: Yes, sir.

MR. KERR: Does it matter about the amount of steam or are you just saying steam?

MR. MOELLER: Well, in his answer he can tell me if there is a limit.

MR. HELWIG: As a matter of fact, leading our steam generic efforts is a steam rise. We have a non-condensing second stage steam generic effort which provides motive force and dilution so we don't handle the moisture again in the off-gas system. So as such it is designed at its inlet to handle a steam and air mixture.

MR. MOELLER: Thank you, that is very helpful.

MR. KERR: Other questions?

(No response.)

MR. KERR: I declare a recess until 5 o'clock.

MR. KERR: The next item on the agenda is a presentation by the applicant. I see Mr. Boyer ready to lead off.

MR. BOYER: I am Vincent S. Boyer, Senior Vice President for Nuclear Power for the Philadelphia Electric Company.

In my introduction I will give just a brief overview of the site and some relative statistics pertinent to it and then tell you a little bit about our organization and then introduce the speakers who will talk on the individual technical issues.

(Slide.)

The site, as you are aware, the site is located on the Schuylkill River near Pottstown, 1.7 miles from Pottstown. The slide here shows the Pennsylvania/ New Jersey area. The Philadelphia Electric Company territory encompasses about 2340 square miles, roughly around about like this, including an area in the southern part of Pennsylvania which includes the Peach Bottom plant, the two boiling water reactors which are operating there and have been since 1974 on the Susquehanna River.

We are located 21 miles northwest of the Philadelphia boundary with the basic population of the Philadelphia City line between 25 and 35 miles away.

Pottstown lies at the intersection of two main

highways, Route 100 running east and west and the Philadelphia/King of Prussia/Pottstown/Reading Highway, Route 422 and the new bypasses or superhighways that have been created along with that.

(Slide.)

This slide gives the population distribution for 1970 and for 1980. You will recall that the plant was conceived in the late 1960s, 1969, and the projections were then forthcoming after the 1970 population. By the time made our preliminary safety analysis report, we had the 1970 data.

The projections for that time for 1980 are shown on the bottom of the slide, and you will note that tney were increasing from the 1970 level of 163,000 up to 180,000. However the actual 1980 data did not show that increase and actually showed a decrease. So that the ±56,000 was the latest census data.

Thus, the area has not grown as projected and this is typical of the entire area due to the movement of some industries and people to the Sunbelt part of our country.

The 1980 population was actually 13 percent less than projected at the time of the construction permit stage.

(Slide.)

The next slide shows some of the Limerick design features which recognize the population situation and location

of Limerick. Limerick was located in the northwestern part ofour territory, Philadelphia Electric Company's territory from the standpoint of reliability. We have Peach Bottom to the south and our Keystone and Commonwealth transmission which are mine-mouth plants. The power from those units comes in from the south. So for an overall system reliability, from a customer reliability standpoint, it was of interest to us to locate a plant in the northern part of our territory.

The Schuylkill and Delaware Rivers were examined for sites and it was decided because of the advantageous transmission routes which we had here at Limerick to construct the plant here and bring water over to it rather than to build the plant where the water was, the greater amount of water on the Delaware River and have problems in getting transmission out from the plant.

(Slide.)

This slide shows improvements in plant design over the standard BWR plant. Some of them have since been incorporated in BWR plants, but many of them are specific to Limerick.

The stronger reactor shiedl was one item that you people recommended at the time of your ACRS letter in 1971. We have increasd the design requirements for the main steamlines to be Class 1

seismic to be equivalent to ASME Section 3 Class 2 design.

We have installed loose parts and vibration monitoring equipment, the vibration monitoring equipment on all mamor pumps including even some of the balance of plant pumps, the condensate and boiler feel as well as those pumps you saw today on your tour which pertain to the ECCS systems.

We designed a refueling floor so that we would not move a cask over the spent fuel pits.

We have increased the structural strength of the reactor building above the refueling floor. It is a reinforced concrete construction so that it would take the impact of Leer jet and be essentially a gas type building to hold a few inches of water pressure.

We have provided a air recirculation system and air filtration system of some 60,000 cubic feet per second capacity to minimize radioactive releases. In other words, we have designed criterias that if we have an event, an accident or a failure of a piping system that we want to maintain the contents of the release on site.

We have changed to an ambient charcoal gaseous waste system to minimize the radioactive releases and to avoid any potential for hydrogen explosions and to eliminate any concerns for the handling of krypton which would have been necessary with the cryogenics system that was originally

installed.

We provided a ceiling system for all major pipes which penetrate the primary containment so that we can again maintain things within the primary containment and prevent leakage to the outside in the event of an accident. This consists of either double valves with a drain between them or stay fill systems on piping systems that are normally filled with water.

We have made certain changes to the ECCS systems which will be identified by a later speaker, including pumps of improved design for better net positive suction head.

MR. KERR: Excuse me. In what sense does No. 8 represent an improvement? I would have thought that would be a requirement.

MR. BOYER: Well, this is over and above what might be required on a double valve. We have made provisions with a vent between or back into a appropriate space so that we have additional assurance of non-leakage through boundary valves.

MR. KERR: Okay. So it is that and the capability of ---

MR. BOYER: Right. The requirements would necessitate a double valved isolation point, but we have gone beyond that to assure that there is no leakage through double closed valves.

MR. KERR: Thank you.

MR. BOYER: No. 10, the diesel generators, we have added four additional diesel generators of the inital designs. So we have four diesel generators per unit rather than shared diesels.

Early in the history of boiling water reactor operation the problem of intergranular stress corrosion cracking came along. At Peach Bottom we were just going through the construction of the reactor vessel and at some great pressure we insisted on the safe ends being replaced with non-sensitized safe ends. That was Peach Bottom. Limerick doesn't have sensitized safe ends on the reactor vessel.

We had the piping installed, the 304 steel piping for the recirculation system. The 28-inch piping hugg in the containment of No. 1 when some of the cracking started occurring in the systems of other boiling water reactors, including a four-inch bypass valve around the main recirculating valve at Peach Bottom.

So looking at this situation we felt one thing we did not want to have was a potential for any cracking in this piping system at Limerick, and we decided, since we had the time, to change the piping. So we ordered new piping of the low carbon steel and the proper grade to be immune to intergranular stress corrosion cracking. We took

out the piping which was hung there and have essentially trouble free systems.

MR. KERR: What evidence is there that cracking won't occur in the 316?

MR. BOYER: By the EPRI tests and other industry tests by General Electric. They have cycled and exposed various materials, including the 304 and the 316 and various grades of carbon to strong salt solutions and have shown that the low carbon 316 is many times, hundreds of times greater resistance than the piping which was in prevalent use prior to this test work.

To my knowledge, even with the work that is still being done today, Bob Zong, is that correct, that there is no change from that position, is there?

ME. ZONG: No.

MR. BOYER: We provided quality control inspection programs to cover balance of plants and certain systems which we felt were important to reliability or safe operation of the plant. We did this early. We called it an R&S system to which we gave a modified quality assurance program to. We didn't necessarily go back to all the certification of heats that we used in the manufacture of the material, but we have applied quality assurance programs to these systems to improve their reliability.

We are using an improved fuel design. This includes use of the core shall concept and a battery of fuel which is more resistant to failure, and in the ATWS area we have installed the System 3A which has 3A pumps with automatic controlled features.

MR. MICHELSON: Before you leave that slide, excuse me, Item No. 9 talks about providing ECCS pumps of improved design. Could you tell me just briefly what that consists of?

MR. BOYER: We will take a lower net positive suction head so that we can operate with a lower net positive suction head. Their motor pump reduces the net positive suction head required for the continued operation.

MR. MICHELSON: I noted in looking at the pumps themselves that they still use sealed water systems using the processed fluid itself and passing it through cycling separators for cleanup.

MR. BOYER: Right. That concern that you identified this morning will be addressed later by Mr. Shannon.

MR. MICHELSON: Okay. I was only going to comment that doing something about that would have been a nice improvement, too.

MR. BENDER: With regard to the stress corrosion cracking test work, is there a report which explains why

the test work verifies that the long life of this 316L is assured? You may not have it off the top of your head.

MR. BOYER: I don't have it. Bob Zong can speak to that issue, I am sure. It is probably due to the low carbon as well as the structure material.

MR. BENDER: Idon't want the explanation. I would like to know the report which explains it.

MR. KERR: Can somebody identify a topical report?

MR. BOYER: Bob Zong is moving to a microphone.

ME. ZONG: Bob Zong of Philadelphia Electric. I can't recite the number of the report at this time, but there are numerous General Electric reports available and several EPRI reports.

MR. BOYER: We will get you a list of those by tomorrow morning, if you would like.

MR. BENDER: If you can just get them to me. I don't care if it is tomorrow morning or not.

MR. BOYER: Okay.

end Simons

Hanson fols.

MR. EBERSOLE: A question before you leave that.

Mr. Boyer, in these 14 items I see a great deal of attention toward what you call safety-grade equipment.

I thought it would be extremely profitable to look at the interface equipment toward the thesis of reducing challenge frequency to emergency systems.

I have recently come back from Big Rock Point. As a case up there, they have not lost main feedwater in twenty years. Since a shutdown costs you probably over half a million dollars a day and every shutdown or trip is a challenge to safety systems -- especially, especially the scram system, I would have thought there would have been in place an intensive effort to improve interphase equipment to reduce challenge frequencies on the safety system.

A case in point would be, I don't want to see you hit HPCI or RCIC more often than you have to, or I don't want to see you have to avoid backlash because you can get the condensers. I don't like to see spurious turbine trips because of vibration meter mal-performance or whatever.

Do you have a program in place dedicated to reduction of challenge frequency of safety systems?

MR. BOYER: I would say that has been an on-going thing with us all along through the entire design. We have been looking for improvements. We have been looking at what problems arise at Peach Bottom, operational problems from

any LERs or experience down there. With each of those it is reviewed by our engineering portion to say, "Is this applicable to Limerick and what is the benefit, should we incorporate this at Limerick?"

Dick, can you tell us how many probably have been incorporated?

MR. MULFORD: My name is Dick Mulford, the project manager for Limerick.

Over the past several years, as Vincent said, we had an on-going program where we have reviewed bulletin circulars and information notices. We have reviewed Peach Bottom operating trends for incorporation, possible incorporation for Limerick.

We have reviewed LERs; we have reviewed SILS, PILS and now, most recently, SOERs, which are the INPO Significant Operating Event Reports.

(Laughter)

MR. MULFORD: To give you a number just how many of them were incorporated would be difficult. I do not know, Tom Shannon is here beside me, maybe he can cite some specific examples. I would say we have reviewed over a thousand documents and probably about, oh, may 50 of those, just as a round number, have been addressed at Limerick directly by changes in design.

So, with all the acronyms I think, yes, there is

definitely.

MR. EBERSOLE: What is the shutdown frequency at Peach Bottom, what has the experience been per year?

MR. BOYER: Well, I can say that Peach Bottom 2 and 3 hold the record for boilding water reactors in this country for capacity factors a year.

Ted, can you tell me the shutdown frequency, do we have a number like that?

Five or six a year.

MR. EBERSOLE: Five or six a year, I don't know --

MR. BOYER: Now, that is planned as well as -- the trips have gotten down to be very few and far between. Originally, we did have some trips. We made changes to certain equipment such as the water level black boxes that were giving us trips during the testing program, and so forth.

MR. EBERSOLE: Thank you.

MR. MOELLER: Back on an earlier slide -- and you don't need to show it again -- but you showed us the population has actually decreased, and that could raise the question -- and I realize you are only showing within ten miles, you are not showing your whole service area -- but do you have a need for the power from Limerick right now, or will it replace existing fossil fuel plants?

MR. BOYER: Yes. We have a need for certainly

the output of Limerick No. 1 now. We have a retirement program schedules for some older plants which are 40 years old, namely Southwark, Ediston Units and Richmond Unit which will take the capacity of Number 2 and provides for some growth at a modest rate of, say, two percent over the next year.

If Limerick No. 2 is not completed, we would have to start planning very soon for some capacity in the early 1990s.

MR. MOELLER: Thank you.

MR. BOYER: The next slide just shows the oversight view which you saw this morning, so I will not linger with that any more.

The following one shows the site layout and you principally took a tour of the site and are familiar with that. Unless there are any questions, we would continue.

I would point out that the Technical Support Center is at this location on the site and we will have a safety parameter display system and other equipment there to handle emergencies.

The Emergency Operation Facility will be in the Plymouth meeting, basically.

MR. EBERSOLE: Did you deliberately pick the transverse orientation of the turbine because of economies in design?

MR. BOYER: Well, this is sort of a duplicate of Peach Bottom. When we started out with this design, we were attempting to duplicate Peach Bottom to get, you know, the best plant we could for the money. That is the arrangement that we had at Peach Bottom.

The orientation of the units with the generators in the center follows that Peach Bottom design, does place the units where the turbine missile consideration is all settled by the actual location of the unit and just the site layout and the duplication of Peach Bottom was the use of this. We did not see anything that was harmful in the arrangement.

MR. EBERSOLE: It will bring us volatility in turbine inspection and in equipment inspection, I guess.

MR. BOYER: Yes. I don't know that we were aware of that at the time.

MR. EBERSOLE: Another thing. Let me ask about the general architecture design. I note that you have a substantial amount of equipment in secondary containment which, over the long haul, have to have been contaminated by some sort of an accident with some leakage, you must probably have to go in and maintain.

What is the rationale for putting maintenance-requiring equipment inside of secondary containment?

MR. BOYER: Can you name a couple?

MR. EBERSOLE: Switchboards, secondary panel boards, things of various sorts in there that must require some operator attention over the three-month interval following an accident.

MR. BOYER: Certainly, in the design of equipment you need to have, you want to shorten the cable run and voltage drop, and what not.

MR. EBERSOLE: Well, do you have a plan in place over the long haul, following some accident, to do in and do things inside the secondary containment?

I have an accident, I don't want a meltdown but I had some leakage into secondary containment. That is one of the classical ones.

Do you have a plan of action to go into that secondary containment and prosecute the business of maintaining equipment which must --

MR. BOYER: We would expect to do that. At Peach Bottom now, since 1974 it has not developed any extremely adverse conditions during its operation there.

MR. EBERSOLE: I know. But in any case, where you have secondary containment the question always arises, snall I put equipment in there which I have to go tend to.

MR. BOYER: But if you don't put it there, you have to put it outside that and try to get the longer pipe runs and face potential for difficulties.

MR. EBERSOLE: I see.

MR. BOYER: Moving on, the Advisory Committee on Reactor Safeguards met between November '70 and July of '71, aNd in August of 1971 wrote a letter recommending the construction permit for Limerick with some items which they thought should be given further attention.

These are the lists of the major items that I identified in going over that letter, and which have been accomodated in the design. Some upgrading of small piping; the main steam line sealing situation, and we either committed to put in the third valve or to install a sealing system. At that time we were thinking of a water shield between the valves. That did not materialize in the, and instead it is a leakage control system.

The biological shield to withstand the jet forces, as I mentioned in the previous slide. Certain design features of the ACCI pumps which will be addressed when Tom Shannon gives his presentation.

We used non-radioactive steam for the turbine -- seals. The recirculation pump trip because of the ATWAS concern we have incorporated that, including additional Gregor, and we have incorporated Alternate 3(a) which is an advance over what other plants are using today. That will be discussed with you a little later.

The inerting capabilities of the containment, just as

we have at Peach Bottom with hydrogen recombined at the outside, and the acceleration of .15 g for the seismic design when our review had indicated a 1.2 g as being satisfactory.

So, this does include some review on your part that a higher seismic design would be appropriate and that was incorporated in the design.

MR. EBERSOLE: Mr. Boyer, although that says they are recommendations from ACRS, that belongs to another era, in particular Item No. 1.

I hope I do not draw from that that piping below two and-a-half inches diameter is not given the benefit of seismic --

MR. BOYER: No, where appropriate.

MR. EBERSOLE: I see.

MR. BOYER: Instrument piping is safety graded. But this was one of the particular things that was mentioned in your letter.

Next I might digress now a little bit to talk about the Philadelphia Electric Company organization per se, and to tell you a little bit more about us. You have seen some of us today.

We have historically been a strong technical company. This probably ensues from the fact that our management have been engineers rather than financial or legal people.

At present, all the vice presidents of the company have an engineering background except for two, and that is the legal vice president and the corporate communications vice president.

We have had a history of being interested in industry activities, to participate in resolution of generic type problems or industry problems, and on this line I have shown some of the participation at the current time by our engineering forces.

You will see, it is spread through ASME, EEI, AIF, ANF, IEEE, and various miscellaneous committees, including EPRI. I do not think I have included all of the EPPI advisory committees on here, particularly in the area of fossil fuels. But these are the ones which relate to the nuclear field.

We have been a leader in system generation, in the utilization of the most modern types of generating equipment. We have hydroelectric, we have pump storage, we have high pressure and temperature fossil units, as well as of course the pulverized coal system. We have installed SO-2 removal systems of an innovative type on our Crombie and Eddystone facilities which is new to the industry, and we entered the nuclear era in 1960 with the commitment to own and operate Peach Bottom No. 1, the high-temperature gas-filled reactor.

This plant went in service in 1967 and operated for

seven years. Peach Bottom 2 and 3 followed on the same site, boiling water reactors went in service in 1974 and Limerick followed that with operation expected, with fuel loading, next year.

The personnel that were developed for our Peach Bottom No. 1 continued with the company in various capacities, being associated with Peach Bottom 2 and 3 and Limerick. Many of the people that are here in the management chart which I will show you were part of the original Peach Bottom No. 1 team.

Our chairman, our present chairman and our former chairman, Bob Gilks and Lee Everett, participated in the SIW design and in the FERMI design. We had five other engineers at FERMI in the early days of that endeavor.

This slide shows that we are also a participant in the BWR Owners Group activity which is pertinent to our nuclear field of endeavor. You can see that we have many of our engineers involved in these activities, serving in responsible positions on these committees to resolve issues that are before the boiling water community today.

The next slide shows the corporate organization, and I would say that I have drawn this one to show nuclear responsibility. It starts with the president and chairman at the top and then comes down to my block, which is the senior vice president responsible for nuclear power, and

then to the two blocks of the operational aspect and the design aspect.

This chart does not include all the divisions or sections, all the sections of the electric production department or the engineering and research department. I have excluded those that do not directly relate to the nuclear activities. So that this is a rather functional chart of the line of command for responsibility in the nuclear area.

I had the overall responsibility for the nuclear operations of Philadelphia Electric Company, both for the operational, operating plant and for Limerick which we have under design and construction and are discussing here today.

I think it is important that you know a little bit about the people who serve in those top three blocks, namely myself, Shield Daltroff and John Kemper.

I served in the position of vice president of Engineering Research Department from 1968 to 1980, with John Kemper as my manager. In 1980, the management saw fit to designate me as the senior vice president with responsibility for all our nuclear activities.

I coordinate and review the plans and programs with and through John Kemper and Shield Daltroff, the two vice presidents. I have no people in my department, per se, other than a secretary. So, I use the people in the Engineering and Electric Production Department as I feel

appropriate through these vice presidents or even directly with notification that I talked to somebody about some things I would like to have done.

I can do this because I have worked with these people in both departments, having been responsible for the Engineering Department for the last twelve years until 1980, and having served half my career in the Electric Production Department and having been the first superintendent of Pach Bottom No. 1. Many of the people that are in these blocks I have brought into the organization at Peach Bottom through my encouragement and discussions with me.

So, we are a very close group. John and Shields and I have offices adjacent to each other. There is hardly a morning goes by when we are not all in the office together if we are not out on other activities, that we don't get together to discuss the current nuclear activities and what is going on, what the problems are, and how we are working to resolve them.

We eat lunch together many times. A group of management at Philadelphia Electric have a table at a local restaurant and many times we are down there together, getting updated with Joe Cooney and some of the others about the current status of activities at Peach Bottom or at Limerick.

So, we are very close. I would say we are different from a lot of other companies, and so, this

organization works where it might not at other companies.

You will note that our quality assurance program is split. There is a quality assurance programs in the Engineering Research Department and there is one in the Electric Production Department.

When we first discussed this type of organization, there were concerns about whether we should integrate the two activities into one department and a discussion as to where it might be placed. But we decided to go ahead with t.. split organization, each department being responsible for its quality assurance program, and if it did not work, we were going to do something to correct the situation.

We have seen no reason up to the present time to change it.

MR. MICHELSON: May I interrupt for a moment and maybe ask you a question on your organization chart?

I realize that these titles are not always too indicative of what really goes on. Maybe you could tell me. I tell you what I am looking for, and then you can tell me where -- what I am looking for in your engineering work is a somewhat independent review function which views the work of a mechanical, electrical, and the other types of engineers from a little more of a systematic, a total systems, a total integrated viewpoint and performs a review of what these independent specialists are doing, and tries to integrate

systems to an overall concept.

Where is that kind of work being done in your Engineering Department?

MR. BOYER: I would say it is being done in two places, one, within the Engineering Department itself by having other people look at the plant designs and review from a systems interaction standpoint or an overall integration aspect. Two, more recently in the Electric Production Department by the designation of the Engineering -- the integrated Safety Evaluation Group which we are organizing in the Electric Production Department which Ted Ullrich will speak to shortly.

MR. MICHELSON: Isn't it a little late, though, to wait until you have set up an operating organization to verify that the design that has been going on for years and years now is really OK? I would think --

MR. BOYER: You are assuming that we have not been looking at it. I am saying, that is not the case.

MR. MICHELSON: No, I am sure you have and I was trying to determine where in your organization chart -- and I was looking at the Engineering side --

MR. BOYER: It is not a special group, but it is the function of the section head and the chief mechanic or engineer and his people to ensure that the review of Bechtel's design and that the individual engineer who has been making the

review has enough supervisory review and input from other areas, if necessary, to get the oveall desired results.

MR. MICHELSON: You apparently do this on a discipline basis.

MR. BOYER: Yes, we do.

MR. MICHELSON: But not on a necessarily integrated system basis.

MR. BOYER: Well, I would not say that. To cite you an example, perhaps, maybe we could address it. But if we are looking at a system design and its interface with other systems or how it affects reliability, whether there are improved ways we might do it, we just mentioned this review of all the outstanding inputs that we can get from industry, from manufacturers and what not and operating experience, the engineers who are responsible for this take this on at the direction of the supervisors in their own area.

MR. LOGUE: If I could interrupt, Vince, this will be discussed tomorrow morning by Mr. Mulford, our response to your concerns about systems interaction. This might be a place to discuss it then.

MR. MOELLER: Down in those two bottom blocks on the independent safety engineering group, what is the difference in LGS and DSA/DS?

MR. BOYER: That is Peach Bottom and Limerick.

MR. MOELLER: And then up where you have the box that says the superintendent, Limerick Generating Station, I presume then you could put in the superintendent for Peach Bottom, on the same chart?

MR. LOGUE: Absolutely.

MR. MOELLER: I mean, this same chart applies to both, to the total.

MR. LOGUE: Right. That will be covered in more detail by Ted tomorrow.

MR. KERR: Please, continue.

MR. BOYER: That concludes my remarks.

MR. KERR: Are there questions?

MR. BOYER: I might say, just to give you an example on the intergranual stress corrosion cracking situation, the question came up about Peach Bottom No. 2, whether we should take it off again. It had been off but because of some results in the industry there was a concern whether we had accurate readings.

It was my decision to take the unit off and conduct further examination, with consultation with the vice president of Electric Production.

So, I am involved in these things.

MR. KERR: Questions? Thank you, Mr. Boyer.

MR. BOYER: The next speaker, then, will be Joe Cooney. Joe is superintendent of the Nuclear Generation

Section. Joe joined the Peach Bottom No. 1 team back in the early 1960s, and we sent him to Orstord where he graduated from that course. He served as superintendent of the Peach Bottom No. 1 plant and is presently a member of the INPO industry review group for the Radiological Protection Emergency Preparedness Division.

Joe will discuss the Limerick offsite support activities.

MR. DALTROFF: Shields Daltroff. While Joe is getting ready, speaking about the organization I think it is important to speak about INPO. Let's just mention it, he left it out of the list. We have been very active in INPO. We take INPO very seriously as far as their comments on our operation go. We are active.

I would just act we get a lot of interchange with other utilities being in INPO. I think that is a very important aspect.

MR. BOYER: We also have Ken Ullrich as a director of INPO. So, that is an honor which we are pleased to make his services available.

MR. KERR: Mr. Cooney, I am trying to understand. You are starting at 5:15 according to this?

MR. COONEY: I have to check, sir. I am advised that is correct.

MR. KERR: And will therefore be finished at six.

(Laughter)

MR. COONEY: With your kind indulgence, I would like to take just a moment of your time and look back, and maybe help some of us.

MR. KERR: You have more than that, you have 20 minutes.

MR. COONEY: To just look back for a moment and discuss the fine that was brought up earlier.

I think it would be fair to say that Philadelphia Electric was one of the last utilities to experience a civil penalty. I think the civil penalty legislation was in place about three years, and we were one of the last to be fined.

I think it would be fair also to say that we were fined primarily for personnel errors. They were not programmatic, they were not management-type things. Our people do an awful lot in a year. They made procedural errors, they forget to do certain valving in most cases.

Finally, I would like to point out -- and Vince alluded to this, and this relates to the challenge frequencies -- we had upwards -- I can't remember the exact number of days but we were around up 250, 280, maybe even as high as 300 full, straight operating days at Peach Bottom last year, and on two previous occasions we beat the world record, free world record, for nuclear electric generation.

So, I would like to believe that the management aspect of the Beach Bottom Atomic Power Station has been pretty good.

MR. KERR: I think you are telling me that you just sort of got lonesome without having been fined.

(Laughter)

MR. COONEY: I thank you for that kind observation.

(Laughter)

MR. COONEY: My purpose today is to discuss offsite support provided by Philadelphia Electric Company's Electric Production Department.

The Electric Production Department underwent some reorganizational changes in anticipation of our operation at Limerick. You will see the results of these reorganizational changes as we progress.

The Electric Production Department is directed by Mr. Daltroff who was assisted by a manager and in company with the manager functioned as an office for directing the activities of the Electrid Production Department.

The Electric Production Department has seven divisions, three of which will be of primary interest to us today. I will take a moment to point them out.

The Maintenance Division, the Quality Assurance Division, and the Nuclear Generation Division. They will be

of primary interest to us.

Centralized maintenance of electrical and mechanical equipment, as well as instruments, has been with the Philadelphia Electric Company for many, many years. It has worked well. We believe it reduces the amount of technical and administrative effort that must be put in by the people working at the power plant.

We think it contributes to the safety of our operation and you will see that as we progress.

The first division I would like to speak about is the Maintenance Division. It is headed by a division-level superintendent who is responsible for all of the mechanical and electrical maintenance in the power plants of the Philadelphia Electric Company.

This division, in addition, has an engineering group that does maintenance engineering work, headed by an engineering charge. Ham Traver will be talking with you shortly and will give you much more information about the functioning of the Maintenance Division.

A very important maintenance operation is conducted by a group that administratively reports within the Engineering Department. This group repairs the instruments at Peach Bottom and will repair them at Limerick.

Again, this method of operating has been with the Philadelphia Electric Company since its earliest dates

and we find that it works quite well.

Gene Fogarty is here, and he is the engineer in charge of that group. He will discuss the workings of the instrument repair group with you shortly.

The second division that should be metnioned is our Quality Assurance Division. Our Quality Assurance people are located at Peach Bottom, assigned to the power plant. We have quality assurance people assigned to Limerick and at the corporate headquarters. The superintendent of the Quality Assurance group, Bob Morre, is scheduled to speak with you shortly.

The final division that I would like to speak with you about is the division that I head, it is the Generation Division. Reporting to me is the superintendent of the Peach Bottom Power Plant. Reporting to me also is the superintendent of the Limerick Power Plant. Graham Leitch. Graham will be talking with you later about his organization and his training program.

Also reporting to me is superintendent of Nuclear Services. Ted Ullrich. Ted has reporting to him engineers in charge or directors for emergency preparedness, licensing, radiation protection, nuclear training and a newly-formed nuclear safety group which has working within it the independent safety engineering group which we are forming for Peach Bottom and Limerick at this time.

We believe that these off-site grups significantly contribute to the support of the power plants,at the same time unloading them of administrative and technical burdens, the result of which is an overall improvement in nuclear safety.

MR. KERR: Pardon me. Before you leave, Mr. Ebersole has a question.

MR. EBERSOLE: If you will go back to your other slide for just a moment, there is some confusion to me. I could not but note the strange aspect of the Engineering Research Department. Who runs it and who runs the party that runs it?

MR. COONEY: The Engineering and Research Department is run by John Kemper.

MR. EBERSOLE: And who does he report to?

MR. COONEY: He reports to the president of the Company, John Austin, as was shown earlier.

MR. EBERSOLE: I see. I did not pick it up earlier.

MR. COONEY: So, here we have Mr. Daltroff taking care of Operations and Maintenance.

MR. KERR: He may have all the information he needs.

MR. EBERSOLE: I am in good shape.

MR. KERR: Don't overload.

(Laughter)

MR. KERR: Mr. Moeller?

MR. MOELLER: On your last chart you have R. W. Volmer as superintendent of Nuclear Taining. What is his background or her background?

MR. COONEY: I will cover that.

MR. KERR: Other questions?

MR. BOYER: To move into some of these explanations, Ted Ullrich will be our next speaker. He is the superintendent of Nuclear Services, as was described. He was superintendent of Peach Bottom 2 and 3 for a period of twelve years and was involved in the Peach Bottom No. 1 operation.

Ted is vice chairman of ANS-3, the Standards Committee and, as I mentioned, is on the INPO Board of Directors.

MR. ULLRICH: My purpose today is to discuss the five sections which report to me, the Nuclear Services Group. I will provide a brief description of the support provided by each of these groups during routine operations.

During your emergency planning discussion tomorrow, Roby Kankus will discuss the roles played by those groups in support of emergency management.

First, I would like to discuss the Nuclear Safety Section. The engineer in charge of the Nuclear Safety Section is George Hunger. George is a registered professional

engineer. He served on the Peach Bottom on-site review committee for ten years prior to assuming his position.

Mr. Hunger reports to me on routine matters and directly to the chairman of the Nuclear Review Board on safety-related matters. The Nuclear Safety Section is responsible for providing the independent safety engineering group function at Limerick and Peach Bottom and for providing support to the Nuclear Review Board.

The independent safety engineering group at Limerick and Peach Bottom will be a full-time dedicated group of engineers that will accomplish four categories of activities: observe operations and maintenance; investigate and assess corrective actions on reportable occurrences, violations and abnormalities; review operating experience information, plant modification, selected procedures and proposed tests and experiments, and make recommendations for improving plant safety.

The corporate group will screen information from INPO, such as significant operating experience reports and significant vent reports, and information contained in General Electric Company Service Information letters, NRC correspondence, internal reports, and meeting minutes of the Plant Operating Review Committee and Nuclear Review Board.

Safety concerns will be identified, investigated, reported to management and tracked for timely resolution. The corporate group will also provide technical backup to the on-site groups to assist investigations and reviews.

In addition to these three groups, there's a Peach Bottom/Limerick operating experience assessment committee. Mr. Hunger chairs this committee, which includes the operations engineers of both the Peach Bottom and Limerick plants and representatives from the Licensing Section, Nuclear Training Section, Quality Assurance Division, Mechanical Engineering, Electrical Engineering and the General Electric Company site representatives.

This committee provides a multi-disciplinary review of significant internal and external operating experience information.

The committee has been functioning since 1980 in support of the Peach Bottom operation. Participation by the Limerick Operations engineer and the review of information for applicability to Limerick has recently begun. We believe the independent safety engineering group function at Limerick complemented by the corporate and Peach Bottom groups and by the operating experience assessment committee, efficiently accomplishes the functions required by the TMI action plan in this area.

MR. MICHELSON: Before you leave that slide, let

me just get a clarification. On your corporate group, it appears that you don't really review LERs, for instance, but just depend on INPO to do all that, and then you look at INPO's output. Is that a correct appraisal?

MR. ULLRICH: The internal LERs are reviewed by our licensing group, which is the next group I want to talk about. The ISEG group at the site would review the LER if they feel it's significant.

MR. MICHELSON: I'm speaking now of other LERs from other utilities than your own.

MR. ULLRICH: I think that's correct. We depend on INPO and, to some extent, on our own internal reviews.

MR. MICHELSON: You actually receive the LERs from all the others --

MR. ULLRICH: No.

MR. MICHELSON: So it would just be happenstance to look at one, then.

MR. ULLRICH: We would look at the Notepad information, which we do now on a daily basis. And if you've been in the industry, the information transfer between nuclear power plants of the same type is very rapid. General Electric Company has a site operating engineer at each PWR, and he usually knows what's happening at the other plants on a daily basis. So within the BWR group, the information transfer is very rapid. And Notepad, if you've looked at, has everything

on it that you ever wanted to know and then some.

MR. KERR: On August 1 of 1983, a nuclear plant -- Monticello Nuclear Plant -- experienced a degraded voltage protection system actuation, and as a result of that, apparently it was discovered that this system had been designed improperly and also had been operated outside of the design and analysis that had been carried out by the licensing group.

What action has PE Company taken as a result of that, if anything, in examining your own system?

MR. ULLRICH: Well, the electrical problems -- and that particular event is an area of degraded voltage. In the operating experience assessment committee we have an engineering representative. That item would come up in that group for discussion and would be assigned to the electrical engineering representative for review to determine what needs to be done.

MR. KERR: I'm trying to get some idea of the lag in the system. Has something been done about that particular event? Do you have any idea?

MR. ULLRICH: I don't know, I haven't seen the operating experience assessment committee meeting minutes for September yet, but I doubt it.

But the degraded voltage problem has been with us at Peach Bottom since the last four or five years. There's

been an awful lot of engineering effort that's gone into it.

MR. KERR: There are two interesting aspects of this as far as I was concerned. One was the degree of voltage problem, but the other was the implication that an analysis had been done of our licensing group, and the operating group was unaware of the analysis. At least, the operations seemed to indicate that they were. So that there was not only a problem of degraded voltage as a communications problem, apparently there was a communications problem within the organization. Either one of these I think is something that one would want to do something about, if it existed within one's own organization.

MR. BOYER: We'll try and find where that stands in our organization for tomorrow morning.

MR. BENDER: Can we get some idea of how big these groups are? How many people are in them, what kind of people are they?

MR. ULLRICH: I gave you the credentials of George Hunger, who leads the group. The Peach Bottom organization at the present time has one person who is a licensed engineer at Peach Bottom, has been on site for about 10 years. We have two other people slated to enter that group in March at Peach Bottom; one is an STA coming off-shift after a three-year assignment on shift, an engineer, and the third is a one-year experienced engineer who is now in STA training.

He will complete that in March.

The corporate group will have one additional engineer. He is presently in certification training for Limerick. The Limerick group, we anticipate having three engineers; one individual is in certification training, was at Peach Bottom in 1968, transferred to Limerick in 1976 or so, and two others that are in STA training at this time.

We expect to have all these people STA-qualified but not working the job, if yousee what I mean.

MR. BENDER: What's their level of experience? Are they experienced engineers? Have they been in operations?

MR. ULLRICH: Yes. The lead people at each site have been in operation. The second man at Peach Bottom, of course, has had three years on shift as an STA, so he's got at least four or five years of operating experience. The individual in the corporate office is about a 10 or 12-year experience individual, not all of that nuclear. He's been in the nuclear business for about two years.

MR. MICHELSON: I'd like a clarification. Did you say there's just one person in the corporate headquarters that's doing this work?

MR. ULLRICH: Between George and one engineer assigned to corporate headquarters, yes.

MR. EBERSOLE: Something is called the Nuclear Safety Section set of words that I don't find anyplace but

here, yet when I look at the assignments in the details below your tree I seem to see that nowhere in there do I see integral safety assessment of designs -- the design evaluation concept in the integral context of nuclear safety.

And I detect that it's like INPO; it's oriented just to include the scope of operations and maintenance and not integral design assessment to where multiplicity of systems is involved.

MR. ULLRICH: We all serve that function in the operating plant for modifications which occur.

MR. EBERSOLE: No, I'm talking about in the original case.

MR. ULLRICH: No, I do not anticipate having this group review the original design --

MR. EBERSOLE: And where does that take place?

MR. ULLRICH: That takes place in Engineering and--

MR. EBERSOLE: Is there a group corresponding to this in Engineering?

MR. ULLRICH: I'll have to defer. I do not know.

MR. EBERSOLE: That looks at the integral design assessment for safety?

MR. BOYER: I think that relates to the questions that one of the gentlemen on the panel was --

MR. EBERSOLE: Yes, it's a function in the design context, however.

MR. BOYER: Yes. And my response would have to be the same with the additional thought that of course, Bechtel design team, the initiator of the design, or General Electric with Bechtel reviewing that design, does give some overview of the total possible effects of system interaction or the design requirements.

And Dick Mulford was going to address that a little bit more tomorrow.

MR. MULFORD: I plan to, in my discussion of systems interactions, heavily describe the design review functions as practiced by GE, Bechtel, and most especially by Philadelphia Electric.

MR. MOELLER: I would like to know how the corporate independent group and the Limerick group interact. For example, under Limerick you say that they review operating experience information. Now, does that include INPO's summaries of LERs?

MR. ULLRICH: The external information coming into the Philadelphia Electric Company is handled by our Licensing Section or by the corporate safety group.

MR. MOELLER: Not by both?

MR. ULLRICH: Not by both. And when I get to the next group you will see that bulletins, information notices and things like that are reviewed by the other group.

MR. MOELLER: So they do come together in that committee function.

MR. ULLRICH: They do come together in that committee function that's up there, the operating experience assessment committee function. That's when everybody gets together.

The ISEG at the sites are primarily reviewing information from the sites for applicability to the sites, and when the corporate groups find things that are of interest to the sites, passes it down. We do not want to burden the site personnel with reviewing all the extraneous information coming in to the Philadelphia Electric Company.

MR. MOELLER: I'm jumping ahead, but to what extent does the Peach Bottom station currently participate in the NPRDS system?

MR. ULLRICH: I think we are pretty much up to date. We have a --

MR. MOELLER: So they're pretty high.

MR. ULLRICH: -- a very large data base, and we are pretty close to having all the failures reported.

MR. MICHELSON: By saying you have a large data system, getting a large data base, what you're referring to is the engineering data portion of NPRDS. How about the experience portion of NPRDS where you're reporting your failures and things?

MR. ULLRICH: I'm saying we're up to date on our failures.

MR. MICHELSON: Up to date means since when?

MR. ULLRICH: Well, since about 1979 or 1980 when we started feeding this stuff to Southwest.

MR. MICHELSON: All your failures have been fed into Southwest?

MR. ULLRICH: All reportable failures have been fed in. We've not gone back and reviewed those which are NRC reportable which may be NPRDS reportable. We've not gone back and done that.

MR. MICHELSON: But essentially, NPRDS concluded that all the components in the engineering data base, if there are failures in those components they are reported to NPRDS?

MR. ULLRICH: That is correct.

MR. MICHELSON: And you're reporting all those failures?

MR. ULLRICH: No, I said we were reporting all failures which were reportable to the NRC.

MR. MICHELSON: All that are reportable to NRC, did you report then to NPRDS?

MR. ULLRICH: Right, that's where we are right now.

MR. KERR: Please continue.

MR. ULLRICH: Okay. The Licensing Section is headed by an engineering charge, Bill Alden. Bill held an NRc license for the Peach Bottom HTGR from 1965 to 1972, and operated that facility in the capacity of shift supervisor

during pre-operational testing, startup and initial commercial operation. Within this group there's a Fuel Management Group which is directed by Lou Rubino, professional engineer with a BS in mechanical engineering and an MS in nuclear engineering. The Fuel Management Group supplies data to the nuclear fuel supplier for use in designing fuel reloads, and reviews these core designs. The group is developing inhouse reload design capabilities which will be applicable to Peach Bottom and Limerick. The target date for completing this activity is 1985.

The group also provides core management operation, support analysis, material accountability, reactor core component analysis and replacement recommendations.

The fuel performance verification and testing programs for Peach Bottom are also done here. Similar support will be provided for Limerick when it becomes operational. We presently have 11 people in that part of the group right now.

The Special Projects Group is headed by Bruce Clark, a senior engineer who presently holds an NRC senior operator's license for Peach Bottom BWRs. He participated in the startup and commercial operation of Peach Bottom as the instrument and controls engineer, and later as the assistant maintenance engineer. He also serves as a Vice Chairman of

the Operating Experience Assessment Committee.

The Special Projects Group provides support on both sites by gathering information related to Licensee Event Reports, investigating these events, developing appropriate reports for submission to the NRC. The group reviews modifications, safety evaluations to identify safety concerns, and gathers and reviews industry-related information such as NRC information notices, bulletins and INPO Notepad information.

Applicable information is provided to the cognizant personnel both within the corporate offices and at the site. Bulletin responses are developed by this group.

The Special Projects Group also supports site personnel in reporting of failures to INPO NPRDS data base. At this time, the majority of the Limerick safety-related data base or engineering data base is ready for submission to NPRDS. It has not been put into the system. It's just a matter of getting on the computer and doing it.

MR. MICHELSON: You're aware, of course, that the scope of NPRDS is significantly changed. Are you agreeing to the new scope with intent to fully report under the new scope?

MR. ULLRICH: We have not seen -- we know that it's going to be expanded, but I haven't been made aware --

MR. MICHELSON: You haven't anybody working on the working groups at INPO that have been putting the scope together?

MR. ULLRICH: No, we have not. We've had people down there to make sure that we know how to input and use it, but not working on the scoping document.

The Licensing Group is directed by another senior engineer, Bill Birely. Bill is a registered professional engineer. He held an NRC license at Peach Bottom HTGR from 1967 through 1975, and served at the HTGR during pre-operational testing, startup, operations and decommissioning. Following decommissioning, he acted as a compliance engineer for the boiling water reactors.

The Licensing Group is responsible for the development and processing of almost all NRC submissions following receipt of an operating license. This includes license amendments, and responses to violations are identified by NRC inspection programs.

Major submittals in support of the fire protection program and TMI action plans are also processed by this group. The rule changes, regulatory guides and NUREGs and industry standards are periodically reviewed for applicability for the preparation of licensability and implementation at each site. This group routinely interfaces with the NRC staff, vendors, owners groups and departments within the company to insure adequate knowledge in implementation of requirements.

The combined group of special projects in the Licensing Group is about 11 engineers, and they switch between

groups as the work load moves around.

MR. KERR: Does that conclude your presentation?

MR. ULLRICH: No, I've got a couple more.

MR. KERR: And there are two more people after you and then Mr. Moore before 6:00 o'clock?

MR. ULLRICH: Well, you gave us a late start. I'll go faster.

The Emergency Preparedness Section is headed by Roberta Kankus. She held an NRC operator's license for the Peach Bottom PWRs from 1976 through 1980. Between 1980 and 82 she completed a two-year assignment in INPO in the Engineering Analysis Division.

Ms. Kankus and the corporate support personnel in this section are responsible for the overall development of the Peach Bottom and Limerick emergency plans and the maintenance and support of these documents. This section is responsible for coordinating these plans with off-site government agencies.

The plant site has an engineer assigned as a site emergency planning coordinator who is responsible for on-site planning activities. Ms. Kankus monitors and directs these activities through the station superintendents at the site. This group develops and maintains emergency training programs as well as the corporate emergency plan implementing procedures. It assists that plants at site in developing and

and maintaining the site implementing procedures and incorporates procedural changes into the emergency plan.

The section works with the site to schedule exercises and drills as well as to provide coordination and direction of the scenario development, control or evaluator selection, placement and training and critiques corrective action implementation. This section provides the off-site interface required for exercise and drill coordination and scheduling.

Interface between PE and the federal, state, county, municipal and local emergency response agencies is provided by this group with the assistance of a contractor, Energy Consultants. This assistance is in the form of plan development and training.

Section personnel interface with industry activities in emergency planning. Ms. Kankus has been involved in the INPO Good Practice development and in the writing of the ANS 3.8 standard in emergency preparedness. Section personnel participate in industry meetings and in emergency drills and exercises of other area utilities as controllers and observers.

(Slide.)

The Radiation Protection Section is directed by Walter Knapp. Walter is a chemical engineer with an NRC license for the HTGR. He gained knowledge and experience in the radiation protection field at Shippingport, Savannah River,

Oak Ridge and the Peach Bottom HTGR and PWRs. He's been active in his profession since 1959 and has held his present position since 1976.

Mr. Knapp has overall responsibility for the proper implementation of the radiation protection programs at Peach Bottom and Limerick. To accomplish this he provides technical direction and consultation to the senior health physicists and senior chemists at Limerick and Peach Bottom. He routinely observes site health physics activities, reviews appropriate health physics and chemistry procedures and conducts ALARA program evaluations in cooperation with the station ALARA coordinator. His experience and frequent visits to the plant help insure quality radiation protection of the chemistry program.

The Corporate Radiation Protection Section personnel provide support to each site by being knowledgeable of radiation protection practices at other facilities, investigating new instrumentation and processing, processing rad waste disposal site permit applications, providing instructors for specific training programs, for health physics supervisors and technicals, as well as the emergency response personnel, auditing of general employee training and general respiratory training programs, accumulating and training of radiation exposure data, health physics and chemistry data, performing internal dose calculations, reviewing

environmental radiation monitoring data and reviewing current and proposed regulations for application to each site.

(Slide.)

Robert W. Bulmer, the Superintendent of the Nuclear Training Section, is an Annapolis graduate and a professional nuclear engineer. He is a veteran of 23 years of service in the nuclear Navy. During two of these years he served as the deputy senior member of the Operational Reactor Safeguards Examining Board for the Atlantic Fleet.

Training programs routinely provided at both Peach Bottom and Limerick sites include non-licensed operator training, licensed operator training, health physics and chemistry technician training, as well as shift technical advisor training. In addition, general employee training and general respiratory training and special programs associated with first aid, fire protection and CPR are provided at both sides. A training coordinator at each site is responsible for these programs.

The Limerick Training Center is operated by General Physics Corporation. Dick Helt, a certified simulator instructor, is assigned to the Training Center on a full-time basis to provide liaison between the Nuclear Training Section and the General Physics Training Center staff. The Limerick has been extensively used by both Peach Bottom and Limerick personnel in the development of the symptomatic emergency

cperating procedures which are presently being used at Peach Bottom. The Limerick procedures are similar,and this training has been or is being provided to the Limerick operators at this time.

The main office group provides additional support to both Peach Bottom and Limerick. INPO accreditation of the Peach Bottom program is being pursued. PE Company was one of the earlier applicants for this accreditation. The group developed programs inaccordance with INPO criteria so that accreditation can be sought at Limerick as soon as the plant is operational.

This group provides a job task and needs analysis to provide the basis for training program development. To insure that training needs are being met, feedback from instructors, trainees and job supervisors are used to evaluate the program. The group is also responsible for instructor development, qualification and certification.

Any questions?

MR. KERR: I see none. Thank you, Mr. Ullrich.

MR. BOYER: The next speaker would be Ham Traver, who's Superintendent of the Station Section of the Maintenance Division. I see he has three charts there which describe the maintenance organization, and I leave it to you whether you want to perhaps glance at those and ask some questions, or whether you'd like him to give his spiel.

MR. KERR: How long is your spiel?

MR. TRAVER: Three minutes.

MR. KERR: Give it.

MR. TRAVER: Okay. My purpose is to discuss the Maintenance Division's participation in the operation of Limerick. I'm going to cover the off-site resources that support the station, the organization of personnel assigned to Limerick and the development and training of our highly-skilled tradesmen.

First, the off-site resources. As Joe Cooney explained earlier, the Maintenance Division is comprised of sections that perform functions on a systemwide basis. This chart shows the services and resources available from Limerick from the various centralized maintenance sections.

My group, the Station Section, includes the personnel assigned to Limerick.

(Slide.)

This organization is led by a supervising engineer who's responsible for both mechanical and electrical work performed by Philadelphia Electric tradesmen as well as vendor personnel. Its primary responsibility is to insure that maintenance activities are properly performed in accordance with priority, schedule and economic criteria developed by the operating staff.

To this end, he communicates with the engineer of

maintenance and the outage manager resports to the station superintendent. This supervising engineer is administratively responsible for the maintenance personnel assigned toLimerick. This arrangement facilitates interaction with off-site maintenance groups, and relieves the station staff of related duties.

Reporting to this supervising engineer is a maintenance supervisor and various group leaders. The technical support group provides technical direction, performs studies and interfaces with the central maintenance engineering section.

MR. KERR: Suppose that you need somebody for a rather crucial maintenance -- not routine, but abnormal maintenance -- at 2:00 a.m. some Saturday night. Who decides who is called on to do the maintenance?

MR. TRAVER: The first person to decide would be our supervisor we have on NRC emergency staffing coverage. Presently at Peach Bottom, we have a supervisor and another helper on 24-hour, three shifts a day, seven day a week on site at the station. One of his responsibilities is to respond to the station staff concerns, assess whether he's capable of judging what requirements are needed to meet those requirements, and if not,communicate with the proper individual in the maintenance organization to make that decision.

MR. KERR: So the answer is you don't know who would decide --

MR. TRAVER: Who would decide would be the supervisor who has an assistant foreman on duty at Peach Bottom, and in the vast majority of cases he might ask for help.

MR. KERR: Does he call on people on the basis of seniority or qualifications or who's around, or how --

MR. TRAVER: No. We normally do call people for overtime assignments, which I assume you're referring to at 2:00 a.m. in the morning who would likely be overtime, although we're anticipating at Limerick that we may well have full shift coverage with maintenance personnel.

We have 1)-shift, multi-shift coverage, at Peach Bottom presently, but if we're calling on overtime, he calls the appropriate trade which is determined by jurisdictional decisions that have been made through our maintenance experience. He knows the appropriate -- that's part of his responsibility to know the appropriate trade to call.

MR. KERR: But he doesn't have a choice as to who the appropriate individual is.

MR. TRAVER: No, he would not normally call any individual by name. I'm going to talk about the qualification of our tradesmen. They are quite capable of handling these

problems.

MR. KERR: So any one of them would be equally competent?

MR. TRAVER: Not equally but adequately.

MR. KERR: Thank you.

MR. MOELLER: In touring the plant this morning I gathered some of these tradesmen are also tradeswomen.

MR. TRAVER: Yes. In fact, that is the case. You did not see our tradesmen this morning at Limerick; however, you're quite right that we do have females progressing in our organization and gaining experience. Right.

Going on with the Planning Group --

MR. MICHELSON: You made a statement a little earlier that I want to be sure I understood. I thought you said that your maintenance organization was kind of separate from the operating organization at the plant and that it reports some other route. Did I understand that correctly?

MR. TRAVER: Yes, but we're stressing the administrative aspect of it. The supervising engineer at maintenance works very closely with the operating staff and they determine, as I mentioned, the priority of work to be done. They basically determine what is to be done and we implement that decision.

MR. MICHELSON: Well, is the supervising engineer a member of the Limerick staff?

MR. TRAVER: No, he's a member of the maintenance organization. He works for me.

MR. MICHELSON: He works at Headquarters.

MR. TRAVER: No, he's at Limerick.

MR. MICHELSON: Yes, but I mean he reports back to the corporate level.

MR. TRAVER: Yes, that's correct.

MR. MICHELSON: So the maintenance is done by people who are not responsible to the superintendent, then.

MR. TRAVER: Well, they're responsible to the superintendent which happens to be myself --

MR. MICHELSON: No, I mean they're not responsible to the plant superintendent.

MR. TRAVER: That's true, they are not directly themselves. We are as a maintenance organization. We're a service organization to the plant operating staff, and we try very hard to meet their requirements. But in fact, the individual is responsible to the maintenance organization, and if he does not perform correctly it's our task, which we pursue, to evaluate his performance and remedy his deficiencies and so forth and so on.

And was explained earlier, that, we feel, is an advantage because it relieves the Peach Bottom staff of that type of responsibility. We assure that we have the proper people on the job.

MR. MICHELSON: This is true at Peach Bottom as well as the Limerick.

MR. TRAVER: Yes, it is.

MR. DALLTHROP: This is historic with Philadelphia Electric. There are a number of what you might perceive as internal contract organizations -- the Maintenance Division is separate from the Operating Division in Electric Production and administratively does not report to the station superintendent. But the station superintendent has complete control over what they do and when they do it and the blocking out of equipment and so forth. The Maintenance Division only controls precisely how the work is done.

And that's true in a number of things. For instance, the Stores Division. For many companies, the storeroom would report to the station manager; in our case it doesn't. We have a centralized stores organization supplied as a service to the plant.

MR. MICHELSON: As an example, I'm thinking, for instance, the lubrication of vital equipment requiring numerous lubrication oils. Those decisions are all made, then, by the maintenance organization.

MR. DALLTHROP: No, no. They are made by the operating organization and they give orders to the Maintenance Division to perform the work.

MR. MICHELSON: Well, who looks at the background

of lubricating oils at various plants and how this might affect your plant and so forth? That's done by the station superintendent, then? How does other maintenance experience get back to your plant?

MR. DALLTHROP: Other maintenance experience in the Philadelphia Electric Company?

MR. MICHELSON: No, in other parts of the country.

MR. DALLTHROP: The same mechanism as we've described before, and generally through the plant organization, although the Maintenance Division itself attends appropriate EEI and that type meetings and so forth, where they bring that kind of feedback.

MR. MICHELSON: But does the station superintendent decide what lubricating oils are to be used and you take care of getting them put in, and they're changed out from time to time?

MR. DALLTHROP: That's essentially correct. The station superintendent, of course, uses the manufacturer's recommendations, and we have -- again, we have a central chem lab which is fully equipped to analyze lubricating oil and lubricating oil problems. There's an internal service organization which can help them with that kind of a problem.

MR. KERR: Please continue.

MR. TRAVER: Thank you. The planning group contains trade background personnel who estimate jobs, coordinate the

collection of scheduling data and interface with the central planning organization.

The electrical, mechanical and piping groups perform tasks in their trade-related categories, and provide supervisory and trade personnel as required for NRC emergency staffing.

The Contract Coordination Group is responsible to oversee work assigned to contractors and insure its satisfactory completion in accordance with established specifications.

We are certain this organization will perform well in Limerick because it's based on our experience maintaining Peach Bottom.

(Slide.)

We've been talking about the organizational aspects of maintenance. Now I'd like to cover the development, training and testing of our tradesmen. We believe tradesmen are most effective if hired or transferred at the entry level and thoroughly trained in maintenance practices. Accordingly, all tradesmen begin their careers as helpers, after passing an aptitude test administered by the Personnel Research Division.

During their time as helpers, these individuals are assigned to various groups or stations at which locations they assist tradesmen in the performance of their duties. This experience develops general mechanical skills and provides

the basis for an informed choice regarding their trade.

Throughout their period as helpers, these individuals' performance is constantly monitored and performance evaluations are used to aid in their development. At the end of their second year, helpers who have progressed satisfactorily are given a third class trade qualification exam. Qualified helpers are offered trades in seniority order.

(Slide.)

As can be seen by this slide, the number of formal training hours is a function of the specific trade selected. After work experience and formal training at the third class tradesman level, these individuals are given their second class trades qualification exam. After further formal training and on-the-job experience, they are eligible for the exam which qualifies them as a first class tradesmen.

MR. KERR: Is it true, as I would gather from this chart, that one as a bricklayer gets $400 but as an electrician only $280?

MR. TRAVER: Yes, that's true. There's quite a difference in the training itself, but that's correct. The amount of on-the-job type training and the nature of it is different than electricians --

MR. KERR: I don't follow that. I think I could reasonable electrical work but I sure can't lay bricks.

(Laughter.)

MR. TRAVER: Thank you.

MR. MICHELSON: Does the maintenance organization take care of the calibration and adjustment of all equipment?

MR. TRAVER: No, it doesn't, and the next speaker is going to touch on that subject.

MR. BOYER: The next speaker is Gene Fogarty, who who is engineer in charge for the Station Test Section of the Research and Testing Division of the Engineering Research Department. So here's another one where we have a group which is centralized with a special section at each location where their services are required.

Gene is a registered professional engineer, he's a member of the IEEE Nuclear Power Engineering Committee, serves as the Chairman of its Quality Assurance Subcommittee.

MR. BENDER: How many people are in it?

MR. FOGARTY: The whole division has 340 engineers and technicians.

MR. BENDER: What's in the systems test section?

MR. FOGARTY: The Systems Test Section -- in the middle section, the communications and relays has approximately 40 people. System control --

MR. BENDER: That's all I wanted to know.

MR. FOGARTY: Okay. I won't dwell on our role as a centralized organization. I will say that the Station Test Section, which is the second section from the right on the

chart, specializes in the maintenance of instrumentation and control equipment. We perform that function at Limerick, and I might add that in addition to having that responsibility during the operations phase, we are doing that for the total startup program, so there will be a continuity of effort through that time.

We also do the instrumentation at Peach Bottom, the Susquehanna Test Branch does that effort, and then the Recorder Test Branch is responsible for maintaining the instrumentation in our fossile fuel generating stations.

And finally, the engineering staff group, which has a group of engineers who specialize in the maintenance of instrumentation and control equipment and systems.

For purposes of time, I'm not going to dwell on the responsibilities of some of the other branches, nor will I dwell on the responsibilities of the two research sections which are shown on the left. I can answer questions later if you wish. But all of those are available to provide either direct or indirect support to the Limerick Test Branch or to Limerick Generating Station.

(Slide.)

MR. KERR: Mr. Fogarty, you have had this responsibility for sometime or is it not a new assignment?

MR. FOGARTY: I started -- I was there at the Susquehanna Test Branch during the startup of Peach Bottom

Units 2 and 3. I had to start up a fossile unit and then became engineer in charge of Station Test Section.

MR. KERR: What would you say is the most important thing about station tests that you have learned from Peach Bottom -- the Peach Bottom plant.

(Pause.)

MR. FOGARTY: I'm sorry, that is a difficult one to answer. I guess maybe the -- as we've seen regulations change, as we've seen QA develop, I think it's the evolution that we've had to go through ourselves both with our engineers and our technicians to grow in those areas. So growing with the technology, growing with the administration and complexity.

MR. KERR: Well, I wish you hadn't said that, because it sounds to me as if what you've learned is you have to do a lot of paperwork, and I thought maybe you had learned something that also might enhance plant safety. And I guess I'm not as sanguine about paperwork's importance to safety as some people.

MR. FOGARTY: I think we have learned a lot about plant safety. A question came up before about the tests of the plant safety systems, for example. We were very much involved with Electric Production counterparts and with our own friends at Electrical and Mechanical Engineering in changing Peach Bottom and going from the digital switches and differential pressure switches and that type of device to the analog trip units, which reduce the calibration periods and

reduce the surveillance test periods, for example. And reduce the scrams, that's one of the reasons why we were able to meet the 300-day runs that Shields talked about before.

MR. KERR: Have you encountered any situations in which you feel that you were perhaps forced by regulations or reg guides to over-test? By over-test I mean a situation in which testing perhaps enhanced or increased risk rather than decreasing it?

MR. FOGARTY: I can't think of any specific case of that. No, sir.

MR. KERR: Thank you.

MR. BENDER: One follow-on question. Why is there no Peach Bottom test branch?

MR. FOGARTY: I'm sorry, I went through that too quickly. The Susquehanna Test Branch performs that function at Peach Bottom. That branch has 63 people. In addition to providing the instrument tests, they also are a small version of the entire division. So they fill that function. They're physically located at Peach Bottom.

MR. BENDER: Thank you.

MR. KERR: I assume it's the Peach Bottom Test Branch that does the tests at Susquehanna.

(Laughter.)

MR. FOGARTY: I guess if we could have gotten that

contract we'd have bid.

(Laughter.)

MR. MICHELSON: Before you leave this slide, who prescribes the tests to be followed, or is this group actually formulating tests? Who prescribes the setpoints that you then go in and set?

MR. FOGARTY: Setpoints come from engineering information. Then the direction as to when tests are done is a responsibility of the Electric Production Department, as was alluded to earlier. Basically, they tell us what they want done and when they want it done.

MR. MICHELSON: I'm trying to get back to the station superintendent again. When I asked the question on lubricating oils, which was a mechanical question, the answer came back the station superintendent prescribes what lubricating oil is to be used. When it comes to a matter of setpoints, does the station superintendent prescribe setpoints to you and then you just carry them out?

MR. FOGARTY: Yes, especially for those instruments for which there are surveillance tests. The surveillance tests are approved by the station staff, including the station superintendent or his designee.

MR. MICHELSON: How about the cases where they are not prescribed, which is many, many --

MR. FOGARTY: There's design information that just

flows through and it's information that the testing engineering group -- station superintendent is aware of it.

MR. MICHELSON: Well, does it come from the station superintendent from another organization he has, or do you develop it and then turn it over to him and say this is what we ought to do?

MR. FOGARTY: For the -- for the basic non-safety related instrument, the calibration data is in the instrument index, which is a basic document which is available to all. There is maybe an implied kind of approval on the part of the station superintendent. In fact, it's an engineering document to which we adhere.

If the station superintendent can implement changes to the setpoints through other mechanisms if he so desires, then he would give us that direction.

MR. LEITCH: I'm Graham Leitch, the Plant Superintendent. We have an instrument and control engineer who reports to me through our technical engineer, who really establishes priorities, is responsible for the development of surveillance tests and bringing procedures to the Plant Operating Review Committee for approval. And in much the same way that the maintenance engineer -- which I'll describe a little bit further in my talk -- coordinates and prioritizes the maintenance activities, although the actual craft work is done by others, the instrument and control engineer establishes

priorities and those in which the work of the people that Gene supervises.

MR. KERR: Please continue.

MR. TRAVER: I'll briefly talk about the selection and training process, which we believe has a lot to do with our success as a service organization.

We require of our technicians that they have an associate degree in electrical and electronics technology. This year, which we believe is a reasonably typical year, more than 400 interviews were held on campuses for prospective graduates. From that number, approximately 70 were brought to Philadelphia for follow-up interviews and the end result was that 18 offers were made to the top candidates to fill the 15 openings in the division.

Our training program begins with a pre-evaluation or needs analysis. All technicians are trainined in electricity, electronics and process control theory. The extent of that training is a function of the needs analysis. In addition, we provide vendor training to select the technicians to assure that we have a sufficient number of competent technicians to maintain the plant systems.

Most of this training relates to the nuclear steam supply system instrumentation but there is a significant amount of training that is done on other plant systems and equipment. This training and the duration of this training varies anywhere

from three days to 16 weeks for one individual.

And finally, we do have a program, a three-step program to monitor the effectiveness of our training program. I won't go into that unless there are question on it. And we believethe results of this selection and training program is a competent, qualified technician.

MR. KERR: That completes your presentation?

MR. FOGARTY: Yes.

MR. KERR: Thank you, sir. Is Mr. Moore next?

MR. BOYER: Yes, Bob Moore is next. He's Superintendent of Quality Assurance, he's a mechanical engineer with over 30 years' experience in maintenance, operations and quality assurance, and for five years he headed the Maintenance Division as its general superintendent. He's been involved in implementing the maintenance programs for Peach Bottom and is or was a member of the Off-site Review Committee.

He's been in charge of Electric Production Quality Assurance Division since 1977.

MR. MOORE: As Vince said, my name is Bob Moore, Superintendent, Quality Assurance Division of the Electric Production Department. I've been in that position for the past six years and it is my position tonight to present the description of the quality assurance plan for operations of the Limerick Generating Station, and I will proceed with all

deliberate haste.

The Electric Production Department is responsible for quality assurance for all phases of the operation and maintenance of Limerick Generating Station. We have delegated that responsibility for quality assurance, or establishing the quality assurance program and for insuring compliance with the quality assurance program, to the Quality Assurance Division of the Electric Production Department with two or three exceptions of certain QA activities which are delegated to the Quality Assurance Section of the Engineering & Research Department, which I'll describe later in my presentation.

(Slide.)

This -- we're back at a simplified chart of the Electric Production Department to show you where quality assurance fits into the department. We are one of the seven-tiered divisions and we report directly to the Office of the Vice President, Electric Production. This gives us a position of independence from many of the organizations that we audit, and also, a direct reporting line to upper levels of management, both of which are mandatory for any quality organization.

(Slide.)

This is a simplified chart of the Quality Assurance Division, and organized under me I have three functional sections; a QA Engineering Section, a QA Auditing Section and

a Quality Control Section.

MR. KERR: Excuse me, from the chart I can't tell whether you have responsibilities outside of the nuclear generating area.

MR. MOORE: None outside of nuclear.

MR. KERR: Does Philadelphia Electric have any sort of QA organization for non-nuclear activities?

MR. MOORE: I am developing the program at present, so if you ask me next year I might not be able to answer you the same way, but we definitely are going to pursue as a division objective to apply certain elements of the quality program to our fossile operation from a cost-benefit, non-regulatory basis.

MR. KERR: Thank you.

MR. MOORE: And our training coordinator provides training or coordinates training for the personnel in the three functional QA divisions and coordinates QA/QC training for those organizations outside of Quality Assurance.

(Slide.)

The first section is the QA Engineering Section organized under the Engineer, QA, consisting of a group of quality engineers and quality assistants in corporate office and we supply a lead quality engineer to the Limerick startup activity, and he supervises a group of QC inspectors involved in the startup operation.

(Slide.)

The program, the quality program is based on 10 CFR 50 Appendix B and 10 CFR 71 Appendix E and the applicable regulatory guides and ANSI standards which we've committed to for Limerick.

Functions of our engineering staff are in the preparation of QA/QC plans, manuals and procedures. They review administrative procedures for the plant and for all support organizations and recommend approval or rejection. They review procurement documents for safety-related material. They prepare an annual status and adequacy evaluation of the QA program. They trend and track non-compliances, non-conformances and Licensee Event Reports, and they maintain a computerized status of all PECO commitments, keeping it updated and finally, verifying when those commitments are completed. And make regular and extraordinary reports to management, and they do QA/QC consultation with the various audited organizations.

The Audit Section, organized under the general supervisor, QA, has personnel assigned at Peach Bottom and Limerick and corporate office, each under an audit supervisor with a group of qualified lead auditors.

(Slide.)

The audit program is established to comply with the Limerick technical specifications and the applicable regulatory

guides and ANSI standards which pertain to QA auditing. I might say that the audit/surveillance program at Limerick is in large measure designed from the audit and surveillance program that we have developed over the years at Peach Bottom and have found it to be extremely satisfactory.

And in an effort to cut down time, I will not go through all these various activities that we include in our quality assurance plan. They are basically the same activities that we have at Peach Bottom, and it covers essentially all safety-related and important to safety activities in the plant.

(Slide.)

This is the Quality Control Section. This is a new organization in Quality Assurance. Up to this point in time, uality control in the Electric Production Department has been performed by the various implementing organizations. This did not satisfy us in Quality Assurance completely because it was fractionalized among various organizations and it did not give all of the independence that we would like to have seen. Management agreed to this assessment and it was decided that all quality control activities in Electric Production would be organized into a single organization which would be part of the Quality Assurance Division.

We are presently in the process of organizing this at Peach Bottom, we have a great deal of the program and

and inspection procedures done and we're about to start manning the activity. It should be functional by the end of the year. We expect to implement essentially the same quality control program that we are about to invoke at Peach Bottom.

MR. KERR: Could you give me a brief explanation of the relationship between QA and QC?

MR. MOORE: Well, QC is generally accepted to be part of QA. In some companies it is organizationally a part of QA and in other companies it is organizationally a part of plant staff. But it is a QA function, a subset, if you will. But it involves the real time on the job, physical observation of activities as they are going on. As contrasted with the audit program, which is a more after-the-fact review of program and documentation.

MR. KERR: It is difficult for me to see how -- maybe the words don't mean what they mean in English, but I would have thought quality assurance was an effort to assure that there not only has been but that there will be quality. If it only works after the fact to discover errors, it seems to me that's not a very good way to assure quality.

MR. MOORE: That's why you need a dynamic quality control organization that functions on real time in the trenches, and observes activities as they are being done.

MR. KERR: But that's not quality assurance.

MR. MOORE: That is not the classical auditing type of quality assurance.

MR. KERR: Okay, I'm just trying to understand what the words mean.

MR. EBERSOLE: May I pursue that a little bit? Is it that quality control is the active aspect of a broader topic, quality assurance. And it assures that the plant, in fact, physically matches the paper, not just that the paper matches the paper.

MR. MOORE: That would be true because the quality control inspectors are on the job and they have certain witness in the hold points that they must be there to inspect at that time because the job cannot proceed past that.

MR. EBERSOLE: Well, looking at the two divisions, is the broader amount of your work done in quality assurance or in quality control? Where's all the hard work?

MR. MOORE: Well, I haven't gotten into quality control yet, but --

MR. EBERSOLE: Doesn't that mean that you're in a paper world up to now? Not a physical world?

MR. KERR: That's a leading question, Mr. Ebersole.

MR. MOORE: I don't think I could answer that unless you insist.

(Laughter.)

But actually, quality control, as I said, has been

implemented by the various organizations; that is, each one had their own quality control group, rather than having a single independent group. And that's what we are proposing now, to have quality control taken away from the various operating organizations and put into a single independent organization.

MR. EBERSOLE: Well, will you collect the quality control documentations for your inventory?

MR. MOORE: We certainly -- part of quality control will be to look at documentation, but it will be -- in fact, that's my next spiel, if you will. That's some of the things they're going to do.

MR. BENDER: Would quality assurance include quality planning and quality standards?

MR. MOORE: Yes.

MR. BENDER: Are they set by your organization?

MR. MOORE: The quality program is established by our organization. We write the quality program for the -- both plants.

MR. BENDER: Well, I'm not sure that program and standards are quite the same thing. As a matter of fact, I guess I would have to presume that quality standards are often set by the engineering organization. Sometimes set by the operating organization. How are they fed into the quality assurance program? You don't create things abstractly.

MR. MOORE: We certainly do not. We don't create one new requirement. All the things that we look for are requirements. We are essentially compliance-oriented and we see that people have done what they are committed to. And as such, we have to be very familiar with the regulation. But we do not establish the quality requirements, say, in the design phase, if you will.

MR. BENDER: I suspect that all the quality assurance is not laid out in the regulations; there has to be some other place where quality guidance comes from, and I guess I've become a little confused by the conversation.

MR. MOORE: In what regard, sir?

MR. BENDER: Well, how often do you inspect -- what documents do you use for inspection, and what guidance is given to the quality control organization.

MR. MOORE: We would have to differentiate between quality assurance and quality control. Quality assurance people are going to be doing auditing, basically. And this is what I said was after the fact, and there are definite requirements in the ANSI standards on what you have to do; minimum requirements. And you have to -- it's in a large sense programmatic. You have to see that the program is effective, that there's no holes in it, and that people are properly implementing the program. Those are really the two things that the auditor looks at.

MR. BENDER: Well, you said quality control was a subset of quality assurance, and that means it's a subset of auditing, if I heard the previous definition. I'll quite.

MR. MOORE: They do generate paperwork, but it's much less -- it's real time and when they go out on a job and they look at an activity it's a go/no-go and they have acceptance, rejection criteria and that's it. If it's within the criteria it's a go, if it's not it's a stop.

MR. KERR: I'm disappointed, Mr. Bender. I thought you were going to explain this so I could understand it. You gave up.

MR. MOORE: There are a lot of people in this world that don't understand the difference between quality control and quality assurance.

MR. BENDER: It's an exercise for the student.

(Laughter.)

MR. MOORE: But I think I understand it in the context that we use it in the nuclear power industry. I think that what I've said here for quality control or what we propose to do is pretty much the way most operating plants are doing quality control.

To go on to the quality control --

(Slide.)

-- the functions of quality control are receipt and storage, inspection of safety-related materials, examination

and monitoring of radioactive waste and radioactive materials, preparation and shipment and maintenance activities witness, and the hold point inspections of maintenance and modification, review and monitoring of plant operation, inspection of refueling operations and health physics activities, the surveillance and testing program, almost daily examination of the fire protection and housekeeping activities, review of containment integrity conditions and verification of Electric Production commitments.

Quality Control also reviews procurement documents sent to vendors for safety-related materials and then reviews the documentation which comes back from the vendors to see if it is in compliance with the original order. They review maintenance and modifications, inspection procedures to see that the proper witness and inspection hold points are included, and they review the plant inspection procedures.

MR. EBERSOLE: In the matter of containment integrity, would you perceive that containment integrity would not be obtained by first going around and doing heavy inspection and maintenance on the containment before you did a pressure test? And that you should do on uncalled occasions, which would reflect the containment being in its natural state?

MR. MOORE: I think it certainly ought to be done randomly, and in large part --

MR. EBERSOLE: Is it? Is it done randomly without

running around and patching up the holes first?

MR. MOORE: If you're talking about primary containment, or secondary --

MR. EBERSOLE: Both.

MR. MOORE: Well, primary containment, of course, is determined basically by ILRT, and they have to be satisfactory, of course, to go into operation. I think the thing that we in Quality Control are going to be looking for are breaches in what was initially a good, firm containment. Particularly in the secondary containment, which is very easy to breach. People opening doors in air locks or taping switches or cutting a hole in a concrete wall. Those are the things we'll be looking for.

MR. EBERSOLE: How do you test the integrity of the -- let's say the control room environment against intrusion of foreign substances, including radiation?

MR. KERR: Is this normally a function of quality control?

MR. EBERSOLE: Well, I'll get to the point. If it is done by pulling a negative pressure in the control room -- would you consider that fulfilling a QA function when really you operate pressurized in the reverse mode?

MR. KERR: I hope you'll say no.

(Laughter.)

MR. MOORE: I think what we would look for is to see

that whatever pressure mode was required was, in fact, operative, whether it be negative or positive. We wouldn't establish that, but once it's established we would want to see that it was maintained.

MR. EBERSOLE: It was tested that way. All right, thank you.

MR. MOORE: The Quality Assurance Division interfaces with many, may organizations and sometimes we're thought to perturbate some of those organizations. We interface with the nuclear plant staff through review and approval of their administrative procedures, through a continuing program of audits and surveillances, by daily QC, inspections and monitoring.

MR. KERR: Mr. Moore, could you just sort of summarize this slide? It has a lot of information on it. What should I learn from it?

MR. MOORE: It means literally that we interface with a lot of people; almost everybody in the plant.

MR. KERR: Good, let's go to the next slide.

(Slide.)

MR. MOORE: And the next slide is really more of the same -- there's one thing I would like to say, though, and that's that lastly, we talk about interface with the Engineering & Research QA Section. We have delegated several key QA activities to that section. One is the quality

assurance of major modifications. That has been delegated along with the design and implementation of those modifications. So they have the whole package; we do not do that.

We've also delegated to them the supply evaluation and the maintenance of an approved evaluated supplier's list, and since we had delegated that to them we do review and approve their QA plan and we audit their activities to see if they are --

MR. KERR: Now, is that the Engineering and Research Division of QA, or the QA Division of Engineering & Research?

MR. MOORE: No, that is the QA Section of Engineering & Research, who really have the QA program during design and construction, and we've delegated these things which are normally operational QA things to them.

I think that really covers my point. Lastly, we interface with the nuclear power industry by participation in the ASME operation and maintenance committee, the EEI quality assurance committee, the joint utility/management audit group, attending utility QA and QC supervisory conferences, ASQC conferences and active participation in the notepad activity, review and comment on proposed regulations, ANSI standards and regulatory guides.

Finally, the program that we have at Peach Bottom and proposing for Limerick has not been generated in a vaccum; we've had a lot of input from various consultants in training

and program development. Among some of those are Management Analysis Corporation, Gilbert Associates, Chem Nuclear Incorporated, General Physics, Bechtel Power Company, Stone & Webster and Stata-Matrix Institute.

That concludes my presentation.

MR. KERR: Are there questions?

MR. MICHELSON: Would you explain what your participation in INPO/Notepad is?

MR. MOORE: Well, INPO/Notepad is an information-sharing system, and one area of that is quality assurance. There are different areas, so it's kind of discipline-oriented.

So we are looking at the items that are on the INPO/Notepad system that pertain to quality assurance. For information, and they're looking for responses from us. When we have a problem, we report our QA problem into INPO/Notepad and we'll get responses back.

MR. BENDER: How many times have you done that?

MR. MOORE: How many times? Not daily but quite often. In fact, I'm encouraging my people to give people responses because we expect them when we put something in there. And it's discouraging when you put something in Notepad and you only get one response. It doesn't help you much. It really requires participation of all the licensees if it's going to work.

MR. BENDER: How many questions have you asked?

MR. MOORE: Fifteen, 20. Some of have been helpful and some haven't.

MR. BENDER: Thank you.

MR. KERR: Mr. Moore, you said earlier I believe that you hope to implement a QA program for your non-nuclear activities but on a cost effective basis. What did you mean by that?

MR. MOORE: Well, in the fossile business since the -- really not regulatory response, the program, in our opinion ought to be prospective, and if it isn't, then we probably shouldn't do it. And probably --

MR. KERR: I'm trying to understand how you would measure cost effectiveness in respect to your business.

MR. MOORE: I guess we're looking at reliability and availability. If by implementing some criteria of -- a limited criteria of quality assurance to a fossile hydro plant, we assure that we can improve their operations. The question is degree.

MR. KERR: Would you say that the QA/QC program for nuclear is not very cost effective?

MR. MOORE: I'd like to take the Fifth Amendment on that one.

(Laughter.)

MR. KERR: You can't take the Fifth Amendment on

that because it costs too much money. And all of us are paying for it. If it's not cost effective then the industry and everybody else with some responsibility ought to be doing something to make it cost effective.

MR. MOORE: My answer is I really don't know, but I suspect it's not.

MR. KERR: It surely is expensive.

MR. MOORE: It is very expensive. But cost effective is --

MR. KERR: It seems to me that if the industry thinks it's not cost effective -- I know that a lot of burdens are being put on you, but I just think you ought to try to persuade whoever is responsible for this that it ought to be cost effective.

The benefits may be immeasurable in a different way, but there ought to be something coming out of this that's usable. The public safety, reliability, something.

MR. MOORE: I think they do come out. As to whether they are warranted by the cost, I don't know. The cost is great. I'm not even sure what the cost is, but I know it's great.

MR. KERR: Are there other questions? I'm going to declare a 10-minute break at this point. I think considering the time of the evening, it's time well spent.

end tk6 (A short recess was taken.)

MR. KERR: May we get started, please.

In the interest of more efficient functioning, I have decided as a committee of one that we will go tonight until about 8:05 or about 8:10 or something like that wherever we see a convenient cutoff. We will then finish what we have not gotten over tonight tomorrow by working right through lunch, for example, until we get through.

I have asked the applicant to rearrange the presentation tonight as is most convenient for him. So we will cover whatever material and in whatever order he wants beginning at this point and continuing until around 8 o'clock.

Mr. Logue.

MR. LOGUE: Our next speaker is Mr. Shannon who is scheduled for later on in theprogram, but because of the fact that GE people have to leave tomorrow morning, he will be speaking now on the scram systems. Tom Shannon.

MR. SHANNON: Good evening. My name is Tom Shannon and I am a Senior Engineer from the Mechanical Engineering Division where I am responsible for the design of the NSSS package at Limerick.

(Slide.)

What I would like to discuss with you at this time is some of the major improvements that we have incorporated into the Limerick design since its inception.

Now since that time we have had the opportunity to take advantage of almost 10 years worth of operating experience at Peach Bottom as well as extensive participation in industry activities to produce a design that we feel is far superior to the standard BWR-4 design.

(Slide.)

I will be talking about three topics this evening, our scram discharge volume design, our ATWS prevention and mitigation features and our ECCS and other related systems designs.

(Slide.)

We will start with the scram discharge volume design. Shortly after the Browns Ferry failure to scram event, GE and the utilities formed a committee to review the causes of that event and to make recommendations on design changes to preclude the reoccurrence of such an event.

These recommendations were subsequently endorsed by the Commission in their safety evaluation report and it is these recommendations I would like to go over with you at this time.

We will start by first briefly listing each recommendation.

Hydraulic coupling. This is direct coupling between the discharge volume and the instrument volume.

Continuously sloped piping.

Dual instrument volumes.

Redundant and diverse level instrumentation.

Instrumentation connected directly to the instrument volume.

Dedicated vent and drain lines with vacuum relief and redundant isolation valves.

What I would like to do now is to show have we have incorporated these recommendations into our design.

(Slide.)

If I am not speaking loud enough, please let me know. The Limerick scram discharge volume design consists of two headers, each with its own instrument volume. The instrument volume is connected directly to the header without restriction. This minimizes the potential for any water accumulating in the header without being detected by the instrument volume.

This is the direct hydraulic coupling that I referred to.

The headers as well as the instrument piping are continuously sloped downward to facilitate drainage.

I mentioned the dual instrument volumes. This enhances the reliability of the scram function in that water accumulating in either volume will cause a scram.

The redundant and diverse level instrumentation is

provided by having four float type level switches, two here and two here, and two Delta P type transducers to detect the accumulation of water in either volume, a total of six level devices on each volume.

This minimizes the potential for common mode failure defeating the scram function.

The instrumentation is connected directly to the instrument volume, not to the vent and drain lines. This minimizes the potential for water hammer induced loads damaging the devices.

We have dedicated vent and drain lines. The vent lines have been provided and the vacuum relief valve to better facilitate drainage after a scram.

Finally, we have provided redundant isolation on the vent and drain line to further assure containment integrity after a scram.

Are there any questions on this chart while I have got it up here?

MR. MICHELSON: Yes. I noticed on the actual physical installation up there that there is a blind flange at the end of the scram header, full sized. Is that a feature that General Electric prescribed?

MR. SHANNON: No, sir. That is a feature that we included in our design to facilitate flushing and cleaning out of the header.

MR. MICHELSON: I have a question first on the blind flange. Is that a double gasketed flange or a single one?

MR. SHANNON: That is a tongue and grove 600 pound flange with a single metallic gasket.

MR. MICHELSON: At the time the reactor scrams and for a period of time thereafter, which might be a matter of minutes or hours or days, that scram discharge volume is an extension of the pressure vessel and maintains the reactor at full pressure, for instance. There has been a question in the past about the possibility of that scram discharge volume failing physically and pipe rupture. It has been discarded on the basis of very low probability which was based on all-welded pipe and so forth. Have you gone back to think about the probability of a scram discharge volume failure, keeping in mind now that it is a flange connection instead of a welded pipe?

MR. SHANNON: Paul, you carrect me on this I guess if I am wrong, but Philadelphia Electric participated in the Owners Group activity in analyzing the probability of that failure and we have looked at our design and have considered the status ofour design in that analysis.

MR. MICHELSON: Have you changed your probability of failure when you went to the flanged connection?

MR. SHANNON: I would have to say no because the

flanged connection was part of our design almost from the beginning. We recognized based on our Peach Bottom experience that it was beneficial to have a flushing connection on the header.

MR. MICHELSON: If I recollect correctly, that probability of failure that you came up with was based on welded pipe and not on the flanges, and I think you will find it is always significantly higher for flanges than for welded pipe.

MR. SHANNON: Paul, can you add anything to that?

MR. TUTTON: My name is Paul Tutton with Philadelphia Electric Company. The probability was based on the actual design, but it was given in a generic manner to envelop the designs of all the plants in the BWR Owners Group. The specific concern from NUREG 0803 with things other than welded piping was with threaded connections. We do not have any threaded connections.

MR. MICHELSON: Do you have some basis for whatever number -- well, you came up I guess with a number that GE is using.

MR. TUTTON: Yes, sir.

MR. MICHELSON: Do you have some basis for that number, because I recollect the basis said pipe failure based on welded pipe. So you must have found some basis to believe that the flanged connection was equal or even

better than welded pipe.

MR. TUTTON: Well, this is not certainly the only flange in the reactor coolant pressure boundary.

MR. MICHELSON: It is sone of the very few, other than the vessel itself.

MR. TUTTON: Well, the vessel itself has ---

MR. MICHELSON: I don't want to pursue it too much. Did you have some data base upon which to decide what the probability of failure of that flange connection might be?

MR. TUTTON: Well, not specifically for that particular flange connection, no, sir.

MR. SHANNON: I think we considered a primary factor that contributed to that probability was the fact that this piping was pressurized such a small percent of the time.

MR. EBERSOLE: May I ask a couple of questions?

MR. SHANNON: Certainly.

MR. EBERSOLE: This design represents at least to me a sort of a curious inversion of common logic. You have 185 rods that open into a common receptor which is calibrated to receive the discharge of all 185 on a gallonage basis and subsequently prevent the leakage from each one, which is a standard leakage rate and possibly the gross failure of maybe one or more.

The thesis that appears to be represented here is that we don't want to bother to attempt to control the initial surge of water which is slightly radioactive and wait until confirmation of the scram to close the receiving volume and then close it after you have got a successful scram or leave it open if you don't on the grounds of the more important function being preserved, namely that you scram the reactor perhaps at the price of having to control a little leakage.

MR. KERR: Be patient. The question is coming.

(Laughter.)

MR. EBERSOLE: It is a very simple question and it is this. Do you as a utility or an operator critically consider and agree to this fundamental logic here that you should have a defined volume and defer the accomplishment of a more critical function as against a less critical one in the design logic of the system?

MR. SHANNON: I missed the second critical function that you are referring to.

MR. EBERSOLE: The second critical function is to stop the leakage that you might have later on. What you are doing is you are burning the system initially ---

MR. SHANNON: That is correct.

MR. EBERSOLE: --- in the zeal to stop a minor processing problem which is the control of radiation.

MR. KERR: If I could reword the question, it is why don't you discharge the water directly into the containment and avoid this problem?

MR. EBERSOLE: And then intercept the flow as you need to.

MR. SHANNON: Why don't we go to the suppression pool, or something to that effect?

MR. EBERSOLE: Only temporarily during the first burst when the greatest need is present.

MR. SHANNON: I would have to say in that respect that this design has existed for a long time. We have had it at Peach Bottom and our operating experience has been good with it and there just has not been a need to change it. We have not identified ---

MR. EBERSOLE: Then the logic of that is we are waiting for the need to develop, like it developed at Browns Ferry.

MR. SHANNON: Except that we have recognized Browns Ferry and we have made extensive changes as a result of that.

MR. EBERSOLE: That is a point patch.

MR. SHANNON: But there is not an identified deficiency that I can see with this design. It works and it has worked.

MR. EBERSOLE: It is just a logical problem. The

singular relief valve, if it hangs out ---

MR. SHANNON: No, sir, it is not a relief valve.

MR. EBERSOLE: The vacuum relief?

MR. SHANNON: The vacuum relief, yes.

MR. EBERSOLE: I was just going to say if that is closed, I presume because of the diameter that you have an unstable volume there and it will go to the bottom anyway and it won't be held up by suction. If the water is leaking in you will not in fact hang up the water because of the relief valve being closed normally?

MR. SHANNON: The reason you won't hang up the water is similar to what was postulated to occur at Browns Ferry. It is primarily that you have no restriction between the header and here.

MR. EBERSOLE: It is an unstable column that will go to the bottom.

MR. SHANNON: Beyond that for drainage, the vent line is dedicated. It does not interface with any other lines and the vacuum relief should you have an adverse influence for whatever reason is there to take care of that.

MR. EBERSOLE: Well, we would hope, for instance, a maintenance man wouldn't accidently someday pressurize a system with air or something.

Let me ask you a second question. What do you

consider to be the function of the common drain at the bottom when you might have individual drains and so separate the volumes and get half the rods independing from the other half?

MR. SHANNON: If you separate the drain lines, if you have two drain lines ---

MR. EBERSOLE: Right.

MR. SHANNON: Now what you have done is you have provided two boundaries for containment instead of one. So we feel one drain line is adequate and it is reliable and it has been proved reliable and it minimizes the number of isolation valves that have to be provided.

MR. EBERSOLE: As you can see, it compromises the dump volume.

MR. SHANNON: That is correct, but again we have made this modification such that we are not concerned with water held up here. We have got the dedicated vent and we feel that drainage will be more than adequate.

MR. EBERSOLE: Well, that is all I have to say.

MR. LOGUE: In fairness to this design, I would say we have not looked at other designs, but we don't have them in detail in front of us to make a complete evaluation of their merits either.

MR. MICHELSON: Will there be any in-service inspection of the scram discharge header?

MR. SHANNON: Paul, why don't you respond to that.

MR. TUTTON: The scram discharge volume will be subject to ASME Section 11 Class 2 inspection.

MR. KERR: Please continue.

Oh, I am sorry, Mr. Garcia.

MR. GARCIA: Mr. Ebersole got most of my question, but I would like to know how you would know if the vacuum relief valve were to fail?

MR. SHANNON: Keep in mind that the vacuum relief valve has no safety function. It is downstream of the isolation valves.

Steve or Bill, we do not have an indication on that vaive I believe, is that correct?

MR. BRADY: We do not.

MR. KERR: Excuse me. We need to get Bill's name and what he said.

MR. SHANNON: That was Bill Brady who provided that answer and the answer was no, that we do not have an indication on the vacuum relief device.

MR. KERR: Thank you.

MR. SHANNON: But, frankly, I don't see the concern.

MR. GARCIA: Then why is it there?

MR. SHANNON: It is there primarily because the

safety evaluation report recommended it. We felt that providing a dedicated vent line was more than adequate but it was not a major item to add to the design. Rather than to beg the question of why didn't you add it, we put it in, but we put it in downstream of the isolations where it is not a concern.

MR. KERR: Anything else?

MR. GARCIA: If the valve were failed, would it be picked up in maintenance?

MR. SHANNON: If the valve were failed, it would be picked up in maintenance and it would not adversely affect either the scram function or the reset of the scram.

MR. GARCIA: Thank you.

MR. SHANNON: With the additions that we have made to our scram discharge volume design, we feel that we have significantly enhanced the reliability of the scram function. However, recog zing the NRC's continuing concern, we committed and Philadelphis Electric commi ted in March of 1980 to incorporate in our design in our design what was known at that time as ATWS alternate 3A.

Since that time we have worked closely with GE and Bechtel to ensure that these modifications are in place prior to fuel load.

In addition, we have gone beyond the 3A requirements

and have incorporated what I think are some significant Limerick unique features in our ATWS design.

Let's go over ATWS design now.

MR. KERR: Excuse me. You indicated that you did this because of NRC concern. Did Philadelphia Electric have no concerns about ATWS?

MR. SHANNON: Philadelphia Electric was convinced at the time and remains convinced now that the scram reliability is such that ATWS mitigation features arecnot required.

MR. KERR: I don't understand. This is an ATWS prevention feature we are talking about, isn't it?

MR. SHANNON: No. What I am going to describe to you right now is not only prevention but mitigation. We have gone beyond prevention.

MR. KERR: What you have been describing is prevention.

MR. SHANNON: That is correct.

MR. KERR: And I got the impression that you said that you did this because of NRC concerns.

MR. SHANNON: No, sir. What I meant to convey to you was that the mitigation features we feel were not justified. But recognizing the continuing concern, we did go ahead and commit to install them.

MR. KERR: Okay. I will find out what the mitigation features are then I guess.

MR. EBERSOLE: Yes, I think that is important. After all, the pump trip is a mitigation feature.

MR. SHANNON: I am referring primarily to the standby leaking control system and its automatic initiation function. Yes, the recirc pump trip is primarily a mitigation feature. We committed to that back at the construction permit stage. That was a long-standing commitment. So I am not referring to that specifically.

MR. KERR: Okay. You are going to tell us now about -- I am sorry, Mr. Ebersole.

MR. EBERSOLE: No, I am done. Thank you.

(Slide.)

MR. SHANNON: The first thing that we have done is that we have lowered the MSID isolation set point from level 2 to level 1. This has the effect of allowing more heat to be transferred to the condenser and less to the pool during an ATWS event.

We provided an HPCI flaw split. Now the standard BWR-4 design includes a 5600 gpm HPCI system injecting through feedwater. Standard BWR-5 includes a 3000 gpm HPCI system injecting through core spray. What we provided at Limerick is a HPCI system that will take approximately two to three thousand gpm and inject it to core spray, take the balance of the 5600 gpm and inject it to feedwater.

What this does, it is does a number of things. One,

it keeps us out of a potential area during an ATWS event where you could see core power oscillations.

GE's analysis has shown that with our design there will be no power oscillations during an ATWS event. At the same time we have maintained the benefit of the HPCI injection through core spray of the BWR-5 design and yet had the full flow rate of the BWR-4 design. This is a Limerick unique feature.

We provided a redundant reactivity control system. This is logic that is redundant and diverse from the reactor protection system to detect that a transient has occurred, that a scram should have occurred, but in fact did not, and upon that recognition to activate the following features: Alternate rod insertion, which is a series of solonoid valves designed to bleed the air off of the scram header should the scram function be unsuccessful.

MR. EBERSOLE: Isn't that commonly provided prior to your design? Isn't that on Peach Bottom already, except for the sensors not on it?

MR. SHANNON: What we have done at Limerick is we have provided a total of eight ARI solonoid valves to increase the reliabilty of that function.

MR. EBERSOLE: Well, you have got that system however on Peach Bottom, not to the extent of having eight, but you certainly have two, don't you?

MR. SHANNON: We have a commitment at Peach

Bottom ot provide ARI. I would have to check to see.

Yes, Wes. Wes Bowers.

MR. EBERSOLE: I thoght it was part of the standard design to have alternate insertion with an energized solonoid system.

MR. SHANNON: Part of the standard alternate 3A design. I have not come to our Limerick unique features yet. What I am describing to you now is for the most part, except for the HPCI splint, the standard 3A design.

MR. BOWERS: Wes Bowers, Philadelphia Electric Company. The standard GE design includes two backup scram solonoids which are energized by the RPS logic.

MR. EBERSOLE: Theycall it ARI, don't they?

MR. BOWERS: No, it is called the backup scram.

MR. EBERSOLE: Oh, all right.

MR. BOWERS: In this case the alternate rod insertion system has two separate solonoids. They do the same function as the backup scram valves, but it is energized by a totally separate and independent logic.

MR. EBERSOLE: Thank you.

MR. KERR: Please continue.

MR. SHANNON: Recirculation pump trip. The recirculation pumps are tripped automatically in order to reduce power by reducing core flow.

MR. EBERSOLE: Before you leave that, how frequent are they tripped, on every scram or just scrams on demand from higher pressure or what?

MR. SHANNON: These would be tripped only in the event of an ATWS. They are controlled by the ATWS logic which is the redundant reactivity control system.

MR. EBERSOLE: Now the mode of trip. How do you trip them? Do you do it with circuit breakers, do you trip the excitation on the MG set or both of these?

MR. SHANNON: I am going to defer that to my electrical people. Ray George.

MR. GEORGE: Ray George, Electrical Engineering. We have placed two breakers in series in the feed to recirc pump motor. They will be tripped by a trip signal from the system.

MR. EBERSOLE: Well, the designer here is to get as rapid as possible rundown of flow as you can, and considering the WR squared in the system, you would get that by tripping excitation. Why didn't you use it?

MR. GEORGE: The excitation system is not a safety grade system. The breakers installed on the motor feed are safety grade.

MR. EBERSOLE: Is that the sole reason you went to breakers? What have you got, two safety grade breakers?

MR. GEORGE:

MR. EBERSOLE: Is Peach Bottom like that? I just want to know if this was a follow on from Peach Bottom.

MR. BOWERS: The Peach Bottom design is different. At Peach Bottom we trip the feeder to the MG set. In this case at Limerick we trip the breakers between the MG set and the pump itself.

MR. EBERSOLE: You have two breakers between the MG set and the motor proper?

MR. BOWERS: Yes.

MR. EBERSOLE: That is a costly system, isn't it?

MR. BOWERS: Yes. It was put in for another reason in addition to that, to protect penetration.

MR. EBERSOLE: Well, thank you.

MR. KERR: Do you approve of that, Mr. Ebersole?

MR. EBERSOLE: Yes, but I wouldn't have spent that much money on it.

(Laughter.)

MR. SHANNON: Likewise, feedwater pumps are run back to zero flow in order to minimize core power by minimizing the core flow and core subcooling.

MR. EBERSOLE: Isn't that staring at the devil and taunting him, losing water?

MR. SHANNON: The feedwater pumps are only run back when the low water level signal is not present. In other words, we have sufficient water before we run the

feedwater pumps back. If we have low level, we don't run them back. It is only on high pressure.

MR. EBERSOLE: So you run them back to maintain level. It is supervised by level, the run-back?

MR. SHANNON: The run back is to zero flow in order to reduce the power during an ATWS event. This is only during an ATWS event and only during the type of event where you have maintained level but you have high pressure. Two of you initiation signals for ATWS are low level or high pressure confirmed by APRMs not down scale. This is the latter situation where you have got the high pressure.

MR. EBERSOLE: Thank you.

MR. KERR: Where did that leave the devil?

(Laughter.)

MR. EBERSOLE: It left him all right.

MR. SHANNON: Finally, we provided automatic initiation of the standby liquid control system. This is a feature that is unique to Limerick. We are the only plant that has committed to this automatic system.

Now I am going to get into this a little more in a second, but I want to mention that with the exception of the HPCI flow split, what I have described here is basically the 3A design in NUREG 0460. We have gone beyond that and let me show you what we have done.

(Slide.)

The standard 3A design requires an injection rate of 86 gpm. What we have done at Limerick if we have provided a total of 120 gpm injection rate via three 43 gpm pumps. This does two things for us. Under an ATWS event it significantly reduces the time to cold shutdown from 22 minutes at 86 gpm to 15 minutes at 129. It also allows us to tolerate a single failure of any one pump and still maintain the full 3A capacity.

Althought it is not clear on this drawing, because I have not shown baffling arrangements, we also have the capability of surveillance testing each pump while maintaining the other two pumps available for injection. We feel this significantly increases the reliability and available of the standby liquid control system.

We provided two paths through containment in order to minimize the potential for a single active failure in that area defeating the purpose of the system.

Finally, we inject through core spray in order to take advantage of higher mixing efficiencies. Our mxing efficiency has been demonstrated to be in excess of 90 percent via injection through core spray.

MR. EBERSOLE: Do the pressure transients that you get at an ATWS exceed pressure transients from all other

other causes?

MR. SHANNON: No. They are below service level sea limits.

MR. EBERSOLE: I don't mean service level sea. I am talking about during the normal course of operation when you have turbine trips and so forth is the ATWS level much higher than these?

MR. SHANNON: Let me ask Bill Brady. He is probably the closes one to those pressure transients.

MR. EBERSOLE: Let me explain what I am asking the question. If you have an unusual pressure transient and you have breached the liquid system you have a very limited volume of poison and you can't afford to let it leak out.

MR. SHANNON: If that is your concern, we have analyzed the ATWS and we know what the pressure surges will be.

MR. EBERSOLE: The seals and so forth?

MR. SHANNON: Yes, sir, and they are well within our design capability.

MR. EBERSOLE: But is the ATWS transient still the higher transient you currently anticipate?

MR. SHANNON: I believe it is. Maybe I can get somebody from Bechtel.

Steve Vail, can you answer that?

MR. VAIL: I believe it is.

MR. EBERSOLE: So then it would be a rarely experienced or never experienced pressure transient and you would be riding on faith on the seal strength that it was strong enough to not invoke a liquid leak.

MR. SHANNON: When you say seal strength, what seal strength are you talking about?

MR. EBERSOLE: I am talking about the seals on the main coolant pumps or any other point where I might lost liquid.

MR. SHANNON: We have considered seal failures and the results of that say the seals will not fail and will not be degraded. That has all been part of our design.

MR. EBERSOLE: Thank you.

MR. SHANNON: I hope by this you can see that Philadelphia Electric has done much more than any other utility with respect to ATWS. We produced a design that we feel greatly enhances the reliability and safety of our plant.

MR. EBERSOLE: Most other utilities stand in horror of having automated inejction on the ground it is going to cost them umteen million dollars because of inadvertent iniation. How did you prevent this?

MR. SHANNON: We stand in horror of it, too.

(Laughter.)

MR. SHANNON: The assessment of your down time

should you inadvertently inject depending on systems available, it could be anywhere from two weeks to a number of months, and frankly we are concerned that we will inject at some point in time. We are doing our level best to preclude inadvertent injection, but the possibility is always there.

MR. EBERSOLE: Well, what is the difficulty of the clean up? It is certainly not from reactivity effects. It is just to get the system out from a corrosion standpoint?

MR. SHANNON: Processing time to get the sodium penaborate out gets significantly longer as the concentrations get lower.

MR. EBERSOLE: So it is the processing time.

MR. SHANNON: It is the processing time, that is correct.

MR. EBERSOLE: Thank you.

MR. SHANNON: The next subject I would like to talk to you about are some of the design improvements to our emergency core cooling and some related systems.

Now in this area I think there are three factors that have helped us significantly. One, as I mentioned previously, is our ten years worth of operating experience at Peach Bottom. Throughout the design process at Limerick we had in place a formal procedure to review improvements made at Peach Bottom for their applicability to Limerick.

In addition, we have consulted our electric production personnel almost constantly on our design to get their recommendations to incorporate.

A second factor is our detailed review of the system level fault trees for the Limerick PRA. This has allowed us to pinpoint areas of greatest potential improvement and in quite a few cases was intrumental in the design decision-making process. The standby liquid control features that I just went over with you are examples of things that have come out of our PRA review.

Athird factor that is worthy of mentioning is our extensive participation in industry activity such as the BWR Owners Group. It has provided a good forum both formal and informal for the learning of design improvements at other plants and allowing us to evaluate them for us at Limerick.

MR. EBERSOLE: On this subject of design improvements I want to open a little topic and I think this is the place to do it. You have in the past or someone has considered containment venting and has discarded that notion for this plant.

MR. KERR: Excuse me. Can we finish the ATWS issue before we get on that?

MR. EBERSOLE: I thought we were off the ATWS issue.

MR. SHANNON: We are done with the ATWS but I believe that the containment venting issue is scheduled to be addressed tomorrow.

MR. EBERSOLE: Oh, very well. I will take it up then. That will be fine.

MR. KERR: Earlier you said there were some mitigation features that you did not feel were necessary and it is still not clear to me which ---

MR. SHANNON: Automatic initaition and standby liquid control. The industry as a whole has said that it is not justified that we have to provide an automatic system. We sympathize with that position.

MR. KERR: Well, on what basis do you decide when you have done enough? I mean I realize that at some point you have to say I have done enough and I am confortable. How did you make the decision that you had gone too far when you put in the automatic initiation?

MR. SHANNON: Well, I wouldn't say too far. We evaluated our scram system and we are convinced that it is reliable and it is reliable enough.

MR. KERR: But how did you decide. That is what I am trying to understand. How did you decide when it got reliable enough?

MR. SHANNON: At the time that we had re-evaluated the Browns Ferry event and had committed to make those

improvements to the scram system as a result of that, I would have to say even before that time we felt there was a good reliability there.

MR. KERR: You mean you just did it on the basis of good engineering judgment and a gut feeling that this is a reliable system?

MR. SHANNON: No.

MR. KERR: I want to know how you made the decision.

MR. SHANNON: An extensive GE analysis was done to support the scram system reliability and it was based on those numbers.

MR. KERR: Well, saw some of those numbers and I can't believe that you took some of those numbers seriously. Surely you didn't.

MR. SHANNON: What can I say. I do believe those numbers are good numbers.

MR. KERR: What number do you use as an accepable scram system failure?

MR. SHANNON: We estimate our scram system reliability, and I shouldn't say estimate, but the analysis that GE has performed tells us that our reliability now is five times ten to the minus six per reactor year. That is the probability of failure to scram. That is well in excess of the NUREG 0460 which is three times ten to the

minus fifth.

MR. KERR: Yes, it is. And you believe that number?

MR. SHANNON: Yes, sir. That is a Limerick unique number that we have had generated.

MR. KERR: And then anything bigger than that would be too big in your view or would you be willing to live with something bigger than that?

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MR. SHANNON: When you say "bigger," you mean less reliable?

MR. KERR: I mean five to the ten minus six is a fairly low number, I think.

MR. SHANNON: Given our ATWS mitigation features, yes, I believe you could.

MR. KERR: Well, I thought you did not meet your ATWS mitigation features because --

MR. SHANNON: If you are talking about the automatic injection.

MT. KERR: Yes.

MR. SHANNON: That is the best thing we have done beyond everybody else.

MR. KERR: I appreciate that. I would applaud it. I am just sort of puzzled that you did in the face of not thinking it was necessary. I was trying to understand.

I am not trying to disagree with you. I am trying to understand on what basis you decide this system is good enough. And you are telling me, I think, that you use a quantitative calculated failure scram number, five plus ten to the minus six.

MT. SHANNON: That is correct.

MR. KERR: I was trying to then find out whether, if you became convinced that it really was not five times ten to the minus six but, say, was ten to the minus five,

you would think that it was too big.

MR. SHANNON: Let me try to put it in another perspective. I think part of the problem you are having is why did we do what we did in spite of the fact that I tell you we think our scram reliability is more than adequate.

Keep in mind that the ATWS rule has been coming out almost any month for years now.

MR. KERR: No, I am really -- I think I understand what you did because you had to satisfy the NRC, you wanted to get this thing on line. I sympathize with that pragmatic approach.

I am trying to understand because I don't know and I am not sure I know how to make the decision, so I am trying to understand how you did it, how you decide what number -- if it is a number -- is good enough.

MR. SHANNON: Engineering judgment. Engineering judgment, I guess I have to say that. If you are asking me if it were three times ten to the minus fifth, would we do the same thing? I guess we would have to evaluate it at that point in time.

MR. KERR: OK, so it is more engineering judgment than it is numbers.

MR. SHANNON: Well, the numbers support that judgment.

MR. KERR: OK, thank you.

MR. EBERSOLE: Mr. Shannon, I have a little report here. It says, "Failure of relay in reactor protection system on that G.E. plant."

It turns out that what happened, the classical thing, the varnish coating on coil melted out. It does not say in here whether that was due to a common excessive high voltage to more than one relay. It attributes the problem to the singular relay without noting that it might have been a potentially common-mode failure.

Do you have excess voltage protection on such matters as this to preclude common failure due to excess supply voltage or pressures or flows, or whatever?

MR. SHANNON: Where are the electrical engineers?

MR. SPROAT: Ward Sproat, Philadelphia Electric.

We have looked in the reactor protection system at common-mode failures of the associated relays. We have taken several steps. One is, we have identified several types of relays that have experienced some sort of coil failure which could possibly lead to a common-mode failure of the relays to drop out.

Those relays have been replaced. As far as the voltage is concerned, in the RPS system, those relays are fed from a dedicated 120 volt inverter system and there are two of them, one for each of the two RPS divisions.

We have a safety grade monitoring scheme on those

power supplies that is redundant and such that if either we experience an over voltage, an under voltage or an under frequency condition, that those safety grade relays will automatically de-energize the feed to that channel of RPS and give us a half scram condition.

MR. EBERSOLE: Thank you.

MR. KERR: A couple more questions, and then I will finish.

About three years ago, I understand, there was a loss of electric power to the SCLC pumps at Peach Bottom due to inadvertent pump breaker tripping. Am I correct?

MR. SHANNON: I am not familiar with that. Is there anybody who can help with that one?

MR. KERR: My information may be invalid, but this is what I am told.

There was an LER dated 10-10-80 and it is labeled, "Electric power loss to SLCS system caused by accidental tripping of a pump breaker. Power restored after receiving alarm."

MR. ULLRICH: Ken Ullrich, Philadelphia Electric Company, Electric Production.

That was during an outage, as I remember. The area that those pump breakers are in is very congested and, as I remember, the breaker tripped because somebody hit the contacter on the breaker, which turned it off.

MR. KERR: I guess the question is, is there some way of perhaps making that less likely in the future?

MR. ULLRICH: You immediately get an alarm in the control room and you can go right out and put it back in. So, it is a matter of plant configuration. You have to look at traffic patterns and things like that. You can provide batteries, or something on that order, to make sure that that does not happen.

MR. KERR: Have you done something about it in Limerick?

MR. ULLRICH: Other than ensure better housekeeping because that was the first time it happened in what, seven years of operation, and it was immediately corrected within a couple of minutes.

So, we did not perceive it as a significant problem, particularly since the plant was shut down.

MR. SPROAT: If I might just add -- Wars Sproat, Philadelphia Electric -- at Limerick the three stand-by electric control pumps are fed from three separate electrical divisions. So, if this occurance was to be repeated, somebody was to inadvertently trip a breaker, they would only trip one pump, there would be two left.

As Ted just mentioned, all three pumps have their control power continuously monitored such that as soon as one pump loses control power we get an out-of-service

alarm in the control room.

MR. KERR: So, your answer is something has been done about it, the design has been changed at Limerick.

MR. SPROAT: That is correct.

MR. KERR: Thank you.

Are there other questions? Thank you, sir.

MR. SHANNON: Let me go on to our emergency core cooling systems. In the area of automatic depressurization there are three Limerick-unique modifications that we have made that we feel enhance the reliability of our ADS function.

The first is that we provided a long-term safety-grade air supply to the ADS valves, such that in the unlikely event of a failure of the RHR shutdown cooling mode, coupled with the failure of the normal air supply to the ADS valves, we could guarantee long-term decay heat removal by virtue of the fact that we have this air supply.

We have committed to an ADS logic modification that will be in place prior to fuel load as a result of TMI Test 2k318.

Essentially what this is, it is a modification that will modify the ADS logic such that for those events where previously operator action was required for depressurization, that will no longer be required, it will be fully automatic. In addition, that modification will include an ADS inhibit switch for ATWS consideration.

As mentioned earlier by Dave Helwig, we provided school pilot solenoid valves on the air supply to the ADS to minimize its susceptibility to single failure.

I believe these are three Limerick-unique features.

MR. MICHELSON: The safety-grade air, that is redundant air to each of the five, I guess, ADS valves you have?

MR. SHANNON: Dave, do you want to speak to that, Dave Helwig?

MR. HELWIG: Dave Helwig, Philadelphia Electric.

We have provided an external safety-grade air supply system that really has teo separate parts, there are five ADS valves, as you mentioned. One header in one of the air supply systems provides three of those valves on one side of the containment, and the other header and other supply provides the two on the other side of containment.

MR. EBERSOLE: In view of the extremely critical nature of guaranteeing ADS -- well, not necessarily ADS but just DS, depressurization -- do you think that having only valves that are forced by air pressure to remain open under the pilotage of solenoids is a logical way to accomplish depressurization as compared to rotary double valves like PRVs on PWRs, systems which stay in place once you set them in position and then are recovered by a second application of

power?

MR. HELWIG: If I can take the other side of that. Having air-operated valves we have been able to provide a system that is extremely reliable.

MR. EBERSOLE: You are doing everything you can to guarantee the air supply.

MR. HELWIG: Yes, sir; we are.

MR. EBERSOLE: The next thing is not that you don't have air supply but to have mode-operated --

MR. HELWIG: I understand the question, to my knowledge we have not evaluated that.

MR. EBERSOLE: See, it is curious to see the logic of the PWRs, and note how they obtain to be depressurized.

MR. SHANNON: I guess I would have to go back to the same type of response I provided earlier, where the operating issue of these valves has been favorable and we have not evaluated all the general points.

MR. EBERSOLE: And here they would be in a modest environment because we have tail pipes on all the safeties.

MR. HELWIG: That's correct.

MR. EBERSOLE: So, they would not see a hard environment.

MR. HELWIG: They are qualified for the environment that they will see.

MR. BOYER: Sir -- Mr. Boyer -- would your situation require power to operate those valves that you say are present in the PWRs? I mean, is it a loss of power versus loss of air comparison?

MR. EBERSOLE: They have a mode-operated valve that open and shut the port.

MR. BOYER: But at least power to the valves.

MR. EBERSOLE: Oh, yes, but it stays in place without power once having been positioned.

MR. BOYERS: But I don't know that limitors have been that --

MR. EBERSOLE: Oh, no.

MR. BOYERS: -- great either.

MR. KERR: I would urge that we not redesign PORVs here.

(Laughter)

MR. MICHELSON: Before we lose our expert on the air supply, and you say it is a safety-grade air supply. Safety-grade to me means that they can perform this function on loss -- the desired function on loss of one of the air supplies. Is three ADS valves enough to do all you need to do?

MR. HELWIG: This is a long-term capability. We went into some considerable detail in the FSAR describing the situation. Each of our five ADS valves is provided with

a local accumulator to fulfill its immediate safety function for depressurization.

The supplemental air supply we are talking about here is the long-term depressurization maintenance, so to speak.

MR. MICHELSON: OK, your safety-grade air supply is supplying at all times, but it is pumping up five accumulators -- I mean, accumulators to the five valves.

MR. HELWIG: Actually, the diversity is much more considerable than that. In normal air supply there is a bottled air supply that provides backup to the normal air supply. But, yes, sir, the accumulators are in line --

MR. MICHELSON: Well, you gave me too much information. Now, what do you mean by "normal" air supply versus the safety-grade air supply?

MR. HELWIG: I am sorry I gave you too much information.

(Laughter)

MR. MICHELSON: I thought you had only a safety-grade system, one air supply supplying three valves and the other one supplying two valves.

MR. HELWIG: Yes, sir. The valves are normally supplied, as are all of our safety valves with a mode of air, a mode of pneumatic supply from our containers with the gas system. They pump back into the gas system.

MR. MICHELSON: So the safety-grade air supply, is it dedicated to dedicated compressors, one to three valves and one to two valves?

MR. HELWIG: I think we were kind of creative on how we approached this. We used bottle supply to nitrogen to provide safety-grade supply to the safety grade.

MR. MICHELSON: Oh, this is not an unlimited supply of gas.

MR. HELWIG: No, sir because we have a limited number of bottles located inside the secondary containment. We have provided connections to outside of the secondary containment in areas that are accessible under all conditions, all hypothesized conditions.

MR. MICHELSON: It is much more complicated than I realized, but I think I follow you.

MR. HELWIG: I can show you the FSAR.

MR. EBERSOLE: Don't leave this. Are these manifolded, these air supplies, so that the ADS are tied together, or do you have individual tests out to outside the containment so you can get at them one at a time?

MR. HELWIG: I believe I answered that the first time. We had three to five SRVs on one air supply manifold and two on the other.

MR. EBERSOLE: So, you got one out of two air supply systems in that context.

MR. HELWIG: Yes, sir. We will either have air to two or to three.

MR. EBERSOLE: By the way, the depressurization valves, there are just five that you can remote operate, or are there more than that?

MR. HELWIG: No, sir. We can manually remote operate all of the five of them.

MR. EBERSO:E: How many are there in toto?

MR. HELWIG: Fourteen.

MR. EBERSOLE: Now, you have 14. Can I go to your DC system and invoke that one of them has failed and then a second one, in the course of meeting the corresponding transient has unfortunately caused me not to be able to do depressurization because you had a one out of two logic?

MR. HELWIG: One of the SRVs failed.

MR. EBERSOLE: Say again?

MR. HELWIG: You said one of them failed.

MR. EBERSOLE: One of the DC systems has failed. How many ADS valves -- not ADS, how many depressurization valves have I failed with one DC system failure?

MR. HELWIG: None.

MR. EBERSOLE: None? Well, that is because of your dual solenoids.

MR. HELWIG: That's correct.

MR. EBERSOLE: They all have dual solenoids, or

just the ADS?

MR. HELWIG: Just the ADS valves.

MR. EBERSOLE: The oth ers have single solenoids. Is that right?

MR. HELWIG: Yes.

MR. EBERSOLE: Could you briefly describe the DC supply logic? I am just trying to find out if I have a DC bottleneck, if I have a one out of two logic --

MR. HELWIG: Why don't we find a DC engineer?

MR. CAMERON: John Cameron, Philadelphia Electric Company.

The ADS system is powered from Divisions 1 and 3.

MR. EBERSOLE: So, that is a one out of two logic.

MR. CAMERON: Yes, the five ADS valves are powered off both divisions. The remaining valves are powered off Division 1 power, and each valve is individually fused off the buses.

MR. EBERSOLE: Now, let's see, the five ADS are of division what?

MR. CAMERON: One and three.

MR. EBERSOLE: And all the others are off what?

MR. CAMERON: Division 1.

MR. EBERSOLE: And if I fail DC Division 1, how many valves have I got left?

MR. CAMERON: You have five.

MR. EBERSOLE: Because it is a double solenoid.

MR. CAMERON: Because it is a double solenoid.

MR. EBERSOLE: Of course, if I now have a secondary DC failure because of cascading loads on that DC system, I can't operate any of them, can I?

(Laughter)

MR. EBERSOLE: You have a one out of two DC logic, is that correct?

MR. CAMERON: Yes.

MR. EBERSOLE: So, this new, modern big plant has two critical batteries, in spite of the fact that numerically it has four.

MR. CAMERON: No.

MR. EBERSOLE: Well, the other two batteries don't do me any good if I can pinpoint a failure with two of them.

MR. CAMERON: With the other two batteries, our HPCI is on Division 2 and 4 with DC batteries.

MR. EBERSOLE: I understand that is high pressure. I am talking about depressurization. Let me just explain, it is real simple.

I have a DC system failure. That disables the bulk of the ADS function.

MR. CAMERON: No, that has not disabled any of the ADS functions.

MR. EBERSOLE: Well, sorry because of the dual solenoid logic it disables all the others that don't have the dual solenoids.

MR. CAMERON: But they are not necessary.

MR. EBERSOLE: That is true.

MR. CAMERON: We only need two valves for the ADS function.

MR. EBERSOLE: That is true. But now in the course of meeting the transient effects of that one DC system failure -- and there always are unless you can tell me otherwise -- if I sustain a cascade failure of the second DC system, I have had it; is that right?

MR. CAMERON: Excuse me, I missed that.

MR. EBERSOLE: If I sustain a cascading failure due to the transient effects on the second DC system, or any sort of failure of any kind, I have had it.

MR. CAMERON: No. First of all, the design criteria -- I think as you are aware of -- are basically a single failure. What you are postulating now is a dual failure of two separate safety divisions.

MR. EBERSOLE: The first failure is certain to occur. During the life of a plant, it is an operational support system. I am going to fail it sooner or later.

I will experience a transient when it fails unless we design the plant to be stable in the presence of that

failure.

MR. CAMERON: Okay.

MR. SPROAT: This is Ward Sproat again from Philadelphia Electric.

MR. EBERSOLE: This is my first exit, just the failure of that system.

MR. SPROAT: I understand.

MR. EBERSOLE: I have a transient condition, I will assume. I am not obligated to face it without redundancy in the context of having DC supply. Am I not correct?

MR. SPROAT: No. There is no such transient that could fail the second DC division.

MR. EBERSOLE: Well, I understand there is no direct overload, it is just that you now begin possibly things to challenge the viability of the Number Two system that is supporting you.

MR. SPROAT: Well, tomorrow in my presentation I am going to get into a lot more detail into our DC system design and reliability.

However, there are no interties between any of the divisions. Therefore, there is no mode of common mode failure that can occur between redundant DC divisions.

MR. EBERSOLE: Well, we will wait until tomorrow. I think it might be well to point out, though, that even if

you had a dozen batteries buried, it would be a one out of two logic, and that is what we have here. That is all I have to say.

MR. SHANNON: Can I go on?

MR. KERR: Please.

MR. BOWERS: Can I say one more thing? Wes Bowers. It is more than one out of two logic. In the case you are postulating we have the HVAC system. So, if you had the two failures that you are talking about in Division 1 and 3, you would have in effect failed ADS. But even if that failure created a transient you have your HVAC system in Divisions 2 and 4. They are totally adequate to take care of that transient.

MR. EBERSOLE: And you take high pressure feedwater without ADS.

MR. BOWERS: Yes.

MR. EBERSOLE: Thank you.

MR. SHANNON: Now I will go on to our LPCI system. The standard BWR-4 design includes four RHR pumps that are generally entered together into two loops, the loops injecting through the recirc lines.

What we provided at Limerick -- and I can show it better on this next slide -- is four direct injected pumps. They inject directly into the vessel, they don't inject through the recirc line, and they are not entered together.

What this means is, if you took a design basis accident in a standard BWR-4 and you imposed on tope of that a single failure, the worst single action failure, you could lose two of the LPCI pumps as a result of the recirculation line break. You could lose the other two LPCI pumps as a result of a single failure.

Given that same occurrence at Limerick, we would still have three LPCI pumps available, thereby would increase the availability, the reliability of that mode of operation.

MR. EBERSOLE: A comment. On the other hand, you have two pads to service the water, whereas you only have four. I see only two pumps there that transport heat to the sink.

MR. SHANNON: Let me go on, then, and I will answer your question in one second.

MR. EBERSOLE: All right.

MR. SHANNON: Was there another question?

In the area of shutdown cooling and suppression pool coils, our experience of Peach Bottom has led to two modifications at Limerick, and they are basically a pump discharge intertie and the improve decay heat removal capability.

If you will flip to the next viewgraph here. What I showed you in LPCI was one mode of operation. I did it with a simplified flow diagram. However, what we have added

in effect is a near tie between the two loops, such that either pump is available for shutdown cooling or suppression pool cooling. Either pump can pump through the heat exchanger.

MR. EBERSOLE: This is just a valve tongue?

MR. SHANNON: That is correct.

MR. EBERSOLE: So, that just did not show in the other drawing.

MR. SHANNON: That's right. The other drawing was simplistic to show you LPCI, show you the four loops. We do in fact have an intertie.

Beyond there, we provided a bypass around the heat exchanger with the appropriate throttling capability to provide better control of decay heat removal long term.

MR. MICHELSON: Before you leave that, before you leave that slide, what is your surface water pressure going to be relative to the pump discharge pressure when circulating from the suppression pool?

MR. SHANNON: Yes, our surface water pressure is low compared to RHR pressure.

MR. MICHELSON: So, you have not attempted to address the problem of tube leakage in the heat exchanger.

MR. SHANNON: Yes, we have. We provided a radiation monitor and the discharge of that heat exchanger --

MR. MICHELSON: What are you going to do with a radiation monitor?

MR. SHANNON: Isolate the heat exchanger.

MR. MICHELSON: How are you going to tell from a radiation monitor -- I assume it is on the outside of the pipe -- what the contamination levels are unless they are extremely high?

You are putting several thousand gallons a minute through the heat exchanger and you are trying to look at the leakage to the river with the radiation monitor on the outside of the plant?

MR. SHANNON: Ray, can you talk to the radiation monitor?

MR. GEORGE: Ray George. I believe our radiation monitoring system -- the heat exchanger takes a sample.

MR. MICHELSON: You are pulling a sample off the stream and analyzing the sample continuously.

MR. GEORGE: Yes.

MR. MICHELSON: OK.

MR. SHANNON: You have two monitors on each discharge line, by the way.

MR. HELWIG: Dave Helwig. You should also clarify that we are not talking about leakage to any body of water except on the heat sink which is vented in the river.

MR. EBERSOLE: If this has a single suction line with the usual two valves in it --

MR. SHANNON: That is correct.

MR. EBERSOLE: -- of this is inadvertently somehow closed, do you have an alternate mode of operation; right?

MR. SHANNON: Yes.

MR. EBERSOLE: You will bleed water through the --

MR. SHANNON: Through these valves to the suppression pool and go into suppression pool cooling.

MR. EBERSOLE: On these pumps also, do they take suction on the suppression pool in the LOCA mode?

MR. SHANNON: The RHR pumps can take suction from the suppression pool, yes. These are used for suppression pool cooling also. I have not show that on here for simplicity.

MR. EBERSOLE: These pumps are used for lots of things.

MR. SHANNON: That's correct.

MR. EBERSOLE: When you are taking suction on the suppression pool, do they perform the dual function of both cooling for the heat exchangers as well as the inventory supply for the reactor?

MR. SHANNON: You can do that, depending on the alignment of the system. In other words, you can take suction from suppression pool and route through the heat exchangers and go back to the vessel if you have a return path.

So, you know, there is a lot of flexibility within

the system.

MR. EBERSOLEL: Do you have a split path to go to either the vessel or the suppression pool?

MR. SHANNON: Yes, we can return it again. I am giving you some simple drawings. We can return either to the vessel or the suppression pool.

MR. EBERSOLE: How do you control that division of flow, do you have a three-way valve or what, two valves?

MT. SHANNON: Well, we would not split the flow. We would go either to the vessel or to the suppression pool.

MR. EBERSOLE: So, how do you perform both functions?

MR. SHANNON: What are you talking about, give me --

MR. EBERSOLE: Well, I have a LOCA that is so small that it is not big enough flow to provide sufficient coolant to cool the core.

MR. SHANNON: OK, but keep in mind that we have four pumps.

MR. EBERSOLE: Oh, you divide up among the pumps, then?

MR. SHANNON: You could operate any pump to provide makeup to the vessel. In addition, you have core spray pumps which I have not described to you because they are basically standard. We would use one pump for decay heat removal; if we were in a mode where we needed to be in

suppression pool cooling, we would use a pump for that mode, also.

MR. EBERSOLE: Thank you.

MR. KERR: How much longer would your presentation take if we didn't interrupt?

MR. SHANNON: I could do it in about two or three minutes.

(Laughter)

MR. SHANNON: All right, the next system I wawnt to talk about are RHR service water system features. Now, the RHR service water system consists of two loops. I have highlighted one loop just for clarity. Two pumps per loop, each loop serves as a heat exchanger for each unit.

Given that each heat exchanger is a hundred percent capacity heat exchanger, each pump is a hundred percent capacity pump.

What this arrangement means is that any one of four pumps can provide decay heat removal to either unit. We feel this is a significant advantage in terms of availability, reliability of RHR service work.

Do you have any questions on that one?

MR. KERR: Continue, please.

MR. SHANNON: OK. The last system that I want to mention is our safeguard piping fill system. Now, most BWR plants will include a fill system to maintain the ECCS pump

discharge piping salt water to minimize the effect of water hammer.

We have such a feature at Limerick, but in addition we have gone beyond the standard plant, we provided a seismically-designed systen and a quality-assured system. I think we are the only plant with that feature also.

This basically concludes my presentation. I just want to reiterate again that I feel we have taken advantage of a lot of operating experience at Peach Bottom; a lot of experience that produced a design that we feel is far superior to the standard design.

MR. MICHELSON: On the question of a fill system, have you looked at the actuary charge system and other systems you are trying to keep cold and analyzed the consequences of the operator for instance failing to close the discharge valve before he trips the pump and thereby emptying the system to a much greater extent than a -- filled system can make up for very quickly?

What do you do to prevent that sort of thing?

MR. SHANNON: To prevent the operator --

MR. MICHELSON: To prevent your pipes from going dry because he failed to close the discharge valve before he tripped the pump.

MR. SHANNON: Well, the discharge valves have -- you are talking about the injection valves, for instance, the

LPCI?

MR. MICHELSON: I am thinking mainly of return to the suppression pool, for instance.

MR. SHANNON: We have control room indication of most of the valves that you are referring to. We have also provided a low level alarm on the piping such that if he did it, we would know it. We would know that the system were not --

MR. MICHELSON: Let's speculate for a moment, though, that you are in the throes of a response to an incident and you lose off-site power.

Now the pumps tripped and the discharge valves can't go because there is no power to close them. What do you do to refill the system?

MR. SHANNON: First of all, we provided a redundancy such that if you lost one LTCI pump, for instance, as a result of that --

MR. MICHELSON: Both of them were cooling, all of them are cooling the pool. You are in the throes of an event and you had to take a lot of heat out of the pool, and you are running along here with all of them cooling the pool and you lose offsite power, or you lose on-site power to the pumps.

MR. SHANNON: You are on the fill system, you fill the line back up again.

MR. MICHELSON: You don't have an automatic restart when the power comes back on site.

MR. SHANNON: For the fill system?

MR. MICHELSON: No, no, for the pumps. See, the pumps generally will restart automatically when the on-site power comes on.

MR. SHANNON: No, we do not have automatic restart features, no.

MR. MICHELSON: You don't?

MR. SHANNON: Right, Ray?

MR. GEORGE: Will you repeat your question, please?

MR. MICHELSON: You lose off-site power while the RHR pumps are running, and then the diesels come on. Do the RHR pumps restart automatically?

MR. GEORGE: The RHR pumps will restart automatically only if there is an accident signal present, a LOCA signal present.

MR. MICHELSON: Okay, that could be high drywall or high containment pressure, for instance.

MR. GEORGE: High containment pressure.

MR. MICHELSON: Which you are likely to have if you have a hot containment and you have been trying to get it cooled down, and so forth.

MR. GOERGE: A slow reactor pressure.

MR. MICHELSON: Yes, which you would also have

because you are to repressurize the reactor, that is how the containment got hot.

I guess it is not worth pursuing. But you do have a little problem, the keep chill is not very big for those kinds of situations.

MR. SHANNON: I have an answer to an earlier question, if you want me to give it now or I can give it tomorrow, concerning the steam line water breaks in compartments.

MR. KERR: I want you to give it tomorrow. Any other questions on this topic?

We will recess until tomorrow morning at 8:30.

(Whereupon, at 8:20 p.m. the subcommittee meeting was adjourned, to reconvene at 8:30 a.m., Saturday, October 8, 1973.)

CERTIFICATE OF PROCEEDINGS

This is to certify that the attached proceedings before the NRC COMMISSION

In the matter of: ACRS SUBCOMMITTEE ON LIMERICK GENERATING STATION, UNITS 1 & 2

Date of Proceeding: Friday, October 7, 1983

Place of Proceeding: Pottstown, Pennsylvania

were held as herein appears, and that this is the original transcript for the file of the Commission.

Suzanne Young

Official Reporter - Typed

Suzanne Young

Official Reporter - Signature

REGION I PRESENTATION

LIMERICK GENERATING STATION

Owner: Philadelphia Electric Company (PECo)

*1960's - Peach Bottom Unit 1 (HTGR)

*1/68 - Construction of Peach Bottom Units 2 and 3

*6/74 - Construction Permit for Limerick Units 1 and 2

AE/Contractor: Bechtel (San Francisco)

*Built Peach Bottom and Susquehanna (same units except Peach Bottom has Mark I Containment).

*Randon sample of 1164 Technical Professionals shows 44% have previous nuclear experience.

*Estimated that 95% of QA/QC staff has provided same function at other nuclear units.

INDEPENDENT EVALUATIONS

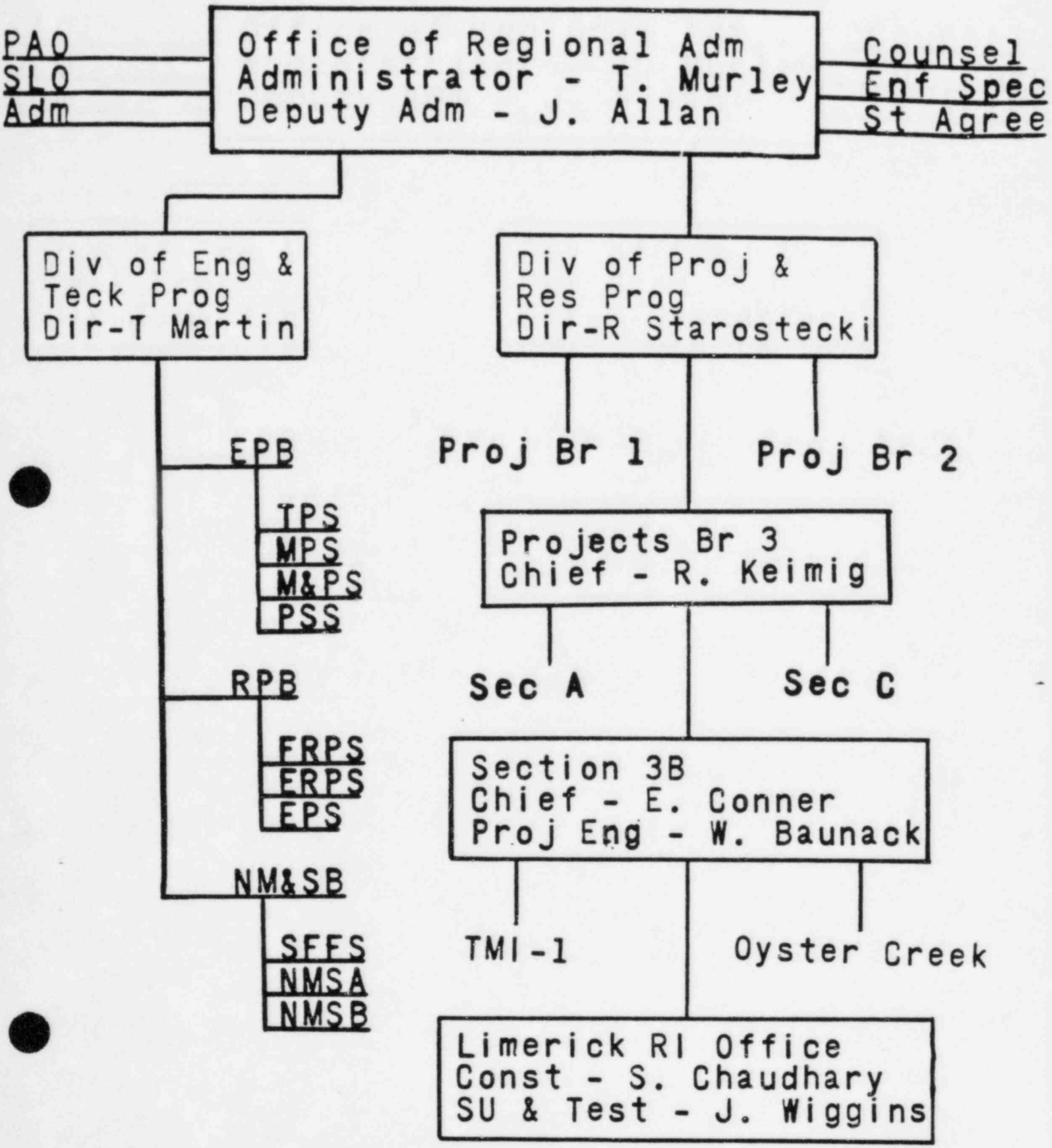
Institute of Nuclear Power Operations (INPO)

* Fall of 1982 - Self-evaluation by 22 PECo and Gilbert team.
  - -- Reviewed aspects of Design, Construction, Procurement, QA, Training and Project Management.
  - -- No major problems identified.
* July, 1983 - Independent team evaluations.
  - -- Concentrated on Construction and Design activities.
  - -- PECo has reviewed Draft and is responding.
  - -- Region I will assess report.

Joint Utility Management Audit (JUMA)

* Independent utility senior management-level audit.
* Evaluated Philadelphia offices and site management.

REGION I TECHNICAL STAFF FOR LIMERICK



REGION I INSPECTION PROGRAM

* Program established by OIE
* Significant portion directed toward QA
* PECo QA Program in the PSAR and FSAR
* NRC accepted QA Program in SER
* Inspections by Resident and Region-Based Inspectors
* Resident Inspector assigned in 1979
* Second Resident Inspector (covering pre-operational testing and startup testing) assigned September 4, 1983

INSPECTION HISTORY

* Initial inspection - 1970
  -- Before Construction Permit
  -- Focused on QA
  -- Management Meeting held to improve QA Program
* Monitored construction activities
  -- Concrete work
  -- Safety related structures
  -- Piping and welding
  -- Electrical activities
  -- Safety related mechanical components
  -- Instrumentation
* To date - 149 inspection reports issued
* Inspection hours (approximate)
  -- Shoreham - 6500 hours
  -- Susquehanna - 7000 hours
  -- Limerick - 7800 hours

ENFORCEMENT RECORD

* Notice of Violation issued for enforcement
* Applicant responds to Notice
* Response reviewed by inspectors and regional management
* Corrective actions verified during routine inspections
* Enforcement history comparison
  -- Shoreham - 77
  -- Susquehanna - 103
  -- Limerick - .86
* To date, Region I has not identified any significant programmatic weaknesses, other than those in the QA program identified and corrected in 1970.

REGIONAL CONSTRUCTION TEAM INSPECTION

* Performed by Region I - late 1982
* Coordinated team approach
* Focused on Construction Practices
* Accounted for about 520 hours of inspection effort
* Significant findings:
  -- Strengths
    * QA indoctrination of PECo engineers and managers
    * Scope and technical depth of QA audits
  -- Weaknesses
    * Bechtel's lack of communication tracking
    * Lack of explicit PECo guidance on audit findings
    * Bechtel's incomplete control of drawings for subcontractor
    * Poor clarification of nonconformance reporting criteria for electrical test

INDEPENDENT NDE VERIFICATION

* Mobile NDE laboratory at Limerick in March, 1982

* 345 Region I and contractor inspector hours on site

* Purpose to verify PECo's welding QC program by performing identical tests

* Selection criteria for welds; ASME Class 1, 2, and 3, pipe sizes, materials and systems

* NRC detailed procedures used

* Examinations performed (adjacent to welds)

  -- Radiography - 19 welds

  -- Magnetic Particle - 2 welds

  -- Liquid Penetrant - 10 welds

  -- Thickness Measurements - 25 areas

  -- Ferrite Measurements - 4 stainless steel welds

  -- Hardness Checks - 25 areas

  -- Weld Reinforcement Measurements - 25 welds

  -- Alloy Analysis - 7 areas

* Independent verification in agreement with applicant's determinations

REVIEW OF CONSTRUCTION DEFICIENCIES

* Required by 10 CFR 50.55(e)
* Applicant's program appears effective
  -- Multi-tiered review
  -- Reportability meets regulations
  -- Appropriate level of evaluations
* End of September, 1983, PECo had investigated 102 CDR's
  -- Resolved 92
  -- Under investigation 10
  -- Reporable to NRC 41

* Background report gives 3 examples
* Region I finds acceptable control by PECo

ALLEGATIONS

* Source of Allegation
  - -- Letters
  - -- Telephone
  - -- Personal contact (Region I or RI)
  - -- Headquarters Duty Officer
* Regional Management Review
  - -- Assess credibility
  - -- Safety significance
* Review Process
  - -- By Region I
  - -- By other NRC offices
  - -- By Office of Investigation
* Documentation
  - -- Inspection report
  - -- Special report
  - -- Letter to alleger
* Limerick Record
  - -- Sixteen total
  - -- All investigated
  - -- None adverse to nuclear safety
  - -- One remains to be documented

SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP)

* Purpose - Sound decisions regarding regional resources.

* Prepared by Region I - input from:

  -- Resident Inspectors

  -- Regional Specialist Inspectors

  -- NRR Project Managers

  -- NMSS Project Managers

  -- AEOD

* Limerick SALP's:

  -- 1980 covered 10/1/79 to 9/30/80

  -- Inspection hours - 1171 hours

  -- Results - Category 2 in 15 areas
  - Category 3 in 1 area (QA/QC)

  -- 1981 covered 7/1/80 to 6/30/81 (3 month overlap)

  -- Inspection hours - 1020 hours

  -- Results - Category 1 in 2 areas
  - Category 2 in 9 areas

-- 1983 covered Calendar Year 1982 (also observations from 6 month period)

-- Inspection hours - 1817 hours

-- Results - Category 1 in 3 areas
- Category 2 in 5 areas

* Beginning in 1984, the SALP will also be focused on preoperational and startup testing activities for Unit 1.

REGION I OVERVIEW

* Aggressive management attention to NRC concerns

* Improving QA/QC program and increasing QA/QC manpower

* Recognizing necessity of continuous management attention to quality

* Adequate management review is evident

* Both site and corporate management involved in decision making

* Records are generally complete, well maintained and readily available

* Increased engineering expertise on site in last 15 months

CONCLUSION

Overall, Region I finds the construction program quality at Limerick to be acceptable. This does not mean there have not and will not be problems to be solved. However, this review adds confidence that PECo, its A-E/Contractor and subcontractors are committed to and capable of building a quality nuclear plant.

removed the two distillation units previously there, and fenced the site. Stipulated penalities are provided for in the event of future noncompliance with the decree.

The consent decree may be examined at (1) the office of the United States Attorney, Northern District of Ohio, Suite 500, 1404 E. 9th Street, Cleveland, Ohio 44114, (2) the office of Regional Counsel, United States Environmental Protection Agency, 16th Floor, 230 South Dearborn Street, Chicago, Illinois 60604, and (3) the Environmental Enforcement Section, Land and Natural Resources Division, United States Department of Justice, Room 1515, Ninth Street and Pennsylvania Avenue NW., Washington, D.C. 20530. A copy of the proposed consent decree may be obtained in person or by mail at the Environmental Enforcement Section at a cost of one dollar per copy.

The Department will receive comments concerning the decree for thirty (30) days from the date of this notice. Comments should be addressed to the Environmental Enforcement Section, Land and Natural Resources Division, United States Department of Justice, Room 1515, Ninth Street and Pennsylvania Avenue NW., Washington, D.C. 20530 and reference *United States v. Chemical Recovery Systems, Inc.*, DOJ No. 90-7-1-47.

F. Henry Habicht II,

Acting Assistant Attorney General, Land and Natural Resources Division.

[FR Doc. 83-25420 Filed 9-16-83; 8:45 am]

BILLING CODE 4410-01-M

MOTOR CARRIER RATEMAKING STUDY COMMISSION

Public Hearing

Date: Friday, October 14, 1983.

Place: John W. McCormack Post Office and Courthouse, Post Office Square, Room 208, Boston, Massachusetts 02109.

Time: 8:30 a.m.

Purpose: To receive testimony, as mandated by the Bus Regulatory Reform Act of 1982, from various parties on: (1) Collective ratemaking in the bus industry and (2) the impact of implementation of the Bus Regulatory Reform Act of 1982 on persons over the age of 60.

Anyone who is interested in submitting written testimony for the record of the Study Commission may do so by sending same to: Gary D. Dunbar, Executive Director, Motor Carrier Ratemaking Study Commission, 100 Indiana Avenue, NW., Washington, D.C. 20001.

For further information, contact: Name: Gary D. Dunbar, Title: Executive Director, Phone No.: (202) 724-9600.

Submitted this, the 14th day of September, 1983.

Gary D. Dunbar,

Executive Director.

[FR Doc. 83-25457 Filed 9-16-83; 8:45 am]

BILLING CODE 6820-80-M

NATIONAL FOUNDATION ON THE ARTS AND THE HUMANITIES

Humanities Panel Meeting

AGENCY: National Endowment for the Humanities.

ACTION: Notice of Meeting.

SUMMARY: Pursuant to the provisions of the Federal Advisory Committee Act (Pub. L. 92-463, as amended), notice is hereby given that the following meeting of the Humanities Panel will be held at the Old Post Office, 1100 Pennsylvania Avenue, N.W., Washington, D.C. 20506.

Date: September 29, 1983.

Time: 9:00 a.m. to 5:00 p.m.

Room: 430.

Program: This meeting will review applications submitted for Constitutional Fellowships (College Teachers), Division of Fellowships, for projects beginning after January 1, 1984.

The proposed meeting is for the purpose of Panel review, discussion, evaluation and recommendation on applications for financial assistance under the National Foundation on the Arts and the Humanities Act of 1965, as amended, including discussion of information given in confidence to the agency by grant applicants. Because the proposed meeting will consider information that is likely to disclose: (1) trade secrets and commercial or financial information obtained from a person and privileged or confidential; (2) information of a personal nature the disclosure of which would constitute a clearly unwarranted invasion of personal privacy; and (3) information the disclosure of which would significantly frustrate implementation of proposed agency action; pursuant to authority granted me by the Chairman's Delegation of Authority to Close Advisory Committee Meetings, dated January 15, 1978, I have determined that this meeting will be closed to the public pursuant to subsections (c)(4), (6) and (9)(B) of section 552b of Title 5, United States Code.

Further information about this meeting can be obtained from Mr. Stephen J. McCleary, Advisory Committee Management Officer, National Endowment for the Humanities, Washington, D.C. 20506, or call (202) 786-0322.

Stephen J. McCleary,

Advisory Committee Management Officer.

[FR Doc. 83-25447 Filed 9-16-83; 8:45 am]

BILLING CODE 7536-01-M

NUCLEAR REGULATORY COMMISSION

Advisory Committee on Reactor Safeguards, Subcommittee on Limerick Generating Station Units 1 and 2, Meeting

The ACRS Subcommittee on Limerick Generating Station Units 1 and 2 will hold a meeting on October 7 and 8, 1983, at the Holiday Inn at Pottstown, Route 100 at West King Street, Pottstown, PA. The Subcommittee will review the application of the Philadelphia Electric Company (PECO) for an operating license.

In accordance with the procedures outlined in the Federal Register on October 1, 1982 (47 FR 43474), oral or written statements may be presented by members of the public, recordings will be permitted only during those portions of the meeting when a transcript is being kept, and questions may be asked only by members of the Subcommittee, its consultants, and Staff. Persons desiring to make oral statements should notify the Cognizant Federal Employee as far in advance as practicable so that appropriate arrangements can be made to allow the necessary time during the meeting for such statements.

The entire meeting will be open to public attendance.

The agenda for subject meeting shall be as follows:

Friday, October 7, 1983—2:00 p.m. until the conclusion of business

Saturday, October 8, 1983—8:00 a.m. until the conclusion of business

During the initial portion of the meeting, the Subcommittee, along with any of its consultants who may be present, may exchange preliminary views regarding matters to be considered during the balance of the meeting.

The Subcommittee will then hear presentations by and hold discussions with representatives of the Philadelphia Electric Company, NRC Staff, their consultants, and other interested persons regarding this review.

Further information regarding topics to be discussed, whether the meeting has been cancelled or rescheduled, the Chairman's ruling on requests for the opportunity to present oral statements

and the time allotted therefor can be obtained by a prepaid telephone call to the Cognizant Designated Federal Employee, Dr. Richard Savio (telephone 202/634-3267) between 8:15 a.m. and 5:00 p.m., EDT.

Dated: September 13, 1983.

John C. Hoyle,

Advisory Committee Management Officer.

[FR Doc. 83-25404 Filed 9-16-83; 8:45 am]

BILLING CODE 7590-01-M

[Docket No. 50-409]

Dairyland Power Cooperative, LaCrosse Boiling Water Reactor; Exemption

I

Dairyland Power Cooperative (the licensee) (DPC) is the holder of Provisional Operating License No. DPR-45 which authorizes operation of the LaCrosse Boiling Water Reactor. This provides, among other things, that it is subject to all rules, regulations and orders of the Commission now or hereafter in effect. The facility is a boiling water reactor rated at 50 MW(e) and is located at the licensee's site located in Vernon County, Wisconsin.

II

The regulation, 10 CFR 50.54(w), requires that each commercial power reactor licensee shall, by June 29, 1982, have taken reasonable steps to obtain on-site property damage insurance available at reasonable cost and on reasonable terms from private sources or to demonstrate to the satisfaction of the Nuclear Regulatory Commission (the Commission) (NRC) that it possesses an equivalent amount of protection covering the facility, provided, among other things, that "this insurance must have a minimum coverage limit no less than the combined total of: (i) That offered by either American Nuclear Insurers (ANI) and Mutual Atomic Energy Reinsurance Pool (MAERP) jointly or Nuclear Mutual Limited (NML); plus (ii) that offered by Nuclear Electric Insurance Limited (NEIL), the Edison Electric Institute (EEI), ANI and MAERP jointly, or NML as excess property insurance."

On June 29, 1982, the licensee filed a Request for Exemption from the provisions of 10 CFR 50.54(w) in excess of $65 million. (10 CFR 50.54(w) currently requires licensees to be insured for a minimum of $500 million in primary coverage plus $66 million in excess property coverage.) In support of this request, the licensee submitted an estimate of decontamination and cleanup costs following a Three Mile Island, Unit 2 (TMI-2) type accident of between $5 million and $39 million. The licensee indicated that it would obtain primary property insurance covering damages up to $65 million but that it did not believe that coverage in excess of that amount was justified. The staff requested additional information from the licensee to support its estimates. This information was solicited by letters to the licensee dated August 2, 1982 and October 25, 1982. The licensee responded to these requests by letters dated September 13, 1982 and March 7, 1983. The March 7, 1983 response included a more detailed study than earlier submissions and increased its estimates of cleanup to $42.5 million in 1982 dollars.

Despite the licensee's original exemption request and two supplemental responses to NRC questions, the Commission concludes that the licensee has failed to provide adequate justification for exemption from the requirements for property insurance above $65 million. First, Dairyland has made certain assumptions in its request that appear to be unwarranted. Specifically, Dairyland asumes that no more than 10.7% of the fuel rods will rupture and that no fuel melting will occur, even in a maximum credible accident. Consistent with this is Dairyland's assumption that LaCrosse's emergency core cooling system will function adequately after an accident. In evaluating the licensee's March 7, 1983 submittal the staff found that the maximum credible accident (MCA) assumed by DPC appears to be equivalent to a design basis loss of coolant accident (LOCA) assuming a single failure evaluated to show conformance with 10 CFR 50 Appendix K. While no check has been made of the level of fuel failures for this accident, it is the staff's judgment that the stated failure level of about 10% may not be conservative, since clad failure for all rods experiencing departure from nucleate boiling may be possible. Since the intent of 10 CFR 50.54(w) is to provide for insurance in the case of core damage accidents of at least the TMI-2 severity, if not worse, the licensee has not shown anything unique in LaCrosse's design that would justify the request for an exemption on the basis of the low cleanup costs. It is clear from the statement of consideration promulgating 10 CFR 50.54(w) (47 FR 13750) that property insurance was intended by the NRC to cover at least TMI-2 type accidents. As stated in that notice, "* * * The Commission disagrees with the position taken by some commenters that it is unfair to many owners of smaller power reactors to require insurance greatly exceeding the cost of replacing the facility. A TMI-2 type accident could well require coverage approaching $1 billion, no matter what the original or size of the facility * * * Until completion of studies evaluating the cost of cleaning up accidents of varying severity, it is prudent to require for all power reactors a reasonable amount of insurance for decontamination expense" (47 FR 13752).

Finally, in a parallel situation, on November 8, 1982, the Commission granted to Consumers Power Company an exemption from the excess property insurance requirements of 10 CFR 50.54(w). Consumers Power Company operates the Big Rock Point Plant (Docket 50-155), a 72 MW(e) BWR, and found, in a comprehensive analysis of a maximum credible accident, that cleanup costs would not exceed $470 million. The staff concludes that it would not be technically consistent in granting Dairyland's full exemption request while requiring seven times the insurance coverage for Big Rock Point.

Although there is no basis for the Commission to approve the licensee's entire exemption request, there is adequate justification to exempt the licensee from the excess property insurance requirements of 10 CFR 50.54(w). Exemption from such excess requirments would be compatible both with the conclusions of Consumers Power Company's findings with respect to its Big Rock Point Plant and with findings of a study developed for the Commission (*Technology, Safety and Costs of Decommissioning Reference Light Water Reactors Following Postulated Accidents*, NUREG/CR-2601, Pacific Northwest Laboratory, November 1982). This report considers three accident scenarios with a TMI-2 type accident considered to be of intermediate severity. The information developed from these scenarios indicates that although there is some relationship between size of a reactor and accident cleanup costs, certain of the major costs involved with accident cleanup—such as defueling a damaged reactor, activities to maintain a facility in cold shutdown, and construction of new treatment facilities—are not strictly power level dependent. But because there are steps in the cleanup process where cost is directly related to core size, lower overall costs can be expected for cleanup of reactors of the size of LaCrosse. The NRC concludes that LaCrosse would be expected to encounter, in the extreme, cleanup costs that would be substantially similar to

10/5/83

AGENDA FOR THE LIMERICK MEETING

OCTOBER 7-8, 19873

Friday, October 7, 1983

I.	Executive Session	15 Min.	2:00 - 2:15 pm
II.	Report from the NRC Staff		
	A. Status of the NRC Staff review	15 Min.	2:15 - 2:30 pm
	B. Comparison of the Limerick plant and site with similar plants and sites reviewed by the NRC Staff.	15 Min.	2:30 - 2:45 pm
	C. Summary of the prinicpal review issues (to include a summary of the open issues and likely resolution, a summary of dissenting NRC Staff opinions applicable to the review, and a summary of the safety issues which the NRC Staff believes were or will be the most different to resolve.)	45 Min.	2:45 - 3:30 pm
	D. I&E Report on significant plant experiences and assessment of plant	45 Min.	3:30 - 4:15 pm
	E. Comments from the Applicant	30 Min.	4:15 - 4:45 pm
***** BREAK *****		15 Min.	4:45 - 5:00 pm
III.	Report from the Applicant		
	A. Organizations and Management		
	1. Summary of construction and operations management structure	15 Min.	5:00 - 5:15 pm
	2. Description of technical support, operations quality assurance, and maintenance programs	45 Min.	5:15 - 6:00 pm
	3. Description of training programs for reactor operators, startup crews, maintenance personnel, outside contractor personnel, and the use of the simulator in the training programs.	30 Min.	6:00 - 6:30 pm

B.	Performance assessment for critical systems.		
	1. Scram systems	15 Min.	6:30 - 6:45 pm
	2. Decay heat removal systems	20 Min.	6:45 - 7:05 pm
	3. AC/DC power systems	20 Min.	7:05 - 7:25 pm
	4. Control and instrumentation systems	20 Min.	7:25 - 7:45 pm
	5. Containment systems	15 Min.	7:45 - 8:00 pm
	6. Discussion	30 Min.	8:00 - 8:30 pm

Saturday, October 8, 1983

C.	Principle insights gained from the Limerick Probabilistic Risk Assessment and Severe Accident Risk Assessme t and use in plant design and operation.		
	1. Scope, purpose, and summary of the results for the Limerick PRA, SARA, and other applicable existing PRAs.	15 Min.	8:30 - 8:45 am
	2. Use of Limerick PRA and SARA in the decision process and in the evaluation of the plant design, purposed safety improvements, and the effectiveness of emergency planning.	45 Min.	8:45 - 9:30 am
	3. Discussion	15 Min.	9:30 - 9:45 am
***** BREAK *****		15 Min.	9:45 - 10:00 am
D.	Use of systems interaction analysis in plant design and in the development of procedures and training programs.	30 Min.	10:00 - 10:30 am
E.	Discussion of emergency planning	45 Min.	10:30 - 11:15 am
F.	Status of seismic reevaluation and plan for resolution	30 Min.	11:15 - 11:45 am
G.	NRC Staff comments	15 Min.	11:45 - 12:00 pm

***** LUNCH *****		1 Hr	12:00 - 1:00 pm
IV.	Oral presentations from members of the public as requested.	1 1/2 Hrs.	1:00 - 2:30 pm
V.	Summary, conclusions, and discussion of future agenda.	30 Min.	2:30 - 3:00 pm