NUCLEAR REGULATORY COMMISSION

050-358

ORIGINAL

In the Matter of:

ADVISORY COMMITTEE ON REACTOR SAFEGUARDS

Subcommittee Meeting on Zimmer Nuclear Power Station

DATE: February 18, 1982 PAGES: 1 thru 224

AT: Cincinnati, Ohio

TR04
delete B. White
S
01

ALDERSON REPORTING

400 Virginia Ave., S.W. Washington, D. C. 20024

Telephone: (202) 554-2345

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

ACRS SUBCOMMITTEE MEETING ON

ZIMMER NUCLEAR POWER STATION

Nuclear Regulatory Commission
Americana Inn
Greater Cincinnati Airport
Cincinnati, Ohio

Wednesday, February 18, 1982

The Commission met, pursuant to notice, at 8:30 a.m.

BEFORE:

M. Carbon, ACRS Member
J. Ebersole, ACRS Member
M. Bender, Chairman of the ACRS Subcommittee
G. Quittschreiber, ACRS Member

ALSO PRESENT:

G. Rivenbark
I. A. Peltier
R. F. Warmick
J. G. Keppler
D. R. Hunter
B. R. Sylvia
E. A. Borgmann
J. D. Flynn
B. K. Culver
M. F. Rulli
H. R. Sager
J. R. Schott

ACE REPORTING, INC.
216 E. 9th St. / Barrister House / 6th Floor
CINCINNATI, OHIO 45202
TELEPHONE AREA CODE 513
241-3200

P R O C E E D I N G S

CHAIRMAN BENDER: This meeting will now come to order. This is the meeting of the ACRS Subcommittee on the William H. Zimmer Nuclear Power Station.

I am Mike Bender, the Subcommittee Chairman. On my right is Mr. Ebersole, and next to him is Dr. Carbon. They are members of the Subcommittee.

On my left is Mr. Quittschreiber. He is the designated representative for the Federal employee for this meeting.

The purpose of this meeting is to review the quality control/quality assurance program and the organization and management structure of the Zimmer Nuclear Station.

The meeting is being conducted in accordance with the provisions of the Federal Advisory Committee Act and the Sunshine Act.

The rules for participation in today's meeting have been announced as part of the notice of this meeting previously published in the Federal Register on Monday, February 1, 1982.

A transcript of the meeting is being kept and will be made available as stated in the Federal Register notes.

It is requested that each speaker first identify himself or herself and speak with sufficient clarity and volume so that he or she can readily be heard.

We have received requests from the following to make

oral statements, and I wonder if those people that have asked to speak and are here will identify themselves as I read their name.

Tom Carpenter from the Cincinnati Alliance for Responsible Energy. Thank you.

Dr. McElheney from the Cincinnati Alliance for Responsible Energy. Thank you.

Vicki Mayer, concerned citizen. Thank you.

Mary Reider from the City of Mentor, Kentucky. Thank you.

And Geneveve Dennison from the Zimmer Area Citizens Committee.

So all the people that wish to make statements are here. We do plan to provide some time for each to make a statement. I am not sure how long it is desired.

We have allocated some time for that, but I would presume that about five minutes for each would be about right. If anyone needs more than that, I think we would like to know about it.

I would like to make a few observations about -- excuse me -- let me get one other piece of business out of the way.

We will try to fit these oral statements into the morning session. Our original plan was to do it around 10:30 following the break this morning, and if that turns out to be a

good time, we will do it that way.

We have also received written statements -- we expect to receive some written statements, and if they are received, they will be put into the record of the meeting.

This plant was reviewed by the ACRS Subcommittee for an operating license back in 1979, and in March, 1979 the Committee wrote a letter indicating that the plant could be given a license to operate.

At that time we were well aware that the organizational plan for operation was still in the thinking stage.

It was also clear to the Cincinnati Gas & Electric people that that was the case. Perhaps it was a little early to look at the review of the operating plan, but at that time there was less attention being given to how such plans were worked out, and the Subcommittee felt then that the Regulatory Staff was in a position to determine operating needs. It wasn't very long thereafter that Three-Mile Island occurred, and all of us became aware that the plants were operating and the operational organization was an element of safety that needed a great deal more attention than it had been given in the past.

So a good deal of what we expect to hear today has to do with being sure we understand what the organizational plans are.

We know they are still being formulated, that more than likely we won't hear a complete story today.

I don't think that would be a surprise to us if it turned out to be the case, but hopefully we will see how the organization is being established and we will have an opportunity to have some dialogue with the Applicant and with the Regulatory Staff to be sure that there is full agreement on what needs to be done.

This plant has had a record of quality assurance questions that have been in the press and in other places. The Committee is interested in knowing what they are.

We presume if the plant is continuing with construction and there are plans to operate it, that any quality assurance matters will be straightened out, and as Chairman Palladino remarked once some months ago, we would expect that the quality will be built into the plant and so we are interested in knowing that that's the case.

Having quality assurance is useful to determine whether it has been built in, but what we want to know is whether it has been built in and hopefully we will hear from both the Regulatory Staff and CG&E as to how that has been established.

I would like to ask the Subcommittee whether it has any matters that it would like to add to the discussion?

MEMBER EBERSOLE: I have none.

CHAIRMAN BENDER: If not, we will proceed with the agenda as it has been laid out, and I would like to call on

Mr. Dickhoner, President of CG&E, and he will make the initial statement for the applicant.

MR. DICKHONER: Thank you, Mr. Chairman, for affording me the opportunity to speak this morning. My remarks will be very, very brief.

But as president of the Cincinnati Gas & Electric Company, I would like to set the tone for our company's presentation here today. We recognize that there have been in the past inadequacies in our quality assurance/quality control program. We firmly believe that these problems are behind us.

We have embarked in a very comprehensive confirmatory plan to assure that the work that has already been completed meets the highest quality standards necessary for the construction of a nuclear facility, as well as to make sure that all future work meets these high quality standards.

In addition, we have greatly reinforced our organization by bringing to the company a nuclear vice-president who has had over 19 years of nuclear operating experience with other utilities.

We have also brought to the company a very reputable and highly qualified quality assurance manager as well as reinforcing our quality assurance/quality control staff at the plant to over 200 employees.

Mr. Borgmann, our Senior Vice-President, among other things will describe in detail our organization, what we are

doing to prepare for the operation of the station, as well as what is going on in the confirmatory plan.

I want to assure you that quality assurance/quality control does have the attention of the top management and the Board of Directors of this company. There can be no substitute for a good and agressive quality assurance/quality control program in order to make sure that the plant will be constructed to the highest safety standards and will be operated to those standards.

We are committed to safety. There will be no compromise in safety in the operation of this plant. We owe that to the citizens of this community as well as the shareholders of the three companies that own Zimmer.

I think, with those remarks, I have certainly set the stage for what my associates here on my right intend to present to this Subcommittee this morning. I thank you for allowing me to speak.

CHAIRMAN BENDER: Thank you. Any questions? If not, we will call on Mr. Borgmann to introduce the CG&E participants.

I will leave it to you, Mr. Borgmann, to line up your participants as you would like to have them.

MR. BORGMANN: You want them all introduced at one time?

CHAIRMAN BENDER: Whatever you want to do.

MR. BORGMAN: The original agenda was starting off with Region 3. We would be happy --

CHAIRMAN BENDER: Thank you. I guess I overlooked that point on the agenda, and I suspect it would be best if we heard from the NRC Staff.

I would like Mr. Keppler, if he would, to make the introductory statement.

MR. KEPPLER: Good morning, Mr. Chairman. We are pleased to be here this morning with you.

I am Jim Keppler, Regional Administrator for the NRC's Regional 3 office. I have with me seven other representatives from the NRC today.

On my left is Mr. Dorwin Hunter who is the who is the Section Chief responsible for the inspection program at the Zimmer Nuclear facility now. On my immediate right is Mr. Robert Warmick. Mr. Warmick is Director of the Inforcement and Investigation office in Region 3.

To his right is Mr. Irv Peltier, Project Manager for Nuclear Reactor Regulations, and on the far right is George Rivenbark who is a Senior Management Analyst who is responsible for reviewing the organization and management of the CG&E Zimmer facility.

Also here today is John Gilray. John is from the quality assurance branch in NRC, and Mr. Pat Gwenn who is the Resident Inspector at the Zimmer Nuclear facility is here today.

So we are prepared to give you presentation concerning the construction problems, quality assurance problems, that were identified at the Zimmer facility, and we will be happy to answer any questions that you have throughout the course of the day.

CHAIRMAN BENDER: Mr. Keppler, could I get a little bit of chronology straight? When we reviewed this plant for the operating license, questions were asked about the adequacy of the quality assurance program then in the Subcommittee reviewing the full committee meeting, and at that time there was no indication that there was cause for concern.

Could you tell us a little bit about when this problem that seems to have led to a fine reared its head so we have a little bit better understanding of where to look for the problem areas?

MR. KEPPLER: The first indications that the -- that there were more serious quality assurance problems at the site than we had believed were there manifested itself in late 1980, and we are prepared to go through the chronology of what led up to all of the actions that culminated in the issuance of a proposed fine to the company.

CHAIRMAN BENDER: Prior to that time, were you fairly well satisfied that things were proceeding all right?

Is this something that was a short-time eruption, or did it represent a deterioration with time, or was it

something that just got progressively worse and you decided to do something about it?

MR. KEPPLER: No, I think it is a combination of things. Certainly I think, as you are aware, Mr. Bender, the threshold for action on the part of the Staff has changed markedly since Three-Mile Island.

CHAIRMAN BENDER: Yes.

MR. KEPPLER: The Moffitt Committee has reviewed the inspection and inforcement activities over the last several years and the appraisal of licensee regulatory performance, and one of the aspects that was made very clear to the Staff was that we had in effect tolerated regulatory performance that was perhaps not as stringent as it should have been, and so I think there has been a general belt-tightening in that area with time.

But I think it is also fair to say that while we had, during the period of time prior to the allegations coming forth, we had identified a number of concerns that were apparent at Zimmer, but we felt they were being handled to our satisfaction. We felt that -- we obviously felt that it was okay for that status of time, but, in effect, when the allegations came forth, we found that the quality assurance program was much less capable than we had thought it was, and so learned some things.

And I think also that there has been a lowering of

the threshold for a higher performance level throughout the industry right now.

CHAIRMAN BENDER: Well, Mr. Dickhoner indicated earlier that CG&E had gone to great lengths to build up its quality control and quality assurance capabilities.

I have to believe that's occurred in the last six months or so. I really don't know exactly when it occurred.

But a lot of the plant was built long before that was done, and I think it is important to be able to determine in the absence of that buildup what comfort do we have that the quality has been established in a suitable way for public safety purposes?

Can you make a remark about that?

MR. KEPPLER: Yes. I think there are two comments that are appropriate at this time. Number one is that Cincinnati Gas & Electric Company has responded to the concerns raised by NRC towards its quality assurance efforts for the construction project as well as for the operations and, if they had not taken those steps, we probably would not be allowing construction to continue at this time.

But the fact of the matter is, as you pointed out, the project was 90 plus percent complete at the time many of these quality assurance problems were raised.

We felt that it was very appropriate for the company to basically confirm the quality of the plant in the absence

of a well-function quality assurance program to provide assurance to NRC as well as theirselves and the public that the plant is of sufficient quality.

And this quality confirmation plan will be carried out and completed to the Staff's satisfaction before an operating license will be recommended.

CHAIRMAN BENDER: Will we hear more about that today?

MR. KEPPLER: Absolutely.

DR. CARBON: This is quality assurance of what has been built?

MR. KEPPLER: That is correct. It is basically -- it is a review of hardware. It is a review of pertinent records and, in the absence of those things, it may require some testing or it may require some replacement of the materials.

DR. CARBON: Then the bottom line by the end of the day, will you be saying that you fell comfortable with the quality of what has been built following completion of this program?

MR. KEPPLER: Absolutely. If I couldn't say that, I wouldn't be letting the project continue today.

MR. EBERSOLE: Mr, Keppler, I gather by the time this uproar started, the bulk of the cable had been pulled into the station.

I have a primary interest, a main interest, in the

distribution characteristics of the shutdown function of this plant. As you well know, NUREG 175 in itself prevents sensitive areas in the plant where a common industrial accident such as a fire can effectively ruin the capacity, to remove shutdown energy after trip.

I am being suspicious that with all the lack of discipline in the general aspects of QC that we may have breached the limited capabilities that NUREG 175, which is an intolerable matter because it is ineffective in itself in really providing protection to the plant in that aspect. I would be happy in your presentation of separability and the shutdown functions as they stand at this plant.

I am not talking about local litigation. I am talking about shutdown.

MR. KEPPLER: I understand.

DR. CARBON: Another question, Mr. Keppler: In terms of the chronology and understanding of what's happened, there was one NRC inquiry which didn't come up with alarming results, and then there was a second inquiry which I believe led to fines and so on.

You speak of change in attitude, belt-tightening, and so on. Did these two fit within that area of time such that when the first inquiry was made there was one general attitude and the second inquiry under a different approach, attitude, whatever?

MR. KEPPLER: That's a difficult question to answer. the allegations that were investigated during the first -- during the period -- when was that?

MR. WARMICK: 1980.

MR. KEPPLER: -- 1980 some allegations were made. They were somewhat narrow in scope, I would describe them, and dealt with a limited area of regulatory concern. When the second --

DR. CARBON: Why was that? I don't really understand.

MR. KEPPLER: Those were the allegations presented to us at that time. They dealt with welding radiographs, quality of radiographs, and handling of nonconformances. It was just a very limited area that there was alleged to be some problems in.

What made the second investigation so much more visible and so much more significant was that additional allegations were presented, and then at the same time many quality control people in the plant started to come forth to us and give us additional information.

It was almost like a domino effect in terms of additional information coming forth.

The type of information that was brought forth during the second investigation made it very apparent there was a broad problem. This wasn't evidenced by the first

investigation.

Now, you might argue, and others have, that it should have been. I think that when you look at total workload involved in the Staff and when you look at the type of allegations that were made, along with the history of similar types of allegations, we felt that we had dealt with the problem from a health and safety point of view. Others on the Staff felt we didn't, and it is a matter of public record.

So I am not defending it. I can tell you that this last investigation was very comprehensive, involved a lot of people, probably the most comprehensive investigation that we have gone into in Region 3, and a lot of information surfaced during that period of time.

DR. CARBON: Thank you.

CHAIRMAN BENDER: Let me emphasize that we are not here to determine whether what was done was done in the best way.

What we are really interested in is just knowing that the end product is acceptable. If somebody else wants to find out what procedural aspects were not followed and the questions were asked, more than they just didn't understand them than anything else.

I think what we would like to do now is just proceed with the presentation by the NRC Staff and, Mr. Keppler, are you going to lead the way?

MR. KEPPLER: What I would like to suggest is that Mr. Hunter give you a short briefing on what has happened in terms of the inspect activities at the site from the time of the last committee meeting, and then I am going to ask Mr. Warmick to describe in considerable detail for you the investigation that was done on quality assurance in the construction area.

This latter presentation will run about a half hour. If you feel that we are getting into too much depth, say so, or if you feel we are not getting into enough depth, say so. We can expand it or shorten it to your wishes.

CHAIRMAN BENDER: We have never been constrained before and we won't be constrained this time.

MR. HUNTER: My name is Dorwin Hunter, and as indicated by Jim, I am the chief of the reactor projects 2-B, and my present assignment is the Zimmer Station.

I will indicate also that it is a recent assignment after being -- I was on the performance appraisal group for three years providing inspections around the country on operating reactors. Similar to INPO.

CHAIRMAN BENDER: Before you?

MR. HUNTER: Mr. Warmick was the project 2's chief so we have a history available. I would like to point out, first, what the program is -- it was from March of 1979 up until today -- and indicate that we had some findings but we

had no -- it was not determined that those findings were of significant numbers or problems until the investigation which Mr. Warmick discussed occurred out of the significant number of allegations we had in late 1980.

I would like to point out that the inspection program at Zimmer today includes a number of areas that we are looking at, and you will hear today about the area of the Immediate Action Letter that has been issued to provide quality of construction from the date of April 8 forward of 1981; also the Quality Confirmation Plan which you will hear about today, which, as was indicated, will verify quality back to the earlier days of construction.

We also, in the inspection program, we also will review the routine preoperational startup program which is being reformulated.

The preoperational program has been partially completed, but there has been a minimum effort in that area in the recent past.

We also will be providing some more investigation. I have an investigator assigned to my group to continue to pursue additional allegations which we have and any additional allegations which are brought forth.

At the present time I have a senior resident inspector at the site. It is Mr. Fred Christianson. He is not here today. He had a death in the family earlier last

week.

You introduced Pat Gwenn who is the resident inspector, and then I have a project inspector to track the Zimmer program.

We will be using regional specialists for special inspection efforts to verify the implementation of the quality of the confirmation program and also to overview the immediate action or continuing construction effort in the area of electrical/mechanical code work, structural steel work, and any of the formal inspection areas.

One thing I would like to point out too is the inspection program does include observations, limited observations, of field activities.

During the period of 1979 through 1980 when the investigation was commenced the first part of 1981, the routine inspection program was implemented at the Zimmer facility, and it did include resident inspectors and support inspectors from the regional office in the areas necessary, including pre-operational testing.

I would like to say that the noncompliance during that time was slightly higher than what we would consider average, but in a systematic assessment of licensing performance that was done for a period of 1979 through September of 1980, it was noted that even though it was slightly higher, that the staff, the Region 3 Staffing, considered at that time

that Zimmer activities were adequate, and we had no large concern at that time.

At the end of 1980, in the first of 1981, the allegations came forth and Jim pointed out a number of allegations over a broad area.

And at that time then we initiated the investigation which actually commenced in January of 1981.

And I would like to allow Mr. Warmick now to pick up on the investigation and go through the outcome of that and talk about the Immediate Action Letter, how that came about, and also about the Quality Confirmation Program.

MR. WARMICK: My name is Robert Warmick. I am the director of Inforcement and Investigation Staff in Region 3.

I was formerly the section chief who supervised the resident inspectors at the Zimmer site. I was in charge of the investigation that we have spoken of.

I have a few slides, and I will talk from the slides. You had asked about the earlier investigation. We received allegations from Tom Applegate on February 28, 1980. That was when the first set of allegations were received from Mr. Applegate, and we looked into those and issued an investigation report in July of 1980.

Although Applegate had given us several allegations, and I don't know exactly how many, we had elected to only look at three of the allegations he had given us. The rest of them

we felt were not within our perview. They were not safety related or they belonged to OSHA or something like that, but we identified three that had primarily to do with welding that we looked at.

Then in November, and we will pick up from the slide, November 18, we received four allegations from an ex-Zimmer employee, a quality control inspector who was working at a different site.

We contacted the alleger. An investigator contacted him December 9. Because of the holidays and other scheduled work, we did not begin our investigation until the middle of January.

In between, Tom Applegate contacted us again on January 5, 1981 with numerous allegations.

Because of the previous allegations and because of the interest generated in headquarters and amongst our management, we determined at that time that we would look at everyone of the allegations, that we would look at them in depth and detail and essentially leave no stone unturned in this investigation.

CHAIRMAN BENDER: Just to clarify a matter: Mr. Applegate was an inspector at the plant?

MR. WARMICK: Mr. Applegate had worked for CG&E for about a 30-day period as an undercover agent who was investigating or looking into charges of fraud on time cards,

time-card cheating.

CHAIRMAN BENDER: So his expertise is not inspection per se then?

MR. WARMICK: By background, he worked for a detective agency, private detective. He was not a quality control inspector.

MR. EBERSOLE: You said you were going to look into the allegations which were identified. Were you also going to extrapolate your investigations into unrevealed problems?

In other words, allegations may identify only the roots of a larger problem.

MR. WARMICK: Yes, was going to touch on that, Mr. Ebersole. What we -- the approach we decided to take, and it is kind of an evolution type thing -- we didn't start out being smart, but we, as we talked, as we started our investigation, we talked to several people and as they would tell us the things that they considered to be problems, we decided at that point that we needed to broaden the scope of the investigation and so we started talking to all of the quality control inspectors that we could visit.

We even went to other sites and visited, interviewed people that were former employees at the Zimmer site, to show you the depth that we wanted to go into to pursue all of the allegations and to try to identify the extent of the problems.

The investigation primarily took place during

January, February and March of 1981.

By the end of March in 1981, the inspection team was convinced that there was a major breakdown in quality assurance at the Zimmer site.

We briefed CG&E management on our preliminary findings, and we went back to the Region and had meetings with our regional management, and we gave strong consideration to whether or not the project should be stopped, all the work should be stopped at that time.

The decision was made that it would not be necessary to stop the work for several reasons: One being that the project was 96 percent complete at that point in time.

We had found a limited number of hardware problems. We had found extensive records problems, but a limited number of hardware problems.

We felt like the work that would be done from that point forward would not mask or hide or in anyway cover our ability to identify problems in work that was already completed.

So for those reasons -- then we also settled on a course of action that involved the Immeidate Action Letter and the Quality Confirmation Program, and that was the basis for the decision at that time.

We issued an Immediate Action Letter on April 8, 1981 which encompassed ten points of action.

The most significant being that we required the

licensee to increase the size and the technical expertise of their quality assurance staff, and then to make sure that all future work would be done correctly, we required Cincinnati Gas & Electric to make 100 percent duplication of the quality control inspections that were being performed by Kaiser and other contractors.

There were eight other points such as reviewing quality control procedures for adequacy, both technical and quality adequacy; training of quality control inspectors; reviewing their audit program; reviewing their procedures for documenting nonconformances and corrective actions; and looking at the separation between construction and quality assurance in the Kaiser organization.

There were a few others, but those are the main points.

CHAIRMAN BENDER: Mr. Warmick, just to clarify some points in my own mind: Kaiser --

MR. WARMICK: Kaiser is the group doing the construction.

CHAIRMAN BENDER: They were under contract to CG&E to build and inspect?

MR. WARMICK: That is correct.

CHAIRMAN BENDER: They were inspecting under what kind of qualification capability, ANSI N-45 standards or ASME standards or some combination thereof?

MR. WARMICK: They were inspecting under our REG guides and the codes and standards that they had committed to in FSAR.

MR. EBERSOLE: Is it common practice to also have the builder do the inspection?

MR. WARMICK: Yes, very common practice.

CHAIRMAN BENDER: I had in mind that there were some reference standards to relate the work to. Could you identify which ones they were?

There are the plans and specifications, of course, but when you say that the plant was being inspected in accordance with NRC REG guides and the like, which ones were governing?

MR. WARMICK: Well, I can't give you the answer to all of the ANSI standards that they are committed to, but we did look at each of the 18 Appendix B criteria to make sure that they were in compliance with all of those.

CHAIRMAN BENDER: Mr. Warmick, does the Regulatory Staff in the review of the operating license make it a point to go through and see that the regulatory guides that are required for inspection are being conformed with when it reviews for an operating license, or is that just implicit in the way in which things are done?

MR. PELTIER: I believe in our review of the in-service inspection program --

MR. WARMICK: Our question was not so much that they didn't have the requirements, that they weren't meeting -- we didn't have the right requirements imposed upon them.

The problem we found was the implementation of the existing QA program. It wasn't so much the program question as the implementation question.

CHAIRMAN BENDER: What I am trying to develop now is some understanding of what guidance you are measuring it by. All of us have some --

MR. WARMICK: We measured against the ASME code section three, against the AWS code, against the --

CHAIRMAN BENDER: American Society.

MR. WARMICK: Against the ANSI standards, but I can't give you all of the ANSI standards.

CHAIRMAN BENDER: We don't need them right now.

MR. WARMICK: But those were the primary ones.

CHAIRMAN BENDER: I would judge that the problem was primarily welding?

MR. WARMICK: No. No.

CHAIRMAN BENDER: Then since I know that the ASME code is mostly a code associated with welding and testing, and the AWS standards are obviously welding, there are some other things that you have left out that you just can't recall right now?

MR. WARMICK: It is the ANSI standards associated --

where is Dorwin? You can raddle off all the numbers.

Dorwin knows the numbers better than I do.

MR. HUNTER: The commitments in FSAR, which is their docketed quality -- commitments to the quality program and in the FSAR, which is their docketed commitments to the program, they have in fact, as an example, Appendix C of the FSAR includes a commitment to each regulatory guide and standard such as separation on the exterior, REG guide IAAA36.

They have committed to a lot of various -- so if we had a problem with cable separation, they have committed to cable separation in their FSAR as Zimmer and their quality assurance program and inspection program as implemented by Kaiser and the licensee, although the licensee's responsibility should have verified that cable separation, as an example, existed, and we did find some problems where they had not implemented those particular areas adequately, and that's in the investigation.

MR. KEPPLER: Let me just add a comment. You have to recall that when Cincinnati Gas & Electric made an application for a construction permit, this was back at a time when the quality assurance requirements were beginning just to get formulated.

I would expect if you would compare the requirements that are in that, the commitments that are in that application, to a plant that is much later in time, you would probably find

some major gaps in this area, but I think the point that Mr. Warmick was trying to make is: As we get into the details of this thing, you will find that the problems really were ones of implementation of basic requirements.

It wasn't that a regulatory guide was lacking in a certain area and wasn't being followed. It is more a basic principal of inspections and audits and recordkeeping.

CHAIRMAN BENDER: That is really why I am pursuing the question the way I am. The regulatory guides are in fact the tail requirements set down usually for technicalogical matters, but my understanding is that the quality system is defined nowadays by references to the ANSI N45 standards and the ASME code and perhaps other things, and really knowing that those things evolved over a period of 10 or 15 years, we would like to know that there is a framework that we are working to right now that we can use as a basis for judgement.

Maybe later on we will hear what CG&E has to say about that matter, but why don't you go ahead.

MR. WARMICK: I think the framework existed. There were just problems in the implementation. The Immediate Action Letter was issued in April, and then over the next few months, we met with the licensee to talk about the Quality Confirmation Program, the actions that would be required of the licensee to confirm the quality of the existing work, that work which had been done in the past.

On August 24 they submitted to the NRC the Quality Confirmation Program. During the period August 24 to October 5, the NRC conducted some independent verifications to try to get an assessment of the impact of the quality assurance problems on the construction of the plant and to give us confidence in what had been done, and then we issued the investigation report in November of last year.

DR. CARBON: Would you say a little more about that August 24 --

MR. WARMICK: I have details on a subsequent slide that will give you all the details on this. Let's go to number two, Dorwin.

(Slide.)

MR. WARMICK: This is a list of the problems that we identified during our investigation. There under the heading of Who's allegation or what was the activity we were pursuing as the timely problems were found, the first items was a problem that involved the supplier of prefabricated piping, a subcontractor, and the technique they were using for conducting radiography.

It involved shimming the penetrameters where they failed to meet a code requirement.

We found that they had been inspecting hanger welds that had previously been painted. They were painted and inspected after the painting.

We observed, visually observed, defects in some of the hanger welds.

The Sargent & Lundy design control programs involved thermal loading, weight loading, and some design calculations.

The piping in the generator rooms, we verified they had voided conformance. We identified a few examples of lack of separation between Kaiser construction and Kaiser quality assurance.

There was a problem with the socket welds on small bored piping. The socket welds are supposed to have a 16-inch clearance, and we couldn't determine that that clearance existed on some of them.

We identified the fact that some of the QC inspectors had been doused with water, and two of the inspectors had been threatened with firing.

We identified code related records problems in that certain weld construction criteria had been deleted, that nonconformance reports were entered on surveillance, and that the surveillance reports procedure was not followed.

We identified unacceptable welds on nine hanger beams. On some of the beams, five hanger beams where a notch had been cut into the beam, the corners were not radius. They were 90-degree, straight 90-degree corners, causing stress risers there.

Four beams had been installed but were not on the

drawings. Nine hanger beams, the traceability of a material, that had not been maintained.

There was violation of cable separation criteria at four locations, and several of the 18 QA materials had not been audited by CG&E, by one of the contractors, Sargent & Lundy.

Those were the problems that we identified. It encompassed many areas, and it was on that basis that we -- that was what raised our concern, why we thought that classified as a major breakdown in quality assurance.

MR. EBERSOLE: I notice a conspicuous absence in the matter of such things as varied safety grade piping, high pressure piping. The really big stuff.

Do you have any findings on that type? I mean, I see hangers. I don't want to down play the importance of hangers being functionally adequate, but, on the other hand, the hydraulic systems themselves, I don't see much in that area.

MR. WARMICK: No, we found -- since you have no problems in the large piping --

MR. EBERSOLE: What about in-service water piping which is buried, which is a nice place to bury mistakes?

MR. WARMICK: There were some questions raised in some of the nonconformance reports that had been voided that involved in-service water piping, but that was the extent of it.

MR. EBERSOLE: Thank you.

MR. WARMICK: We agreed upon this Immediate Action Letter which was -- the whole purpose of the Immediate Action Letter was to control the ongoing and future work, and as I touched on the points of it before, but it resulted in changes in key management personnel.

As Mr. Dickhoner pointed out, CG&E brought in a new vice-president for nuclear power. They replaced their quality assurance manager. They changed their quality assurance organization.

Kaiser replaced their quality or their construction manager and also replaced their quality control manager and made changes within their quality organization.

CG&E increased the size and technical expertise of their staff from six to up to 204 on their QA staff.

They are doing 100 percent reinspection of QC inspections. They took over full control of the records.

Our inspection shows that the quality of the ongoing work is acceptable.

DR. CARBON: Mr. Warmick, you said they did 100 percent inspection of past quality control.

MR. WARMICK: They are duplicating everything that is being done by Kaiser and other contractors on work that's being done at the present time.

DR. CARBON: Being done in the future?

MR. WARMICK: Now and in the future, yes.

DR. CARBON: Are they checking to see what was done in the past?

MR. WARMICK: On what was done in the past, that's prior to April 8, 1981 which is being checked under the Quality Confirmation Program.

This work was for that which would be done after April 8, 1981.

CHAIRMAN BENDER: CG&E is going to tell us about the quality control program?

MR. WARMICK: Yes.

MR. EBERSOLE: Does that include this lifting of the cables to check their routing and --

MR. WARMICK: In part. We did not identify any problems in separation of cables in the routing.

Where we identified the problem was where it would make a transition through a wall or through the ceiling. So we required them as part of the Quality Confirmation Program to go back and look at everyone of these transition places to make sure they didn't have a separations problem at those locations where we had typically found them.

DR. CARBON: I would like to go back to your comment that you received some questions about the in-service water piping which you were answering Mr. Ebersole.

Were these allegations, so to speak? Did you check

them out, or were you saying --

MR. WARMICK: No, these were problems identified by NRC inspectors, Kaiser QC inspectors who had been voided.

In other words, somebody in management had said, "It is not a problem." What we had done and because there were some voided nonconformance reports, we are requiring the licensee to go back and review all voided nonconformance reports to make sure that the disposition of those problems is proper, and then we are overviewing what the licensee is doing.

The whole purpose of the Quality Confirmation program is to determine the quality of the past construction work, that which was already completed when we had identified these problems.

There are 11 points on the Quality Confirmation Program. The major ones being that we required them to look into the area of structural steel material and welds where we had found problems, to look at pipe welds material and radiographs where problems had been identified, to look at the electrical cable separation at these transition points, to look at the proper disposition of nonconforming materials, to determine the adequacy of the architect/engineering design controls, to review the adequacy of subcontractor QA programs, the adequacy of past audits, and the adequacy of control of design changes. These are the major points.

I think that CG&E in their presentation will speak to

each of the problems under these areas and where they stand today so there will be more detail in each of those areas.

To give us an assessment and provide perspective of what the effect of this QA breakdown on construction was and to provide confidence in the quality of the plant, we spent some time between August and October where our people went out and did some independent work.

We brought in a radiography company to do some -- make radiographs, and we contracted with a laboratory to perform metalurgical analyses for us.

We will go through the list. We inspected the hardware related to 24 voided nc ormance reports. We had this laboratory perform metalurgical analyses of six welds which we had identified.

We, the NRC, had picked out -- the licensee had cut out of their existing piping systems, and then we sent them to the laboratory for analysis.

We did the same --

DR. CARBON: How did you come up with a number of six? This strikes me as infinitesimally small almost.

MR. KEPPLER: The purpose of this effort was to just try to get a feel for whether the quality assurance deficiencies were indicative of a hardware problem or not.

It was to get a preliminary look at this point in time before we issued our investigation report, solely to try

to put some perspective to the findings.

DR. CARBON: Did you feel that six would be a number that would give you some perspective?

MR. KEPPLER: Cutting out six major welds, yes, we thought it would because we took them based upon some areas that were suspect to us.

This is not to mean that we won't be doing more in the end. It was just to get a capsule look at where we stood at this point in time. It could have been eight or ten or twelve. It was a judgement call.

MR. EBERSOLE: You said there were six cut out by the licensee. Did you designate which ones were to be cut out?

MR. WARMICK: Yes, we designated it. Six is a very infinitesimally small number, but at least it gave us some perspective, but we picked out the welds and the pipes based on the systems where we had had problems or identified problems or where -- areas where they had found welding electrodes laying around.

CHAIRMAN BENDER: What you are saying, it was not a random selection process? You had reason to believe that there were going to be problems? They would be more likely to show up there than some other places; is that an interpretation?

MR. WARMICK: Yes.

MR. KEPPLER: Let me make a clarifying comment here. The investigation work that we have been doing is not yet

completed.

We made a decision to try to put out an investigation report at the time we did because of the high public concern for what had been going on and also we felt we had a fairly good understanding of what the picture looked like at this point in time.

There may be additional things that turn up later, and these will have to be factored into the Quality Confirmation Program, but we did not want to put out what I will call as a highly undesirable situation in quality assurance without trying to provide some perspective as to what it meant on the hardware of the plant.

That was a conscious decision on our part to do that. If you find fault with the program, so be it, but that was what we looked at to try to gain some perspective of the thing. Go ahead.

MR. WARMICK: We had the licensee cut out two mismatched welds, and by mismatched welds, what we mean is where one pipe may be round and the other pipe has a little bit of an oval shape to it.

There is one section where it is under and there is one section where it is over. We tested 70 pipe welds for hardness and thickness. We visually examined 69 pipe welds. We radiographed 60 pipe welds; dye penetrant tested 42 pipe welds; ultrasonically examined 21 pipe welds, and I might add

that we did the same kind of examination on these welds that the licensee was required to do on the welds.

In other words, if it was a weld that was visually examined, that's what we did. If it was a weld that was radiographed, that's what we did. If it was ultrasonically tested, that's what we did.

We tested 53 beams for hardness and fitup. We visually inspected 380 beam welds, and we inspected additional areas for cable separation.

We found ten cases of weld defects and dimensional problems such as porosity or slag where the weld was either too high or not high enough.

We found four hangers that were unacceptably installed. That's out of about 125 hangers that were looked at.

Four examples of cable separation problems, and possible problem with welds of mismatched pipe. That's still being evaluated.

Our conclusion, preliminary conclusion, that we reached was that there was not a widespread construction problem resulting from the breakdown in QA.

Now, we also, the other point I want to make, is if in the conduct of the Quality Confirmation Program or during our NRC investigation work or inspection work, if we find other problems, then we will expand the Quality Confirmation Program to include those areas.

DR. CARBON: Question about your preliminary conclusion. You say that four hangers out of 125 were unacceptable, which is something like three percent.

What would you have considered as being widespread problems, 50 percent or what?

MR. WARMICK: On the hangers, they have committed to reinspect all hangers so that --

DR. CARBON: But that almost seems contrary to your conclusion.

MR. WARMICK: The hanger problem had been identified in an earlier inspection, a December inspection, by one of our people, and the licensee was working on this problem so that one influenced us less than some of the other things.

DR. CARBON: Let me switch to the cable separation problems. There were three of them. What sort of a percentage does that represent? I didn't expect the part up above with the part down below on cable separation.

Was that any significant percentage of points that you checked?

MR. WARMICK: No, what we did is we went through several rooms and we, taking broad looks at the areas where we -- to see if we could pick out any problems. It was -- I don't have a good feel for the percent of that problem, but the people that were doing the looking who were experts in these areas were the ones who said, who put the perspective on

it, that it was not what we would call a widespread problem.

MR. KEPPLER: Dr. Carbon, let me add a comment to that. We pulsed all of the inspectors that were involved in this, and based upon the types of quality assurance deficiencies we identified during the investigation, it was our view that a lot more problems would have resulted, would have shown up, and these people felt that at this stage of the game that that was not indicative of a major problem.

There were still further checks to be done on the part of the company. Yes, these things should not have occurred at this point, but it was not viewed as a bit problem by the people who were doing the inspection of it.

CHAIRMAN BENDER: Mr. Keppler, I think it is not unusual to find things if you look again, and we are not surprised that some of those things show up.

Do you judge the question of whether something is widespread or not by comparing it with the experience of other plants that have been inspected?

MR. KEPPLER: Yes.

CHAIRMAN BENDER: So the judgements you might be making here would be along the lines of saying, well, other plants have seen problems too, and there are corrective measures that are taken, and this is in line with those? Is that the kind of judgement you are making?

MR. KEPPLER: Yes.

CHAIRMAN BENDER: I wanted to ask about the matter of how things like cable separation problems come about.

If it were true that the drawings provided by the architect/engineer adequately defined the separation requirements, then I would want to ask whether the problems arose because the drawings were wrong or whether they arose because the requirements were not spelled out on the drawings or whether the drawings were not followed exactly?

Which of those three things characterizes the problem?

MR. KEPPLER: I don't think that we can answer that at this moment. We will get that information for you, if you like.

MR. WARMICK: One thing I do know is that there are many cases, and I think this is most of the cases but I am not positive, where the cables would be almost -- had the correct distance between them but because maybe somebody was doing work in there that pushed them out of placement, they would then become too close. That was the situation we found pretty much.

CHAIRMAN BENDER: I see. So we are arguing about whether something is a foot or two out of line?

MR. WARMICK: Yes.

CHAIRMAN BENDER: Or a few inches out of line?

MR. WARMICK: Yes, that's correct.

MR. EBERSOLE: Could you tell me does this plant have an independent shutdown capability from outside the control room if the separation scheme is invalidated?

MR. WARMICK: Yes.

MR. EBERSOLE: It has the same capability of safe shutdown if the control room becomes heavily involved?

MR. WARMICK: Yes.

MR. EBERSOLE: It has that so it has met the responsibility of requirements on the 175 separation a great deal.

Your statement of no widespread construction problems I gather, should be interpreted in the narrow context?

You didn't find any bad problems in pipe welds and hanger welds and cable separation. But I gather from reading some of the materials submitted on this that apparently a great deal of field routing and field design was leaving the design process, that there was a design process which was essentially following construction rather than the reverse which should be the case.

Is that last statement supposed to be in broad context, no construction, or was it the fact that the building was built ahead of designers?

MR. WARMICK: Well, the preliminary construction is really based on what we looked at in relationship to the problems that we had identified.

CHAIRMAN BENDER: In a narrow context?

MR. KEPPLER: I think Mr. Bender said it well, and I believe that's the way some of the inspectors characterized it. If you look to this depth at another power plant under construction, the types of problems found would be similar.

DR. CARBON: That gives one confidence if you find them at this plant and other plants and that they don't continue to show up and that they aren't serious, that they are things like an inch too close instead of some problem that will keep it from functioning properly.

Are you saying that the case is that they are not serious problems or that they are all corrected?

If you tell me that each plant has uncorrected problems of a serious nature, I get no comfort from that.

MR. KEPPLER: Nor do I, but I think, Dr. Carbon, you have been around enough power plants to know that you are not going to build a power plant without any mistakes.

I am not defending the kinds of problems we found. In fact, I think we have taken very firm regulatory action on these matters.

But the fact is to go in any power plant and not find a problem is, I don't think, too likely a course of action.

Don't forget the preoperational testing program has not been done yet, the hydrostatic testing of systems.

Hopefully a lot will still be learned at the plant, but I suspect by the time this licensee goes through this Quality Confirmation Program and goes through the scrutiny that's under -- that's being placed upon it by the NRC today, we will know more about this project than we do about any other plant in the United States.

CHAIRMAN BENDER: Mr. Keppler, you are probably right. We learn lessons from every plant, and we learn more from the ones that get in trouble than the ones who don't get in trouble.

I wanted to pursue Mr. Ebersole's question a little bit, again, to see how much the engineering practice in this plant is like other plants.

One might interpret from the kind of observations that Mr. Ebersole made as suggesting that more latitude was given to make field changes, or to make field decisions in this plant than might be the case in others. Is that true or not?

MR. WARMICK: I don't think that the practice here varies that far from what we find at other plants. It is common practice to red line drawings to deflect field changes.

CHAIRMAN BENDER: Is the recordkeeping adequate?

MR. WARMICK: That was part of the problem.

CHAIRMAN BENDER: Okay.

MR. WARMICK: It was the records and the other part of the problem was the implementation of the licensee's system

for identifying problems and correcting them, their non-conformance system.

That's why we imposed these actions on them to review all of the nonconformance reports, the surveillance reports, their exception lists, their punchlist.

CHAIRMAN BENDER: Why don't we go on.

MR. WARMICK: That concludes my presentation on the investigation.

MR. EBERSOLE: One more question. Again, I got an impression from reading the material that in many cases the field decided where to put major hangers, and then they reflected that decision back into the design process.

I never was convinced that subsequent analyses were made to confirm the adequacy of those location decisions. Is that the case?

MR. WARMICK: No, I think that what you find in any plant is when the hanger doesn't fit where the drawings shows it, then they shift it a few inches one way or the other and then there has to be a reanalysis to make sure that that change is taken into effect and is all right.

MR. EBERSOLE: Another point here: I noticed no comments on the steam relief piping, the quality control on steam relief piping. Some of that piping is extremely critical where it traverses the void space above the water.

It is not a non-responsible pipe. It is a very

responsible pipe. Could you say that the current steam relief piping, the discharge from the steam relief valves, is now meeting the necessary quality standards?

MR. WARMICK: One of the allegations made had to do with the main steam relief piping, and we did go in and we looked at it and we made -- we did some ultrasonic testing of some of those welds and visually examined them.

And, yes, we didn't find any problems with it.

MR. EBERSOLE: Are the mounting and supports of that piping where it traverses the void space above the water, has that been done according to the design? That's the critical portion.

MR. WARMICK: Yes, and I am not sure where they stand on the hangers in there, as to what has been done or what hasn't been done, but all that work is in progress where they are reviewing everything that's been done and analyzing every-one of the hangers.

MR. EBERSOLE: You understand why I say that? That portion is capable of bypassing the suppression portion, and you have no containment if that occurs.

MR. KEPPLER: We will factor that into our inspection program.

CHAIRMAN BENDER: Is that all the presentation Staff wants to make right now?

MR. KEPPLER: Yes.

CHAIRMAN BENDER: I want to ask one other question mainly for clarification.

When we reviewed this plant sometime ago, it was not clear what the role of the architect/engineer was in the inspection program, and I am not clear today that I understand how the architect/engineer's people enter into this quality program.

Will we hear about that from you or from the Staff or from CG&E?

MR. KEPPLER: Are you prepared to talk about it?

MR. BORGMANN: We can address it. It is not in our presentation, but we can address it.

CHAIRMAN BENDER: I think we would like to hear that. It is always comforting, at least, to know that the people who designed the plant have some continuing interest in whether the building of it is in accordance with what they intended, and it is often difficult when you come to carry on a more extensive quality review process to know whether they have access to the thinking of the designers.

And I think it would be useful to hear some commentary on that when you get to your presentation.

MR. KEPPLER: To the extent that we can comment on what they say, we will do so.

CHAIRMAN BENDER: Fine. I think the next thing we have on the agenda is the response of CG&E. Mr. Borgmann, do

you want to make that commentary?

MR. BORGMANN: I would like to make a few comments. First of all, I think you have to put the role, I guess, of CG&E over the years in the quality assurance area in proper perspective.

When this project initially started, we were like a lot of other projects. We vested the quality assurance implementation program in the field to a contractor.

And in this case, it was also the constructor, but they had distinct, separate areas of reporting. In otherwords, they had separate channels back to the headquarters, and it met all the criteria.

We had a very limited overview of the program. Over the years while there were problems brought to our attention in the normal course of inspections, I personally never got the impression that things were out of control and so many times we were very close to finish on the plant and our attention was vocused primarily on developing operational QA,and we never did attempt to develop a QA organization in the field that was completely all inclusive and independent so that CG&E was doing all the QA.

We basically had vested the authority in the contractor and had an audit function, an overview of what they were doing.

Now, as Mr. Dickhoner said this morning, we are not

coming here to say that there were not breakdowns in the quality assurance program.

I think what I would like to say is this, though: That there was an adequate program and the criteria under which the program was established and the qualification of the people implementing the program, I think, met all of the commitments, but in the implementation there obviously was some shortcomings and some sloppy recordkeeping and things like that.

From the construction standpoint, we have always maintained that we never shortcut any quality, and we have every confidence in the quality of the plant.

We didn't come here today to go down and refute point by point each of the things that were found. I don't know that that would solve any purpose.

I think my thrust is this: We feel that it will be demonstrated to everybody's satisfaction that this plant is built to a satisfactory level of quality and a lot of the things that were found you could interpret to a degree.

I mean, in today's climate, things which in the past could have been looked at as being satisfactory are no longer satisfactory.

I am not condoning saying that they should be accepted or not. I am merely saying that we are being looked at a lot more closely than perhaps somebody would have been in the past.

I don't want to imply that we are shortcutting anything, and it has been our motivation to build things just as well as we could.

I don't know that it would serve any purpose, as I indicated, to go down and try to discuss each defect, just how serious they were or to what depth they were. I think we have some good cases on our side to indicate that some of these things would have been found in the normal course of final walkdowns, final checkouts, because a lot of that has not occurred.

But be that as it may, I think that it is our position that we want to complete this plant and operate it.

I guess we have been given a very sound lesson, and that lesson is that you don't delegate anything to anybody, and I think we have learned that lesson and we are prepared to put into the QA program what it takes to personally assure the management of our company that the implementation is as it was designed in that the final result will satisfy everybody.

Now, we are prepared later on to go through the Quality Confirmation Program to show you what we are doing to give our side of that, but if you have any questions, I would try to answer them.

I don't think it would serve any purpose for me to try to characterize each of the defects found. If you want our side of the history as was indicated by Mr. Warmick, I guess our turn in the limelight began with the allegations of

Tom Applegate.

Here, again, he was on a case, investigating a divorce case, where he tapped a telephone line of a woman who's husband was a pipefitter at Zimmer and brought to our attention that he was on the second shift and should have been at work and maybe somebody is doing things up there that they shouldn't so we decided to hire the man and investigate it.

And we made the appropriate -- took the appropriate actions in getting rid of three pipefitters and two guards who were allowing people to go off the site on the second shift.

These were pipefitters who were involved with the radiography and standing around most of the time.

In any event, he saw fit to make a lot of other allegations which were mostly things picked up on the site and, of course, he has been pushing his allegations for over two years now, and one thing led to another.

You have hard the initial investigation which basically said that with the exception of some pipe spools that were thrown off a truck, things were basically as sound at Zimmer as most plants, and we were going to get on with the work.

We went to GAP. He came back and further allegations resulted, and it snowballed, and this investigation was culminated in the report of November 24.

If you had many, many hours, we can sit down and go through each of those items. I don't think that's a useful exercise.

I think there are things to be said on our side, and I think you would have to take each individual case and try to characterize it as to its seriousness, how much of it is rumor, how much of it is fact.

I think it all boils down to this: We allowed sloppy implementation of a QA program. We admit that.

We believe that the current program will substantiate the quality of the plant, and we will do what it takes to satisfy everybody that the confidence that we have in the quality will be justified.

CHAIRMAN BENDER: There would not be any purpose in going into that detail, and that was not the reason for asking for this discussion.

We want to understand what the important aspects of the problem are and to understand how they relate to the safety of the plant.

Mr. Ebersole made an exceptionally important point when he said, well, look, if there are other kinds of shutdown capabilities that are available in this plant, the issues that have to do with certain issues of quality control may be less important.

MR. BORGMANN: Right.

CHAIRMAN BENDER: A lot of that is in the design approach. That does not mean that the plant should not be built to high standards.

I just mean that you can have tolerance for certain kinds of mistakes if they are alternatives in the design.

In fact, one of the things I am anxious to find out about is how well the people that are evaluating the flaws understand the design philosophy that is built into the safety approach.

We will do more exploration of that today as we go along.

MR. BORGMANN: I might add with regard to service water piping, we have reviewed every radiograph on the service water piping.

In fact, did we dig up two wells?

MR. CULVER: Yes.

MR. BORGMANN: We dug up two wells where there were questionable radiographs so I think we feel confident we have good radiographs on the service wells on the water system.

CHAIRMAN BENDER: Other questions of Mr. Borgmann? We had scheduled a break at 10:00. Looks like a good time to take a break.

(THEREUPON, a short recess was taken.)

CHAIRMAN BENDER: As I suggested, we will allocate five minutes for each one of the speakers. I might as well

start in the order I received them.

Mr. Carpenter. Let me emphasize we are going to limit the statements to five minutes so, if they take longer than that, we will just ask you to sit down.

MR. CARPENTER: Okay. I have only got two copies of the statement.

My name is Tom Carpenter, and I work for the Cincinnati Alliance for Responsible Energy. We have always approached the issue of the Zimmer Station from the standpoint that the plant is not safe unless proven safe. Contrary.

I am going to deviate a little bit from my written statement here. I would like to point out, since I only have five minutes, that the information that has been brought up in these investigations of recent, preliminary findings released in November, isn't anything that's brand new.

We did a brief summary of the docket room documents in Batavia where the records on the plant are kept, and we have provided copies of those.

And one document in particular was very interesting from 1974 to 1976, a summary. You find some very familiar things in here concerning quality assurance and the fact that even then there were problems with records falsification, just a huge, huge list of things, problems that are summarized.

These are problems that aren't old -- I mean, aren't new. They are something that has been going on for quite a

long time.

As a matter of fact, Tom Applegate wasn't the first whistle-blower on the Zimmer Station. As early as 1965, Dick Griffin, who is a quality control inspector for Kaiser Engineering, came forth and says that there is a lack of quality control at the Zimmer Station.

The NRC sent down a representative or a couple of representatives to spend an afternoon with him.

Three days later they held a press conference downtown and announced that the plant was safe and that there was no problem.

From our perspective, we have dealt with many workers in the past, not just Mr. Applegate. We have sponsored workers in the licensing as interveners.

We have seen the type of problems at the Zimmer Station that came to a head in November.

I would say, from our point of view, that we have had to beat the NRC over the head to get them to act.

It was only through the courage and sacrifice of a certain individual, Tom Applegate, who did step forward and at great personal sacrifice to himself and to other people and managed to get the attention of the Nuclear Regulatory Commission, and then only with the assistance of the Government Accountability Project which, by the way, I haven't heard mentioned, which investigated this whole issue way before the NRC, much

more thoroughly than the NRC every investigated it.

Then after only filing a petition with the Mayor's Citizens Projection Board was the NRC forced to stand up and take notice.

In light of the problems that have been going on over the lifetime of the plant, over the history of the plant, I would like to ask you as an advisory commission to consider taking a step which is a little beyond what is being talked about here today.

From our viewpoint, the fact that CG&E is conducting its own Quality Confirmation Program is a little bit like letting the fox guard the hen house.

Even though CG&E hired Kaiser to do the Quality Confirmation Program, I think there is plenty of evidence that CG&E had some control over that program.

I urge you to read the investigation report, especially the interview with Mr. Bill Schwiers who was the head of CG&E quality assurance for many years.

He was recently released or early retirement or whatever you want to call it when the investigation was over.

He stated that his name would appear on certain documents, but that all decisions were made at CG&E management meetings.

He said his role in denying Kaiser quality assurance staffing requests were not his decisions but CG&E's management

decisions.

He didn't go into detail as to who was exactly at these management meetings. He concluded his interview that he was under tremendous pressure, and he would only answer subsequent questions with a yes or a no.

Why this wasn't followed up in utility management, I don't know.

Obviously there are some indications that -- the report itself has listed over a dozen instances of possible CG&E management involvement in quality assurance falsification, haharassment and intimidation and the fact that there is a lack of a quality assurance program.

We feel that on the face of that evidence and the face that there is even a possibility that CG&E management had anything to do with this that there should be an independent 100 percent reinspection program by another firm independent of CG&E that would report directly to the NRC.

CHAIRMAN BENDER: Thank you, Mr. Carpenter. Dr. McElheney. I take it he is not here yet.

Let me ask Mrs. Mayer if she would like to come forward and make her statement.

MRS. MAYER: Good Morning. My name is Vicki Mayer. Sometimes when I have trouble, I am sorry I am not related with the other Oscar Mayer.

CHAIRMAN BENDER: I apologize.

MRS. MAYER: That's all right. I understand. My name is Vicki Mayer. I am a property owner in Clermont County and I say, unfortunately, I live within the EPZ zone, Emergency Planning Zone, and I have been involved in this project as a concerned citizen since the spring of 1979.

Three-Mile Island was a red flag for everyone and especially those of us who live around the plant.

We are not or we were not experts, but I believe we have become almost lay experts in the nuclear power generation because we were scared to death.

We thought, "Hey, this could happen in our neighborhood as well." We have investigated. We have rung doorbells. We have screamed. We have yelled. We have protested, and we have investigated.

I charge that you cannot have a quality assurance program after the fact, and I think, yes, that this is what you are finding out now, that you cannot have a quality assurance program when the plant has been 90 percent completed.

During the summer of 1979, we contacted and were contacted by many workers at the plant, and we took many affidavits, and I believe the NRC does have copies of those affidavits.

The charges from those affidavits were all the way from inadequate welding to overloading of cable trays, much drug use and alcohol use by the workers.

Many of the workers said it was the worst plant that they had worked in. The construction was so poor that when they turned the plant on for a test, they were sure to be at least 100 miles away.

This happened time and time again. Sometimes anonymous phone calls; we can't take that into consideration because they are anonymous, but there were many that were willing to come to the front and tell us the problems that had been happening there.

You know, silly things like throwing beer bottles into the concrete, I think, around the containment vessel. You know, just crazy little things like that.

There was also harassment by upper echelon saying, "Don't say anything. Don't talk to these people," you know, threats. They have had threats.

One fellow was threatened by anonymous phone calls. You have heard about falsified records, cover-up, cover here. Public confidence,I think, is at an all time low.

My confidence level is very low, not only with the quality of the plant, but also with the actions taken by the NRC.

We had, as Tom Carpenter said before, we had to pull them by the ear. We had to do everything within our power to let them know that there was a problem.

I think that the NRC at this point has a vested

interest in the favorable outcome of this investigation because I think there credibility is also on the line at this point.

You are saying that the big investigation started with Applegate. That I would also say was after the fact as well. Applegate yelled and screamed too, and this was maybe two or three years after some very serious problems had surfaced.

And the old adage, I will say: "A chain is only as good as its weakest link." I think that Zimmer at this point cannot be investigated unless, if you will, and carefully, unless you were to tear down the walls and start from scratch.

I think that you gentlemen here have a moral obligation to see that this is practically done before you can assure the safety of the people in this county. Thank you.

CHAIRMAN BENDER: Thank you, Mrs. Mayer. Mrs. Reider.

DR. CARBON: When such statements, written statements, and so on come in to you and I presume they have to be in written form before you really look into them, does your Staff review these, put them -- factor them into the investigation process such that you feel that they have been given dutiful consideration, however your judgement tells you to define that?

MR. KEPPLER: Dr. Carbon, any possible connections about the safety of the plant are investigated by the NRC. Mrs. Mayer's statements that other allegations have come forth is true. There have been other allegations, and those were

investigated by the NRC.

I think that, as I mentioned to you earlier, the investigation that was discussed here today is still ongoing, and some of the same allegations that came forth earlier have been brought up again.

I think in fairness, we have to, in an attempt to do a solid job on it, we have to take a look at what was done with respect to those and satisfy ourselves once again that what we did previously was an acceptable product.

If it was not, we will have to correct it. If it was, then we will have that information, but it is my intent to go back to all of the allegations that have come forth as part of this to make sure that in today's light we think we did a good job on them.

MR. EBERSOLE: May I make an observation? Mrs. Mayer suggested that there were QA people or a person who was responsible to CG&E who was not permitted to do what they wanted him to do.

In the course of the development of this case, he was fired as a result of all such cases like this. Is thrown out. It may well be that he has testimony which under subpoena or any other necessary legal pressure to get it that he can tell us his story.

MR. KEPPLER: We have interviewed Mr. Schwiers as part of our investigation.

MR. EBERSOLE: What was the result?

MR. WARMICK: He did not give us any information that -- well, the information he gave us we have pursued. We still have more work to do.

MR. EBERSOLE: It is not done then?

MR. WARMICK: No, we have more work to do. I guess we can't answer your question at this moment.

MR. EBERSOLE: All right.

CHAIRMAN BENDER: I think Mrs. Mayer did make an important point, and it is one we are also concerned about: The matter of whether the quality is in the plant. That will have to be established.

I do not expect that to be done by bald statements here one way or the other. I think the NRC itself has indicated that it wants to know that the quality is built into the plant, and I guess I would not be so skeptical as to say you could not find out how good the quality is after the plant has been built. Neither would I be so optimistic as to say that you might not want to take a wall out or two.

We will be looking forward to seeing what the results of whatever this confirmation program is, and I am sure the NRC will make some judgements about it.

But all concrete structures and others have certain tolerances for flaws. If we did not tolerate a pop bottle or a beer bottle once in awhile, I think human nature would say

no concrete structure would ever survive. I do not think the comments should be ignored.

Neither do I think they should be dealt with out of proportion to their significance, and hopefully we will see more of that as the review is carried out.

MR. KEPPLER: Could I make a comment? I think that all of us here feel the strong need to have as good a quality plant as can be had, but the safety does not depend upon 100 percent perfect quality, as you know.

This project will be put through a rigorous test program that will be reviewed by the NRC, and when you talk about concrete structures, I think specifically it is worth noting that the structures will go through and over pressure test and a leak rate test, and I think if there are serious flaws in the concrete, that's going to show up at that time.

MR. EBERSOLE: May I ask a question? In view of the fact that there are not now any regulations that require an independent shutdown capability at a distant place in the control room, GDC-19 does not specifically and implicitly require that you have that completely independent from the control room. Someone has elected -- I doubt that it was CG&E and I am surprised that it is Kaiser -- but you have told me that you have that kind of shutdown, but now who and how are the parties going to expect the shutdown independence and separation of this capability you are talking you have from the

standard capability because you are not going to find it in your regulatory guides.

MR. PELTIER: The shutdown capability is required by fire protection and the Zimmer plant currently has two shutdown panels outside and remote from the control room.

MR. EBERSOLE: Who identified the separability features of that particular system as the wires meander back to the source points of information control.

You are not going to find it in your guides that such a scheme exists.

MR. PELTIER: I am sure that I cannot answer your question with regard to those particular panels.

However, I would point out that the issue of the associated cables and the utility, rereview of their associated cables is still an open issue on Zimmer. We are looking at that.

MR. EBERSOLE: Let me suggest that you make a strong point of determining the independent and the separations of this independent function.

I am not talking about one channel from another channel or division A from division B.

I am talking about an integral shutdown capability which I know of no existing regulatory guides.

CHAIRMAN BENDER: Mrs. Reider, I think we have had you standing up there long enough.

Would you like to go ahead?

MRS. REIDER: Yes, sir. My name is Mary Reider. I represent the City of Mentor.

The City of Mentor is a participant in the Zimmer Operating Licensing Hearings which are ongoing. Since December, 1979, we have participated in those hearings.

When we were admitted as a participant, we were required to take the proceedings as we found them. The only thing left to hear were contentions relating to emergency and evacuation planning.

We were not given the opportunity in those hearings to bring forth any safety related items.

I would like to take this opportunity now to tell you about a great concern that the City of Mentor has. The City of Mentor is concerned about the blasting at the Black River Mine.

Black River Mine is a limestone mine. It is only a few miles from the Zimmer Plant.

For years, sir, we have heard rumors of a foundation at Zimmer cracking when blasting at Black River Mine occurred. We have never had the money, the opportunity, or the energy to investigate these allegations.

Quite frankly, we heard them time and time again, and at best ignored them. Just recently,we have talked with several people who were involved in formal proceedings against Black River Mine several years ago.

As a result of those conversations with these people,

these participants, we are even more greatly concerned about the blasting and that the blasting will create problems, safety problems, at Zimmer.

We are concerned that the Zimmer plant and Black River Mine, which is a few miles away, are on the same rock stratum.

CHAIRMAN BENDER: Is Black River Mine in Kentucky?

MRS. REIDER: Yes, sir, Black River Mine is on Route 8 in Kentucky. We are concerned that the shock waves transmitted from Black River Mine to the foundation of the Zimmer plant in the pairings or pilings for the structure of the plant and the structures themselves will be effected by some sort of safety related problem.

We are concerned about the magnitude of those shock waves or vibrations. We are concerned about the impact of the frequency of the blasting at Black River Mine. What impact will it have on the Zimmer plant?

In July of 1980, there was an earthquake at Maysville, Kentucky. That earthquake was felt up in the area around the Zimmer plant.

I live about four miles from that plant. The City of Mentor is two miles away. We felt that earthquake.

Two days later we received a letter from the NRC.

As participants in the hearings, there indeed had been an earthquake and that they would investigate to see if Zimmer

was designed to withstand the shock or impact of an earthquake.

Months later, and I will stand corrected on this because I was unable to pull this document out of the numerous files of documents that we have accumulated in two-and-a-half years, but months later we received a communication from the NRC and to the best of my knowledge, it said that the earthquakes, the possibility of earthquakes, was so remote that we did not have to worry about them.

Now, in view of the recent conversations that we have had with the participants in this Black River Mine Hearing, the possibility that Zimmer and Black River are on the same rock stratum, we are again concerned about our safety.

We are again concerned about the overall basic design of that plant to withstand shock waves, be they a result of an earthquake in Maysville or blasting just a few miles away at Black River Mine.

We would like to ask you to investigate, to answer our questions. We would like before that plant is ever given an operating license to know if indeed the mine and the plant are on the same rock stratum.

We would like to know what are the calculations, what is the magnitude of those shock waves resulting from blasting which is frequent.

We would like to know about the frequency of the

blasting and it's impact on Zimmer. We would like to know about design of the reactor, the buildings, to withstand these shock waves.

And we would also like to know if indeed the rumor we have heard for years about a cracking foundation when a foundation was poured actually occurred. We thank you.

CHAIRMAN BENDER: Thank you, Mrs. Reider. The Regulatory Staff has some obligation to look into -- more than an obligation -- it is a requirement to look into any potential hazards in the vicinity of a nuclear plant.

Earthquakes have always been a matter of considerable concern to the NRC. The blasting I had not heard about before, but the questions Mrs. Reider raises are the kinds of questions that I have heard at other plants.

What is the status of the Staff on this matter?

MR. PELTIER: Mr. Chairman, I would first address the quarry operation. In the early reviews, the NRC did look at quarry operations in the area.

As a result of an inquiry that came from a congressman, and I don't recall his name any more, the issue was reopened because someone had called to his attention the fact that there was a limestone mining operation where they would be blasting in the California or Kentucky area. That's the Town of California.

So we took another look at that situation, the mining

and the blasting effects at the plant site.

The Staff made very, very conservative assumptions about both above ground and below ground storage of blasting materials and did an analysis to determine what the accelerations and the ground effects and the air effects would be at the plant site.

There conclusion, which is contained in Supplement I to the Safety Evaluation Report, there conclusion was that the blast effects from the air and the -- would not exceed the pressure design of the structures, nor would the blast effects through the ground exceed the operating basis, earthquake accelerations.

So the Staff was satisfied after re-examining this matter and making conservative assumptions that the mining operations would have no impact on the safety of the plant.

CHAIRMAN BENDER: Is there a numerical analysis to back that statement?

MR. PELTIER: Yes, there is. The numbers are contained in here. I could find them for you, if you would like.

CHAIRMAN BENDER: I do not need to know what page they are on right now. I suspect the analysis is not there, that is maybe there that came from the analysis.

MR. PELTIER: All results from the analysis are here. The plans, actualy calculations, of course, are not present.

MR. EBERSOLE: What is the likelihood of a magazine

exposure? What you imply is the earthquake is the same as or larger than that of a magazine explosion.

That is why I asked that. We do not like to have operating earthquakes too often.

MR. PELTIER: I am not familiar with the term "magazine." The Staff used a thousand tons.

MR. EBERSOLE: Is that the maximum amount?

MR. PELTIER: That is a conservative estimate of the maximum.

CHAIRMAN BENDER: I suspect that is well above.

DR. CARBON: That was a thousand tons?

MR. PELTER: Assuming the explosives stored at the site would not exceed a thousand tons.

DR. CARBON: Would that analysis apply to certainly cover the Black River Mine area? Would it be applicable there?

MR. PELTIER: I believe the mine she is talking about is the one that was called to the Staff's attention, although I cannot be sure of that.

I believe it was California.

MR. BORGMANN: In the beginning, there is some date in the early days on the Black River Mine. It is not something that was ignored.

DR. CARBON: Mrs. Reider, let me make one comment without wishing to argue, but nuclear plants are built to tolerate earthquakes. It is not on the basis that they won't

occur, but rather that it is assumed that they will, and they are then built to withstand them.

MRS. REIDER: Could you ask about the crack in the foundation of the building?

MR. BORGMANN: To our knowledge, there has been no crack in the foundation. If you want to be specific, I would like to know what foundation is being referenced.

MR. REIDER: Sir, I don't really know. All I know people now in the City of Mentor have heard by word of mouth about the cracking of a foundation that was just recently poured and the blasting at the Black River Mine, the fact that the foundation had to be repoured.

We have heard rumors of this nature for years and years and have never ever gotten at the source of it, but we feel that there is some concern by some of the workmen for this rumor to have gotten started in the first place.

MR. BORGMANN: Mrs. Reider, I can assure you as I sit here I have never heard that before, and has anybody here at this table?

MR. SCHOTT: Not only not heard, never seen.

MR. BORGMANN: I would be happy to investigate in depth if you can tell me the man and what he is talking about because nobody from CG&E has any information on a foundation that was cracked, let along being cracked as a result of blasting at Black River Mine.

I just do not know anything about it. But we certainly would investigate it if you give us some more detail.

MRS. REIDER: If I find out more details, I will give them to you and also the NRC.

MR. BORGMANN: But as far as the earthquake goes, we were asked to investigate and in fact they sent a team down after the Maysville earthquake and looked over the plant and asked a lot of questions and wrote a report, so I think there is sufficient data indicating that Zimmer went through that earthquake with not even a ripple.

CHAIRMAN BENDER: What was the size of the Maysville earthquake?

MR. REIDER: We just felt it.

MR. BORGMANN: Six, six-and-a-half, something like that.

CHAIRMAN BENDER: What is the G value that the plant is designed for?

MR. BORGMANN: Point I and Point II.

MR. PELTIER: If I am looking at the right numbers here, the Staff's report on this also is included in Supplement I, and they concluded that the earthquake was in the order of, let me get my numbers right, intensity seven earthquake. Magnitude 5.0 to 5.2.

This was at the site which was well below the operating basis earthquake designed level.

CHAIRMAN BENDER: Mrs. Reider, do you have access to this particular report? What is the report number?

MR. PELTIER: This is NUREG 0528, Supplement I. . . .

MRS. REIDER: I have not read the supplement yet. I have read the other report.

The reason I bring this up is in the conversations that we have recently had concerning the foundations and that in the whole area, I have talked with an engineer that testified at this hearing, and he was an engineer in soil and foundations, and it was his opinion that if indeed Zimmer and Black River Mine are on the same rock stratum that blasting at the mine would definitely be much greater than what we experience with this last earthquake and that it would have a strong impact on the plant.

Now, I realize that there are design features built into the plant, but my concern is whether or not those design features are actually great enough to withstand an impact of blasting if it is the same rock stratum.

CHAIRMAN BENDER: Well, let me leave it this way: The Staff is aware of the problem. I think it is the kind of thing that the public record would need to have clarified, at least, and it seems to me something to that effect ought to be available at some time for the purpose of just being sure that all the information that has been raised about this plant is understood.

I, myself, am a little skeptical that blasting to the extent that it could go on in a quarry could transmit much force over a 12-mile distance, but that is a judgement based on --

MRS. REIDER: Sir, it is about two or three miles from the plant.

MR. PELTIER: We are talking about less than two miles.

MRS. REIDER: California, Kentucky is not the site of the mine. It is Kentucky, though.

CHAIRMAN BENDER: Let me leave it: The Staff ought to at least update the information and know about this thing and be sure that there is a record of it somewhere.

There is certainly adequate capabilities on the Staff to evaluate this type of thing, and if CG&E has any way of adding to the clarification, nobody would object to it.

MR. BORGMANN: No, not at all. I am concerned about the cracked foundation.

If there are specifics on that, we would certainly look at it.

CHAIRMAN BENDER: Ms. Dennison.

MS. DENNISON: I am Geneveve Dennison, and I am a member of Zimmer Area Citizens Committee. It is a group comprised of residents within the ten-mile EPZ.

Many points of my statements have already been

covered, but I feel that they bear emphasis, particularly the fact that I am in the evacuation zone and to me, they need emphasis.

For many years, and particularly since 1975, I have had first-hand information regarding quality control at Zimmer.

Dick Griffin, who I feel is the first victim of the station, brought the problems of quality control to the public. At that time he was humiliated, threatened and discredited by the Cincinnati Gas & Electric Company.

Subsequently, all of his allegations of noncompliance were proved to be accurate.

In August of 1979, I talked with a Kaiser employee who was harassed and fired from his job as a quality control employee.

His allegations were reviewed by the NRC Branch of Inspection and Inforcement, and he was discredited in their report.

As far as I know, this was never made public and perhaps this is an event which should be further investigated.

Recently Thomas Applegate has made severe allegations regarding quality control. He too was humiliated, threatened, discredited by and subsequently all of his allegations of noncompliance have been proved to be accurate.

Currently the group that I represent, Zimmer Area Citizens, is participating as an intervener in the hearings

before the Atomic Safety and Licensing Board, and we are faced with the situation of discussing an evacuation plan which was prepared by an engineering firm in New York City with no local public hearing input or control as promised, and as I believe is regulated by the NRC.

All of this leads me to the point of credibility, responsibility and attitude of the utility as it affects the health, safety and psychological well-being of the population in the ten-mile EPZ.

From testimony at the licensing hearings and matters discussed this morning, it appears that the NRC and CG&E work in tandem to cover-up mistakes in matters of noncompliance.

Can a population of approximately 24,000 people feel confident about reactor safety and evacuation plans when time and time again the applicant has been proved noncredible, non-responsive, and incompetent?

How will you find all faulty construction in a facility which was 90 some percent complete when the crime was exposed?

I do not want my family to be a buried mistake.

CHAIRMAN BENDER: Thank you, Ms. Dennison. Is Dr. McElheney here?

DR. MCELHENEY: I am Dr. McElheney of Covington, Kentucky. I am a surgeon by trade. I am an associate professor in surgery at the University of Cincinnati for many years.

I happened to have a patient who stimulated me about three years ago to become interested in nuclear power. The patient happened to be Tom Applegate.

When Tom Applegate started with the things that he saw, one of the unusual things that he first was remarking about was the shiney belts that everybody was wearing at the Zimmer plant.

And, you know, I thought it was kind of peculiar, but everybody runs around with a great big belt buckle which is made out of stainless stell which -- I don't know what it costs per square inch -- but they were made evidently in the plant.

I couldn't see any significance to it, but then he kept talking about this weld business, that x-ray of welds, that there was some question about breaks in the place where they x-rayed the welds.

I listened to all this and questioned him, and in the meantime I started to read things about nuclear power and so in the last three years, I have gone through about maybe ten books such as John Goffman's Effective Nuclear Radiation on Human health, Dr. Sternglass who is an M.D. and has talked about the things like that. He now has a job both at Pittsburgh and University of Indiana.

I talked to him at least three times last week on the telephone. I brought some of my comments to the officials

here, and I was told that those people didn't know about radiation.

Honestly, I am a surgeon. I don't know much about radiation except for 30 years I have been working around it, and I still alive in my operating room and I bring x-ray machines in, and I know that x-ray does have an effect.

I know radioactive material has an effect. As more of this material comes out, the amount of radiation that we get from or that we did get from the blast in the air that came down and affected the children, particularly the thyroids of children, and it has taken a long time for people like Sternglass to be able to document how much leukemia, how much cretinism. That's due to the effect on the thyroid.

Just like over the telephone yesterday, he said, and the latest, my latest link is with sudden infant deaths, SIDs. At Baltimore now, they have found that the T-3s in, let's see, maybe 50 out of 60 children that were autopsied, that the T-3s have gone from -- so my point is -- that I have become involved in this, and I have gone to all the meetings and I have listened to -- I went through the evacuation plan. I went through it the night before. I asked a silly question of a general from Kentucky.

I said: "General, if the thing blows, you say you don't cover the rods and the gases out of the stack. Of course, the Ohio River runs by it and the water supply for Cincinnati is

on one side and the water supply for Kentucky is on the other side.

General, what are we going to do?"

By the way, I am still an active surgeon, and I am assigned, if this thing would happen, to Booth Hospital which is right near this hospital.

He said, "Doctor, I have never come up -- I don't know what to do about it."

I said, "The water comes in our intakes. You have got monitors to Cincinnati, but our poor folks in Kentucky, we didn't any monitors."

The water goes in, and then it goes up to open reservoirs.

He said, "Well, I think we will truck the water in to give these people baths, if this happens."

Evidently they don't think it is ever going to happen, but my point is that this thing is sitting on top of the water supply of Cincinnati and Northern Kentucky, and here we have got a plant that they admit it is built wrong and how they can ever make the thing safe for us, how they can ever protect or water supply, I cannot see in any way that this thing can be straightened out.

And I think, like Mr. Applegate, I followed him, for example, like the lady before you.

This man made these charges. He was harassed. He

ended up driving a taxi cab. They run him out of town.

Tom Applegate was run out of town because he said, "Hey, there is something wrong in this plant."

I have listened. I went to all of the meetings, just like the quality assurance plan. On the last page of 50 things there, it says that the quality assurance man has left and he didn't answer the questions, see.

Now, I can't see how you are going to go back and built this plant safe so we won't get radioactive diodes in the water of Cincinnati and Northern Kentucky.

Now, maybe you people can make it a safe plant, but I can't see how you can do it.

CHAIRMAN BENDER: Thank you, Dr. McElheney. I am sure that the question of emergency planning is among the things that the NRC is looking at.

I don't know where the review stands at the moment. Is it still in the evaluation stage?

MR. PELTIER: Of course, this is a hearing contention. The hearing is no process at this time.

The Staff's review is not completely finished at this time. There are a number of things yet that have to be finished.

CHAIRMAN BENDER: Are the ground water controls under evaluation?

MR. PELTIER: Now we are talking about emergency

planning, planning for --

CHAIRMAN BENDER: Active control planning.

MR. PELTIER: Yes, I would assume that's in every plant with regard to exposure within -- the exposure pathway.

CHAIRMAN BENDER: Are the concerns of Kentucky residents being dealt with the same way that Ohio residents are being dealt with?

MR. PELTIER: I can't personally answer that question.

CHAIRMAN BENDER: I suggest you find out.

MR. PELTIER: It is being heard at the hearing at this time.

CHAIRMAN BENDER: Thank you. As far as I know, there are no other people to be heard from this morning. We appreciate the willingness of the people from the area to come in and make their concerns known.

I assure you that the regulatory organization will give appropriate attention to the points that have been raised.

I do not want to try to make any judgements here about the significance of the matters raised. I think they are not new kinds of questions that are associated with nuclear plants, and they are ligitimate questions.

Presumably if the plant is licensed, they will all be resolved in a way that assures that the health and safety of the public is protected, but we won't go into them further here.

Mr. Borgmann, would you like to comment on any of the remarks that have been made here?

MR. BORGMANN: Only in a general sense. From CG&E's standpoint, I guess we take some objection to saying we intimidated or that we harassed any of these people. That is absolu ely untrue.

Beyond that, I think most of the observations that were made I think pretty well speak for themselves. It should be noted, I think, that the water intakes are some 20 miles below Zimmer and even with a fairly decent current, you would have three hours or more to close the intakes.

We do have radio communication with each of the water works intakes, and they would be given -- any time we have an unusual event, it will be on the radio and any discharge, they will be told about it.

There is adequate time to close the intakes. It is a contention at the hearing so it will be discussed even further.

I just want to assure you, gentlemen, that we never harassed or drove Mr. Applegate or Mr. Griffin out of town. I mean, we disagreed with them, but we never harassed them.

CHAIRMAN BENDER: If there are no other comments about the public statements, I think it would be wise for us to try to recover part of our schedule, at least, and I think CG&E is scheduled now to --

MR. KEPPLER: May I make a comment?

CHAIRMAN BENDER: Yes, sir.

MR. KEPPLER: In view of the comments that were made today, it is proper to say that it is understandable why public confidence has eroded as a result of both CG&E's performance and the NRC's performance prior to this investigation.

I think that the facts speak for themselves in what we are talking about here today. The important consideration is the recognition that the plant has to be proven to be of high quality before an operating license can be given and that the utility is capable of performing its intended job before an operating license is given.

I think very clearly it is -- we are dedicated to see to that, that that is done.

I think the requirement for the Quality Confirmation Program that we have placed on the utility and the required upgrading of the utility's efforts in completing the plant speak toward that, but I think the purpose of the Regulatory Staff is to show that the licensee, to the public, that the plant is capable of being licensed.

MR. BORGMANN: We would like to introduce Mr. Barney Culver. He is the manager of Generation Construction and CG&E's site construction manager at Zimmer.

He will give us an update on the construction at Zimmer.

MR. CULVER: My presentation this morning will consist of five parts that are shown in this slide.

Our project completion to date is approximately 97 percent. The thrust of this presentation will concentrate on the work remaining, the fuel load, and that's delineated as follows: H. J. Kaiser/Foothill Electric, which is a wholly owned subsidiary of Kaiser Company. The remaining work consists of drywell steel, seismic columns, pipe supports, and other miscellaneous work.

Waldinger, Young & Bertke Company is the ductwork and hangers company. Catalytic, Inc. has been hired in the last eight months for a construction complete effort which consists of mainly punchlist work and some work involved in the Confirmation Program.

R. E. Kramig Company, a local firm, who is insulation and also for floor and wall, ceiling closures, if you will.

Kite, Incorporated has been selected as the painting contractor.

MR. EBERSOLE: Does this include painting and insulation on the interior?

MR. CULVER: Yes.

MR. EBERSOLE: What kind of insulation?

MR. CULVER: Mirror insulation.

MR. EBERSOLE: Is the painting work done with due consideration of QA on the type and grade of paint?

MR. CULVER: Absolutely. Coatings are all specified

MR. EBERSOLE: I suppose it is divided into two, one for safety grade and then unsafety grade?

MR. CULVER: Yes. The third section will detail for you our work force and manpower situation at the site and our plans regarding that.

The fourth item will be the TMI related facilities which are nearing completion, and last will be the Milestone schedule which each of you have copies of.

MR. EBERSOLE: In consideration of the painting, again, and the insulation, what is your rational for filtration of water which is used for post-accident circulation and cooling of critical components?

Do you have filtration systems on the pumps for the seals and journals, lubrication systems, or is there any one who can get to that level of detail?

Usually one has to filter some tracks of the water which is being recycled out of the containment to protect certain critical seals and bearings depending on the pump design.

It is a very critical aspect of the design process. It is how you filter a fraction of that flow for use of seals and journals.

Anyone here to comment on that?

MR. BORGMANN: Jim Schott can talk to you on that.

MR. SCHOTT: I am assuming your question leads to a typical closed cooling water type arrangement?

MR. EBERSOLE: I am talking about the post-accident case where you are using the water for recycled cooling.

MR. SCHOTT: We have no filter or clean-up on the suppression type water.

MR. EBERSOLE: The seals which are independent of the quality grade of the water being circulated?

MR. SCHOTT: In some cases, we do. In other cases, the pump seals take a portion of the recirculated water which is used for seal cooling.

MR. EBERSOLE: That must be filtered, is that it?

MR. SCHOTT: There are little in-line filters, if that's what you are talking about.

MR. EBERSOLE: I would like to have you express to the Staff the design rational for those filters, including the presumed filtration loads, the duration of the function.

MR. SCHOTT: We understand your question.

MR. EBERSOLE: Thank you.

MR. CULVER: In the first category of work remaining to be accomplished by the Kaiser Company are steel.

The reason the revisions are required, it is interesting to know, in 1965 the Zimmer plant was pretty well designed and construction was pretty well along.

The reactor vessel was reinstalled in the container.

About that time frame, the company of the -- came about and the Mark II owners group began investigation of these loads.

Zimmer redesigned, due to loads and construction, intending using estimated loads. We opted to, rather than shut down work in this area, to go ahead and risk using estimated loads.

As knowledge from the Mark II Program became available, design and construction changes were required and implemented, although several inovations of these loads has occurred.

The drywell, this was our third generation of changes. The status at the present time is that we are working all eight drywell elevations.

The types of revisions we are performing include reinforcement of beams, revising end-connections, and replacement of entire beam.

The impact on work previously installed in the drywell has been significant. As a way of illustration, in many cases, conduit containing cable had already been installed and supported from some of this steel, as had pipe supports.

For instrumentation lines and for containment -- many of the changes in the beams required that this conduit be removed or at least temporarily detached until the modification could be performed and the same is true with pipes.

We are presently working two ten-hour shifts on the

drywell steel effort involving 120 structural ironworkers.

We estimate it will take approximately 100,000 additional manhours, and we are scheduling the completion for June of this year.

The second effort is being accomplished by Henry J. Kaiser Company. The seismic columns associated with the reinforcement of concrete masonry block walls.

This requirement resulted from I.E. Bulletin 80-11 where at the Trojan Nuclear Plant it was found that many of the masonry walls were not properly designed to accommodate the pipe anchor loads that were attached to them.

Our effort at Zimmer is affecting the masonry walls in both the auxiliary building and reactor buildings.

We are reinforcing these walls with structural shape beams and channels with base plates anchored to the floor.

In the cases where the columns or beams attached to the wall themselves, they are being through-bolted.

There are approximately 135 separate masonry walls involved requiring modification, and the total number of modifications is approximately 325. The work is progressing on this effort on a two ten-hour shift basis utilizing a planned peak force of 180 structural steel workers as that is the current work force.

We are estimating 165,000 manhours remain, and that's scheduled for completion this July of this year.

The next area is pipe supports or more accurately, revisions to pipe supports, that have previously been installed.

The total supports listed is 10,000 process, and 3,458 instrumentation for a total of 13,458 supports.

The supports are either safet related or seismic, nonessential supports.

Of the 13,458, only 1,388 have never been installed. It isn't to say that all of these are yet to be put in. The supports we have performed modifications to is really what the supports completed column is. That amounts to a little over 3,000 to date.

The total supports remaining to have modifications performed, a total of 10,398, and that 10,398 is broken down as follows: In the drywell, 2,610; reactor building, 5,190; balance of plant, 1,950; and in the suppression pool 648.

This work is proceeding on two ten-hour shift basis utilizing a planned peak force of 621 pipefitters.

We don't anticipate having the 621 fitters devoted directly to this effort until the third week in March, at which time the installation rate is expected to be 335 a week.

The manhour estimate for this effort is 700,000 direct hours, and we are scheduling this effort for completion in October of this year.

Other work to be performed by H. J. Kaiser/Foothill

Electric consists of miscellaneous architectural work, which is platforms, galleries, grating; 56,000 manhours.

Piping, we have a TP system which is the in-corp probe, leak in the control system and likely detection systems and some suppression pool non-MSRV related; 32,000 estimated manhours to complete.

Testing work consisting of hydrostatic tests to be performed, radiography support, and electrical testing support amounts to 50,000 manhours.

Flushing, this is craft support to the nuclear production department because they are responsible for the flushing effort. Twenty-thousand manhours.

Hydrostatic testing, the potential rework associated with hydrostatic testing we are estimating to be 28,000 manhours. At best there might not be any retesting required.

We are anticipating there will be some, and the 28,000 manhour figure was developed by some early data we have acquired concerning documentation review.

Engineering change requests and punchlist items not previously assigned to the construction completion contractor amount to 200,000 manhours.

Engineering change requests are items that are originated for several reasons.

We apply a three-way rule before an engineering change request is approved. The three-way rule is that it must

be for safety, number one; it must be a licensing requirement; and the last is to accommodate any oversights in original design, for example, to cause a system to work as it should.

The electrical work remaining consists of some raceway, cable, and terminations, which amount to 20,000 man-hours. The total of the miscellaneous work of Kaiser is 406,000 manhours.

DR CARBON: On your statements needing three criteria before changes made, you seem to be saying it has to be required for safety and it also has to be required for licensing.

Are you saying that if the license does not require it but it is needede for safety, that you won't do it?

MR. CULVER: No.

DR. CARBON: Perhaps I misunderstood.

MR. CULVER: The heating, ventilating and air conditioning effort is conducted by Waldinger, Young & Bertke. The majority of their work is directing HVAC duct supports brought about by reanalysis of those duct supports.

This is mostly an effort for several months of weld mapping all welds on HVAC panels. They were reviewed by the architect/engineer and additional weld metal was required as in most cases in nonessential support.

The majority of the HVAC duct work to be installed yet is in the primary containment.

The reason that it isn't in is because the hanger

supporting the duct work came off of the drywelled steel which will not be complete until June. Work progressing on Waldinger's effort is on two ten-hour shift basis.

We are estimating the hanger welding rework to take 44,000 manhours, and we are scheduling for completion in July of this year.

The containment hanger steel rework, 15,000 hours, completing in August.

The containmen: of the installation of the duct work, 4,000 hours, completing in August for a total of 63,000 direct manhours.

MR. EBERSOLE: I take it you have not done much of the electrical installation work inside drywell?

MR. CULVER: We have done a QA.

MR. EBERSOLE: It requires a high level of installation procedure control. How do you propose to test, if at all, the environmental capability of this equipment that you put in there?

MR. CULVER: The environmental qualification issue in ongoing with our company now.

We have made arrangements with the University of Cincinnati and other private contractors for testing of some equipment.

We have a representative of the company here that is in charge of that programand could elaborate, certainly better

than I could, if you would like to hear.

MR. EBERSOLE: I just wanted to touch on it because of its intense requirements on procedural detail and installation and the general absence of a testing program after you have installed it, which is one of the questionable aspects of those installations.

MR. CULVER: Well, all of our cables, of course, are tested.

MR. EBERSOLE: Yes, I am talking about at least a drenching or a dousing test to confirm the adequacy of the equipment inside the drywell.

A case in point: Do you have values on the semi-automatic reliefs?

MR. CULVER: Yes.

MR. EBERSOLE: Do you know in fact that they are invulnerable to drenching?

MR. CULVER: Those valves are in the process of being replaced by the electric company, and they are environmentally qualified.

MR. EBERSOLE: On paper. In reality, are they?

MR. BORGMANN: Mr. Brinkman is in charge of our environmental qualifications. He has been involved in some of these laboratory tests.

MR. EBERSOLE: I am basically questioning the mode of qualification by type of test which is heavily dependent

on installation procedures to be realized as an environmental qualifier.

MR. SCHOTT: I think our testing in the past has addressed the type of test at a laboratory or at a factory.

Our testing in the past has been, as you say, restricted to laboratory tests and to prototype tests at factories. We have reviewed our installation procedures, and we have provided training for the people who installed these devices to make sure they make the proper seals.

To perform such a test as spraying the drywell for these solenoid valves would be a very serious test to do because it would -- in fact, my first thought is that it might cause more damage than it would prevent, and I would be a little cautious, quite frankly, to agree to spray water in the drywell as a means of investigating the solenoids.

MR. EBERSOLE: Your first confirmation, then, is when it really gets sprayed and it gets sprayed in there without your control?

MR. BRINKMAN: It will be tested to satisfy us that it functions. It will be tested both by our testing department which determines the continuity of the circuits and the lodging of the circuits, that it is proper, and it will all be tested by our production department when they check out the functionality of the system.

MR. EBERSOLE: It is testing in a dry environment.

I understand your reluctance of doing this type of test because you will be faced with potential damage to equipment, but you might locally test that equipment and confirm or deny that you have a working installation.

Otherwise, you must be extremely cautious in the installation procedures and that, I believe, leaves a level of doubt. That's all I wanted to know. Thank you.

MR. CULVER: Continuing other work to be performed by Catalytic, Incorporated consists of punchlist work on turned-over systems and to perform selected engineering change requests. 191,000 hours remaining.

R. E. Kramig Company for the insulation and closure sealing, 90,000 hours.

Kite, Inc., paint, 19,000 manhours.

To summarize, the total direct manhours remaining to be expended between now and fuel load by the Kaiser Company, 1,371,000; Catalytic, 191,000; Kramig, 90,000; Kite, Incorporated, 19,000; and Waldinger, Young & Bertke, 63,000 for a total of 1,734,000 direct manhours remaining.

These direct manhours do not include the support crafts that may be required to support those efforts. The MI related facilities. Our supplemental computer center is essentially complete with the exception of some of the equipment which has not arrived.

We are expecting to have that totally complete in

June of this year. The technical support center is estimated to be complete in July, which is housed in addition to our existing service building.

The power center to support the technical support center and the computer center is essentially complete at this time.

The emergency operations facility, our permanent facility in Batavia, Ohio, is expected to be complete in September of 1982.

I have prepared here a very simplified mainline diagram showing some of the more important milestones that are to be accomplished between now and fuel load.

The reactor recirculation pump's initial run has begun. Those pumps were operated for the first time two weeks ago, and we are getting those operable now in order that we can conduct the IHSI or stress improvement of the recirculating piping because the running of those pipes is necessary during that conduction.

The drywell steel, as I mentioned, we are planning to complete in June. ECCS flush work will begin at that time followed by the ECCS flow test July 1, and these numbers below, each of these milestones represents the time duration to accomplish the particular milestone. They don't necessarily represent the time between notes.

We are hopeful of loading fuel by the end of the year.

CHAIRMAN BENDER: Just a matter of getting something in the record: Is the Staff evaluating the hydrogen control problem for Zimmer?

MR. PELTIER: Yes, Zimmer will be in containment.

CHAIRMAN BENDER: It will be.

MR. CULVER: We are anticipating complete pipe installation by November 1, a very critical item because it operates preoperational testing of certain tests and, of course, the pre-op testing will run out to November with final assembly of test records being the last activity on that item.

Again, this is an extremely simplified chart prepared for this presentation, and in no way is indicative of the detail that we have in our project schedule.

The actual schedule is computerized and quite lengthy.

CHAIRMAN BENDER: Is this schedule consistent with the experience of other nuclear plants?

MR. CULVER: I think from the time the ECCS flush begins until fuel load has on several recent plants been in the neighborhood of six months.

CHAIRMAN BENDER: Thank you.

MR. CULVER: I have tabulated here certain additional milestones listing what they are, a more complete description, and the schedule and in parentheses is estimated the time to accomplish these particular milestones.

As I said earlier, we are well into this first one here, and our goal, of course, is to complete all remaining work in time for fuel load by the end of this year.

I would be happy to answer any questions.

MR. EBERSOLE: On the strength of the mapping between the suppression pool and the drywell, do you physically test that and, if so, how do you do it?

MR. CULVER: It will be tested.

MR. EBERSOLE: Do you blank the pipes off?

MR. CULVER: Yes, during the --

MR. EBERSOLE: You impose what psi load?

MR. CULVER: Forty-five.

MR. EBERSOLE: That includes -- it is less than -- you have got the blanking plates off the bottom --

MR. CULVER: Right. Your comment earlier about the pipe supports on the SRV pipe under the floor, that work is nearing completion and it is quite an extensive --

MR. EBERSOLE: Everybody has been bracing those pipes in all directions.

CHAIRMAN BENDER: Any other questions? If not, let's go to the Quality Confirmation discussion.

MR. BORGMANN: I would like to introduce Mr. Harlen Sager. He is manager of quality assurance for CG&E.

MR. SAGER: My name is Harlen Sager, and I would like to present this in two aspects.

First of all, the actions that have been taken by Cincinnati Gas & Electric in the form of a quality assurance improvement program in response to the Immediate Action Letter of April 8, 1981.

The second part will be the details of the Quality Confirmation Program which will be presented by Mr. Mike Rulli.

As Mr. Warmick mentioned, there were ten elements that were specified in the Immediate Action Letter of April 8. His concern: Increasing the size and technical expertise of the CG&E QA Staffing, assuring the independence and separation between Kaiser Construction and Kaiser QA/QC, upgrading the quality control inspection efforts by the contractors, assuring that the quality control inspection procedures were correct and adequate, increasing the training that was performed for QA and QC personnel, evaluating deviation from codes and FSAR statements to assure that they are being properly considered and documented, the concern of voided nonconformance reports, the adequacy and completeness of QA and QC records, concerns on conditions adverse to quality as those documented on nonconformance answer reports and inspection reports, the completeness of the review of those and the concerns of the audit program.

So the first item addressed, QA Staffing, as I mentioned required CG&E to increase the size and technical

expertise of their quality assurance organization to include the specific areas of radiography, nondestructive testing, pipe supports, hangers, welding, structural design and fabrication, electrical design and construction, and metallurgy.

This was accomplished through increasing the number of individuals on CG&E's Staff and through augmenting the Staff with qualified contractor personnel.

This technical expertise and size increase was presented to the NRC Staff in our response to the Immediate Action Letter of May 18, 1981.

This shows the organizational change that took place in the quality assurance department to support the construction effort.

There are seven division reporting to the quality assurance manager in the areas of QA: Program development and administration, quality engineering effort which includes the items that are listed under each, audits, quality control and inspection effort. This was segregated to support specifically the increase in inspections in the 100 percent reinspection during the ongoing construction.

The quality assurance operations program and then two items that expressly deal with the concerns of the Immediate Action Letter, quality documentation, and this was a group to review and verify the adequacy of documentation and the Quality Confirmation Program.

MR. EBERSOLE: Let me ask a question: All of this quality assurance seems to be oriented toward fabrication and construction.

Does Cincinnati Gas & Electric have any role in design quality assurance which is done by Kaiser or do they hand that to Kaiser as an internal function?

MR. SAGER: The design quality assurance program is implemented by Sargent & Lundy. They are the architect/ engineer.

MR. EBERSOLE: They are the independent function over Kaiser?

MR. SAGER: No, sir.

MR. EBERSOLE: Carry on then.

MR. SAGER: Sargent & Lundy is responsible for the design. Sargent & Lundy's quality assurance program evaluates the QA requirements for that design.

Cincinnati Gas & Electric then audits and reviews that audit program or that review program by Sargent & Lundy as well as some of the direct design programs.

MR. EBERSOLE: Cincinnati Gas & Electric does perform a design engineering audit?

MR. SAGER: Yes, sir.

MR. EBERSOLE: Which is really over the work done by Sargent & Lundy?

MR. SAGER: In the sense of the audit, that is

correct. Yes.

MR. EBERSOLE: How big of a staff do you have that does that?

MR. SAGER: That stuff is augmented by our entire engineering department of the nuclear engineering division.

MR. EBERSOLE: How many is that?

MR. SAGER: I can't give you -- roughly 30 individuals right now.

MR. EBERSOLE: Thirty?

MR. SAGER: About 30, in addition to the eight individuals that I have in the audit area.

MR. EBERSOLE: Thank you.

MR. SAGER: This chart illustrates the change in QA department staffing since the April 8 letter.

The last number should be February 15, 1982 instead of 1981.

Under the quality assurance department in support of the construction activity, there were initially six CG&E employees. This shows the entire breakdown of other individuals who were from various contractor organizations who were also supporting the department.

The four individuals in the operations QA division did not report directly to the QA manager on April 8, but they are shown here, for illustration purposes, since they do now in the new organization.

The date of our May 18 response, the breakdown of individuals in each division, was indicated to show the amount of increase in the area that were specifically addressed in the Immediate Action Letter, and as of February 15, this number, as you can see, well in excess of 200 individuals

The majority of these are concentrated in the reinspection effort and in the Quality Confirmation Program.

The next slide illustrates a little more graphically where these individuals are located within the division.

In the way of providing the breakdown of the increase in technical expertise in the areas, each division I have listed with specific positions and their prime responsibility as well as what organization they belong to within the quality engineering effort.

Within the quality engineering effort you can see the individuals who provide the expertise in welding and nondestructive examination, in the electrical areas, structural disciplines, metallurgy, pipe supports and hangers, ventilation systems, piping and in-service inspection.

As I mentioned, a large portion of this report is provided by the contractor personnel. This shows the remaining divisions, audit, quality control, the operations QA, quality documentation and confirmation program.

This organizational structure reflects the planned operations organization after fuel load which consists of

four divisions: Quality engineering division, audit division, the operations division, and the program development and administration division.

The anticipated staffing after fuel load is 26 members of which 16 will be associated specifically with the station with the operations division.

Item two of the Immediate Action Letter concerned the independence and separation between Kaiser Construction and quality assurance.

CG&E took immediate action in a directive to Kaiser requesting that they assure this functional end.

As I mentioned, our letter was dated April 7 and the independence of the QA and QC organization has been emphasized and effective leadership has been established.

This is the current Kaiser quality assurance organization which was also in effect February 15.

The site QA manager, Mr. Hedzik and currently David Price is -- it has the four areas of administration, quality engineering and quality control and records within that organization.

Quality assurance manager reports directly to the Kaiser corporate office for quality assurance and is independent of the organization for construction at the site, construction management.

CHAIRMAN BENDER: How many people are on the Kaiser

inspection process?

MR. SAGER: In the entire Kaiser quality assurance program, there are in excess of 170.

CHAIRMAN BENDER: 200 some in CG&E?

MR. SAGER: Yes, sir.

CHAIRMAN BENDER: Roughly 350 people.

MR. SAGER: 375 people, yes, sir.

DR. CARBON: You mentioned changes in CG&E and Kaiser. You didn't say anything about Sargent & Lundy.

They must have been remiss somewhere along here.

MR. SAGER: Sargent & Lundy has not specifically been involved in the construction activity at the site. What I am attempting to illustrate here is the construction activity.

There have been some improvements made to Sargent & Lundy's quality assurance program in the way of additional procedures that have taken place as a result of our reviews here.

There have not been any changes in their organizational structure.

DR. CARBON: Under your set up, are they supposed to be auditing Kaiser?

MR. SAGER: No, sir, they were not.

DR. CARBON: Okay.

MR. SAGER: Item three of the Immediate Action Letter concerned the quality control inspections, requirement for

CG&E to conduct a 100 percent reinspection of all quality control inspections performed by Kaiser and other contractors on the site which has been implemented.

This will continue until such time as the CG&E audit program as described in item ten, below.

This audit program is specifically designed at increasing the surveillance activity of ongoing construction work.

The actions taken, as I mentioned, CG&E is conducting 100 percent reinspection and, therefore, a large number of individuals that you saw, 61 in the quality control inspection area, and CG&E's audit program is being revised to include surveillance of those construction activities.

This surveillance program is expected to reduce the requirements for the 100 percent reinspection of all construction activities.

Item four concerns the quality of QC inspection procedures, and after the date of the Immediate Action Letter, all inspection procedures required review and revision, if appropriate.

The reviews were to be conducted by individuals who were independent of construction and to assure that they appropriately included inspection requirements and hold points.

Construction activities controlled by these procedures did not commence until after the date of this review.

Several specific steps were taken and have been taken by CG&E as a result. Some of these are still ongoing.

This particular item, first, procedures were established to determine the qualification requirements and to assure that the review and approval process was adequately described in procedures and documents.

Second, the QC inspection procedures were reviewed by qualified design engineers. These are engineers who are qualified in accordance with those procedures and by QA personnel for inclusion of the inspection requirements.

All these individuals were independent of the construction organization. The construction activities did not commence until after each specific procedure had completed its review, approval and, if revised, the training requirements.

In the process of completing this, it was determined that there was an essential requirement to break this into two phases.

The first was to address the specific items of the Immediate Action Letter. The second, because of the separation of construction requirements, some of which were included in inspection procedures, the need existed to consolidate and systematically organize these procedures, and that's what occurred during phase two.

That is still ongoing and is scheduled to be completed by the end of this month.

This is a breakdown, a tabulation, if you will, of total number of procedural reviews that have taken place in support of this phase one and phase two effort.

In the area specifically of Kaiser, there were a total of 69 inspection procedures.

The revisions that have occurred to those upwards of 98 and the phase two procedure is a total of 38 have been reviewed to date.

CHAIRMAN BENDER: Mr. Sager, this is kind of an impressive number of procedures. When they have to be reviewed, what is the review process? Who does that?

MR. SAGER: There are individuals in the engineering organization. There are individuals in the quality assurance organization who were described by that first step that I showed you on the previous slide as to what their requirements for qualification were based upon, their previous experience and education in the areas of concern, and based upon their knowledge and training on specific Zimmer requirements, they reviewed these procedures to verify that they were in compliance with our commitments.

CHAIRMAN BENDER: The group that is doing the reviewing, how long have they been on the project?

MR. SAGER: All of these individuals were assembled after April 8. The majority of those individuals have been on the project -- well, that's not entirely correct because a

number of these individuals were associated with the engineering organization, which had been in place in some cases since the beginning of the project for some individuals.

But the people who are specifically reviewing for the quality assurance requirements, most of those individuals came aboard the project after April 8, went through an intensive training program to become familiar with the requirements, and then did this review.

CHAIRMAN BENDER: Training was done by whom?

MR. SAGER: Training was done by a training specialist that is a member of the quality assurance department who had been at the Zimmer station in excess of two, three years, I believe.

(THEREUPON, a brief off-the-record discussion was held.)

MR. SAGER: You would acquaint them with what is the entire document hierarchy so they would know where to find the information in FSAR.

These were experienced people who came from other nuclear sites who basically understood how the structure is in nuclear plants.

CHAIRMAN BENDER: Are you saying that most of the inspection people came from other sites?

MR. SAGER: Yes, sir.

CHAIRMAN BENDER: Thank you.

MR. EBERSOLE: It is implicit in reviewing these procedures, I gather they had been in use prior to your review of them, that all the prior reviews of installation and fabrication defects had been against a deficient procedure?

MR. SAGER: Not necessarily so. In some of those procedures, we identified deficiencies which required revision. In many cases, the revisions were simply for getting a better understanding or clarification as to how those requirements were to be implemented.

MR. EBERSOLE: Where were the material differences? Did you recognize that you had to go back to the areas reviewed against that procedure and conduct a re-examination?

MR. SAGER: Those areas were identified in our Quality Confirmation Program.

MR. EBERSOLE: Thank you.

MR. SAGER: The other organizations involved besides Kaiser were Catalytic procedures. We reviewed those. NES is the nondestructive examination contractor on site. We completed a review of their procedures.

Tech-Sil and Kramig were reviewed. Other procedures that required review by the quality assurance departments are broken down here that were not specifically inspection procedures in this area.

As you can see, this has been a tremendous effort.

MR. EBERSOLE: For example, you have wall penetrations,

One-E, in the context of preventing leakage. Some of One-E in the context of providing functional service -- these things come, I believe, with wiring extensions to which you must splice the ongoing conductors to whatever articles you are going to send the circuit on.

Will you describe a little bit the QA procedures for making up that splice?

MR. SAGER: I cannot give you the details of the splice. The inspection procedure for terminating those conditions includes what they are to verify in the process of the construction, performing this splice, and it also includes what they are to check in the way of cleanliness and sealing of that particular penetration device.

MR. EBERSOLE: Do they use heat stripable tube?

MR. SAGER: They do.

MR. EBERSOLE: There is no attempt to evaluate the hermeticity or the sealing function per se?

MR. SAGER: It is procedural.

MR. EBERSOLE: Then one hopes that it is in fact water proof?

MR. SAGER: Well, the penetration itself has a seal on the outside.

MR. EBERSOLE: I am talking about the splice. One hopes that it is water tight as a result of the procedures?

MR. SAGER: There is no requirement to check the

water tightness.

MR. EBERSOLE: Yes, thank you.

CHAIRMAN BENDER: Just to be sure that we keep the questions in context, the practice is comparable to other practices in other water reactor systems?

MR. SAGER: That's correct.

CHAIRMAN BENDER: Not comparable, but it is different?

MR. SAGER: That is true. Item five concerning training. This required that each new or revised procedure that the training be accomplished for QA and QC personnel prior to implementation of that procedure, its specific training being conducted in the identification and documentation of nonconformances, deficiencies and problems, the feedback mechanism for informing the identifying individual of the resolution of the nonconformance, deficiency, or problem and the avenue of appeal should the identifying individual of the resolution of the nonconformance, deficiency, or problem and the avenue of appeal should the identifying individual disagree with the adequacy of the resolution.

The specific training, as I mentioned, under procedures has been performed again as a result of a large number of procedures and the necessity of identifying specific individuals with specific training requirements.

There have been 958 training sessions conducted or schedules by this training group. These are conducted by people

who either prepared the procedure or were knowledgable of the procedure or were actually performing the steps to this procedure and were appropriately trained and familiar with the requirement.

The Kaiser quality assurance organization has conducted over 510 training sessions as a result of these procedure changes and training requirements.

The specific training required by the items five A through five D listed in the Immediate Action Letter were completed prior to June 1.

In addition, as to the instruction of the avenue of appeal for a particular individual are incorporated in these procedures and in each indoctrination session they are covered with the individuals to assure that they understand them.

An improved inspector certification program has recently been implemented to provide additional confidence that the personnel who perform quality related functions are adequately trained and qualified in the area of thier assigned tasks.

Item six concerned deviation from codes and FSAR statements. Prior to May 1, 1981, the procedures governing the identification, reporting and resolution of deviations from codes and FSAR statements will be reviewed for adequacy and revised as appropriate.

The procedures will require CG&E to review and

approve the resolution of any such deviations.

CG&E management directives for identifying, reporting and resolving deviations from codes and FSAR commitments, and specifically here Sargent & Lundy project instructions for how their engineering personnel were to identify changes in the FSAR proposed standards commitments was established.

This procedure required that formally changes that are identified to their licensing organization be submitted semiannually to the FSAR.

The result of the review of the existing FSAR at the time of April 8 and identifying any cha ;es that have been made from commitments in that document were included in the Revision 75 of the FSAR, which was issued in July, 1981.

Item seven concerned voiding the nonconformance reports, required procedures for that not being accomplished later than the 10th of April.

The disposition of each nonconformance report together with appropriate justification will be documented.

This particular item is incorporated, the majority of it, within the Quality Confirmation Program, but the specific action to take, to be taken, to eliminate voiding a nonconformance report was completed and revision of the appropriate procedures.

Item eight concerns quality assurance and quality control records requiring the review and alteration of existing

QA and QC records to be stopped, and those records to be controlled by CG&E until a program defining records control, usage, and adequacy has been prepared by CG&E and agreed to by Region 3.

The detailed response and program for that control was contained in our May 18 response to the Immediate Action Letter that included completed construction and occupied an improved physicall facility for record handling and storage. That is controlled by CG&E individuals.

CG&E and established procedures that provide for improved receipt, control, and maintenance of QA/QC documentation. Clear lines of responsibility from CG&E and Kaiser have been established for review and resolution of documentation deficiencies that are identified.

Commitment control program to effectively track commitments that are made in these documents has also been developed.

CHAIRMAN BENDER: Can you tell us about that commitment control program? What does it consist of?

MR. SAGER: Basically it identified items that require corrective action or response as a result or a review as a result of identified deficiencies, potential deficiencies.

These items are identified on a computer program with a responsible individual signing and a date for completion of action.

Updates are provided weekly for items due within a month and a summary monthly.

It is shepherded by an individual in the operations quality assurance organization that it includes all the items that affect operations as well as construction.

MR. SYLVIA: Also includes commitments.

MR. SAGER: Did you hear Mr. Sylvia's response? It also includes responses that were made in bulletins or actions to be taken.

CHAIRMAN BENDER: That is your assurance that what the construction organization agreed to do will be done?

MR. SAGER: No, sir, it is our assurance that the required action to determine what is going to be happening will occur and then the appropriate follow-up to see that that gets implemented is covered under the corrective action system, not necessarily the commitment.

CHAIRMAN BENDER: There is a separate control on the action itself?

MR. SAGER: Yes, sir.

CHAIRMAN BENDER: How does the feedback work?

MR. SAGER: Feedback consists of two parts. The first part is a review of the action that's taken and the documentation for that action to determine if it adequately addresses the response as well as the review of a response that's required itself, and the second part of that in many of these

commitments, if they involve NRC items, those are in turn reviewed and tracked by the NRC to be sure that they agree that it's adequately involved.

CHAIRMAN BENDER: That is okay for them. I do not put much stock in the responsibility of the NRC to see that commitments are followed.

Do you have your own assurance that you get everything done that you are committed to?

MR. SAGER: That is what this system is designed to provide us, yes.

CHAIRMAN BENDER: There seems to be a subdivided set of controls, and I am a little unclear yet.

You have identified what needs to be done, but there is a separate control over getting it done, and I don't quite see the interface yet.

MR. SAGER: I think that is really defined under the audit area in which this program is reviewed to determine the adequacy of it's implementation to assure that those responses to the commitments made are adequately addressed.

CHAIRMAN BENDER: I will accept that an audit does that. Where is the audit program?

MR. SAGER: It is under myself in the QA department.

CHAIRMAN BENDER: How big is the organization that handles that part?

MR. SAGER: It consists of eight individuals, as you

saw there.

CHAIRMAN BENDER: Thank you.

MR. SAGER: One individual is assigned full-time responsibility in that area for tracking these items.

Item nine concerns conditions adverse to quality. Specifically, CG&E was to perform 100 percent review of all surveillance and nonconformance reports written by contractor personnel after the April 8 letter.

To accomplish this a site-wide project procedure requiring all contractors to submit nonconformance reports to CG&E for review was issued as well as direct contact with these contractors to assure that they understood those requirements, and quality engineers are reviewing all those nonconformance reports to establish quality trends, to assure appropriate disposition, and to determine the adequacy of corrective action taken.

Item ten concerns the audit program, and as you saw, was linked with item three in terms of the inspection area.

The existing CG&E audit program was to be reviewed and revised before June 1 to include technical audits of construction and more comprehensive and effective programmatic audits.

To accomplish this, it increased the size of the qualifications of the audit division staff and the on-site audit schedule, including all organizations audits of applicable

10CFR50 Appendix B criteria being included once a year has been established and more comprehensive and in depth audits to assure that the range from program commitments to construction work activities are being performed.

Then their vendor audit schedule has been reviewed for appropriate inclusion of suppliers of essential equipment.

Improvements have been made in the audit. Open audit item tracking and close-out system is being developed to assure more timely follow-up of audit findings.

That concludes the items specifically in the Immediate Action Letter, and I would like to briefly address one of your questions concerning involvement of the design engineer with respect to plant construction.

We have Sargent & Lundy design engineers on site following much of the construction, and their specific activities include evaluating each design change that is necessitated due to construction interference or other difficulties, to evaluate any deviations that are detected from the design requirements that would show up as a result of our inspection effort, and to be part of the resolution of those deviations, and also to review the items that have been identified under the Quality Confirmation Program.

So we do have specific design involvement by the engineers to provide their feedback as to what they intended by the design and are we implementing it adequately and are our

inspections covering those items to be sure that any deviations that would occur are reviewed adequately by them and also acceptable to that design practice.

CHAIRMAN BENDER: How many people does Sargent & Lundy have involved in this?

MR. CULVER: Approximately 20 on site.

CHAIRMAN BENDER: Twenty at the site. About 375 people in this quality assurance/quality control program? Was that the number I heard?

MR. SAGER: Between both CG&E and Kaiser, yes, sir.

CHAIRMAN BENDER: How big was it before?

MR. SAGER: As you can see in that first chart on April 8, there were a total of six individuals on CG&E's part and around 70 for the Kaiser organization.

CHAIRMAN BENDER: Impressive expansion. It is not an easy problem to control.

MR. SAGER: You are right.

CHAIRMAN BENDER: How to keep all the flow of information going to the right channels and being sure that inspections reported are -- need to be dealt with and non-conformances straightened out.

I suspect it involves a pretty large paper mill.

MR. SAGER: It does, and there have been some fairly extensive efforts to consolidate these programs to control those activities, which were part of that phase two, to assure

better control of these activities.

CHAIRMAN BENDER: Is the Staff satisfied that the management of a massive group of quality control and quality assurance people like this is effective, or are you still looking at it?

MR. HUNTER: Specifically, we have looked at the Immediate Action Letter and what it states.

You realize, of course, it is a sample look. As any large program, we have some items that we are following up to make sure that we are happy.

My general comment will be that, yes, we feel like the commitments they made are being met, notwithstanding obviously that there may be some points that we may need to clear up on, question on some procedural details, maybe some specific qualifications of people, but we are working on that.

But at this point, it is not an issue. The answer is then: We at this time feel like it is effective.

CHAIRMAN BENDER: In a way, I could see the pendulum swinging from one way to the other. Here is quality control people. The larger the number, the harder it is to know that the people that are there are fully knowledgable and have a good interchange with each other.

While I have no doubt there is an intent to do it, to get all that done in the course of about six months, looks to me like a pretty significant challenge.

MR. KEPPLER: Mr. Bender, we have place Zimmer at the highest priority in Region 3.

We have, in fact, put Zimmer under the direction of a single section chief with a section and no other assignments other than Zimmer to follow the construction activities at the site and the Quality Confirmation Program.

So to the extent that we have gone this far and the concerns that we had raised earlier, if we had any -- if we felt the Immediate Action Letter was not being complied with, we would step in to take steps to assure it was.

And I think at this stage of the game, I would say we have guarded optimism of the way things are going.

CHAIRMAN BENDER: I think the extent of the management, it indicates an effort to do the right thing. I am not trying to raise that question at all.

I just recognize that many people suddenly appearing on the job at one time can of itself create a chaotic condition that has to be watched.

MR. BORGMANN: This has been occurring since April. It has been a gradual build-up.

A lot of these people are doing completely different functions. That is, the dual inspection is really a redundant inspection over Kaiser. So these people are doing one job all by themselves.

Quality Confirmation Program is another job, but I

don't think we should minimize, and it was a challenge, management challenge, and remains one and probably the job could be done with less people, but when you are put under the gun to do something, I mean, we did something and I think it is under control.

I don't know, Ralph, do you want to comment further?

MR. SYLVIA: We also went to ship for it, which we did not have before. You are doing a dual inspection so that's twice as many as you would normally need, plus we are going back from April looking all the way back in history which adds a whole new crew.

If you put the whole thing in perspective, we probably had functions that require four times as many as you would normally find in that construction site, but I think most construction sites also increase in numbers currently too.

CHAIRMAN BENDER: I say a couple hundred sounds reasonable and twice that number seems like a whole lot.

MR. SYLVIA: We have been wrestling with the same concern you have, and that's why we have been thinking about it.

MR. BORGMANN: The quality of the Confirmation Program will be presented by Mike Rulli.

MR. RULLI: The information that I will be presenting on the status of the Confirmation Program is as of February 5, just to keep things in perspective

The goal of the Quality Confirmation Program is to

confirm the quality of construction of the William H. Zimmer Nuclear Power Station and to assure that any deficiencies are properly addressed through engineering evaluation, analysis, and/or rework.

As mentioned earlier by the NRC, the Quality Confirmation covers eleven areas. The areas are listed and include structural steel, weld quality, heat number traceability, socket weld fitup radiographs, cable separation, nonconformances, design control and verification, design document changes, subcontractor QA programs, and audits.

The next table shows a summary of the people involved in the Confirmation Program.

At the present time we have a staff of 74 people, and there will be increasing in the inspection area.

This graph just shows the percent complete of each of eleven tasks in the Quality Confirmation Program, and at the present time the overall program is approximately 48 percent complete.

The first task deals with structural steel. To summarize the concerns in this area, nonconforming welds have been identified. Some welds were painted prior to inspection. Some beams have nonconforming re-entrant corners. Some beams installed but not shown on the design drawings.

Some beams received from unapproved vendor. Heat number traceability has not been maintained for some beams and

steel plate.

Some cable tray foot connections have not been inspected.

The assessment shows that the most common weld deficiencies include slag,porosity, undercut and improper weld size. The majority of deficiencies do not affect the structural integrity of the welds and are fully capable of withstanding the loads on structural members.

All Quality Confirmation Program inspections are being performed after the paint has been removed from the weld.

Approximately 25 percent of the re-entrant corners that we have inspected to date are deficient in that they have a notch instead of a smooth transition.

The installed beams to date that we have looked at have all been shown on design document changes. Some of these design document changes which modify a design drawing have been in process and were not issued yet, but this is in accordance with Sargent & Lundy's specification.

All beams in question, whether or not from an approved vendor, have been received with material certifications.

The American Welding Society Welding Code does not require heat number traceability of members in place. It does require that identification be maintained as to the type of material that has been installed.

Any cable tray foot connections that were not inspected

prior to the Confirmation Program are being inspected.

CHAIRMAN BENDER: Where there are no certified test reports, what is it that you do?

MR. RULLI: We would have to test the material.

CHAIRMAN BENDER: You take a specimen of it?

MR. RULLI: Yes, sir.

CHAIRMAN BENDER: Literally do a chemical analysis?

MR. RULLI: And required physical. Findings in addition to the concerns stated previously, the majority of steel in the auxiliary and reactor buildings was not inspected at the time of installation. This is the first inspection of the steel.

This is primarily auxiliary steel used to support hangers of one type or another.

Also approximately 10 percent of the end connections that we have examined do not conform to the design drawings at this time.

The matter is being reviewed by Sargent & Lundy.

Our conclusion at this time as a result of our inspections and analysis from evaluations are no significant problems of safety have been identified to date.

Most of the deficiencies that we have found can be resolved with engineering evaluations or minor rework.

A lot of the requirements in the AWS Code for weld profile and what a weld looks like are cosmetic in nature.

There is no impa . on overall plant schedule expected at this time.

C' .MAN BENDER: Could I ask about structural imbedments? Are they a separate problem? They deem not to be a problem? What is the current view of that?

MR. RULLI: In what way are you referring to?

CHAIRMAN BENDER: I can see the structural steel. I can inspect it.

Some portion of the structural steel winds up being surrounded by concrete.

MR. RULLI: In that case, Sargent & Lundy's analysis of the structure does not take credit for any of the incased structural steel.

That stell is installed to support construction loads while the building is being erected.

After the concrete has set, the structural steel is usua'ly located in the zero axis, or in the center of the concrete when any loading to the building is done for seismic analysis or any other type of analysis. No credit is taken for structural steel.

CHAIRMAN BENDER: Well, that is interesting. Thank you.

MR. RULLI: The second task deals with weld quality. The concerns are summarized as follows: In-process inspections were not performed for some welds.

There are questions as to whether or not field welds have been made using improper or nonconforming weld rod.

Weld rod heat numbers have been transferred to the weld data sheet, KE-1, by individuals other than the QC inspectors who inspected the weld.

Some weld inspection criteria deleted from weld data sheets from approximately July 1980 to February -- that should be of 1981.

The assessments of our investigations to date are in two parts: Those dealing with the American Welding Society Code and those dealing with the American Society of Mechanical Engineers Code.

In the AWS area, it was found that the filler metal and welder qualification verifications were not made at the time of installation.

The evaluation is in process to resolve welder qualification issue. All weld rod was acceptable for structural welding per Sargent & Lundy evaluation.

This was due to the high quality of the steel. The rest are primarily being addressed along with number one here.

The welding governed by the American Society of Mechanical Engineers, ASME, code is primarily the piping area.

We have found very few examples of in-process inspections being missed. At this point I am aware of less than five in all of the records that we have reviewed outside

the area of socket weld disengagement that we are treating as a separate issue.

The records indicating weld rod traceability are in order. Some deficiencies have been identified, and these items will be resolved by field inspections.

Item three dealing with the heat numbers being transferred will also be covered with the field inspections.

And item four above was primarily directed towards the AWS welding done on site.

However, because of the way we have structured this task, we are essentially doing the same thing in part one with our review of the weld date forms.

In addition to looking strictly at the welding date, we are looking at the welder qualification data and the weld procedure qualification.

At this time based on our reviews and extrapolating, we felt that 15 percent of the welding procedures may have to be requalified.

In conclusion on this item, we don't feel that any of these items identified to date are -- have a significant safety impact, but our evaluations are still im process.

CHAIRMAN BENDER: When you say a weld procedure has to be requalified and it has been used, what conclusion do I draw for the need for requalification?

MR. RULLI: If the procedure, if a new one is made up

according to the procedure and tested and qualified, you know, with everything being in order, there will be no impact on past work.

The place where we would run into a problem is should a specimen be made up according to a procedure and the specimen failed to qualified?

As I said, the evaluations are still in process.

CHAIRMAN BENDER: What you are saying you may have used procedures that did not have qualification records?

MR. RULLI: We have records, but some parts are missing or questionable. We are taking the conservative approach and requalifying those procedures.

CHAIRMAN BENDER: Thank you.

MR. RULLI: Task three deals with the heat traceability of code piping. Some of the heat members found on installed small bore piping do not appear on the records of accepted heat numbers.

Some heat numbers recorded on isometric drawings do not match the heat numbers on installed piping.

Some heat numbers recorded on the isometric drawings had been marked out and incorrect heat numbers recorded.

The heat numbers could not be found on some installed small bore piping.

The heat numbers records are being verified against certified material test reports. A verified list of heat

numbers will be used in the review of isometric drawings and field inspection results.

To date, we have essentially completed this review. We have found 40 heat numbers out of over 3,000 that we have some question about and that we are planning to address as time goes on here.

To cover item two on the heat numbers that have been recorded, we have reviewed over 2,400 drawings for small bore pipe. The weld records for the welds contained on that drawing are located on the back of the actual drawing.

We have identified traceability deficiencies on approximately 20 percent of the drawings.

I will cover the concern on that a little later. ASME Code allows heat numbers to be recorded on pipe or on records directly traceable to the pipe.

If the heat number is on the pipe or on records traceable to the pipe, no rework is necessary.

This item is being addressed through document reviews and field walk downs to verify that the heat number shows up on either the pipe or the material and that it is a proper heat number.

We will also be verifying that if the heat number occurs on a piece of pipe and on a record, that the same heat number is recorded on both.

Some additional findings in this area that lead to

some of the problems that we have in just closing this out is that construction and final walk downs need to be completed on all systems and that no systems have received final acceptance.

The problem that we run into is that there are drawings in the field that are being worked on right now and as a result we are not looking at a static system.

When we go out to do an inspection, it is possible this line -- we have a drawing, for example, from 1980 -- and as a result of the drywell modifications, that line may have been removed.

When we go out to inspect it, the configuration may be different, and if we see heat numbers on that pipe and compare it to our drawings that we have with the records from 1980, we don't match.

This is to be expected, and we have to go back and look at this again when we receive the completed document from the field that reflects the rework that has been done.

In conclusion on this item, rework will be necessary. The exact amount is yet to be determined, although we do not see any significant schedule impact since final walk downs and reviews have not been performed.

We don't feel that there is any significant safety impact, that the review eould have identified most of these problems.

The fourth area in the Confirmation Program concerns

socket weld fit up.

As mentioned earlier by the NRC, when a pipe is inserted into a socket, there should be approximately a sixteenth of an inch disengagement from the color inside of the socket.

This is to prevent stressing the socket or the fitting during the welding process.

We have reviewed records for 20,572 welds out of a total that we have identified to date of 29,486.

Due to revisions of the pipelines, however, we have actually reviewed welding records for a total number of records for 44,021 welds. This is repetitious of all the records that we have gone through. We have found 230 welds that lack evidence of disengagement.

We have radiographed these welds to determine if there is in fact disengagement. Of the 230 radiographed to date, we have found 49 where there appears to be a lack of disengagement.

Our conclusion of this item is that this is not a significant safety problem and minor rework will be required.

CHAIRMAN BENDER: What do you plan to do on this disengagement?

MR. RULLI: If there is no disengagement, at the present time we are planning on replacing the socket in the weld.

MR. SYLVIA: On the 49.

MR. RULLI: On the 49. We still have approximately -- this whole pipe is two-and-a-half inches in length.

Task five deals with the radiographs that were received from the M. W. Kellogg Company.

The radiographic technique used by M. W. Kellogg allegedly does not meet the ASME Code in that the penetrameters were not adequately shimmed.

The action already taken is radiographic film has been reviewed, 18,000 pieces of film.

Most radiographs that we review do meet all other code requirements for quality and sensitivity. Other than the conditions stated above, approximately 40 to 60 percent did not have addiquate shimming or were not shimmed.

We have prepared a code inquiry,prepared for the submittal to the American Society of Mechanical Engineers for clarification of the shimming issue.

The program does have the concurrents of the National Board of Boiler and Pressure Vessel Inspectors and the State of Ohio.

I said earlier that most welds were found to meet all other requirements. We have found 131 welds that did not meet all the code sensitivity requirements.

Additional testing records are being reviewed for acceptance of this material. The configurations represented

by the material welding in these examples is a very difficult condition to radiograph.

The reason that it was radiographed initially is that the Sargent & Lundy piping specification that was given to Pullman required all welds to be radiographed.

At the time that that specification was issued, the only welding anticipated by Sargent & Lundy was but welding of two pieces of pipe or a piece of pipe to a fitting.

As time progressed, the welding given to M. W. Kellogg included the addition of lateral sockets and nozzles.

At the same time the requirements were not changed to indicate another method of nondestructive examination. However, in most of the cases that we have looked at so far, we have not been able to find ultrasonic testing records to show the acceptability of this material.

At this time we have not identified any significant safety problems.

To conclude this program, we have classified all of the Pullman pipe size and wall thickness and a sample will be taken from these adequately shimming the radiographs and comparing it to the original radiograph for that weld.

We do not think that we will find any problems such as a new defect that was missed because of the inadequate shimming.

If we do, that problem will be addressed at that time.

Task six deals with cable separation. The NRC identified six examples to us of failure to meet the cable separation criteria.

We have committed to verify cable separation criteria as having been met.

The six examples identified to us are being addressed through analysis and, if necessary, rework.

Deficiencies that we have identified in our inspection of the cable have included cable identification problems, cable route problems and some separation problems.

In light of the single failure criteria, the overall significance of these deficiencies is minimal, especially when we look at the types of separation problems that have been identified and, as mentioned earlier, on the order of being an inch off from what was required in many cases.

At this time as part of this review we have not identified any items significant to safety.

The evaluation of the deficiencies, however, is still in process. This task has been expanded beyond the original scope in that we are also going to look at the cable separation for the reactor protection system and the cable separation in --

MR. EBERSOLE: What do you mean by the statement that the deficiency is minimal?

It only takes two cables which are contingent to one another which, if destroyed, will destroy redundant functions.

MR. RULLI: That's what we are saying. The analysis that is being done by Sargent & Lundy, when a separation problem is identified by field inspection --

MR. EBERSOLE: I can find to cables in the plant and destroy --

MR. RULLI: That is what they are looking for. When the inspector goes out to look at the cable, he doesn't know whether it is, you know, a quarter of a mile down at the end of that cable.

Sargent & Lundy has a very sensitive computer program that tracts the equipment at either end or panels at either end and when they identify a problem, all the cables at that route point are evaluated to make sure that the cables and the cable in this grade do not carry redundant functions.

MR. EBERSOLE: That only protects against electrically originated fires and other phenomenon.

Your other program has a higher degree of separation requirements which is also dually inspected to see if you could shut down if you evaluated this.

MR. RULLI: Yes.

MR. EBERSOLE: I asked earlier who was going to inspect that, and I guess it has to do with your fire protection program.

MR. RULLI: That's right. Much of that insulation program has not been installed yet. Task seven deals with

nonconformance reports. They found that conformances have been documented on surveillance reports, on punchlists, on exception lists, nonconformances were not documented, nonconformances have been documented but not entered into the system, and non-conformances voided rather than being dispositioned.

Take these in order. We have identified approximately 3,500 surveillance reports, and based on a review which has extended beyond the February 5 date which I gave earlier, we have identified approximately 20 percent, which may have to be transferred and addressed through the NRC.

At the present time the reason I say may, we are still looking for documentation to close out the surveillance reports.

The information for the review of the punchlists is being developed right now. That task has not yet begun.

The exception lists, as I identified above, are a subsection of the punchlist items.

To address nonconformances that have not been documented, we are sending letters to all past QC inspectors requesting information of nonconforming items that were not entered into the system.

All inspectors will be contacted as soon as addresses are obtained.

We have written to the contractors who are providing people to us and who have provided people to Kaiser in the past asking for the last known whereabouts of these inspectors.

The first batch of letters have gone out. Many of the inspectors in that batch are still located at the Zimmer site in one capacity or another, and in talking to some of them, they all stated that their letters were received last week.

We have not yet received anything back.

MR. SYLVIA: We sent a lot through the certified mail and got a lot of no one at this address-returns.

MR. RULLI: The nonconformance reports with control numbers, which are those that were -- concern number five that were documented but not entered into the system -- number 170.

The total number of nonconformance reports that were stamped void, just under 1,100, and documents that were written up on nonconformance reports that were actually inspection reports and have been stamped as such number 470.

The items in both five and six are being treated together as foreclosure. We are reviewing what was done and what was said to make sure that the item was addressed and properly closed.

If not, new nonconformance reports will be generated and, as listed in seven, approximately 20 percent of the nonconformance reports that list in five and six will probably require reopening.

In addition to the items stated above, we were asked to get a feel for the dispositions of the properly handled nonconformances and a stamping of 300 properly closed

nonconformance reports will be reviewed to be sure that they were properly dispositioned and they were properly closed.

This is another effort that is just getting ready to start.

As a result of our reviews today, we have identified no items significant to safety. A lot of these listed on the nonconformance reports have been closed out by action by construction to nonconformance reports being acted upon or those dealing with pipe hangers are being redesigned and reanalyzed.

CHAIRMAN BENDER: Let me try to get that statement, "significant to safety" clarified.

Does that mean if you have not done anything to correct these items that have been identified that the plant would have been adequately safe?

MR. RULLI: In the cases that we have looked at, we feel that this would be the case with the exceptions that I have noted earlier where we feel that even though their traceability was lacking on some of the heat numbers for the pipe, that the Kaiser system for verification and final turn-over had not yet taken place and would have caught that.

Also on the welding issue for structural steel, say, most of the items that we have received have not shown to be problems, although we don't have all the analysis back yet.

CHAIRMAN BENDER: Maybe this isn't the time to ask this question, but it is convenient to ask it.

There is a small fine associated with the quality problem that the NRC levied. It would be interesting to know what the real cost of this massive reinspection program is.

Is there any way to assess that?

MR. BORGMANN: Not completely. We have got some idea, but until the thing is completed and the amount of rework is done, it is pretty hard to put an exact number on the program.

Obviously, it is going to cost something. It is not cheap.

CHAIRMAN BENDER: Just the addition of the inspectors alone represents a significant investment, I would guess.

MR. BORGMANN: That is correct.

CHAIRMAN BENDER: As undoubtedly a lot of labor that goes in that besides that.

MR. BORGMANN: When you come up with a net cost, you have to determine how much of this you would have been doing anyway, how much you would have caught in a final walkdown, and you have to get all the numbers together and come up with a net figure and then try to determine if that's your final cost of doing this program.

CHAIRMAN BENDER: Without doing an inspection, you wouldn't really know whether you needed to do it or not. It is somewhat reassuring that you have not found things that were of serious safety concern.

It is important that it was done right the first time

so you don't have to do it twice, but I think some of us get some comfort in you not finding anything.

MR. RULLI: I think what we have found with a much larger sample is that the actual physical construction problems are not that significant.

CHAIRMAN BENDER: Go ahead. See if we can move through this in a hurry.

MR. RULLI: Task eight deals with design control and verification. Sargent & Lundy had no formal procedure requiring verification of design calculations for thermal loading of power sleeves and dead weight loading of all trays.

Three examples were identified in which Sargent & Lundy's design deviated from the FSAR. The first was cable tray loading: Design base is different from that stated in the FSAR.

The second was cable separation which will be addressed as a separate task.

The third item is weld acceptance criteria: Site procedures take exception to AWS D-1.101972. Inspection acceptance for undercut. The FSAR does not stipulate the exception.

Sargent & Lundy had no formal procedure for documenting design deviations when identified by engineers.

The system has been clarified and to all of their design people, GQ 16.03.

Item 2A above: Methodology differed from FSAR. However, acceptance criteria unchanged.

In item 2C above: Sargent & Lundy has engineering evaluation to justify exception to AWS Code criteria. FSAR now allows exceptions to be taken based on engineering evaluation.

CHAIRMAN BENDER: Let me suggest: In view of the time factor, the use of the luncheon facility we chose it when we did, maybe you could just skip to the summary slide, and we do have copies of the information.

It will be in the record, and I think we have heard most of the substance of it.

MR. RULLI: In summary to date, we have not found or have not identified through evaluation or inspection yet any items of significant safety impact on the plant or of any significant scheduled impact on the construction of the plant.

CHAIRMAN BENDER: One quick question: I heard nothing about bolting or inserts. Are those problems not evident in this plant?

MR. RULLI: Are you referring to anchor bolts?

CHAIRMAN BENDER: Anchor bolts.

MR. RULLI: We did a fairly --

MR. CULVER: We did an extensive test.

CHAIRMAN BENDER: That has all been taken care of.

MR. CULVER: Yes.

CHAIRMAN BENDER: How about stress corrosion and

and cracking of holddown bolts?

MR. CULVER: Stress corrosion and cracking?

CHAIRMAN BENDER: In some plants we found that bolts were being stressed up above 150,000 psi as specified to take loads up in excess of that and that suggests the high strength bolts, they have limits, and in some places the bolting has not behaved the way you would want it to behave.

I am interested to know whether you have had any of those problems.

MR. BRINKMAN: In response to your question, as part of our equipment qualification program, we have reviewed the anchor bolts on all of our equipment.

We have found a couple of isolated cases where we checked out foundations and did replace anchor bolts for strength reasons.

We are generally not using stainless steel anchor bolts.

CHAIRMAN BENDER: I was not thinking about stainless steel so much. Low alloy steels.

MR. BRINKMAN: We do have some steel high strength bolts. We are reviewing the anchor bolts as part of the equipment requalification program.

CHAIRMAN BENDER: Thank you. Why don't we break for lunch and plan to come back at 1:50.

(THEREUPON, noon recess was taken.)

CHAIRMAN BENDER: This meeting will now reconvene. Mr. Borgmann, I think we will shift gears here and going to the organization of management as it has been set up to reflect the operating program that you have in mind.

MR. BORGMANN: In other words, you want to wait for the NRC's comments on the QCP?

CHAIRMAN BENDER: Yes. Maybe we will take a couple minutes. I do not think they have much to say, but where are they?

Why don't we go ahead. When they show up, I may interrupt you. No sense in wasting time. Short day.

Jim, we decided to go ahead with the CG&E presentation. If you want to make some comments on what you have heard so far, go ahead.

MR. KEPPLER: One comment that might be worth making has to do with Mr.Ebersole's question about design verification.

As I know you are aware, several lessons were learned in connection with Diablo Canyon in terms of the amount of design verification work that utilities are involved in and to the amount of design verification effort that's done by the Staff, both in terms of review process and in terms of the inspection effort.

The Staff has been taking each new plant as it comes up right now, and requiring some independent design verification

effort based upon the degree of involvement that the utilities have had to date and what best can be shown to give confidence that there has been adequate design control employed.

In the case of LaSalle, for example, which is a plant to be licensed in Region 3 very shortly, there is an independent design review verification effort on the way.

Sexton 2, which is coming up also, had some independent design review done and I except Zimmer will have to have some done.

A lot will hinge on how much the utility has been involved and how much Sargent & Lundy can convince the Staff as to the adequacy of that effort.

We are sensitive to that problem as an agency, and I think Zimmer will fall into that same class.

CHAIRMAN BENDER: In particular, there is the question of as-build record. We did not hear very much about that.

I think it is implicit in what we are doing that you must be developing that built record of what has been installed.

You obviously did not choose to dig into it.

MR. BORGMANN: We are.

CHAIRMAN BENDER: Any other comments?

MR. KEPPLER: I don't think so.

MR. BORGMANN: I will give an introduction to the organization and sort of a broad overview, and then turn the thing over to Ralph Sylvia to zero in on his own operation, but

to go back for a few moments, at the committee meeting back in 1979, we realized that there was a concern on depth of staffing, and on the operations review committee we did arrange to have a couple of gentlemen come on that committee, Mr. Schneider from General Electric, and Bob Lowe from Kendig-Lowe, and we were underway toward getting that thing going and, of course, Three-Mile Island hit.

In the throws of rearranging our priorities, we were continuing to build up the operational staff and were really searching as to how we should best organize a one-unit operation.

Some of our original thinking was to have the nuclear operations of the plant be part of the production department and have the engineering support be an arm of our general engineering department, but as time went on and after we reread 0731 and had some discussions in-house, I decided to form a task force to give me some evaluation of what was going on in the industry and how to best approach an organization to support Zimmer.

So I had three gentlemen go out and talk to a number of people and give me some recommendations, which I discussed with Mr. Dickhoner, and this was towards, I guess, the latter part of 1980, and finally decided that the best thing to do was to create a nuclear organization that would be independent and have basically most of the functions under a corporate officer, and we would proceed in that way.

When the NRC came to see us the early part of 1981 to discuss staffing, I told them at that time that that is what we were going to do and that we would proceed to implement that.

Now, actually it took us until September of 1981 to implement that organization that we are going to go with so, first of all, I will show you the general overview of our corporate structure.

It is kind of hard to see here. but this is looking at the big picture.

Currently reporting to Mr. Dickhoner there are a number of vice-presidents, and two senior vice-presidents, and I am one of those two.

And in my area, I have the fossile production and then I have engineering services which comprises general engineering, licensing and environmental affairs department, generation construction and then we have Mr. Sylvia's operation, vice-president of nuclear operations, and he has the nuclear production, the nuclear engineering, nuclear services and the quality assurance department.

This organization is pretty independent with the exception of the administrative services department, the personnel relations work so there will be some interfacing, particularly with union grievances and things like that with that department and also with purchasing of stores which comes

under Mr. Ehrnschwender also, but those operations as they interface with nuclear will be covered with procedures that are controlled under the operation of the nuclear vice-president.

In other words, the services that will be performed for Mr. Sylvia outside of his group will be covered by his procedures, and they will do it in accordance with the way he wants things done.

So we don't think that's going to be a problem. Next slide.

To kind of zero in on that a little bit, there is the president of the company, and this will be my responsibility right here. This will be Mr. Sylvia, and we are having all of the organization reporting up to him, and we are trying to do some interfacing with generation construction and also with administrative service which would support industrial relations and materials management.

So that would like of give you an idea of the way the whole company structure would tie together up into Mr. Sylvia's operation which basically is going to be self-contained because he is going to have the operation of the plant, the engineering, the quality assurance, and all of the services are going to go along with the nuclear operations at Zimmer. Next slide.

I think the other thing that should be noted is that the generation construction is not under nuclear operations. It is reporting directly to myself.

This was done primarily to make certain that the quality assurance is independent of the construction at Zimmer, and when the plant gets into operation, the normal jobs that will be done in the plant with outside labor would be under the control of the nuclear engineering department from project management standpoint, and when we got to a large project that would require a separate construction management group, that group would still be under the generation construction department but it would be opeating under the proceeding and direction of the plant operations.

So we think that's a workable arrangement. The only other thing that is an interim situation is that the nuclear licensing will eventually, when the plant gets its operating license, the nuclear licensing will go under the nuclear services department.

The way we were set up, we have a licensing environmental affairs department. We have licensing and environment melted together under Mr. Flynn, and that operation is so far along for getting the license, that is, we hope we are in the final stages of hearing that.

Rather than breaking tha up at this point in time, I elected to leave it there until the plant is ready to load fuel, and at that time the licensing function, the ongoing nuclear licensing for Zimmer, would then be placed under the nuclear services department by the appropriate transfer of

needed support personnel.

So that in a capsule form is the organization that we are going to. It went into effect on September 1 of last year.

We think it is well along and we feel sure that Mr. Sylvia's more than 15 years of operations done at Bebco that it is going to be an organization that will insure dedicated support for Zimmer.

Obviously it took us six months or more to get a corporate officer of the type we wanted. At first we were looking for somebody predominantly with boiling water reactor experience, but after we reviewed a number of candidates, we decided that we would look for the man with the best experience, believing that somebody that had extensive pressurized water experience would be able to take over a boiling water plant with appropriate indoctrination and training because he has all the necessary qualifications which we think overrode some of the qualifications that people with more BWR experience might have had.

So that was the basis for us selecting Mr. Sylvia.

So with that, I would like to turn it over to Ralph, let him go into a little bit more depth on his organization.

DR. CARBON: Will either of you say anything more about Mr. Schneider from GE and the gentleman, Mr. Lowe, what sort of backgrounds they have? Go ahead, Jim.

MR. FLYNN: Yes, sir. William Lowe is with Bickert, Lowe & Garrity. He is the man that was in charge of the night shift that was called in at Three-Mile Island, to run the night crew, so to speak, in the early phases of it when they were still trying to find out what was going on and what they should do.

He has many years experience in the field, and I would be surprised if there weren't some members of the ACRS who hasn't had personal contact with William Lowe during the years.

The second man is Mr. Schneider, and he is an in-house consultant. He is intimately involved in GE VWRR infractor systems and has been from its inception.

DR. CARBON: What role do they plan in your organization now?

MR. FLYNN: They will be voting members of the operating review committee.

Mr. Borgmann is chairman of the operating review committee. This is a direct result of Mr. Bender's suggestions at the ACRS committee meeting that we do get some outside expertise onboard this ORC.

MR. BORMANN: I think that what we have done was consistent with what we told Mr. Rivenbark, I think, back in the early part of 1981.

MR. SYLVIA: Would you like to see who the other members are on that committee?

CHAIRMAN BENDER: Yes.

MR. SYLVIA: In addition to the two consultants Mr. Flynn mentioned, we have the four managers underneath also on the committee and I am on the committee.

The management of the trust department, the manager of the nuclear services department, the manager of a nuclear engineering department, and station manager, the manager of the nuclear production department.

Also, the manager of generation construction and the manager of general engineering and Mr. Flynn himself will be on that committee.

CHAIRMAN BENDER: You will have to refresh my memory because it has been a while since we told the story. You were not here, as a matter of fact, when we heard it the last time.

Are you planning other committees as well as that one?

MR. SYLVIA: Yes, sir, we have a station review committee and we also have the independent safety evaluation group.

We call that Independent Safety Review Group.

CHAIRMAN BENDER: And the makeup of those two groups, are you going to tell us about that somewhere along the way?

MR. SYLVIA: Right. Mr. Schott will cover that, but it is the key supervisors at the station and the independent safety evaluation review committees under the nuclear services department.

They report directly to the manager of nuclear services,

and we will have people with all the required disciplines to perform the safety engineering function.

CHAIRMAN BENDER: I do not need to hear it then. When Mr. Schott gets up there, he will give us a shot at it. Go ahead.

MR. SYLVIA: As Mr. Borgmann pointed out, the four managers under me each run a department, and we will become the nuclear operations department once the plant is licensed and operating.

We are currently messing our operations into the construction and starter back. The manager of the quality assurance department that is currently the manager of construction quality assurance and a lot of the people will become the operational QA department.

Also, the nuclear engineering department is performing the project engineering function for the new project, and once we become operational, they will become the project engineers for design changes and major engineering problems.

As we go through each of the four departments, I would like to just briefly talk about the functions that they will perform and the qualification of the manager and other key individuals and give you some general overview of the overall qualifications of each department.

The nuclear engineering department, as I mentioned earlier, will be responsible for major design changes at the

plant and for major engineering problems.

The day-to-day engineering support is in the nuclear, the technical services department, technical services section under the plant manager.

We have divided the engineering project function into four groups: The nuclear supply system, the balance of the plant structural group and electrical and INC group.

The department is headed by Mr. Herb Brinkman. He has a degree in mechanical engineering, and he has over 18 years of project experience and he has been on the Zimmer project for over half of that time, over 9 years, I believe.

The four directors, currently we have three of those jobs filled and the minimum amount of nuclear engineering experience, those three people is 7 years. The overall, this group has 65 years of nuclear experience.

We currently have 16 permanent slots filled. We have plans to have 32 people in this group.

CHAIRMAN BENDER: Let me -- people tend to quote these total years of experience, and sometimes the experience has meaningful basis and sometimes you wonder about it.

If most of it is associated with building a plant, then you wonder how effective that person might be in its application operation.

Have you made an attempt to form some judgement about how much operating experience is needed in that group as

opposed to construction and engineering experience?

MR. SYLVIA: We have put a number of the engineers in that group through STA training, and we also sent quite a few of those fellows to simulator training so we are trying to get them involved in operations aspects, and I fully intend to rotate people among the various departments to get some interchange experience as the plant starts up and operates.

CHAIRMAN BENDER: That certainly will give them some insite as to how the plant is supposed to work, but there is -- I always have to face the question of whether the simulator was as smart as the guy that was learning needed to be so we have always asked, well, how much analytical skill is in these groups, how much do they understand about the technology independently of what they get through these very quick training program, 16 weeks of training.

You know, it is impressive, but I am always reminded of the 90-day wonders that used to be made officers in the military during the war.

People were very nervous about those people when they put troops under them.

MR. SYLVIA: I certainly agree with you. I would like to see several of the engineers in the nuclear engineering department have SRO licenses.

I think that gives you the big picture of the plant, and you apply the technical background along with the operational

experience.

I think that is sort of an ideal situation, and as you will see when Mr. Schott makes his presentation, we are putting quite a few staff people through the SRO training program.

CHAIRMAN BENDER: Go ahead.

DR. CARBON: Let me ask further there: I was one of those 90-day wonders that Mr. Bender speaks about, and I think the country had every right to have some concern.

I can't find Mr. Brinkman's resume, and I am not concerned with him personally, but what experience does he have in nuclear affairs other than the Zimmer program right now?

MR. SYLVIA: He has been very active in industry groups. He was a leader in the Mark II containment task study, and most of the CG&E people have done a very good job of keeping up with the industry.

We are active in participating with EPRE projects. The plant manager is a member of the EEI Nuclear Power Subcommittee, and we take an active part in getting the most out of IMPO as they have come into existence.

DR. CARBON: Has he been involved in some responsible position at an operating nuclear plant of any kind?

MR. SYLVIA: No, sir. I believe his resume is in there.

DR. CARBON: I am sure it is, but I can't find it.

MR. SYLVIA: Right at the end of section 13.

DR. CARBON: Thank you.

MR. EBERSOLE: I have a little trouble with the connotations associated with the title also under those several divisions.

For instance, in the one case you have AWS which is a very point in time problem, and in another place you have piping instrumentation. I think that it is in control, which is a rather broad problem.

Do I understand General Electric engineering is over there under Mr. Cooper?

MR. SYLVIA: Right.

MR. EBERSOLE: That the single lines and schismatics and so forth for the whole plant are done by him?

MR. SYLVIA: That's right.

MR. EBERSOLE: So it is really broader than diesel generators?

MR. SYLVIA: He has like six or seven engineers assigned to him.

MR. EBERSOLE: Do you have any arrangement for doing system and intersystem studies, just interaction studies?

MR. SYLVIA: I believe that was done in the design phase. Herb may be able --

MR. EBERSOLE: You are not talking -- I thought you were talking about a transition sort of state of affairs now where this is a transition organization going into design.

This is the operating organization here?

MR. SYLVIA: Yes, sir, that's correct.

MR. EBERSOLE: Okay. Thank you.

MR. SYLVIA: The nuclear services department is headed up by Dr. Chitkara. He currently has four groups under him and, as Mr. Borgmann mentioned, when the operating license is granted, he will also have the licensing division.

The first group is the independent safety review group. That will consist of a supervisor and four engineers to perform the safety engineering review function.

Second division is a nuclear fuel division. They will be responsible for fuel procurement, economic analysis, quota management, materials safeguards program and fuel performance.

The third group division under Dr. Chitkara is nuclear systems and reliability analysis division. This group will handle the PRA, Probability Risk Assessment Program. It will evaluate plant transients and perform operational analysis to support new fuel loads, refueling, licensing submittals for fuel loads.

The fourth group under the nuclear services department is the training division. We have a director and TM training and supervisors and instructors in that division. This will cover training all classifications in the nuclear operations group.

The employees in the -- on the plant staff as well

as on the support staffs. Then the licensing division will function to handle amendments to the license, FSAR changes, review design changes to see what licensing implications those design changes may have.

MR. EBERSOLE: If you would have to do a system interaction analysis like -- would it be your --

MR. SYLVIA: I believe -- but three groups would have to work together on a problem like that. I would think that the operating group, the nuclear production department, the engineering group and this group, it would have to be a joint effort.

CHAIRMAN BENDER: How much of this organization is in existence right now?

MR. SYLVIA: We currently have 20 -- it is 19. We have 19 engineers and a manager in place.

Dr. Chitkara has a Ph.D. in nuclear engineering and 10 years experience. We have a total of 129 years of experience in this group among the 16 people, and all 16 people except for four people in the training group have degrees, B.S. degrees, and three have Master's Degrees, and I think four others are working on a Master's Degree.

CHAIRMAN BENDER: Mr.Gott's background is what?

MR. SYLVIA: He is a nuclear navy officer, has a degree in -- B.S. Degree in industrial technology, I believe. Is that the right title?

CHAIRMAN BENDER: Has he been doing training work before?

MR. SYLVIA: Yes, sir, he is well experienced. He is a qualified nuclear navy officer.

MR. SCHOTT: He ran the Great Lakes Electrician Training School. He was the officer in charge before he came with us.

MR. SYLVIA: He has like 19 years experience, I believe.

CHAIRMAN BENDER: We don't really need to have a number. We are more just trying to get a feeling for what kinds of backgrounds these people have.

I noticed in looking at the operational plan information on what you provided in the FSAR that you were using NUS to do a lot of training.

Is there any other training that these operating groups will get through this training division or training operation other than what the NUS gives?

MR. SYLVIA: Yes, sir, they have had extensive training from GE and also a training in general physics on site.

We have, I believe, six consultants on site, and we currently have five of the ten positions filled with permanent employees, and I believe three of those five have gone through the senior reactor operator and reactor operating training

GE.

Candidates for RO and SRO are schedules to take the license exam, NRC license exam, in April and June. Half are going in April. The other half is going in June.

I think the walk through is the end of June, first of July.

CHAIRMAN BENDER: What kind of training does the technical group get?

MR. SYLVIA: We are looking at expanding that program. Currently the STA training and, of course, other courses from the University of Cincinnati, but we are expanding that to cover training on some systems and training on using the proper standards and REG Guides, and utilizing the ANSI standards that apply to whatever they are working on properly and make sure that they are aware of what the reference is.

CHAIRMAN BENDER: Do you plan on developing some formalized plan or is this sort of --

MR. SYLVIA: There will be a formal training program. We have technical support training in the plant, in this licensing division. It will be a formal technical school training.

MR. EBERSOLE: Let me take a shot in the dark here. If I were to ask you about small break and large break analysis, you would give me great answers becasue that is the great thing,

but let me give you a darker case.

Do you intend to have or have you already examined, for instance, the failure modes of the impulse or static lines that service your level and pressure systems?

MR. SYLVIA: I can't answer that. I haven't been involved with it since I have been here.

MR. EBERSOLE: Do you know if it is on your scope to do, or has it been done and who would do it?

CHAIRMAN BENDER: It has not been looked at yet.

MR. BRINKMAN: We are now doing something like that with the instrumentation; however, on the control drive system.

So in that area, it is being done.

MR. EBERSOLE: Thank you. It will come out in due course.

MR. SYLVIA: This is the quality assurance department. This shows the divisions and the structure of the organization that we will have once we go into the operational mode.

This is a reduction in the slide that Mr. Sager showed you earlier. This is headed up by Harlen Sager. He has a B.S. Degree in math and a degree in physics and a Master's Degree in nuclear engineering and 13 years of experience; 6 of those in the navy and the other 7, other 7½ really, with commercial plants.

He worked at Marble Hill two-and-a-half years, was at Portland for three-and-a-half, and he has been with Zimmer

since June of this past year of 1981.

CHAIRMAN BENDER: Portland being Trojan?

MR. SYLVIA: Right. In his group we currently have, I believe it is 19, I believe, is that right, 19 permanent CG&E people?

And they have a total of 109 years, so on the average, it is over five years per person, almost six. We have four -- six of those 19 people have been through the nuclear navy program.

The only -- one of these positions that has been permanently filled is the supervisor of the quality assurance operation division, a gentleman by the name of John Wall is in that position. He has a B.S. Degree in chemical engineering. He is also a nuclear navy qualified officer. He did some field engineering with -- finished school in 1968 and the rest of his time has been nuclear experience.

He did some work as field engineer with B & W, and he has been at Zimmer since 1974. He is also a well-qualified individual.

This is the plant stuff, the nuclear production department. I won't go into the details of who does what or the qualification of people. I noticed on the agenda that you had that as a separate item so Mr. Jim Schott will cover that in detail.

Mr. Schott has 28 years of experience. He has a degree

in mechanical engineering.

He has 28 years of power plant related work, and he has been assigned to the Zimmer project since 1969.

This is sort of a summary of our staff. We have eight people in the administrative group at corporate. The plant staff has quite a number in their administrative group.

We will have 32 people in the nuclear engineering group. Thirty-six in nuclear services, 258 on the plant staff. That does not include security. That is contracted out.

And 26 including the manager in the operational, on the operational QA staff. I though I would take this opportunity to just give you an idea of how we plan to approach the administrative control for the nuclear operations department.

As you can see from the organizational structure, it pretty much follows 0731, and I have also used 0731 in determining the qualification of people for comparison of what should be required to their actual qualifications.

We are committed to 18.1. In our office, our operational plan which is really the QA plan, we have tried to follow the 18.7 outline as much as we could.

Instead of having the QA manual that only applied to the plant, we got a cohesive nuclear organization so what we plan to have is a nuclear operation administrative plan.

So the way we started this off was to identify all the activities that needed to be performed in order to operate,

maintain and make necessary design changes to an operating plant.

Then we also looked for what commitments we had made to identify activity. So we looked in tec specs. They are not listed questions. We determined all the activities that needed to be performed in order to safely operate Zimmer Power Station.

From that, we developed the -- used to develop the organization to show who would be involved in performing all of these activities.

As Mr. Borgmann showed that diagram earlier, all the functions are under me except for the materials management, management purchasing function, and the industrial relations, the assistance in hiring people and the salaried administration program.

So we will have directives that will tell them how they interface with their departments in order for them to carry out their functions. Any activity that needs to be performed, I would generate a directive saying who was responsible for each part of that activity.

I would send it to the managers of the department within the company. From there, they would give their people directives for performing the duties that they are required to perform in each department, and from those directives, they would develop implementing procedures that would describe the exact responsibilities and duties of each person involved with an

activity and the interface between the departments.

The QA would use these procedures and their own procedures to see that these activities are performed properly.

To give you an example of how this would work, we have got a little diagram of how this would apply. One activity, the design change program.

I would put the activity of a design change program, I would generate directives saying who was responsible for each aspect of the design change program, who had to approve it.

I would direct the station review committee -- station review group to approve it. The off-site review committee would also have to approve it, and the independent safety engineering group would have to review it.

I would direct the NED to do the actual design; direct the QA manager to provide the quality engineering of the design and provide inspection of the installation; direct the licensing manager to review the design and make sure that the FSAR, that it meets 50/59 requirements, to see if the FSAR does generate necessary paperwork or directives to start that process rolling to cause a licensing amendment to take place.

To see if the tec spec needs to be changed. For that design change, each of those managers would have to write detailed procedures for performing their functions necessary to make design changes within the power station.

MR. EBERSOLE: Could you give us a brief description of the inverse of that process, namely, how does a design change come to be born and how does it --

MR. SYLVIA: Most of the time --

MR. EBERSOLE: Let's say the janitor found it.

MR. SYLVIA: It would either come from operations quite a bit. If they are trying to operate a system and they are having difficulty or if it is not performing as its designed function, then that would be a likely source for a design change.

MR. EBERSOLE: Does it make its way upward through a formalized process?

MR. SYLVIA: Right.

MR. EBERSOLE: It could be turned off at any point?

MR. SYLVIA: No. We would have an escalation so that it would get adequate review and feedback to the individual who generated the need.

MR. EBERSOLE: Generally they can be turned off at any point, but there is always a recourse; do you have that?

MR. SYLVIA: We will have it.

CHAIRMAN BENDER: There is a need for written procedures to manage things like this, but it is also possible to get procedure bound.

How many procedures are you likely to have of this sort?

MR. SYLVIA: I would say probably four, but each activity, it will have the same format which should make this approach clear, concise, and easy to use.

CHAIRMAN BENDER: So each one of the departments will write a charter for his part of the, for example, direct design modification activity?

MR. SYLVIA: That's correct.

CHAIRMAN BENDER: Then how do you establish that those procedures interface with each other properly? Is that your job?

MR. SYLVIA: Right. My job and the manager's job. We would review it together.

CHAIRMAN BENDER: How about the development of operating procedures? Where does that fit into this?

MR. SYLVIA: That is done within the nuclear production department, and they are for the most part written. We still need to write some on TMI changes that are being made, but for the most part, they are already in place.

As a matter of fact, I think -- I am sure they have been sent to the NRC because of the upcoming license exams.

CHAIRMAN BENDER: Are we coming back to this later? I will just wait until then.

MR. SCHOTT: I am sure you will remind me.

CHAIRMAN BENDER: Carry on.

MR. SYLVIA: Well, if there are no more questions,

I guess that sort of wraps up what I had to say.

CHAIRMAN BENDER: No other questions.

MR. SYLVIA: I would like to turn --

MR. KEPPLER: Has CG&E given any consideration in asking for an audit by IMPO prior to start-up?

MR. SYLVIA: Yes, sir, they are coming the week after next. They will be in from March 1 to the 6th, and they have an --

MR. KEPPLER: They are going to do a similar audit to that which they are doing for the operating plants?

MR. SYLVIA: Right. We requested a pre-operational audit, and they are coming the first week in March to do that.

MR. KEPPLER: Do you feel there is enough in place for them to look at?

MR. SYLVIA: We think so. They are primarily looking at the plant itself -- from my personal point of view.

MR. BORGMANN: It is a courtesy type audit, isn't it?

MR. SYLVIA: Right. They did it at our request.

MR. KEPPLER: I appreciate that.

MR. BORGMANN: We won't get the official audit. It is our idea to get their input to be sure that what we are doing meets their criteria.

I don't think we are going to get a public -- that's going to be publicized throughout the industry, are we?

MR. SYLVIA: No, sir. It would just be a critique.

MR. KEPPLER: Why not?

MR. SYLVIA: It is a courtesy to get an outside review to see if we are as right as we think we are.

MR. BORGMANN: We can review it with you if you want to. I don't have any problem.

I am saying this is not the official audit. We are trying to be sure that we are going down the right track.

MR. KEPPLER: I appreciate that. I don't see any reason why you wouldn't want to have a written report of the audit.

I don't want to debate this here.

MR. SYLVIA: I don't think that is in that policy. I never have seen one of the full-blown written reports for a pre-operational audit.

MR. SCHOTT: Jim, they have a program of inspection or operational assistance, I believe it is called, for all the new term plants now, and I don't know exactly how many have been completed.

I know Shorham has been completed. LaSalle has not been completed. We are all on the schedule.

It is a formal program to that degree.

MR. KEPPLER: Okay.

MR. SCHOTT: We will have a formal one with the senior officers of the company just like they always do, Mr. Wilkinson himself will lead that. They just won't

document it in the usual form that you are used to seeing.

It will be documented. No question about it.

MR. KEPPLER: Fair enough.

MR. SCHOTT: And it is focused at the plant basically. Seems like I have done this before.

CHAIRMAN BENDER: I wouldn't be surprised. You might try it again.

MR. SCHOTT: Well, it is my intent to discuss the station staff using the organizational charts and tables that you have in your handout.

I am prepared to go into as much detail you would care to do.

I do have some prepared remarks that are based primarily on my own opinions as to what I though you would want to hear.

So if you do not hear what you want to hear, I am certain that you will stop me and question me.

CHAIRMAN BENDER: You know how we operate. Why don't you go ahead and present it the way you think it should be presented, and we will chip in where we can.

MR. SCHOTT: Thank you. The chart you see before you is the station, the basic station management structure, that we have recently developed.

We are all aware of the effort, discussion and attempt to focus in on the quality of the human staff.

We have all been involved with the various opinions, regulatory guides, industry positions, transcripts with the ACRS and the commissioners where this idea of the human staff gets a lot of attention.

In establishing and upgrading the plant, I wanted to just briefly touch on several points that we considered in attempting to put together a group of persons that we felt addressed the education, training and experience qualifications.

I would just like to briefly touch on those criteria before I start. We looked at education and training requirements that are established and that are also in draft form again in such documents as ANSI standards, regulatory guides, industry positions, IMPO papers, transcripts of dialogues between organizations.

We looked at the experience needs of the Staff, again, based on the printed information and based on some of our own input.

We looked very strongly at the consideration of building the team concept, and I know there is an awful lot of feeling going around the industry that there are a lot of Gypsy Ma's out there that float around for the sake of a few dollars.

And they are here today and gone tomorrow, and it is our opinion that building a staff with those types of individuals has some detriment to safety, and we gave that

some consideration.

We are trying to build in company loyalty using a lot of personnel from the immediate Cincinnati area, trying to build long-term employees, trying to promote from within, and things of that type that help build and sustain a staff.

We tried to balance between what we would consider as gaining appropriate experience versus this thing we call company loyalty and family loyalty where you try to balance sending people out of town for a long period of time and still maintain that feeling that they belong to you and that they have some loyalty to their family.

And we tried to balance between the pain and experience at operating plants and gaining experience with our own plant and our own systems during the pre-operational and testing program.

With those thoughts in mind, why don't we focus our attention on the slide for just a few moments.

We have four divisions that consist of the functional areas of operation, maintenance, technical support and rad/chem and a fifth section which we call the administrative section. All of those superintendents, we call them, report to myself.

The one thing that does not show on this slide is the station review board. That is an organization composed of key management personnel and they report also directly to me.

The four division superintendents are on the station

review board and as we go through the other organizational charts that depict each division, I will point out the members of the station review board as they appear on those charts.

Let's go to the next slide.

This first organizational chart, number two, is a very brief or kind of an overview of the technical support division.

At this time, we have 16 professional or graduate persons who are members of this technical staff.

Our goal is to increase this group to a total of 24 individuals graduating with engineering or scientific degrees by July of this year.

We have added what we call a test supervisor. That is not at this point in time designated as a degreed position.

They have three technicians reporting to that man. This is something new that at least we are going to give it a try.

I feel that there are probably some aspects of plant operation and testing that fall within the purview of a group of this type who have a little bit more technical awareness of system interactions and requirements.

I will give you a few examples such as integrated ECCS testing, loss of power testing that test the integrated operation of the diesel generators and the load shedding system on an annual basis, and we would have this group perform

those types of surveillance testing activities.

That is our intent now. I can touch very briefly on the experience and qualifications of the persons who make up this organization at this time.

We have a total, and I know we are going right into one of the areas you touched on a few moments ago, experience in terms of numbers, and I think we could probably wax philosophically for many hours in that area, but I will try to touch on some of your thoughts and some of your concerns.

The superintendent of this division is a chemical engineer with a Master of Science Degree in nuclear engineering and six credits short of a Doctorate.

He has about six years, seven years, of actual nuclear commercial experience working with the Babcock & Wilcox Company, and he has been with us for about four years now.

Right now he is in senior reactor operator training program, and he will sit for senior license. It is a requirement for his position.

I will just briefly touch on this gentleman. Technical Engineer. He is actually our reactor engineer. He is directly in charge of the on site corporate management, performance of vessel safety and so forth. Also a graduate nuclear engineer.

He already has his senior reactor operator certification. His basic experience has been at the Zimmer Station.

However, he has participated in the Hatch Unit II start-up. We have sent him for several months to Monticello refueling outages,and it is our intent to send him one more time to start-up or to a refueling, whichever comes first, prior to our loading fuel.

The remainder of the staff as a whole right now we have accumulated a total of 81 years of nuclear experience that breaks down as follows: We have 29 years of actual commercial nuclear power plant experience on that staff, 7 years of navy nuclear officer experience.

Thirty-eight years of the 81 is experience that has been acculumated at the site, 7 other years of related nuclear experience at facilities such as Sexton, and others. Well, those are examples.

For of this group will have and hold senior reactor operator licenses. With the exception of the one who will finish his training in April, all of the other ones are senior certified right now.

All 16 of the staff are designated STAs, and I want to briefly touch on our STA program.

We fell that it is nothing unique, but I want to touch on it for your information.

Back in August of 1980, we embarked on a program between ourselves and in cooperation with the University of Cincinnati, Department of Nuclear Engineering, a program of

STA education that was based primarily on the IMPO document was begun.

Since August of 1981, we have completed courses such as reactor theory I, reactor theory II, principals of radiation protection, nuclear instrumentation, electrical machinery, specifically geared toward the Zimmer plant, radiation effects on materials,and the unique part of this is that the University is awarding graduate credit to those individuals who take part so they can use that toward the attainment of a nuclear engineering degree if they already do not hold a nuclear engineering degree so they are awarding graduate credit for these courses.

In addition to the 16 individuals who are on the technical support staff, we also have 8 other engineers who I will point out as we go through the slides who are also in STA training, and they too participate in the same courses.

So that I do not mislead you, if an individual meets the prerequisite, in other words, many of these courses are part of a nuclear engineering curriculum so by virtue of their degree, some of these courses, they have already had so they are exempted from taking those courses a second time.

It is only those courses where a person cannot show equivalence do we require them to take the STA educational course.

In addition to that, they have already participated

in a simulator course designed specifically for shift technical advisors. They have all participated in the retraining with our actual operating crews as they went back to the simulator for retraining and have actually participated in the last several days as shift technical advisors on shift with an operating crew and their shift supervisor.

I believe that touches on the basic comments of the STA program.

DR. CARBON: Could you summarize what courses, training, whatever you want to call it, your STAs take that are different from what would be taken in, say, a Master's Degree program in nuclear engineering at the University?

MR. SCHOTT: There are a lot of courses that are equivalent and for the most part they are the very same.

The University has utilized some of the existing course work that we have developed for the courses you are talking about in their Master's program.

That's why they are awarding graduate credit for these courses. They have tailored those to include specific Zimmer -- well, corporate parameters, for example, actual equipment, nuclear instrumentation that is actually used in the plant, have slanted it toward the boiling water reactor.

I have some details that I would be happy to show you if you would like to.

DR. CARBON: The thing I would really like to know is

what courses do they take that are different from a Master's Degree program?

MR. SCHOTT: All right. If you permit me --

DR. CARBON: If you will summarize it.

MR. SCHOTT: We specifically worked with the University in developing, for example, a reactor chemistry course in cooperation with the Ohio State University.

That would not have been included in a nuclear Master's program.

Two nuclear instrumentation courses were specifically developed that would not be part of the Master's program.

DR. CARBON: What basically do they learn in those courses?

MR. SCHOTT: The chemistry course would be --

DR. CARBON: The instrumentation courses.

MR. SCHOTT: Basically diode solid state theory, control theory. Then beginning to take individual components and putting them together and how you make a control circuit, applications, and then with that basis in mind, then actually looking at some of the nuclear instrumentation and how you put that together in a system and then how the thing dovetails together.

None of these would be a part of a necessarily nuclear Master's curriculum. All of these -- I don't know if I have answered your question.

DR. CARBON: I think you have, but in the direction that troubles me very much. I am from an academic institution, and I know about Master's degrees in nuclear engineering.

I think it is great, but I do not really think it is the kind of training that people need for shift technical advisor functions to be there to advise a plant manager or shift supervisor or superintendent of operations.

It is not the systems engineering with the knowledge of the plant, the safety analysis of the plant, that seems to me that a shift technical advisor needs.

He would not get it in an academic program.

MR. SCHOTT: We agree with you 100 percent, and the academic portion was developed, as I mentioned before, based on the IMPO guidelines because at that point in time, I believe that was the best document available as far as meeting educational requirements.

That also included the simulator work and everyone of these persons have been through the same balance of plant and the same nuclear steam system courses that all our licensed operators are required to go through.

So they go through the systems training. Then I am still not sure I have answered your question, but I have the same general concern that you do and so to address the safety aspects and that sort of thing, we have or the University has developed for us, if I could use that a minute.

It is called applied boiling water reactor engineering which is one of the courses where they talk about the final cycle and the BWR safety analysis where they use the safety analysis and some of the things that they talked about, disbursal of nucleides in the environment, analytical methods for predicting system responsibilities to transient events and things of that type.

This has been put together by the head of the department himself and so --

DR. CARBON: I have no idea who that is or don't want to know. He might be an acquaintance or something.

What I do want to know is: Does he have some practical experience on BWRs?

MR. SCHOTT: I would rather not answer that one way or the other because I might be telling the truth.

In other words, I am sure he has some practical experience, but whether it is boiling water plants or whether they are on pressurized water plants, I don't know.

DR. CARBON: If you do not know, how can you put much confidence in that, not knowing whether he has some down-to-earth practical experience on the kinds of problems you might encounter in BWR plants?

MR. SCHOTT: I am going by the -- I guess the understanding that his colleagues have imparted to me has to his industry experience and, like I said, I am not sure whether

it is BWR or PWR, but his experience in the industry, his awareness and practical approach, I have -- we don't like to call it this -- we have used these terms before, a warm feeling. I don't know how else to describe it.

MR. SYLVIA: We depend a lot on the operator type of training, the fluid systems training that the STA engineer gets in order to apply some of this academic training to his job.

DR. CARBON: The academic training is fine. I am not trying to downplay it at all. I do not think it is nearly enough, and I do not see offhand where it has added to the rust that brings it up.

MR. SYLVIA: I guess that is what I am trying to say. We have used the guidelines that existed from the industry in order to have enough of the systems training, plus the candidate has to have a month, 12 months of experience, before he goes into the program, plant experience at Zimmer plant.

CHAIRMAN BENDER: Well, in a way we are on a fishing expedition here.

MR. SYLVIA: Why don't we give you the plan.

CHAIRMAN BENDER: This kind of discussion is more to enlighten us some about the philosophy of training.

In trying to develop your program, aside from IMPO, do you get any feedback -- feedback is the wrong term -- do you get any interchange of ideas between yourselves and other utilities that are going through about the same kind of

subjective reasoning about organizational problems?

MR. SCHOTT: I think so. I believe we all have the same concerns about people moving around. Am I coming on in the right tone here, or are you talking about the STA people?

CHAIRMAN BENDER: I am not thinking so much as people moving around, but given you have some fraction of academic training. You are presenting some fraction of applied reactor experience that comes from just seeing what is going on.

It would seem to me that there might be some opportunity for one station superintendent to talk to another station superintendent and to say, "Well, here are other things that I felt really enhanced our operation."

I wonder if any of that exists.

MR. SCHOTT: Yes, it does. That kind of interchange does occur, and Mr. Sylvia mentioned the Edison Electric Institute Nuclear Power Subcommittee. There is a lot of interchange that takes place there.

There is a lot of interchange that takes place over telephone calls. There is a lot of interchange that takes place during the break periods and dinner periods at some of these meetings that occur three times a year, and the IMPO station managers seminars and workshops that are held in Atlanta.

There is a lot of informal exchange about programs of this type. Probably for every operating plant going, I am

not sure you would find two STA programs alike or any two opinions that might go along the same path as to the best approach.

CHAIRMAN BENDER: That is one of the interesting things that I have observed. We never hear the same story twice.

Somehow or other, there ought to be a best way to do something.

MR. SCHOTT: We think we have the best way.

CHAIRMAN BENDER: With your extensive experience, maybe I ought to accept that.

MR. SCHOTT: There is a difference of opinion, you know, like I think even amongst Commonwealth Edison's superintendents as to how the STA program ought to work, but yet there is a corporate approach so that is what they do.

Let me take about two more minutes and explain to you our approach for having the STAs rotate on shift.

We have not taken the conventional five or six people and that's their job. We have taken the approach that we are going to designate about 15 or 10 of the qualified STAs, and they would rotate on a 24-hour basis which means they come around about every two weeks.

We feel that there are some distinct advantages in this approach, and I have enumerated that in that little blue book. We have had discussions with the Staff in regard, and

I believe in am correct in saying that there is a favorable finding in their safety evaluation report in this regard, so at least there is some meeting of the minds.

So I just wanted to mention that. The chart you see before you now, I do not know if I have answered your question --

CHAIRMAN BENDER: Well, at least you have taken a shot at it.

MR. SCHOTT: I better not say this, but Harlen reminded me, "You could counter your remark before about saying I am the guy who shot JR." That's terrible.

CHAIRMAN BENDER: I apologize.

MR. SCHOTT: This is a little further breakdown of the technical support division as to how we intend to do business, and it is divided into several lead groups: Computer engineering, reactor engineering, system engineering, scheduling and so forth, and you can read that for yourselves. Unless you have any further questions on the technical group, I will move ahead.

CHAIRMAN BENDER: That is fine. Let's go ahead.

MR. SCHOTT: The next slide is the operational organization headed again by a superintendent who reports to myself.

We have just recently made a change that we have not yet implemented, and that takes place at this one step above the

management line here.

Prior to just a few months ago, we were going to implement the two senior reactor operators per shift by using one shift supervisor and then the second senior operator would have been part of the manual or union group.

We decided to go to a two-management per shift concept. We would use a shift supervisor and instead of calling it a shift foreman, I think maybe we will call it an assistant shift supervisor or to get away from the term man.

So this is how we are meeting the two SRO per shift requirement, both management positions.

We have recently made another change that reporting directly to the superintendent is an operations supervisor, senior reactor qualified. He is straight-day run.

His office is adjacent to the control room, and all shift supervisors report to him. This is the man who is going to be responsible for the normal day-to-day operations, and he relieves the shift supervisor of some of his administrative responsibilities.

We have implemented and staffed what we call an operations staff assistant. Again, both of these men are old shift supervisors.

The man has a two-year mechanical engineering degree in -- I forget what they call those two-year degrees -- some kind of a mechanical technology or something like that.

Then we have engineering assistants over there who are the designated alternates to the operations superintendent.

The operations superintendent is a six-year navy man, engineering officer qualified as is the engineering assistant. Both gentlemen have their senior certification.

So on the operating staff as a minimum, we have 6, 12, 13, 14, 15, 16 management persons who have operator licenses.

As far as the manual group, the two ROs per shift will be met by having two reactor operators, as we call them, per shift, and then we are calling for 24 plant operators non-licensed between three and four per shift depending on our attrition rate.

You might note that the minimum technical requirements are 6 per shift.

In a subsequent slide, you will see the radiation chemistry group. Two of those technicians will also be on shift at all times so it is --

CHAIRMAN BENDER: Does radiation chemistry include water chemistry?

MR. SCHOTT: Yes.

DR. CARBON: What commerical nuclear power experience other than Zimmer does the operations supervisor have?

MR. SCHOTT: This gentleman?

DR. CARBON: No.

MR. SCHOTT: This gentleman?

DR. CARBON: Yes.

MR. SCHOTT: He is at this point in time, he participated in the Hatch Unit II start-up, not as part of their staff, but he was there. He has participated in several visits to Millstone, a trip to Monticello, and I guess if you just want to add that up, you are not going to come up with a very large number, but we figure about four months of actual BWR exposure.

DR. CARBON: Shift supervisors, how much commercial nuclear power plant experience do they have other than Zimmer?

MR. SCHOTT: We have had quite a dialogue with the staff in this regard. When an attempt was made back in the middle to late 1980s, we embarked on an operational experience program where we attempted to get our shifts supervisors and some of our key control operators, we called them at that time, actual BWR experience.

And we set down a schedule where shift supervisors and one of their control operators would go to Monticello, and we programmed on a two-week basis attempting to try to get, again, a balance between keeping them out of town for a long period of time or getting them back home against with their families, but also keying in in trying to dovetail that with start-up and refuelings which are sometimes predictable and

sometimes are not.

So on the average, our shift supervisors have about 12 to 16 weeks of experience, and selected operators have an average of 8 to 10 weeks of actual BWR experience.

At that point in time when we presented the program to the Staff, there was a disagreement as to what was meant by meaningful experience and so we agreed them to supplement during start-up by bringing on personnel from an outside organization who had boiling water plant start-up experience who would actually -- I don't like to us the term babysit, but I can't think of another word -- they would be available for guidance and counsel during the start-up phase until our senior people on each shift had accumulated six months experience or until we went commercial, whichever was sooner.

DR. CARBON: Those people would be advisors to the shift supervisors?

MR. SCHOTT: Yes, sir.

DR. CARBON: Will you have experienced advisors to the operations supervisor or to the superintendent or to yourself?

MR. SCHOTT: We have not planned on doing that.

DR. CARBON: I would like to address a question to Mr. Sylvia.

From conversations I have had with experienced plant managers and other people of that general level at

commercial plants, the impression I get from them is that people really are not fully qualified to operate plants.

Maybe they have been through one refueling or some such thing where they have really held the responsibility for operations, not where they have simply been there as an observer, but rather where they have carried the ball.

Do you feel comfortable with a lack of commercial power plant experience under you?

To me, I think the company has done a fine thing to bring someone like yourself in with your nuclear, your commerical nuclear experience. That to me is very good, but it seems to me that the heart of the safety of the plant is the people under you and in their experience, and the experience is not there.

To me, that looks like a serious weakness.

MR. SYLVIA: There is a tremendous amount of navy experience in this group, including the superintendent of operations.

DR. CARBON: I look at the superintendent of operations, and I see no particular nuclear experience; certainly no commercial nuclear experience.

MR. SYLVIA: He is navy.

DR. CARBON: There really is not that much navy that I see. The point I get at and I ask again: Do you view this as a weakness?

MR. SYLVIA: Well we started up one and two with navy experience, and I was pretty impressed with the people.

DR. CARBON: But there is not navy experience here.

MR. SYLVIA: Maybe we have not done a very good job of relaying to you how much experience is there. The experience is there.

DR. CARBON: I can read Mr. Schott's resume. I am not certainly criticizing Mr. Schott.

I am talking about experience, not competence and so on. There is not commercial nuclear power plant experience there. There just is not.

Mr. Link does not have commercial nuclear power plant experience.

MR. SYLVIA: Just the navy and the training that we have described.

DR. CARBON: Even in the nuclear navy, there is not really all that much.

MR. SCHOTT: He was a qualified EEOW.

DR. CARBON: It says under Mr. Link he has U.S. Navy Nuclear School six months.

MR. SCHOTT: That is --

DR. CARBON: Prototype nine months. That is about it.

MR. SCHOTT: Then he was -- I am not sure. It should be there, but he was actually on several patrols.

DR. CARBON: Under the experience, he has been at

Zimmer five years. He was in your downtown office for a year.

He observed the task for three months. I am sorry, here it is. U. S. Navy Engineering Office with watch two years.

There is experience there back in 1970, but to me, that's an awful minimal amount.

CHAIRMAN BENDER: Well, my own reaction is to say that you are not unlike others we have talked to.

DR. CARBON: Excuse me. It may be. I think that there is less commercial experience here than in most plants that I personally have encountered.

CHAIRMAN BENDER: I would not know that I would argue one way or the other. I have seen some comparable, and I think what we need to address is the matter of, given limited experience, how does the Regulatory Staff intend to be sure that the plant can be started up and operated?

I think that they are going to talk about it. I think haranguing him with the fact that they have so little, as we think it is, is not going to help us very much.

DR. CARBON: If it sounded like a harangueing, I apologize.

MR. SYLVIA: Two years is how long Bob Link had that particular job. He had four years -- what is the total number of --

MR. SCHOTT: Whether these numbers mean anything to you or not, in the total group, which includes plant operators

all the way up to and including everything, there is 170 years of navy experience.

DR. CARBON: It is the people like yourself and Mr. Link that I am not concerned about.

Will Mr. Peltier be addressing this question later?

MR. PELTIER: I won't, but Mr. Rivenbark will.

DR. CARBON: If you are going to address it later, I will drop it at the moment.

MR. RIVENBARK: I will address it at your request later or now.

CHAIRMAN BENDER: Let's leave it like this: We are going to hear from you.

At that time we would like to hear some commentary on how you view the adequacy of the capability of this organization of terms of experience, training and support.

We all have our views about what is needed. I think we are spending too much time worrying about whether Mr.Link has any training or not.

Mr. Carbon's point, one I share incidently, is in the upper management, there is a limited amount of experience.

It is not unique to CG&E. It is just that we would like to see more. I am sure you would like to see more.

But given that it is what it is, what we need to find out is: Is it enough? Does it need to be supplemented?

Does the training program provide adequate kinds of

skill development to take care of the need over the short period and the long period?

And if it is not enough, what could be done about it? That is kind of what we are asking right now.

We are not trying to make a judgement this afternoon. I do not care what we might say about one individual or another.

I think we are more just trying to test out some things, and I think we would like to hear the rest of your story, Mr. Schott.

MR. SCHOTT: If we adequately touch on training to your satisfaction as far as numbers of people, licenses held or to be held or that kind of thing --

CHAIRMAN BENDER: Let me make an observation about this business because I have been listening and not doing much talking, and Dr. Carbon has been nice enough to be the prober, but some how or other what I have heard, it has got a lot of good buzzwords in it, but it does not seem to have the kind of integration you would like to hear.

It is not because you have not thought about it. It is just that maybe this is the first time we have heard it from you.

I think a little bit more thought to how the whole thing goes together might help us to understand what it is.

We may have heard too much. In a way, that is what I

am judging right now.

MR. SYLVIA: I don't understand you.

MR. SCHOTT: I do not really follow you, sir.

CHAIRMAN BENDER: Well, there are so many diverse kinds of activity here that are put into various places that I have some trouble seeing how the organization gets integrated, and the only integration I see right now that seems to be well structured in the description of a few procedures, which some of your organization will agree to, and I see a lot of diverse activities that have to interact with each other and right now I am not sure that I see that the interaction has order to it, that there is all that much thought given to how the lines of responsibility will be drawn.

In fact, who are the button-pushers? Who are the decision makers? And how and when do the decisions get made?

I think you need to give some more thought to it. If I can use my listening apparatus as a way of saying that it did not come across to me, it may just be my fault, not yours.

MR. SCHOTT: I am not sure I am still grasping what you are driving at, but I am prepared to try to go into as much depth to wherever your probing might lead.

MR. BORGMANN: Are you talking about the nuclear operations in total, or are you talking about Mr. Schott's area in particular?

CHAIRMAN BENDER: I am talking about in total.

MR. BORGMANN: So that is beyond what the scope Jim is saying.

CHAIRMAN BENDER: Every department seems to have something that it needs to do. I do not find a lot of trouble with having Mr. Schott and Mr. Link and two operations supervisors there and two assistants.

You can organize it anyway you want to. The functional responsibilities of that group as opposed to the other groups and how they fit together to me needs to be developed a little better.

In order to --

MR. SYLVIA: We will have detailed procedures that will outline the interface on every activity to be performed in order to meet our commitments and operate and maintain decisions.

CHAIRMAN BENDER: I believe that you will. I am just saying that the way I hear it right now, it still seems fuzzy to me.

MR. SCHOTT: I do not know if this helps or not. The plant andministrative program is there. It is developed.

It has been developed and in place for almost four years, four years now and, of course, we have been rebuilding and revising as we go that discuss and describe and require in great detail as to how the plant fits together, who is responsible for what, and just in terms again of volume of

procedures, you know, we have probably got 2,500 procedures, which is ridiculous, but, of course, you subtract the enunciators out, you cut it in half, but the plant administrative manual is in place and we have been working with it for several years now so I don't know if that helps you as far as the plant is concerned.

Those are developed, approved, signed, sealed and taken advantage of.

CHAIRMAN BENDER: Well, I have probably said more than I should. Maybe what I said may have been misinterpreted by you.

All I am saying is I feel like more thought -- you thought a lot about it. I think it is necessary to see a little bit more how those groups relate to each other.

MR. SYLVIA: You mean the groups under Mr. Schott?

CHAIRMAN BENDER: In both cases. I think there is a lot of organizational structure shown there and a lot of organizational structure shown in the rest of the operation, so much so that you wonder, well, an awful lot of chiefs in this operation.

How does the order of a Congressman get laid out? I think you could give some thought to it, but that's an observation.

It is not intended to be something --

MR. SYLVIA: Incohesive observation to me, almost

identical to 0751 which is the best guidance. We have also used the PAB directives and IMPO directives.

The administrative program we have established to tie all the departments together to perform each activity.

CHAIRMAN BENDER: I have said enough, I suspect.

MR. SCHOTT: Would you want to see the rest of the station organization?

CHAIRMAN BENDER: I think you should show it to us, yes.

MR. SCHOTT: The next one is the maintenance group, maintenance division, and here we have integrated the functions of instrumentation control, mechanical and electrical maintenance under one superintendent, and you can see for yourself how the organizational structure is laid out.

In this particular area, again, if you add the numbers up, they probably do not impress you too much, but we have sent three foreman and two senior technicians to a refueling outage at Monticello plant, and several more men have also participated during a hatch refueling outage in order to try to accumulate some actual boiling water experience during plant outages.

The same thing is true of the instrumentation group. We have sent the two foremen and several technicians to a Monticello refueling outage for them to get actual hands-on experience during the refueling outage.

MR. EBERSOLE: Is the maintenance engineering combined mechanical/electrical?

MR. SCHOTT: Yes, sir. This man is combined mechanical/electrical. This is strictly instrumentation and control. Any other questions?

Then we can show the next slide which is our radiation/chemistry group. This group is headed up again in the same general arrangement.

The superintendent has the combined function of chemistry, radiochemistry, heat physics and radioactive waves treatment.

He has working for him appropriate qualified engineers, what we call a radiation protection engineering specialist who is basically or primarily involved with the Alara program, respiratory protection and exposure records.

This gentleman has a 20-year navy background, over 10 of which has been in radiological health and safety.

The station chemist is a navy ELT with a chemical engineering -- not a chemical -- a chemical degree.

The health physics engineer is a former employee of a pressurized water reactor who then obtained his engineering degree and came to work for us.

The rad/chem foremen have approximately in the total group 42 years of applicable chemistry, radiochemistry and health physics experience in the management area.

CHAIRMAN BENDER: If you were about to embark on your periodic in-service inspection program, what would the radiation protection specialist be expected to do in connection with that kind of an activity?

MR. SCHOTT: Would you mind saying that one more time?

CHAIRMAN BENDER: If you were about to embark on your periodic in-service inspection route, what would be the duty of the radiation protection specialist in connection with that kind of an activity?

MR. SCHOTT: Several of his basic responsibilities would be to review the task, first of all, that had to be accomplished for that ISI program, what the expected radiation doses were, and then, of course, before you get in there, they would take an actual physical measurements and you sit with the -- in this case -- our maintenance engineer who would be responsible for the removal and gaining access to the equipment that was to be inspected such as welds, and make sure that appropriate measures have been taken to keep doses as low as reasonably achieveable.

In addition, he would be working intimately with the contractors prime contact in order to assure that their functions were accomplished in this same manner.

He would also be responsible for assuring that appropriate health physics or radiation protection coverage was occuring and had been planned for and that all exposure

records were properly accounted for, both prior to, during and after the ISI program.

CHAIRMAN BENDER: How would Mr. Link and Mr. Erickson fit in that effort?

MR. SCHOTT: Mr. Erickson is the prime man who is responsible for the radiation and protection engineering -- radiation protection specialist activities. He would be an overseer to make sure that that program was being properly implemented.

Mr. Link's involvement would be strictly from the standpoint of are there sufficient safety systems that have not been disabled such as that we can maintain appropriate shutdown cooling and have not compromised the reactor in any way and are meeting our minimum requirements.

Erickson, Link and maintenance would be involved with myself in daily meetings prior to the day's activities where problems from the previous day and anticipated problems from the day to come would be discussed.

CHAIRMAN BENDER: Well, of course, with one plant, you have got the prerogative to do that.

MR. SCHOTT: That's correct.

CHAIRMAN BENDER: That is something I have not given enough thought to myself. Everybody is, in this particular case, is Zimmer and nothing else.

MR. SCHOTT: That's correct. A one-unit plant does

make a tremendous difference.

CHAIRMAN BENDER: Well, Max, do you have other questions?

DR. CARBON: No.

MR. EBERSOLE: No.

MR. SCHOTT: The last slide I will discuss briefly for the sake of time. That is the administrative group. We have combined the functions of administrative operation, document control, clerical, safety, security, and payroll under this individual. It is a rather large department.

We have endeavored to delegate duties of a clerical nature and provide clerical support to the various divisions such that activities of this type are delegated to person who are trained to do this kind of thing and get the paperwork nightmare off of the superintendents and the engineers such that they can devote their attention to status of the plant. That's our basic idea here.

CHAIRMAN BENDER: Couple of questions about specialty skills. Do you have a metallurgist on the staff?

MR. SCHOTT: I do not have a metallurgist. I think Mr. Sager is looking for or has one.

MR. SAGER: I have one.

MR. SCHOTT: He has one, and we had intended to share the expertise.

CHAIRMAN BENDER: What other skills have you

envisioned that you need? Do you have heat transfer people?

MR. SCHOTT: Mr. Chitkara has transfer people. We have several persons on our staff who have that capability, and I am not sure about Herb Brinkman's group, but those kinds of capabilities do exist in the total corporate structure, and we do work together.

CHAIRMAN BENDER: I assume the knowledge of rotating machinery rests in the maintenance department?

MR. SCHOTT: That is correct, sir, as well as the ISI have nuclear pumps and valves which is overseen by a number of our staff but is actually implemented by the maintenance group.

We have a broad cross section of educational degrees as far as -- we do have a lot of people who are going to school in the maintenance area, INC area, going for those two-year technical degrees for which the company underwrites 75 percent of their tuition, and I might point out that in the radiation chemistry group, almost without exception, everyone of those technicians, the hands on type people, have a two year degree in either chemistry or physics or something of that type, and in our instrumentation group, we require them to have at least one year of post high school in electronics or electricity, and most of them have two-year degrees.

So there are specialty areas there. That basically concludes my prepared remarks.

CHAIRMAN BENDER: I think we have scheduled a break. We might as well have one. Let's take ten minutes.

(THEREUPON, a short recess was taken.)

CHAIRMAN BENDER: Mr. Rivenbark, you are on the agenda next to tell us a little bit about how your organization is structured.

MR. RIVENBARK: Thank you. My name is George Rivenbark. I was the licensee qualification branch reviewer for the Zimmer management in the organization structure.

We prepared our, well, first off, we visited the Zimmer plant about 11 months ago at which time they presented to us the organization pretty much as you have seen it today.

I notice today that they have increased the number of people involved in some of the areas over that that they had discussed with us at the time we were there.

We discussed with them the generalities of their organization.

Then we interviewed in the neighborhood of 10 or 11 or 12 or 13 people over a three-day period.

We discussed with them their means of communication, their interfaces back and forth amongst the organization. We came away -- we also discussed with each individual the training processes, how they were trained or how they trained their people.

We discussed these things with Mr. Borgmann, the other

corporate managers, plant superintendent, the plant managers who were present.

That was most of them. An STA, couple of SROs, RO instrument technician, rad/chem technician to get a good cross section, get their impressions of how the plant was supposed to be run, who they got their orders from, how they communicated with people and also to ask them about feedback of information.

Based on our review of the information submitted by the applicant later and our interviews up there, we found that, as we stated in the SER, which was written in the month of May, that the management structure and technical resources provided for operation and support of the Zimmer station meet the requirements of TMI action that we were addressing at the time.

Now, the way that we reviewed Zimmer was through the TMI action items, and one of the action items had to do with the organizational structure, and so we actually did pretty much of a repeat of what would normally have been done or was done at the construction permit stage, not 100 percent identical, with some of the added requirements that came about through TMI.

Based on that review, we found that the management structure and the technical resources provided for operation and support of the Zimmer station met our requirements and were acceptable.

This is stated in the SER. I have no reason today to think that they are any less capable than they were when we reviewed the plant.

As a matter of fact, they have added to their organization and improved it since we did complete our review.

With respect to the question of the operating experience, at the time that we reviewed the Zimmer plant, I guess I saw some navy experience in the operating organization at the management level, and I felt that where they were lacking was at the operator level and that by adding the advisor on each shift that that would be sufficient.

I do not have any reason today to believe that our findings should be changed, and so I find that, based on our previous review, that the previous review was adequate.

DR. CARBON: Mr. Rivenbark, it is my impression or believe that in the early days when were were first starting up plants and people, of course, had lack of experience in operating a plant, that the AEC, I guess it was at that time, perhaps was requiring each organization bring on two its staff on a temporary basis advisors who would have had experience in maybe a production plant or some such thing, but much more reliance on advisors to help out in starting up new plants.

Is that so? Has that changed?

MR. RIVENBARK: Well, I really can't go back all of this time to all of those old plants that you are talking about

so I can't personally respond to your question.

I assume that's a rhetorical question.

DR. CARBON: Well, it was a real question.

MR. RIVENBARK: I can't answer it, Dr. Carbon.

MR. EBERSOLE: I have been trying to absorb the meaning of the term "experience" here and I was just telling my colleague that experience is hard to define itself.

If it is year of placid, no event type of experience, it doesn't mean much, but a month or two of TMI type experience is experience.

So before one says experience, you better qualify what you are talking about.

I look on all these people in somewhat this context, and you can tell me where I am wrong: Presuming you have got a well defined plant ready to operate, I look on it as your responsibility to walk into it and do not align it properly or maladjust it so it refuses to obey its intended purpose.

It is well automated if it is a standard BWR.

So I hope that steam valves, the missetting of controls, and so forth but what bothers me: If I can assume that you do all these other things right, if I assume the plant responsibility gets into some sort of trouble, I will take an example: I have a failure on the high side of the ways and the B division, does the operator know what has happened when he sees the symptoms of this?

Can he properly respond to events which I hope have been specified for him to respond?

Do you, as management, go down and probe once in a while and say, Joe, I just had such a failure, what do you do? Or pick another one: Do you make spot investigations if it arises to the occasion, what the occasion might be, that you want to put to him, or do you let him run his business the way he wants to run it?

Does high management go down and poke into the inners of operation and see what is there and, if not, why not?

MR. BORGMANN: If you are addressing it to me, Mr. Ebersole, to date I have not done that.

But certainly as this plant gets into operation, it would be my intention to be seen up there and ask some questions.

I am sure that is the objective of Mr. Sylvia.

MR. SYLVIA: I have an office at Zimmer, and I plan to spend 50 percent of my time at the station and a large part of that time will hopefully be in the lant.

MR. EBERSOLE: You will then walk into the control room and say: This is x,y,z, and how do you fellows handle it?

MR. SYLVIA: I won't tell them I am simulating that.

MR. EBERSOLE: I think it would be well worth your while.

CHAIRMAN BENDER: Mr. Ebersole suggests one way of

doing things, and some people would favor it. In trying to sort out what is here, I think I made an observation earlier that I find so far that the stories that I have heard have all the elements in it, but it still seemed a little diffuse.

I think the kind of thing that Mr. Ebersole has just pointed out is more a matter of deciding, well, what should our training program consist of, and does CG&E have a view?

Training arrangement and skill requirements independent of what it reads in the few rules that have been provided by NRC and IMPO.

I don't want to argue about the value of considering those, but the management itself needs to have some considered capability that it sees as important to the success of this business, and depending solely on the advice of the regulatory organization does not necessarily get the job done.

You build your organization based on the people you could get. They have a diversity of skills. Some strong in one place and weak in others, and that's true of all organizations and most people try to take into account their weaknesses and strengths and put their organization in place by saying: Here is what I know I can do, and here are the things where I am weak and I have got to shore myself up in some way, either by having outside help or by building skill that does not exist right now.

I think this organization could benefit from some of

that kind of thought. Just a little introspective evaluation of what the real skills are.

And I am not setting this out here as a basis for deciding whether you should have an operating license or not.

I would say that is a judgement the Staff will make, and that I won't make, but I think if that kind of thing were done, it would be easier to see that as a management organization you have judged your capabilities.

There has been a lot of pressure put on you to get capabilities in one place and another. There is not all that much available that you can get everything that people ask you to get.

It does not all show up at one time. The training helps and the development of skills just because some people just have an inate capability to build their strengths is something you have going for you.

All I would say right now is that I feel a lot more comfortable with this organization now than I did when I saw it a few years ago.

It is a lot nearer to being an organization than it was. It probably has enough capability to run a plant. I am not doubtful of that, but I think if you did this kind of evaulation of how good you really think you are in certain places, that you would know better where you need to shore up your capabilities.

You cannot train everybody to do everything. I am not overwhelmed by the idea that everybody gets operator training and an operating license.

Some people will never have use for it. On the other hand, some of that training does not give people the right kind of insite. Some effort to work on the accident analysis side of things, to put people through the kinds of exercises that occurred at Browns Ferry would tell people more about what the problems are BWRs than maybe learning where the buttons are.

That is a purely philosophical kind of observation. I think if a little of that kind of thought were given to the way you are going to do business, some of us would come away with more comfort.

It is more re-assuring to me for an organization to say, here is where I think I am strong and here is where I think I need help, and it is to say I have not everything.

And I am still listening with the understanding that you think you have got everything because you complied with some requirements that have been laid down for you.

An organization that is just getting started is not going to be that good. That's the end of my lecture.

MR. SYLVIA: Can we respond to the accident analysis type of training?

CHAIRMAN BENDER: I would be glad to have you respond

to any part of the discussion.

MR. SYLVIA: We have given that some thought, and we have developed a group to model the plant, model the systems, and do some accident analysis training and studying.

Tell him about that and how we plan to use that for operational analysis and ERA and so forth.

MR. CHITKARA: We are trying to develop within the nuclear services department the nuclear systems and the liability analysis division with a capability to be able to model the operation of the transients that are identified in Chapter 15.

So far the progress has been in terms of getting the computer modeled from EPI. It is called retrain package, and it looks at different interactions.

The model has been put on the computer at the company, and we are in the process of developing the input for the radius plant parameters, and we will have the model operation in another two or three months.

We would also use that as a training tool for some of the technical engineers and eventually some of that training would also become part of the training division.

Within the training division, as Mr. Sylvia pointed out, we have the director of training division and then we have under that three supervisors.

One supervisor would be the supervisor of the

technical staff training which would be training of all technical staff within the nuclear production department and also the engineers within the three remaining departments.

And we are taking a broader look at what else could be done in terms of enhancing that training.

CHAIRMAN BENDER: Dr. Carbon had something.

DR. CARBON: Mr. Borgmann, a question of you, if I may. It seems to me that one of the most important aspects of safety in a nuclear plant is the attitude and the appreciation of what one has of people at your level in the organization.

Do people at your level within the context of EPRE or AIF or some other organization, do you frequently have exchanges of information and experience and so on such as to gain an appreciation of problems and things like that?

MR. BORGMANN: I think the interchange is pretty good.

DR. CARBON: At your level?

MR. BORGMANN: Yes, I think I am pretty well aware of what is going on in the industry through the information that is put out by EEI, EPRE and AIF and by the various functions and also this IMPO thing they have been having every year for the CEOs and the key representatives to IMPO where they exchange a lot of information, and I think the message has gotten across.

I mean, I very much appreciate, you know, the need for

expertise, and I think that we are pretty well tuned into what is going on.

But I think we all realize that there is a limitation, I guess, to the talent that is out there, and you have to get what you can and train what you can.

And I, for one, inspite of what Chairman Bender said, do not believe that we are satisfied that we have got everything. That is somewhat of a mischaracterization.

I think everybody tends to put their best foot forward, but I do not think we are satisfied that we got all the expertise as required in all areas.

But I think that we have come forward a long way in the last six months and since Ralph has been on board, and I think we are headed in the right direction.

I can assure you that either Ralph or myself are tuned in to all these groups. I am not saying we know everything that is going on, but I feel that we are pretty well informed, and I think all the way up to Mr. Dickhoner's level.

I think in the nuclear industry today, with what is at stake financially in a nuclear plant, that everybody in top management, even the company officers who are not involved in the Zimmer project, are asking questions and even people in the financial end get interfacing information with other utilities because of what it means to the utility.

So we would be very foolish if we would not do everything we can to get the proper expertise, and I do not what to imply that we are satisfied where we are.

I think this is a status report, and I think it is a milestone on the road to where we want to get.

As Bill Dickhoner said this morning, we are going to get there. I certainly intend to keep in touch with industry, and I think within reason, we pretty well know what is going on.

CHAIRMAN BENDER: Any further thoughts?

MR. KEPPLER: I would like to make a number of comments, if I could please. They may be a little bit disjointed, but I will try to weave them together.

During the last year or longer, most of our attention has been placed on the construction of this facility, the adequacy of construction, and we recognize that there has to be a considerable effort placed by Region 3 on the operational readiness of the facility before it gets an operating license.

I would be less than candid to tell you that I don't have a number of concerns about CG&E getting a license.

That does not mean that they are insurmountable. Over the last several years, I have had opportunities to watch new utilities in the business, and my experience is that it seems as though while you can talk about the problems that are going to be encountered in the nuclear business, either in

construction or in operation, it often takes a very critical mishap of some sort or event or another to really gain the attention of a utility.

Whether this construction quality assurance concern has done that at CG&E remains to be seen.

I said this morning I have guarded optimism, and I think that is a fair statement.

I would like to think that the attention of management is present right now at Zimmer, and we intend to see that it stays there.

Back before Three-Mile Island, it used to be an accepted practice, perhaps not wisely, to recognize that new utilities were going to go through a learning curve in the business, a learning curve perhaps while they were operating the reactor.

Davis-Besse was a good example in Region 3. That utility probably had less insite than Cincinnati Gas & Electric Company did prior to its construction problems, and it went through two years of low availability in capacity runs, constant outages, valving mistakes, surveillances not done properly, and, in general, the type of operation that I do not think any of us would be too happy with today.

I think it is the view of the regulatory staff throughout that this kind of learning curve cannot be tolerated today with an operating reactor.

So we have to convince ourselves that CG&E is prepared to run this plant at the time it gets a license, prepared to run this plant safely and in compliance with the regulations, not going through valving errors, not going through mis-surveillances, not going through operator mistakes.

I have no basis to agree or disagree with Mr. Rivenbark's comments.

We look to the NRC to establish the staffing qualifiecations for utilities, but I am very sensitive personally and our Region is sensitive to the fact that Zimmer has to be prepared to operate.

If we have a differing view based on what we observed through the pre-operational program, to the pre-operational procedures, through just seeing how the organization functions together over the next year, I will assure you that I will be in touch with Mr. Denton to express that concern and to see that the staff is augmented if that is what it takes.

I am well aware also that we are bringing forth some new projects to the ACRS Committee now, Clinton, Calloway, other new utilities in the business, and the ACRS Committee has given us strong feedback and comments on the need to augment staffing during the start-up phase, and I think we will take that into consideration here.

We will weigh that need here. I just really can't give you a warm feeling at this time on the operational

readiness of it, but I think that -- I guess I like to think that we will get there.

CHAIRMAN BENDER: We do not have to make that judgement. The regulatory staff collectively does.

MR. KEPPLER: That's right.

CHAIRMAN BENDER: Our purpose is to review and I am not at the moment -- I don't know whether the Committee wants to have any further comments on this particular plant.

Maybe the Subcommittee ought to think a little about whether it needs to have the full Committee here on more of this. Jessie, do you have any thoughts about it?

MR. EBERSOLE: Just a couple things. I will just take as an example: I wonder if management participated in a couple of the decisions. They are not small. We mentioned earlier about the independent shutdown service.

This is remote from the control room. I assure you it is worth a lot in protection to your capital investment and to the safety of the public because these plants can go down from common industrial accidents like fires.

I rather doubt that you participated in the original decision to put that in as you may not know. I don't know. NRC does not in fact require that.

Evidently Sargent & Lundy looking after you interests put it in there. I do not know whether you actively participated and requested it or specified the character of that

design or not.

Going back to another matter, going back to the early BWRs, there was a minimum of active electrical apparatus, and the old original power plants put in with the doughnut Mark I containment.

Since that date, there has been regression. More and more sensitive apparatus has been poured into the containment by GE and making them further and further subject from this evil problem of environmental qualifications.

I do not know now, and I wonder if management knows, to what extent you have depended upon environmental qualification which is now resting on a research program within in NRC and elsewhere which says that we can hopefully qualify this apparatus.

Do you participate in decisions that determine whether you have to get involved in that or not because it is to your advantage to have a little risk in that area as possible.

Those are just two problem areas which I am a little curious about. Sometime you might tell us about how or whether managmeent gets involved in such considerations.

MR. BORGMANN: I certainly was involved in the first one because at that point in time it was discussed with the NRC Staff, and I did not participate in the design, but I participated in the decision to go ahead with it and was also well aware of what was included in the design.

On the second one, of course, I am aware of the problems, and I will admit that anybody that bought the nuclear steam supply basically bought what was there, and I think it goes back to what I said before: I think we are learning all the time that you have to go and find it out for yourself.

We are basically trying to direct the environmental qualification program ourself. We are trying to be fully involved. I, for one, am not involved in all the testing.

I know what is going on, and I am well aware of that, but I am not aware of every test or every device, how it is being tested, but I am aware of the program in general.

MR. EBERSOLE: It is worthwhile in knowing what functional dependence you have on environmental defenses for apparatus, whether you really agree with having subjected yourself to environmental qualification of needs.

Sometimes you can do it by simply moving equipment around. You can get out of the problem.

MR. BORGMANN: I think we are looking at that option in certain cases, trying to do some redesign.

CHAIRMAN BENDER: Max, do you have any feeling about whether we should ask the full Committee to hear this?

DR. CARBON: At this moment, I sort of lean toward not asking the full Committee.

CHAIRMAN BENDER: How about you, Jessie?

MR. EBERSOLE: I think we could stand another period

without going to full Committee yet.

CHAIRMAN BENDER: I think it is maybe different. The question is whether we need to have the full Committee here this period.

My own inclination is to say that the Staff certainly has a good handle on the quality assurance problems at this stage of the game, and I feel that it is not necessary for the ACRS to dabble in it.

I am inclined to say we certainly will just want to be kept informed about what is going on.

With regard to the operational staffing, I personally am fairly comfortable with where you are today, and I think with the proper kind of urging in certain places, whatever concerns I might have about my understanding of the organization, they will be sorted out.

I don't have to know about them. I just need to be aware of them.

I think Mr. Riverbark, just because you are conscious sometimes of what the NRC says about things, I will repeat the point that I tried to make about the organization here.

When we get an evaluation of the capabilities of an organization, I think we like to know what you think the strengths and weaknesses of the organization are.

It is very unrewarding to have somebody say that we

have a warm feeling about your organization because there is no organization that does not have some weaknesses and some strengths.

When you evaluate the organization, I think you have to say, here is what is good about it, here is what is bad about it, and on balance we think it is good enough, if it is, or it would be good enough with certain improvements.

If the staff review said something like that, not only would the ACRS understand it better, but so would the Applicants.

Hopefully when I get out there to chat with your guys, I can get that message across a bit better.

Would Mr. Borgmann, do you have any other things that you would like to add to the discussion?

MR. BORGMANN: No, I do not think so. I think you have heard our comments.

We appreciate the time. Maybe Dr. Carbon has something else to say.

CHAIRMAN BENDER: I was going to get to him.

MR. BORGMANN: I can only assure you, again, that along the lines that Jim Keppler is saying, maybe it did take the effort that we embarked the QA program to really get the involvement of management on this scale.

I can assure you that it is going to continue, and we are going to get to the level that we all want to get to.

So I can tell you that is going to be our goal.

DR. CARBON: I simply wanted to follow your comment, Mike, and say that I personally do not have concerns either today regarding operations, but I am concerned about what I consider minimal amount of commercial nuclear power experience at the operating level, and I would like very much to stay some how or another in touch with Mr. Keppler or Mr. Riverbark to keep up to date on any changes that might be made or any such thing.

MR. KEPPLER: I will be glad to keep the Subcommittee informed.

CHAIRMAN BENDER: If there are no other comments from any source, we are about 11 minutes ahead of schedule, but that is all right.

You can use that time to get your plant in operation 11 minutes earlier.

Thank you very much for coming to our meeting, and it has been very informative.

I want to express my appreciation to the Staff and especially Jim Keppler for coming down and spending a day with me.

(HEARING ADJOURNED AT 4:25 P.M.)

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

ACRS Subcommittee

in the matter of: Zimmer Nuclear Power Station

Date of Proceeding: Feb. 18, 1982

Docket Number: NRC/501/Lot I

Place of Proceeding: Cincinnati, Ohio

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Patty L. Artrip, RPR

Official Reporter (Typed)

Patty L. Artrip

Official Reporter (Signature)

CINCINNATI ALLIANCE FOR RESPONSIBLE ENERGY

2699 Clifton Avenue
Cincinnati, Ohio 45220
(513) 861-3533

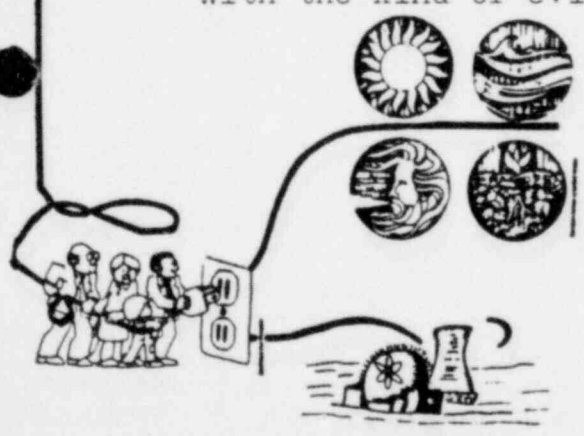
Advisory Committee on Reactor Safeguards
February 18

My name is Tom Carpenter, and I am Chairman of the Cincinnati based Cincinnati Alliance for Responsible Energy. I am addressing this committee today to share with you concerns of our organization in the matter of the Zimmer nuclear station.

Our organization has been the channel for literally dozens of dissatisfied Zimmer workers who have found no redress of their greivances through either the utility or the Nuclear Regulatory Commission. In the past we have sponsored several Zimmer workers in the licensing hearings at great personal expense to ourselves, and expense to these brave people who, having witnessed major problems at the Zimmer station, took the painful step of coming forward and exposing Zimmer's problems. More recently, we have helped utility-hired detective Tom Applegate hook up with the Washington based Government Accountability Project. I would like to take a minute or so of your time to dwell on this particular individual, Tom Applegate, and the experiences we have gone through with him.'

Briefly, Tom Applegate was hired by the Cincinnati Gas & Electric company in December of 1979 to uncover any wrongdoing on the part of anyone at the Zimmer nuclear station. Finding perhaps more than the company had bargained for, Applegate was released after four weeks. He kept a copy of everything he found in his investigation, which was later narrowed down to 28 separate allegations, some having to do with safety, other allegations crime-related. With this evidence he contacted the NRC.

With the kind of evidence that Mr. Applegate had, which included tape recordings, witnesses, documents and physical material, one would think that the NRC would have conducted a full blown investigation immediately. That was not the case. The NRC sent out Investigator Gerald Philips, who conducted a shallow and brief probe which



(continued)

covered only three of the 28 allegations. It was at this point that Mr. Applegate, frustrated with the NRC, came to our organization, a vocal and well-known critic of Zimmer.

It was only after the Government Accountability Project started their own investigation into Applegate's allegations, finding them substantive, and petitioning the Merit Systems Board, that the NRC was persuaded to re-investigate Zimmer and the Phillip's inspection. The preliminary findings of the investigation team released in November, '81, revealed massive years long alteration of quality assurance documents, harassment and intimidation of quality control inspectors and a lack of an effective quality assurance program.

The point I'm trying to make here is that the NRC, in its complacency, was compelled to do their job only after extensive pressure from a variety of sources...an honest and frustrated private detective, an ill-funded volunteer safe energy organization and a Washington-based whistle-blower assistance agency that had enough vision to recognize that something fishy was happening at Zimmer.

Now we come to the NRC's preliminary findings of fact, released in November,'81, carrying with a proposed $200,000 fine and a requirement by the NRC that CG&E conduct its own quality confirmation program.

I would like to note at this point that the problems found at the Zimmer station have been problems that have existed from the very beginning at Zimmer. I would like to submit here the results of some research our members have done in conjunction with Ed Hofstadter, a former employee of Husky Products, a contractor at Zimmer responsible for the cable trays. By going through the records in the Public Docket Room on Zimmer, we found the exact same violations over and over again in quality assurance, in Design Control, and on and on. Provided in this exhibit is an eleven page summary covering the period from 1974 to 1976. It shows that CG&E has been violating NRC guidelines...the same infractions which brought on the $200,000 fine in November..for many years.

As noted in the November preliminary findings, CG&E failed 12 out of 18 quality assurance criteria, drawn from 578 examples in the plant. The report also revealed massive alterations of non-comformance reports illegally; intimidation and harassment of quality control inspectors; inadequate X-rays, welds, piping,

and over-loaded cable trays that constituted fire hazards, among other violations.

The report also noted over a dozen instances of CG&E management involvement. Region III Director James Keppler has stated that CG&E is as much to blame as Kaiser, the contractor for Zimmer. Perhaps most revealing is the very last interview in the NRC November findings. That interview was with William Schwiers, then the head of CG&E's quality assurance program. Schwiers was being queried by the NRC investigator as to his role in records falsification and denying Kaiser quality assurance staffing requests. Schwiers stated that his name would appear on documents but that all decisions were made at CG&E "management meetings". He concluded his interview by stating that he was under tremendous pressure, and that he would only answer subsequent questions with a yes or no.

As an advisory committee on Zimmer, I ask you to thoroughly question whether or not the Cincinnati Gas & Electric company management may have had more than just a little influence over quality control decisions at Zimmer in the past. In light of the Nuclear Regulatory Commission's past record of laxity, complancency and perhaps a tendency to overlook severe problems in the construction of a machine that requires near perfection, could you characterize their decision of placing the utility in charge of its own quality confirmation program as a wise decision? This is a company that has been repeatedly been brought to task for the same violations year after year, and their record in this area is less than comforting to the citizens of Cincinnati who must live with this plant for forty years.

I submit that CG&E should not be trusted to run its own reinspection program. The fact is, we do not know what kind of work has gone into Zimmer...good or bad. We do know that CG&E has been caught in massive alteration and falsification of quality assurance documents, that they approached their whole q/a program as a necessary evil, trivializing its importance, interfering with the inspectors whose job it was to uncover defective welds, workmanship and components.

Once again, as an advisory committee, on behalf of the membership of my organization and the interest of the health and safety of the population around Zimmer, I ask you to pursue implementing an independent, qualified, 100% re-inspection of the Zimmer station before it ever opens. To do otherwise is to allow the fox to guard the henhouse. It can be unhealthy to deal with unkown quantities when we deal with a sensitive technology like a nuclear plant. To our minds, Zimmer is such an unknown quantity. That needs to be changed.

Thank you for your time, and I will be happy to answer any questions that I am able.

February 15, 1982

ADVISORY COMMITTEE ON REACTOR SAFETY:

The review of Region III NRC reports made by the Government Accountability Project and reported on in May 11, 1981 letter to Mr. Keppler, Director of NRC Region III, covered the years of 1979, 1980 and some of 1981.

We decided to review the same type reports from the beginning of construction thru the year 1978. We first noticed that many of the Inspections are shown as "unanounced". On checking this out we found it to be highly misleading. The Inspectors came to Cincinnati and stopped in at the downtown offices of CG&E unanounced. The minute they entered the offices downtown a call was made by CG&E people to the construction site that the NRC Inspectors are coming! This early warning gave the construction people 2 to 3 hours time to prepare their "act", prior to the arrival of the Inspectors. Knowing this advance warning was given, only serves to make their Inspection findings even more significant! It also makes one wonder what or how bad the actual conditions were on the 20 or more working days between Inspection visits!

Several other significant factors also emerged. It can be readily seen that there was never any serious effort made by CG&E to institute an effective QC program. It is very evident they felt it was unnecessary and too costly to set up. They built coal fired plants and didn't need it, so all they ever gave QC was "lip service" at best. As the Licensee they had the prime responsibility to set up controls necessary to insure the overall safety of the construction.

It is very evident this was never done. It is paradoxical that as a "reward" for this total disregard of safety responsibility they are about to be rewarded with an Operating License, which involves even more safety responsibility! However, prior to issuance of the License they are engaged presently in "Inspecting" themselves! After nearly 10 years of <u>Total</u> irresponsiblity we can now all at once become responsible.

In one important area alone the record is simply horrendous. Welding and the proper control of welding rod. Inspection reports almost from the very beginning describe flagrant lack of control in every aspect and in particular relative to the proper control of welding rod. Where no effective efforts are made by the licensee this becomes readily apparent to the workers and the problem not only continues but worsens, on a continuing basis. Nothing is done to prevent it, so it becomes an "uncontrolled" situation. Proper testing and Certifying of weldors and constant use of unqualified weldors is as ongoing a problem as failure to control the welding rod. This <u>POSITIVELY</u> guarantees a multitude of weld failures. It is inescapable.

It was also noted that some Inspectors must have been given "Rose Tinted Glasses" at their visit to the CG&E offices. Their Inspections invariably were "rosy" with no observations of non-compliance. It is almost as tho they visited an entirely different plant.

The Public Access Files are far from being complete and in order. This adds to the difficulty in ascertaining the facts. Examples of missing reports only, is shown below.

1972 only report 72-06 is in the file
1973 only report 73-07 is in the file
1974 only report 74-03 is in the file
1975 none are in the file
1976 two are missing--76-01 --76-02
1977 one is missing--77-04
1978 two are missing--78-08---78-27

We also found a Summary of The Inspection problems identified by Region 111 Inspectors during the period 1974-1976. It was obviously prepared by NRC personnel, but their is no cover document or explanation for its being in the file! This is a 11 page report (copy attached) comprehensive in scope and which clearly shows a situation completely out of control. If ever there was a time for strong corrective steps this report clearly and concisely highlights the urgency. The files show no action taken on this report so all we can assume is that it was just another piece of paper!

In addition to the 11 page report which covers the period of 1974-1976 far better and more concise and complete than the individual Inspection reports, we have enclosed copies from other reports to illustrate the completeness and wide range of non-compliances. This proves total lack of concern in any area.

These are as follows:

Enclosure 2--Concrete test non-conformance
Enclosure 3--Falsification of records to say the least.
Enclosure 4--Weld Rod Control non-conformance
Enclosure 5--Weld Rod Control non- conformance
Enclosure 6 Weld Rod Control non-conformance
Enclosure 7--Lack of protection of critical safety switchgear items, this is a highly repetitious item of an ongoing nature. Cylinder storage breaks nearly every common sense safety practice. Valve protectors must always be in place while in storage, Stored cylinders must be chained and acetylene should always be stored at least 20 feet away from oxygen. This is also a repetitive item but only illustrates extremely poor safety practice.
Enclosure 8--Pages 1 and 2 illustrate that as late as 1978 there was no semblance of an effective QC program.

These enclosures by themselves do not attempt to show the magnitude of the situation. The magnitude could only be determined by a complete and comprehensive evaluation of all of the reports. However, it clearly shows that from the very beginning there never was an effective QC system. It became a situation completely out of control.

At this late date to even think that all we need do is reinspect and the situation can be straightened out is ridiculous for many reasons. Then to let the party responsible for the mess, Inspect himself, we can expect nothing less than complete exoneration! Many items can only be inspected prior to asembly (welded assemblies) others such as processes (welding) must be controlled as they occur. Overall this is truly a horrible situation. It was 10 years in the making.

The least that can be done at this time is to have INDEPENDENT & COMPETENT people come in and evaluate the entire situation and tell us what are the feasible choices and alternatives. We simply can't afford to do anything less.

Note! The weld rod non-conformance items shown are by no manner near to the actual number of occurrences. They are only typical and show that every year for nearly 10 years they were found. This means beyond any doubt that many welds were made using the wrong welding rod. Also we must remember that the Inspections were 20 or more working days apart, the use of incorrect welding rod ocurred each and every working day. There are millions of welds in the entire plant. Without question most of the welds are satisfactory. However with a multiplier of millions and just 1% possibly being critically deficient because the incorrect rod was used we immediately have 10,000 possibly critical weld failures per each million welds. The question simply is, how can anybody justify taking this degree of risk with so many lives possibly at stake?

ELECTRICAL AND INSTRUMENTATION PROBLEMS

IDENTIFIED BY REGION III INSPECTORS

DURING 1974 - 1976* (Last Page)

I. Organization

a. Timely stop-work order not issued (no stop-work authority or vague responsibility). Unacceptable generic electrical and instrument problems identified, but work continued until cited.

b. Stop-work authority not specified or where specified, not appropriately exercised.

II. Quality Assurance Program

a. Inspection, engineering, and installation personnel not familiar with requirements of their own program, e.g. separation, equipment identification, grounding, testing, certification programs, etc. No training program or minimum standards for qualification.

b. Welding operations (tray, supports, instrument stands-racks, etc.) ongoing without qualified welders, procedures, or NDE evaluations.

c. Inadequate (not detailed enough) or constantly changing essential component, "N", "Q", or by any other name - "safety related equipment list".

d. Vague or inadequate offsite QA audit requirements, especially for subcontractors. (Time frame, who, what, when, where, why, followup.)

e. Installers, inspectors not familiar with drawings, procedures, and other requirements (training - dissemination of information has been a point of allegation).

f. Pulling crew not familiar with tension meter or other related requirements (training).

III. Design Control

a. Inconsistencies between SAR sections (3-7-8) e.g. separation distances, LOCA requirements for cable, motors (MOVS too) and instruments, seismic requirements, terms, and definitions.

b. SAR requirements not translated into procurement, design, and installation specifications. (Seismic, environmental, fire, etc., for cables, motors, motor-operated valves, and instrumentation.)

c. Installation specification requirements do not reflect SAR requirements. (Separation, seismic hostile environment, barriers.)

d. No seismic installation requirements for conduits, junction boxes, wireways, local panels, tubing supports, instrument racks. (Only tray considered.)

e. Separation (both mechanical and electrical) requirements vague, nonexistent or contrary to SAR commitments.

f. Separation of redundant wiring within cabinets, boxes, switchgear, etc. (end routing, crossovers, safety from nonsafety, barriers - when, type). No requirements.

g. No drawings available for fire barrier installations or cable entry blockout closure installations.

h. Changes made to cabinets not according to drawings: violated seismic and fire barrier considerations (drilled holes and mounted instruments).

i. Field changes not approved or transposed to as-built drawings.

j. Safety system instrument panels and tubing supports not seismically installed. (No requirements.)

k. Safety system instrument tubing installed without any physical protection (channel, tray, or angle iron). No requirements.

l. Safety system equipment installed adjacent to nonseismically installed equipment. (Side-by-side - above/below.) No considerations.

m. Separation distance of conduit, or other raceway from high pressure, or other potential hostile environment equipment. No consideration.

n. Conduit not properly supported, neither vertically nor horizontally. No requirement.

o. Conduit run excessive lengths without junction boxes. No requirements.

p. Conduit installations changed without engineering approval; changed without any authority whatsoever.

q. Indiscriminate positioning of seismic mounting supports for safety related tubing supports (ceiling-wall-floor). No requirements.

r. Inappropriate engineering review and approval of instrument installation drawings. Some cases, no review or approval.

s. Inappropriate design engineer changes to instrument installation design drawings which precluded seismic Class 1 tubing protection. (Removed all protection provided by angle iron, channel iron, or tubing tray.)

t. Improper, inappropriate, and ineffective quality assurance approvals to completed installation/fabrication (I/F) planners. (Inspection records indicated work complete and acceptable - IE concluded otherwise when reinspected by them.)

IV. Procurement Document Control

Specification requirements not translated into purchase order requirements. No specification reference included in purchase order (cables, motor-operated valves, motors, transformers, instrumentation for LOCA, seismic, fire, etc.).

V. Instructions, Procedures, and Drawings

a. Inadequate Procedures

1. Surveillance of diesel generator (megger).

2. Vague requirements, ambiguous results (no acceptance criteria).

b. Drawing Controls

1. Void field drawings (marked void).

2. Out-of-date field drawings (not marked void).

3. No retrieval control of voided drawings.

4. Inappropriate or missing approvals.

c. Inadequate or vague equipment securement procedures (torqueing, welding, type and size of anchors, bolts, washers, etc.).

d. Installation procedures and specifications do not reflect SAR requirements. (Separation, seismic, etc.)

e. Installation procedures/specifications for barriers vague or not considered.

f. Procedures too complex to insure a good job. (Too many referenced activities. Personnel frustrated, do not use as a tool.)

g. Procedures too vague to insure a good job. (No acceptance criteria, not enough personnel input, e.g. readings, measurements, or other data.)

h. Procedures for support of cables vague (good workmanship, etc.) or nonexistent (vertical runs, within cabinets).

i. Terminating procedures: no washers or lock nuts (when required) type of lugs (spaded, nonspaded, etc.) three lugs under one screw (is this permitted?).

j. No procedures or drawings for mounting of seismic supports (type, orientation, securement).

k. Welding of seismic supports without qualified welders, procedures, controls, inspections, etc.

l. Inappropriate person approving procedures.

m. Inappropriate acceptance criteria for instruments.

   1. Acceptability of storage areas (what is it?).

   2. Specific storage requirements of received equipment (what are they?).

   3. Specific surveillance inspection requirements (what are they?).

n. Failure to follow installation drawings (grounding, welding, tray, conduit).

VI. Document Control

a. Drawing Controls

   1. Void field drawings (marked void).

   2. Out-of-date field drawings (not marked void).

   3. No retrieval control of voided drawings.

   4. Inappropriate or missing approvals.

b. Cable routing cards do not compliment master circuit schedule (tabs). (Routed per card; however, master circuit schedule does not agree.)

c. Improper, inappropriate, and ineffective quality assurance approvals to installation/fabrication planners.

d. QA/QC field manuals and/or procedures not maintained. Many voided sections in use by field personnel.

VII. Control of Purchased Material, Equipment, and Services

a. Poor certification programs; many excellent specification requirements, but no requirement for certification of requirements - not specific as to what is actually being certified. (Cables - fire, LOCA, motors - LOCA, seismic, motor-operated valves - LOCA, seismic, etc.)

b. Cable pulling compounds not certified or tested and determined to be flame retardant or otherwise nondeleterious.

c. Cable materials not certified or tested to be fire retardant or able to withstand a LOCA.

d. Penetrations - no qualifying prototype tests. Equipment installed anyway.

e. Lack of vendor and subvendor quality assurance program by licensee. Equipment accepted and installed anyway. (Cable, supporting materials, etc.)

f. Equipment installed prior to receipt of material certifications. Instrument base mounting structures and unistrut.

g. Vendor supplied supports had visual discontinuities, i.e. porosity and cracks.

h. List of approved materials not developed or maintained. (Cables, lugs, pulling compounds, tapes, nuts, bolts, splicing kits, etc.)

VIII. Identification and Control of Materials, Parts, and Components

a. Unsatisfactory equipment, instrument identification program (IEEE 279-1971, Section 4.22) both temporary and permanent. Cables misrouted and instrument separation requirements violated because of this.

b. Improper lugs used on motors - wrong size caused local heating and single phasing of three-phase motor.

c. Safety and nonsafety equipment not segregated.

IX. Control of Special Processes

a. Cables stripped without proper tools; conductors damaged.

b. Not following specification requirements: not logging total weight of zinc installed in containment (handrails, conduit, tray, walkways, etc.).

c. Galvanizing coating burned off during welding of unistrut, tray, handrails, etc., similarly when cutting with a saw. No followup for repair.

d. Meggering of cables before being installed in the completed raceway system (pull and coil).

e. No system of verifying that tests already performed and documented are not compromised by rework, etc.

X. Inspection

a. Raceway inspections supposedly performed, but many problems, listed below, identified by IE inspectors.

b. Cables damaged, e.g. cuts and knicks.

c. Cables tested (meggered) before complete installation into raceway. Terminated at one end (pull and coil). Records indicated that cable pulling and all inspections completed.

d. Equipment improperly identified or not identified at all.

e. Minimum separation requirements not maintained.

f. Cables not routed according to routing cards or cable schedule.

g. Wireways physically overloaded (could not cover).

h. Improper terminations: exposed terminals within 1/8 inch of panel and bent, thus not precluding undue strain.

i. Drilling fragments throughout bottom of cabinets.

j. Cable I.D. tags do not match pull card.

k. Sharp edges on cable tray and wireway.

l. Conduit bushings not installed.

m. Safety and nonsafety channel cables not separated.

n. Minimum bending radius exceeded.

o. Conduit installed with more than four 90° bends.

p. Conduit not swabbed before pulling cable.

q. Cable tray not adequately inspected, including seismic supports, before pulling or properly surveilled afterwards.

r. Debris in cable trays (concrete blocks, cement blocks, welding materials, cigarettes, bottles, rags, etc.).

s. Separation distances not maintained between redundant channels or potential hostile environments (steam or other high pressure lines, nonseismic, water, etc.).

t. Conduit run excessive lengths without junction boxes.

u. Improper inspection of terminations. Screws were tight but cross threaded, lugs loose on terminals, caused intermittent operation.

v. Improper use of lugging tools. Tool dies filed. Conductors easily pulled from lugs.

w. No welding inspections or acceptance criteria (cable tray, supports, tubing installation, tubing supports).

x. Incorrectly installed equipment, known to be incorrectly installed, was not reported as being a nonconformance.

y. Class IE transformer not mounted according to drawings. Seismic requirements compromised. (Inspections signed off.)

z. No inspection requirements for conduit, junction boxes, etc.

aa. No seismic installation requirements for conduit, junction boxes, or wireways.

XI. Test Control

a. Retesting procedures for reworked electrical problems (nonexistent or, if existing, personnel unfamiliar).

b. No resistance tests to verify minimum motor termination resistances insuring correct lugs used.

c. Inappropriate test controls relative to surveillance of motors and generators, i.e. proper (calibrated, appropriate range) instruments used, readings obtained are plotted and used for tracking moisture absorbtion, readings obtained are compared with documented acceptance criteria.

XII. Control of Measuring and Test Equipment

a. Crimping tools not calibrated. Conductors easily pulled from lugs.

b. Crimping tool not traceable to person using same.

c. Failure to calibrate gauges, meters, and other instruments or tools.

d. Failure to maintain inspection standards (cups of silicone foam for physical comparison, cable block-out penetration seals.)

XIII. Handling, Storage, and Shipping

a. Equipment directly on ground.

b. No acceptance tags (use of "negative" tags, e.g. "if no NCR tag, equipment must be accepted") did tag fall off?

c. No heat (switchgear, motors, "MOVS").

d. Dirt, dust, sand, metal filings, water, etc.

e. Construction damage: bent tubing, cracked glass, fire, etc.

f. Cable tray contains debris.

g. Safety system instrument tubing not protected to preclude construction, maintenance, or earthquake damage. Installed without any physical protection whatsoever.

h. Tension meter not used during cable pulling.

i. Circuit breakers not stored to preclude dust, debris, etc. from contaminating, or otherwise deteriorating, the equipment.

j. Cables and other equipment damaged by welding or other construction activities. (Burning, bending of conduits, denting.)

k. General plant areas not kept clean, dry, or heated.

l. Instruments not properly covered. Dust entering, cases bent, glass broken.

m. Instrument stands - racks were painted and stored outdoors - rust coming through paint.

n. Rodent control guard missing.

o. Construction materials hanging from, or leaning against, safety equipment.

p. Cables laying in walkways and being damaged, I.D. tags falling off.

q. Switchgear doors left open.

r. Motors not rotated.

s. Motors/generators not meggered.

t. Transformer gas pressures not recorded/maintained.

u. Dessicants not checked and/or changed.

XIV. Inspection, Test, and Operating Status

a. Misuse of inspection stamps (approved stamp used by uninformed individual).

b. Completed items not identified as accepted, rejected.

c. No way of keeping personnel out of equipment cabinets, components after all work is completed. ("This item tested. Keep out.")

XV. Nonconforming Materials, Parts, or Components

a. Misuse of rejected or hold material areas (quarantined area). Used as an eating area, card playing area, general storage area, accepted with unacceptable, etc.

b. Uncontrolled NCR system. Each contractor has own system, none of which have same criteria. Extremely hard to manage, especially at end of construction.

c. Equipment tagged as nonconforming still has work being performed upon same. (Terminating, pulling cables, etc.)

d. NCR's not closed out in a timely manner (whatever that is). Define "timely" and followup on NCR'd items.

e. Nonconforming and accepted materials not identified or segregated.

f. Equipment known to be nonconforming not tagged or repaired to expedite work.

XVI. Corrective Action

a. NCR's not closed out in a timely manner. Define timely and followup.

b. NCR's inappropriately dispositioned. Safety, or other committee not consulted.

XVII. Quality Assurance Records

a. Inappropriate/inadequate review of completed inspection reports.

b. Records not in auditable form.

c. No installation or inspection records maintained.

d. No qualification or other training records available.

e. Falsified records.

f. Fabricated records - upon audit, not able to establish validity.

g. Records for records sake. No acceptance criteria, no quantitative or qualitative results.

h. Dates indicate when filled in and not when actual work or observation performed.

XVIII. Audits

a. Vague or inadequate offsite QA audit requirements, both for onsite contractors and of those fabricating offsite.

b. Audits ineffective - too "administrative" in nature. Not enough redoing of actual inspection, etc., where practical or able (cable routing, tray installation, receipt inspection, etc.).

c. Audits untimely, after the fact.

e. No follow-up audits on identified problems.

f. No audit schedules.

g. No qualification statement for auditors or who will perform audits.

h. Not enough auditors - personnel spread too thin, responsible for areas not in their realm of knowledge.

*Not all of the above problems were identified as individual items of noncompliance. Some were unresolved items, and others simply observations. The Appendix B format is for illustrative purposes only!

Enclosure 2

the report stated, that the analysis of the drilled cores, the laboratory test results, and the structural integrity evaluation showed that the rust stains and the deposits of residue did not jeopardize the structural integrity at the joint. The inspector concurs with this analysis.

To repair the joint, KEI used a S&L procedure, dated September 23, 1974, entitled "Repair Procedure for Patching Voids on Vertical Surfaces Horizontal Construction Joint, Elevation 501.9" between pours APC-3 and APC-4, using a dry-pack method. KEI prepared a QA/QC construction inspection plan to control the repair. The KEI inspection plan covered the check-off steps to be used for the inspection of the construction joint prior to repair and the dry-pack repair procedure. KEI QA/QC personnel performed inspections during the repairs, which started on September 24, 1974, and was completed on October 1, 1974. The KEI inspection plan indicated that a strength test of grout cubes would be taken, recorded, and analyzed for 7-day and 28-day intervals. The minimum 28-day test was specified to be 4,500 psi. The records reviewed indicated that both the 7-day and 28-day tests had been completed, but that the 28-day test did not meet the specified 4,500 psi strength requirement. It was also noted that KEI Nonconformance Report No. E-152, which had been prepared following the discovery of the nonconforming condition of the construction joint, had been closed out as completed without indicating that the requirements of the specification had not been met. In addition, the result of the 28-day cube strength test was found not to have been entered on the inspection form. The information, pertaining to the failure of the grout cubes to meet the S&L specification, had been sent to the CG&E QA representative, but had not been sent to the A-E for an engineering evaluation. In addition, a KEI nonconformance report had not been prepared, as required by KEI procedures. The above items constituted a breakdown of the KEI QA program for control of critical concrete pours.

2. Nonconformance Reports (NCR's) and Document Deficiency Reports DDR's)

The KEI NCR summary, dated January 3, 1975, and the DDR, dated December 2, 1974, were reviewed by the inspector. Action is being taken to resolve these items in a prompt manner. These areas will receive continuing attention during subsequent inspections.

3. Audits

The inspector reviewed vendor audits which were performed by CG&E personnel since the last inspection. The following audits had been performed and documented:

Insp. Report 75-01 or 74-04

Enclosure 3

interview with the civil QA inspector, who inspected the placement of the reinforcing bars, revealed that he did not utilize the actual drawings for the inspection but used notes transcribed on a piece of paper.

c. In other respects, the preplacement preparation record appeared complete.

d. Slump, air content, temperature, and strength tests were being taken at the required intervals and the results, as recorded, appeared to meet the applicable requirements.

e. The placement crew, the equipment used, and the directive measures appeared to meet requirements. The concrete free fall did not exceed five (5) feet. Coordination between the concrete trucks, conveyor operator, and placement crew appeared to be adequate.

f. An inspection of the concrete batching plant was made, and concrete delivery tickets for lift AP2-7 were reviewed. The date stamps did not match that of the remaining quality records for this lift. KEI QA Stamp No. 45, assigned to the regular batch plant inspector, was placed on the tickets, even though the inspector (No. 45) had not reported for work. The relief inspector on duty was using stamp No. 45. Further information indicated that the relief inspector neither understood the proper use of the QA stamping procedure, nor was indoctrinated on how to perform certain inspections as required by the daily batch plant inspection procedures.

g. The concrete delivery tickets indicated that a 4,000 psi mix was delivered to lift AP2-7. The total elapsed time between mixing and placing on ticket No. 55705 was 41 minutes. These operations appear to meet requirements.

h. The inspector observed that the concrete pier was draped with a tarpaulin for curing purposes. Temperature and weather monitoring records were not reviewed.

i. The inspectors observed that a KEI QC civil inspector was present during the concrete placement operation.

j. The inspectors reviewed the Klinger reinforcing bar splicing records for lift AP2-7. Cadwelding operator B was verified to be qualified as indicated by a document dated November 13, 1974. Tests of sister splice No. 9 and other inspection records were also reviewed. All areas appeared to meet requirements.

Ins. Report 75-01 or 74-04

Enclosure 4

(7) SPPM #4.4 - Rev. 1 dated June 10, 1974, Magnetic particle examination procedure.

(8) SPPM #4.5 - Rev. 1 dated March 18, 1975, Personnel qualification procedure.

b. Qualification of NDE & Welding Personnel

A review, by the inspector, of NDE personnel qualification documentation for Kaiser & Peabody Test Lab. indicated conformance to the requirements of SNT-TC-1A, it's supplements and appendices. Site records were considered to be in order.

A review of the qualification for three welders who performed the safety related work completed to date indicated that they were qualified for the procedures used.

c. Inspection of Completed Work

The inspector visually inspected the welds of the elbows to the isolation valves, reviewed the radiographs and documentation records of this work. All records appeared to be in order, and no problem areas were identified.

d. Observation - Weld Rod Storage Control

During review of weld rod storage control it was noted that low hydrogen carbon weld rod (7018) was being stored in the same rod heating oven with stainless steel rod. This practice is contrary to requirements of Kaiser Engineers Incorporated Weld Filler Metal Control Procedure No. SPPM 3.3, Rev. 4, and in noncompliance with Criterion V, of 10 CFR Part 50, Appendix B.

Ins R. Report
75-05

Enclosure 5

Docket No. 50-358
IE Inspection Report
No. 050-358/76-06
8/11/76

REPORT DETAILS

Persons Contacted

The following persons in addition to those listed in the Management Interview section of this report, were contacted during the inspection.

Kaiser Engineers, Incorporated, KEI

M. Franchuk, Mechanical QA Engineer
W. Kacer, Electrical QA Engineer
W. Puckett, Mechanical Inspector
H. Pugh, Piping Superintendent
C. Yohe, QA Inspection Supervisor

1. Weld Rod Noncompliance

KEI Nonconformance Report No. NR-353 was issued on January 8, 1976, identifying an instance of incorrect weld rod issuance and use of incorrect rod. KEI welding procedure SPPM 3.1.3.7 specifies use of G-308-16 filler material, however, 9 pieces of G-309-16 rod was inadvertently issued to the welder and 3 pieces were welded into the reactor recirculation line weld number B3 before the error was identified. Disposition of the NR was provided by GE in their Field Disposition Request Number KN-1-18, January 13, 1976, and in their letter to CG&E dated February 2, 1976. GE directed that from a technical standpoint an accept as is disposition would probably have been adequate, however, GE felt that in the long view a disposition for repair and rework would provide a better quality control/quality assurance tool during the critical construction stage. The GE letter stated that the deficiency was not of sufficient magnitude to cause any safety implications but was necessary in order to strengthen administrative controls. Corrective action performed included replacing the rod shack attendant.

The inspector concluded that the error could not have adversely affected the safety of the nuclear plant were it to have remained uncorrected and that the licensee had exercised proper control in correcting the noncompliance identified by the licensee's quality assurance program.

2. Kaiser QA Program Manual Review

A general revision of the KEI QA manual was completed effective May 6, 1976. The inspector conducted a review and entered into discussions with personnel regarding the revisions. No problem areas were identified as a result of the review and discussions.

Enclosure 6

Jan. 12, 1977
IE Inspection Report No.
050-358/76-11

REPORT DETAILS

Section I
Prepared by C. M. Erb

Persons Contacted

The following persons in addition to those in the management interview were contacted during this inpection.

Kaiser (KEI)

M. Lowe, Quality Control - NDT
C. Schroeder, Quality Assurance Engineer
D. Kramer, QA Engineer - Civil

Inland Ryerson Company (InRyCo)

R. Sturm, Site QA Supervisor

Bristol Steel and Iron Works (BS&IW)

H. W. Whigham, Site Quality Assurance

Results of Inspection

1. Noncompliance - Weld Rod Control

Criterion VIII of Part 50, Appendix B states that, "Measures shall be established for the identification and control of materials, parts and components, . . . assemblies." It further states that these identification and control measures shall be designed to prevent the use of incorrect or defective materials, parts and components.

Kaiser procedure SPPM 3.3R4, paragraph 6.9 states that, damaged and discarded welding materials, stub ends etc., must be cleared from work areas. Buckets will be located throughout the site for discards.

Contrary to the above Criterion VIII and commitment to SPPM 3.3R4, uncontrolled weld rod was found at three different levels in the reactor building. These weld rods were type 7018 coated electrode and one uncoated electrode.

Enclosure 7 Report Details Section II

(2) A "Chain of Events" i.e., how the safety analysis report should be reflected in specifications, purchase orders and procedures.

(3) Commitments, i.e., Regulatory Guides, Institute of Electrical and Electronic Engineers (IEEE) Standards and American National Standards Institute (ANSI) Standards.

(4) Discussion of Sections three and eight of the SAR.

A copy of the elements in Sections one, two, and three and a summary of Section four is included as attachment one to this report.

b. A meeting was held by Region III inspectors with construction site personnel including those of the electrical contractor, Foothill Electric Corporation, and Kaiser Engineers, Incorporated, inspectors. The primary purpose was to discuss specific electrical and instrument construction problems identified by IE inspectors in the past and put into perspective the key role which inspectors and installers must play. A copy of the elements of the discussion is included as Attachment two of this report.

2. Plant Area Housekeeping

The inspector observed various plant construction areas and determined the following:

a. 480V switchgear, in some cases, was not protected, even though core drilling, welding, and grinding operations were in very close proximity to the gear. "It will be cleaned and vacuumed later" is not acceptable.

b. At the entrance of the containment, a bank of 10-15 oxygen, acetylene, and argon cylinders was stored together, some without valve protectors. The cylinders were not properly chained but tied off between valves with a piece of electrical wire. Open cans of paint thinner were in close proximity.

c. Provisions of "No Smoking" and No Chewing" signs at the containment entrance were noted to be in violation.

Apr. 8, 1976

Enclosure 3
Page
1 of 2

Contrary to the above this condition was determined to be an item of noncompliance identified in Appendix A of the report transmittal letter (78-08-01).

2. Review of QA Implementing Procedures for Construction Testing of Instrumentation

a. The following attributes of the CG&E construction testing program for instrumentation were considered to be acceptable:

(1) Duties and responsibilities of permanent station personnel are delineated in Job Manual No. 76.

(2) Procedures are developed in accordance with procedure IC.GCP.U109 and include objectives, precautions, required test equipment, sequence of events, prerequistes, approvals, and acceptance criteria.

(3) The testing group uses CG&E 7000 series nonconformance reporting system.

b. The following attributes of the CC&E testing program for instrumentation were considered to be unacceptable, i.e., did not meet IEEE 336, 1971.

(1) Testing personnel, including temporary technicians, have not been indoctrinated into the elements of the QA program, trained or otherwise qualified. No qualification or training records were available for the temporary technicians.

(2) No method has been established to control design changes, such as deviating from established set point criteria.

(3) Test reports do not include which piece of test equipment is used and if it is in calibration nor the revision status of drawings, procedures, and/or specifications used for the calibration or test.

(4) No method has been established to verify that changes made by the AE or other agency to devices already calibrated or tested, would be actually implemented.

(5) No methods have been established for the calibration and control of test equipment including:

(a) Prescribed intervals.

Insp. Report 78-08

Enclosure 8
Page
2 of 2

(b) Against standards traceable to the National Bureau of Standards.

(c) Identification on instruments of calibration due date.

(d) Issue control, identification, and isolation of defective instruments.

(6) No method has been established to identify components, parts or systems under test to prevent compromising the testing activity.

(7) No method has been established to prevent dust, dirt, or other damage from occuring to the components, parts or systems already tested or being tested.

(8) No method has been established to identify and control abnormal conditions, such as bypass lines and temporary set points.

Calibration and testing of Class IE instrumentation has not taken place. The matters reported in subparagraph 2.b. above are unresolved and will be reviewed during a subsequent inspection. (78-08-02).

Insp. Report
78-08