ORIGINAL

OFFICIAL TRANSCRIPT OF PROCEEDINGS

Agency: NUCLEAR REGULATORY COMMISSION
ATOMIC SAFETY AND LICENSING BOARD

Title: In the Matter of:
PACIFIC GAS AND ELECTRIC COMAPNY
(DIABLO CANYON NUCLEAR POWER PLANT
UNITS 1 AND 2)

Docket No. 50-275-OLA and 50-323-OLA

LOCATION: San Luis Obispo, California

DATE: Saturday, August 21, 1993 PAGES: 1498 - 1705

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Washington, D.C. 20006
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UNITED STATES OF AMERICA

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In the Matter of: :

PACIFIC GAS AND ELECTRIC : Docket Nos. 50-275-OLA-2

COMPANY : 50-323-OLA-2

(Diablo Canyon Nuclear :

Power Plant, Units 1 and 2) :

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San Luis Obispo

County Library

995 Palm Street

San Luis Obispo, CA

Saturday, 21, 1993

The above-entitled matter came on for evidentiary hearing, pursuant to notice, at 9:10 a.m.

BEFORE: THE HONORABLE CHARLES BECHHOEFER, CHAIRMAN

THE HONORABLE DR. JERRY KLINE, MEMBER

THE HONORABLE FREDERICK J. SHON, MEMBER

Atomic Safety and Licensing Board

U.S. Nuclear Regulatory Commission

Washington, D.C. 20555

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Washington, D.C. 20555

On behalf of San Luis Obispo Mothers for Peace:

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JILL ZAMEK

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WILLIAM CROCKETT, MANAGER TECHNICAL SUPPORT

STEVEN ORTORE, DIRECTOR ELECTRICAL MAINTENANCE

DAVID A. VOSBURG, DIRECTOR WORK PLANNING

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PROCEEDINGS

[9:10 a.m.]

JUDGE BECHHOEFER: Good morning, ladies and gentlemen. We're back on the record. As you can observe, it's permissible not to wear coats. I think most of you aren't. We're resuming the original panel that we started with before we interrupted yesterday prior.

Are there any preliminary matters before we start?

[No audible response.]

JUDGE BECHHOEFER: If not, I would like to comment we're allowed to go to precisely 11:30. The whole room has to be cleared for some other function by 12:00, but we will be able, though, to just cart stuff across the hall, and that room, I guess, will be available starting at about 10:30.

I'm told we can lock stuff there or have stuff watched during lunch, and that type of thing. So before lunch we'll to some transporting and have the room from 1:00 to 5:00 this afternoon. It's a little crowded, but there are some chairs there.

Okay. Ms. Curran, are you ready to proceed?

MS. CURRAN: Yes. We're on page 1d of our road map, and the category we're under now is Control of Foreign Material/Housekeeping.

The exhibits here are Exhibit 105 NCR Inspection

Report 92-31, dated December 11, 1992; Exhibit 106, NCR Diablo Canyon Shutdown Risk and Outage Management Inspection, NCR Inspection Report 50-275/92-201, dated December 8, '92; Exhibit 107, which is Inspection Reports 88-10 and 88-11, which is dated June 17, 1988; Exhibit 108, which is NCR NOV and Inspection Reports 88-07 dated May 5, 1988, 88-10 and 88-11, dated June 17, 1988; Exhibit 109, which is NCR DC 2-91-TN-N102-RT, dated November 11, 1992.

Exhibit 110, which is NCR DCO-91-MM-NO42, dated May 19, 1992; Exhibit 111, which is LER 2-91-012-00, dated March 5, 1929; Exhibit 112, which is PG&E Reply to NCREA 89-241; and Exhibit 113, which is PG&E Letter Number DCL-90-070, dated March 12, 1990.

[Judges confer.]

MR. REPKA: Okay. Does everybody have copies of all of those documents?

MR. GIFFIN: We have one copy at this table, yes.

MR. REPKA: What's been marked as Exhibits -- MFP Exhibits 105-113?

MR. GIFFIN: Yes, but it seems like 112 and 113 are the same thing.

MS. CURRAN: Weren't you going to give us new copies of those?

MR. REPKA: Were we going to do that?

MS. CURRAN: Yeah.

MR. REPKA: We forgot.

MS. CURRAN: I knew it wasn't me. Yeah. You volunteered to get new copies, because they were messed up in some way.

MR. REPKA: Okay. We'll get new copies, but let me ask the witnesses, are 112 and 113, in fact, the same document?

MR. GIFFIN: Yes.

MR. CROCKETT: The documents that we were issued are the same document.

MR. REPKA: Okay. So what I would propose is that we deplete 113, and 112 we'll get a fresh copy somewhere along the line. Okay. We'll provide for the record later a clean copy of MFP Exhibit 112, and, for now, we'll work with what we have.

JUDGE BECHHOEFER: Are you withdrawing 113, just as a matter of information?

MS. CURRAN: Yes. PG&E will provide it.

JUDGE BECHHOEFER: I take it they're not -- they're different versions of the same document.

MS. CURRAN: We'll consolidate 113 into 112. I don't think all the information is under 112 there.

JUDGE BECHHOEFER: Well, aren't they identical?

MS. CURRAN: As I identified the document, I don't think I gave the date. I guess what I should do is just

withdraw 112, because the information that we gave the court reporter for the description of 113 is a more complete description of the document.

MR. REPKA: That's fine. Whatever.

JUDGE BECHHOEFER: They seem identical. So I'm not sure --

MR. REPKA: Right. I don't care which number he gets.

JUDGE BECHHOEFER: What I wanted to make sure is that there wasn't, like, a -1, -2, -3 so that one was a later version of the other one. So, if they're identical -- they appear to be the same.

MR. REPKA: Okay. Let's --

JUDGE BECHHOEFER: Okay. We'll treat 112 as being withdrawn, then.

MR. REPKA: Okay. Let's press on, then.

DIRECT EXAMINATION

BY MR. REPKA:

Q Gentlemen, are you familiar with the documents that have been identified as MFP Exhibits 105 through 111 and then MFP Exhibit 113?

A (Witness Giffin) Yes.

A (Witness Crockett) Yes, I am.

Q Mr. Crockett, these documents appear to mix several disparate debris issues, am I correct?

A That's correct.

Q What are those issues?

A There's, basically, three issues. There's one issue of material inside the RHR sump, which is inside containment, and there is an issue of material inside containment but outside the RHR sump, and then there's a FMEA issue, Foreign Material Exclusion issue.

Q Let me take those three issues one by one. The first issue you mentioned is the debris in the RHR recirc sump. Which of these documents relates to that issue?

A Exhibit 113.

Q And that -- were you finished?

A Yeah. Exhibit 113.

Q Okay. And that issue arose when?

A During Unit 1's third refueling outage in 1989.

Q Is that issue addressed in your direct testimony?

A Yes, it is.

Q Would that be the testimony at page 105?

A That's correct, on page 105.

Q And that issue was resolved?

A Yes, it was. Corrective actions were taken.

Q Have there been instances of debris in the RHR recirc since that time?

A Since we modified the procedures to control material inside the sump, we have not had any recurring

problems.

Q Okay. Let me move to the second of the three issues, the debris in the containment outside the RHR sump. What do you mean by that issue?

A Here we're talking about materials such as some rags, papers, test equipment, some miscellaneous tools that were discovered outside the RHR sump but inside containment, generally during mode 4 operations while we're heating in the plant.

Q These instances of these kinds of materials being identified, when did they occur?

A 2 R-4 in particular, we have an NCR and an LER with 2 R-4. That's Unit 2's fourth refueling outage, and again in 1 R-5, Unit 1's fifth refueling outage.

Q Okay. Which of these documents that have been identified by MFP relate to this second debris issue?

A I think Exhibit 105,. NRC Inspection Report 92-31 and Exhibit 109. That's the NCR DC 2-91-TN-N102, and Exhibit 111. It's the LER 2-91-012.

Q Following these instances, which you said were identified during 2 R-4 and 1 R-5, were actions taken to address the issue?

A Yeah. Yes, they were. In particular, the kind of actions that we took were we -- I think one of the most important ones was that, in each work order that goes into

containment, we now have specific instructions in that work order that tell the individual worker their responsibilities and the procedures they need to do to conform with material inside containment, control of that material.

Q Has that been successful?

A Well, 2 R-4, during one of our inspections in mode 4, we did find some, on a few occasions, some material inside containment. We made some corrections to that procedure. I think it improved it a lot; improved the wearness of the requirements, and 1 R-5, the site inspector on a survey with our QC inspectors to monitor and look for material that was unattended, we found some more occasions, and we strengthened the program from that and improved it even further.

Q How did you do during 2 R-5, which is --

A 4 or 5 we had no findings.

Q Now, this is issue of debris in the containment outside the RHR sump, is this addressed in your direct testimony also?

A Yes, it is.

Q Would that be your testimony at page 97?

A That's correct.

Q Now, we just talked about two of these issues, the debris inside containment in the RHR sump and the debris in containment outside the RHR sump, Mr. Vosburg, can you give

me a sense of how they correlate, if at all?

A Well, there's -- in terms of significance, there's really two issues. The intent of the RHR sump is in the post-LOCA recirculation mode. The RHR system takes suction from the research sump inside of the containment.

In terms of having debris inside of the research sump -- I guess describing the research sump generally, it's, of course, a sump condition the containment, and outside that sump it's covered by structure, a screen structure that's intended to keep any material from flowing inside the screens, getting inside the sump and then getting to the suction of the RHR pumps.

In terms of having debris inside the sump, the concern is that that debris could get, then, sucked into the RHR suction line and either have an impact on the RHR pump directly or pass through the RHR pump and then, potentially, block some of the tubes in the RHR heat exchanger.

The concern with debris outside of the sump is that, if there was a large amount of debris in the general containment area, it's possible that that debris could be transported to the screens, the screens outside the research sump, and plug the screens such that the flow into the sump would be restricted.

However, this is a very large structure, and it would take a very large amount of debris to have any

significant effect on the RHR pumps for debris outside of the sump.

Q But, nonetheless, you'll remain vigilant to both of these issues?

A Oh, absolutely.

Q Now, with respect to the third of the issues that's mixed into this grouping of documents, that's, Mr. Crockett, what I believe you referred to as foreign material exclusion; is that correct?

A That's correct.

Q What do you mean by that terminology?

A Well, that's just a -- a process, a program that you try to prevent an object from entering a system when you take it apart and disassemble it.

Q So this relates to specific activities on specific items of equipment?

A That's correct.

Q And which of the documents identified here this morning relate to that issue?

A It's Exhibit 106. That's the Diablo Canyon Shutdown Risk Outage Management Inspection Report, Exhibits 107 and 108. Those are inspection reports that occurred during the second refueling outage on Unit 1.

Q The second refueling outage was when?

A Second refueling outage on Unit 1. Exhibits 107

and 108 are two inspection reports from that outage.

Q Right. That's 1 R-2 in what year?

A That's 1 R-2 1988.

Q Okay. Go ahead. Which other documents?

A Exhibit 110, which is an NCR DC0-19-MM-N042. That's it.

Q Okay. Now, Exhibits 107 and 108, you said, related to the 1 R-2 outage in 1987, '88, I think you said.

A 1988.

Q Were actions taken to address those issues at that time?

A Yes, they were.

MR. REPKA: I have marked for identification two documents, PG&E Exhibits 25 and 26.

BY MR. REPKA:

Q The document I have identified as PG&E Exhibit 25 is a June 6, 1988 letter from J.D. Shiffer of PG&E to the U.S. Nuclear Regulatory Commission, and the document that I've identified as PG&E Exhibit 26 is a letter from J.D. Shiffer, PG&E, to the Nuclear Regulatory Commission, dated July 18, 1988.

A That's correct.

Q Mr. Crockett, do these documents represent PG&E's responses to Exhibits 107 and 108?

A That's correct.

Q And they include the actions taken in -- at that time to address this issue?

A That's correct.

Q Have those actions, with respect to foreign material exclusion, have they been successful?

A Yeah. I think they've been -- they've really helped a lot. Let me say one thing. I think our program -- we have a good program to begin with. I mean, it's the same process that other utilities, including ourselves, we use -- we've been using for as long as my years of experience.

It's a program that we're using. When you disassemble a component, you try to keep things from falling inside of it. We have disassembled -- for years we have been disassembling things like our turbines, lots and lots of parts in it, 6,000 horsepower reactor coolant pump motors and seals, 12,000 horsepower circulating water pump motors and pumps.

We've been doing this for a long time, and we've been doing it very successfully, and I think what this pointed out is that the weakness is that not everybody is familiar with some of the specific requirements, but, in general, we have a good program.

We've been taking things apart and keeping foreign objects out for a long time, and I think what happened, as part of these corrective actions, I think we strengthened

the program. We improved the procedures. We improved the understanding by plant staff about what their individual responsibilities are.

Q And yet Exhibit 110 appears to be a subsequent NCR that relates to foreign material exclusion. Does that undermine your confidence in any way in the program?

A Not at all. I think -- again, like I said, I think we had a pretty good program. We made some pretty good improvements after the NOVs in 1988, but we still found where some people didn't understand their responsibilities, and we had some problems with FMEA control, but, again, you know, I can go on.

When we disassemble our reactor and look at -- inside the vessel, we do a thorough examination very outage. We have a submarine that goes in. We inspect our fuel, and we don't find -- we have not had problems with foreign materials causing damage, but I think we got a good program, and we made some improvements.

Q And does that include -- does that reflect your experience in the most recent 2 R-5 outage?

A That's right. 2 R-5, no problems. One of the things we did in 110, it was a -- it was an NRC that lasted over 2 R-4 and 1 R-5. We did some things to improve the understanding of the system, things like we clarified procedures. We provided some more training. We included in

work orders specific requirements for FMEA control, and what I thought was another really significant improvement is that we now have a FMEA coordinator and FMEA monitors and QC inspections of work in FMEA areas, in areas to minimize any problems with foreign materials.

Q Does all this guarantee that you'll never find foreign material in equipment?

A You know, we have a good program, but, you know, I couldn't guarantee, but if the situation happened where someone violated an administrative part of the procedure or, you know, we would identify it, document it, and correct the action and improve the program more.

Q Now, let me turn your attention to the document that's be identified as MFP Exhibit 106, and particularly to page 21. On that page, the NCR appears to identify a particular instance related to foreign material. Do you have a reaction to that?

A Yeah. This was an inspection team by the NRC, and they identified a -- I'd say a part of our FMEA process that didn't include instrument tubing, and instrument tubing, you know, three-eights instrument tubing, that supplies signals to our pressure transmitters. We didn't have provisions in our procedures to cap that off.

You've got to keep in mind the likelihood of foreign materials going into an instrument tap.

Q What is that likelihood? It's low?

A It's not very likely. It's very low, but it was a weakness in the program, and we corrected and added it to our procedures for instrumentation.

Q What did the NCR say about housekeeping in general?

A If you look -- what I thought was interesting, on page 21, the -- in the middle where it says -- middle paragraph, where it says,

"Aside from the above deficiency,"

it says,

"the team included that material condition and housekeeping throughout the plant and the Licensee's policies and procedures regarding housekeeping, tool control and equipment and material control as implemented were a strength."

MR. REPKA: I have no further questions on this group of documents. I'll stipulate to the admissibility of MFP Exhibit 105, 106, 107, 108, 109, 110, and 111, and 113, and I'll move into evidence the documents I've identified as PG&E Exhibits 25 and 26.

MS. ZAMEK: No objection.

JUDGE BECHHOEFER: I'm assuming you're moving in the MFP exhibits that --

MS. ZAMEK: That he just mentioned.

JUDGE BECHHOEFER: -- Mr. Repka stipulated to?

MS. ZAMEK: That's correct, although I still have some questions.

JUDGE BECHHOEFER: Oh, yes. We do, too. Those documents will be admitted into evidence.

[PG&E Exhibit Nos. 25 and 26 were received in evidence.]

JUDGE BECHHOEFER: I'm including both the MFP and the PG&E documents. Does PG&E -- the MFP documents that are Staff documents, I guess we probably should wait. Let's see which ones those are for the benefit of the reporter.

MS. ZAMEK: 106 is a staff document, and 107 and 108 and 105.

JUDGE BECHHOEFER: So 105, 6, 7 and 8?

MS. ZAMEK: Yes.

JUDGE BECHHOEFER: Okay. Those documents, I guess, are not admitted at this time. You can change that, if there is no objection, and when these Staff witnesses identify them as Staff Inspection Reports, I'm sure it'll follow that they will be admitted then, but, as of the moment, they're not.

[MFP Exhibit Nos. 109-111 and 113 were received in evidence.]

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: Before we get into further questions, I just have a personal clarification question, which stems from PG&E Exhibit 26. Was there any -- and any individual may answer this, but was there any point in time when cleanliness controls were discontinued so that none existed?

MR. CROCKETT: I'm not sure I understand your question.

JUDGE BECHHOEFER: Well, my question arises, if you turn to page 1 of the enclosure in PG&E Exhibit 26, where, under "Reason for the violation," it says,

"Immediate corrective actions were to reestablish cleanliness controls."

I just wondered what that meant. Does that mean you didn't have any at some point in time? This I didn't understand from the other testimony.

MR. CROCKETT: No. I don't think that's -- I think -- I think this is referring to controls on top of the reactor vessel head.

MR. GIFFIN: If I remember from the nonconformance report, the foreign material exclusion was removed while the

work that this is discussing was in progress. When it was identified, then it was reestablished, and that's what this is.

JUDGE BECHHOEFER: I see. Well, isn't the guideline or the control an overall-type of program that you don't remove or put on? Isn't it always applicable? If a particular action false within the program, then it's covered. Isn't it a continuing program?

MR. CROCKETT: Oh, certainly. It's a continuing program.

JUDGE BECHHOEFER: So that was why I raised the question about the word "reestablish." Should it ever have been disestablished?

MR. CROCKETT: No. It should never have been disestablished.

MR. GIFFIN: I guess I'm -- I think that this is talking about one specific event where they had foreign material exclusion in place, and then it was inadvertently removed while the job was still in progress, and then, when it was realized that the exclusion area was removed, it was reestablished, and that's why -- that's what this Notice of Violation addresses respect that specific instance, not that we had a program in place and then stopped it for a while and then reinstituted the program.

This is one moment in time for one particular

task, and they should have continued it, but they didn't, and that's -- that's what this is talking about. This Notice of Violation is discussing that event.

JUDGE BECHHOEFER: Well, should that have been more a reference to not the controls but the implementing activities? Because, as I say, if it's an overall guideline or rule or probably not a tech spec, but I don't think it would be -- I don't think it gets removed and put on again.

MR. GIFFIN: It wasn't done on -- it was error. It should have been left in place, and then the barrier was removed, and then that's why this Notice of Violation occurs, because that particular job inadvertently removed the foreign material exclusion and then reinstalled it, I believe. I'll have to check.

MR. REPKA: Mr. Giffin, it might help if you can tell me, when you're talking about a specific job and you say a control or a barrier, what do you mean?

MR. GIFFIN: If you are doing a job that you want to establish foreign material exclusion, then you'll establish barriers. The procedure says go into this area. You must log in tools and equipment. You must have things that can fall off -- out of your pocket or something, or hard hats or glasses must be tied, secured so that, if you bend over, the material doesn't -- you know, as you bend over, you don't drop your glasses into the pool, and that's

what I mean by the controls that are in place for foreign material inclusion.

The way I read this is that we had those controls in place for this task, and then they were removed. They stopped requiring them, and they should have -- they shouldn't have done that.

JUDGE BECHHOEFER: So that was contrary to your overall --

MR. GIFFIN: Oh, yes.

JUDGE BECHHOEFER: -- rule or guideline, whatever it is. Okay. That's the end of my inquiry. We can go back.

CROSS EXAMINATION

BY MS. ZAMEK:

Q Mr. Dillard yesterday was quite impressed with the cleanliness of the plant, but isn't it true that all these documents here show a similar problem with a lack of cleanliness, debris left here and there and controls out of place.

A (Witness Crockett) No, I wouldn't say that.

Q They don't --

A No. I'm saying they deal with -- I think you were trying to say generally that cleanliness of a plant is not good, and I --

Q I didn't say that. I said do they all deal with

the cleanliness issue? Whether it's called housekeeping or whether it's called foreign material control, is it all dealing with the control of materials to keep the place clean?

A I think it's your use of the word "cleanliness." This is more to deal with control of unattended materials that are inside containment or in FMEA boundary areas.

Q Would you say that this issue has some potential safety significance?

A I'd say the issue, back in the RHR sump, if you read the exhibits, I think the safety analysis shows on those that they are very low safety significance, in some cases, none. The enforcement action really dealt with more of our administrative and procedural requirements and not the safety significance.

In fact, the RHR sump was capable and functional of performing its intended function. Materials outside the RHR sump, due to the nature of those materials, their weight and where they were located, that even during a LOCA that many of those -- those articles could not be carried away.

The flow velocity of the water to the sump in containment is slow enough to where it wouldn't make it to the sump, and even if they did make it to the sump, the sump is a hardened, screen-protected sump that would have prevented that debris from going into the sump.

The sump is also located in the annulus area in the bottom of containment, which is -- which is very advantageous, because the high density -- I mean high energy lines are inside a wall called a missile barrier.

So, I mean, the access, the potential for getting debris into the sump is very, very small, and, like I said, the nature and amount of materials that were in containment were not enough to have prevented the RHR from performing its intended function. So, the safety significance was very low.

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: Was the latter point fortuitous? I mean --

MR. CROCKETT: Pardon me?

JUDGE BECHHOEFER: Is the latter point, sort of, fortuitous?

MR. CROCKETT: You mean where the sump is? No, it's by design.

JUDGE BECHHOEFER: If the person or whoever had violated the loose materials had left more there --

MR. CROCKETT: You're saying the amount?

JUDGE BECHHOEFER: [illegible]

MR. CROCKETT: You [illegible] the amount of material.

JUDGE BECHHOEFER: Yeah. Isn't that just

fortuitous, if a person has --

MR. CROCKETT: No, absolutely not. I -- you know, mode, that's when we establish containment integrity, and there is exhaustive efforts to control that material, to keep it down to a minimum and to control it. I mean, it's an hourly, minute-by-minute attempt to control the amount.

So we minimize that. So it wasn't just by luck there was only --

JUDGE BECHHOEFER: But it doesn't depend on the amount of food the person was going to have for lunch that day or whatever, soft drinks?

JUDGE SHON: Just to put it in perspective, Mr. Crockett, we say if the person had brought in more. Just magnitude, the kind of thing it would take to plug the RHR recirc sump, could a person take it in and leave it there?

MR. CROCKETT: No. Well, first of all, you know, the kind of things that people take in is not their lunch bag. You don't eat inside containment. The things you take inside there is a procedure. You take in your tools and yourself.

MR. GIFFIN: When we go from after an outage -- during an outage, there's a lot of material that's kept and a lot of activities that go on in containment. When we get ready to change modes at the end of the outage, then a big

effort is done to remove all of those things out of containment.

Then, there's a walk-down by our quality control organization. There's walk-downs by our RPs and maintenance and ops, going through all the little places inside containment to assure that there are no -- there is no debris left.

Then, every once in a while, after we have finished that, when we continue to walk down to make sure that the equipment in containment is in great condition, we find something that we might have to go back in and do, a procedure.

So when the mechanic and an operator and the RP tech go in, they take the procedures, the work package and the tools that are necessary to perform that function, and then, in the case -- some of the cases where things were left in containment, they exited containment and went back in.

So the issue was, while they weren't there, this material was left unattended. What they should have done is take it out with them or leave someone there, but the other question is that that's the type of material that's taken into a containment, not food wrappers. You can't eat in there. You can't smoke in there. You can't chew gum in there.

So the only things that are taken into that space are those things that you need to perform the task that you're going in for. So it's -- so, in order to block the sump, that wouldn't be what you would expect during that maintenance procedure. It would be during large maintenance activities, which are done on the sump's not needed.

JUDGE BECHHOEFER: In the latter situation, can more or different types of material be brought in?

MR. GIFFIN: Oh, yes, sir. The sumps are required in modes 4 and above. So, in modes 5 and 6, the sump has no function. So, therefore, we perform activities that -- a lot of work is going on in containment at that time.

We take in shielding and then, as we change modes, we remove those items from containment.

MR. CROCKETT: Let me add one more thing. Once we establish containment integrity and prior to go into mode 4, the jobs that are going to take place in containment while we're in mode 4 and mode 3 are evaluated by our on-site engineering group to ensure that -- and they look at the job that's being done, the process, and they're, kind of, an over-site group to ensure that material, the type that we bring in and the way we stage it will prevent the sump from being affected.

BY MS. ZAMEK:

Q Isn't it true that PG&E received a violation and a

$50,000 civil penalty -- this is Exhibit 113 -- for failure to take -- this is page -- well, this is the Notification of Significant Enforcement Action, near the end of the document,

"for failure to take adequate corrective actions for gaps in the sumps, trash screens just identified in 1985, opening sump access hatches on a number of occasions for time periods exceeding technical specification limits and the failure to do adequate surveillance inspection resulting in operation with debris inside the sump screens."

MR. REPKA: Ms. ZamEk, are you reading from Exhibit 113? Is that your reference?

MS. ZAMEK: Yes.

MR. CROCKETT: That described -- that's described in our written testimony, but, you know, let me -- let me clarify the reason for the enforcement action was not because of the inability of the pump to perform its intended function.

BY MS. ZAMEK:

Q In Exhibit 110, on page 4, under "Safety Analysis," it says,

"The presence of a loose part in the

primary coolant system can be indicative of degraded reactor safety, resulting from failure or weakening of the safety related component."

Would you agree with that.

A (Witness Crockett) I'd agree that a loose part in the -- in the fuel assembly can have potential problems, but let me say again, we haven't seen it. We've inspected our fuel. We inspect it every outage. In fact, we have been noted to have -- our fuel integrity is one of the best in the U.S.

One of the other things that we have done for our fuel is that we have what they call Vantage 5 fuel that we put in recently, and one of the unique advantages of Vantage 5 fuel assemblies is that it has the bottom nozzle acts as a screen to prevent even very small debris from going up into and affecting the fuel assemblies.

Q But, on page 3, doesn't it, in fact, say, "The root cause is management failure to implement the FMEA program as described in applicable administrative procedures, and, as a contributory cause, there's also an overall lack of ownership for the program."

A I've got to disagree with the root cause. I agree

with the corrective actions of this NRC, but I disagree with the root cause. As I stated earlier, we've had FMEA control programs for PG&E and Diablo Canyon for a long time, and the basic process is to protect equipment that you disassemble, protect it from foreign objects falling in it.

We take apart 12,000 horsepower motors and 6,000 horsepower motors, lots of equipment, and we've had a good program. We had a good program before. We had a good program now. I think any time that we can improve that understanding -- I think that was kind of the root cause in this thing is a lack of understanding, and I think the corrective actions that came out of this NRC helped improve that understanding of the program.

Q Okay. I'd like to bring your attention to the same Exhibit 110, page 14, under "Previous Similar Events." I'd like to point out that the first previous event was noted in 1986 and also note that this is a 1992 document. Based on that, would you say that this is a long-standing problem?

A (Witness Giffin) I think that what we'd like to characterize it as, as Mr. Crockett said before, we do a tremendous amount -- number of activities. As he said, there will be times when a foreign material exclusionary is not established as we, management, would like it to be.

We continue to improve in the performance in this

area, but, as he said, there will be problems, and it showed in 1986 there was a problem. There probably will be problems in the future, but we're addressing it.

We're looking to assure that our program is set up so that there is not damage to the fuel, that there's not damage to equipment. It makes sense to implement a good program, and that's what we are trying to do.

Q Is the debris that we discussed in ASW and CO2 and the DFO trenches, do you recall is talking about that a few days ago, the debris that was found and the standing water that was created from the debris? Would you relate those types of -- could you relate those types of activities, the failure to remove debris and control material?

A (Witness Giffin) The debris -- the trenches were outside. The debris that we were talking about is called dust and dirt and leaves --

Q And wood.

A And wood that's blown around and moved around. The debris that they're talking about in containment were things that people took in and left. There's a difference. The trenches were outside. You know, that's -- and what was inside were those things needed to perform work. Outside it was just what was blowing around in the wind.

MS. ZAMEK: I don't have any further questions.

MR. GIFFIN: I'd like to add one comment. The way

that it seemed when I first heard one of the questions was that there was a housekeeping issue, and it doubted what Mr. Dillard said yesterday, but I think that the general housekeeping for the plant is very, very good.

There have been several plants, both fossil and nuclear, and the way that we keep the housekeeping at our plant is very good. The NRC and that inspection report that was used as an exhibit, I believe it's 106 that Mr. Crockett read from, also -- the NRC also said that the housekeeping was good.

So, I think that -- I just wanted to add that statement.

JUDGE BECHHOEFER: Does the Staff have any questions?

MS. HODGDON: No.

[Pause.]

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: I have one question, and I have to -- let's see. Well, without tracing it through the documents, when you get a housekeeping error, let's say Unit 1 -- I'm just being arbitrary right now, but assuming you find one in Unit 1 during an outage and you impose additional controls, would those controls also govern Unit 2? Because then I noticed later on you had Unit 2 problems.

Whether it was 1 or 2 or 2 or 1, I'm not sure, but

I'm just wondering about the relationship between these controls for one reactor where a problem may arise and the other reactor, which would be scheduled, say, for a shutdown at a later -- a different date. Because I assume they're all shut down at different dates to the extent practicable.

MR. CROCKETT: Is your question, does the programs and rules apply to both units?

JUDGE BECHHOEFER: Yeah. When you establish controls for this type of thing, housekeeping controls, would it apply for both as well?

MR. CROCKETT: Yes. We don't differentiate between -- in these areas between the two units. Any controls or administrative procedures put in place would definitely apply the same for both units.

In fact, you know, we have often learned lessons while one unit's in an outage, and we may have an outage on the next unit just a few months later. We are very diligent in making sure that any corrective actions that we've learned from experience on the first unit are -- that the changes are put in place prior to going into the outage.

The answer is yes, that the same programs apply to both units. We don't differentiate.

MR. GIFFIN: And probably the reason that it goes from Unit 1 to 2 or 2 to 1 is that the majority of the activities that we perform would be during an outage period,

and because, you know, we have one outage then another, that's why it's a Unit 1 or Unit 2 or 2 and 1.

JUDGE BECHHOEFER: Now, referencing Exhibit 105, the cover letter at this point, third paragraph down, where they comment that corrective actions had not addressed this weakness sufficiently or a sufficiently comprehensive manner, this document represents, I believe, a different unit than the previous one that was cited.

MR. CROCKETT: I'm sorry, a different what?

JUDGE BECHHOEFER: Different unit than the previous one that was cited. That was the basis, really, for my question does one apply to the other. So I take it that any further strengthening as a result of the inspection in Exhibit 105 would also be carried through to both units?

MR. CROCKETT: That's correct. In fact, in that same paragraph, in you read the second to the last sentence,

> "Before the completion of the inspection, the inspectors confirm that PG&E had initiated corrective actions which satisfactorily addressed the concern."

So before the inspection was over, the NRC inspectors confirmed that our corrective actions were -- addressed their concerns.

JUDGE BECHHOEFER: Right. I noticed that as well. That's all the questions the Board has. Follow-up

questions?

MR. REPKA: No.

JUDGE BECHHOEFER: Okay. I guess we're ready to go on to the next group.

[Pause.]

MS. CURRAN: Okay. We're going to pass over Exhibit 114 for the moment.

MS. HODGDON: May I ask a question? Isn't it the same as 106?

MS. CURRAN: It is. That's right.

MS. HODGDON: Oh, okay.

MS. CURRAN: We're going to -- not going to be offering Exhibit 115. So we'll move on to Exhibits 116 and 117. Exhibit 116 is NRC Summary of October 20, 1992, Public Meeting to Discuss Steam Generator Feed Water Nozzle Cracking, dated November 23, 1992; and Exhibit 117 is LER 1-92-022-00, dated October 30, 1992.

On the road map, there's a reference to Event 24304, and that's not included here.

DIRECT EXAMINATION

BY MR. REPKA:

Q Gentlemen, are you familiar with these documents?

A (Witness Giffin) Not completely.

[Pause.]

Q Okay, are you now familiar with these documents?

A (Witness Crockett) Yes, I am.

Q Isn't it true these documents both relate to the same issue?

A (Witness Crockett) That's correct.

Q And this is an issue identified by PG&E in a voluntary LER?

A (Witness Crockett) That's correct.

Q And briefly, what was that issue?

A (Witness Crockett) Briefly, we had an engineer who was at a refueling outage at Sequoia, another power plant, and during that outage that plant had some problems with a through-wall small leak in their feed water nozzles, their pipe to nozzle welds. And he came back to our plant and made recommendations to Mr. Giffin that we, in our upcoming outage, that we perform a surveillance to see if we had any effect on our nozzle welds.

When we did that, we performed the inspection and our first indications, I think it was -- and it was primarily due to the sensitivity of the instrument, it's a UT ultrasonic test probe that is designed for intergranular stress corrosion cracking. It's a new technology and a very sensitive instrument. And during our first inspections of those nozzles we found what we thought were indications of cracks that in, I think in one situation, on one steam generator weld that was beyond the code allowable crack.

And in that outage we took actions, we cut that section of pipe out and reweld it and repaired the pipe and also sent that section of pipe for metallurgical analysis to determine the root cause.

But subsequent to that, well, we repaired the pipe, but after the analysis we found out that the indications were not at the depths that we originally thought. We thought they were like pretty much like .37, that was the worst one, .37 of an inch, a little over a third of an inch. And in fact, after the analysis, they really were a factor of ten less, .035, in other words about 35 mils was the deepest crack that we had. In fact it was 35 mils is a few sheets of paper.

Q Okay, when you first identified this issue you wrote a voluntary LER to the NCR?

A (Witness Crockett) That's correct.

Q And that's the document that's been identified as MFP Exhibit 117?

A (Witness Crockett) That's correct.

Q And Exhibit 116, that reflects the fact that you went to the NRC to brief them on the issue, does it not?

A (Witness Crockett) That's correct.

Q And this issue has also been addressed in your direct testimony, hasn't it?

A (Witness Crockett) That's correct.

Q And would that be your testimony at pages 91 to 93?

A (Witness Crockett) That is also correct.

Q In that testimony you conclude that -- you say, "In retrospect this is an excellent example of the proper functioning of the DCPP maintenance and surveillance program, especially in assimilating industry experience and pro-actively initiating repairs even where existing standards do not require such repairs."?

A (Witness Crockett) That's correct.

Q Do you still agree with that?

A (Witness Crockett) I still agree with that.

MR. REPKA: I have no further questions on these documents.

CROSS EXAMINATION

BY MS. CURRAN:

Q Mr. Crockett, how any nozzles are on a steam generator, these particular nozzles?

A (Witness Crockett) There's just one feed water nozzle per steam generator.

Q On each steam generator?

A (Witness Crockett) On each steam generator.

Q And where you found the cracking was -- the nozzle

is the connector to the steam generator, right? The place where the --

A (Witness Crockett) That's where the feed water piping connects up to --

Q -- is welded to the steam generator?

A (Witness Crockett) It's welded to the steam generator.

Q And you found cracking in the nozzle and in the feed water pipe as well?

A (Witness Crockett) No. Let me say again, the cracking that we found, the deepest one was 37 mils.

Q Uh-huh.

A (Witness Crockett) We found that in the weld area, that's the pipe to nozzle weld area.

Q Oh, so it's where the pipe meets the nozzle?

A (Witness Crockett) That's correct.

Q Okay.

A (Witness Crockett) And, as I said, you know, the cracking, we're talking micro cracking, 37 mils.

Q Uh-huh.

A (Witness Crockett) And I might add, we inspected not just that weld, we went upstream and we went into the nozzle itself and we saw no cracking inside the nozzle area.

Q So, upstream is away from the steam generator?

A (Witness Crockett) That's right.

Q Okay.

A (Witness Crockett) And downstream of the weld.

Q Uh-huh.

A (Witness Crockett) In the nozzle area, we inspected that also and found a crack.

Q Okay. And this problem wasn't something that you had previously known about, was it?

A (Witness Crockett) No. Our tenure, our ASME inspection process requires us to look at those nozzles once in ten years, every ten years we take a look at the nozzle. And the next -- the following outage, we would have looked at that nozzle on our normal inspection program.

Q Uh-huh. Would you say that with Westinghouse pressurized water reactors there are new issues coming up all the time about aging of steam generators and steam generator parts? Or maybe I'll, I'll retract that. Would you say that there has been -- that in recent years new issues have come up regarding the aging of steam generators and steam generator parts in Westinghouse pressurized water reactors?

A (Witness Giffin) I'm not sure if it's an aging issue. There have been, over the years, things that are being discovered in Westinghouse steam generators, depending upon the model, that's correct.

Q Well, what do you think causes this cracking?

A (Witness Giffin) Which cracking?

Q The cracking that was found in the welds?

A (Witness Crockett) Well, first of all, you know, when -- you have to put in perspective the depths of the cracks. I mean we're talking about a two inch thick pipe, this is 37 mils, way below the code allowable. In fact, based on -- I'll explain, I'll answer your question here right now, but the mechanism that would propagate the crack, had seven years worth, at least, before the crack would propagate to beyond code.

The mechanism that made it, that created it is a thermal fatigue cycling issue that's created when we're in modes three and mode two we use aux speed water. That's another, it's not main feed water, it's our low power level hot shut-down source of feed water and it's cold water. And due to the cyclic flow of that aux speed water to that nozzle, it has a phenomena, it's a thermal fatigue factor that creates and then propagates cracks. So, it's a different issue than what you're -- than you're referring to with the steam generators in general. It's this nozzle area.

Q Okay. And it's this phenomena, the cyclic change in temperatures, that's something occurs over and over over time, is that right?

A (Witness Crockett) During certain modes of the

plant.

Q That's right.

A (Witness Crockett) Just during certain modes.

Q And each time it occurs it puts additional stress on the nozzle, is that right?

A (Witness Crockett) It's a gradual effect. If you look in the reports, based on that thermal fatigue factor that the conclusion was the integrity of the nozzles would be maintained over the next several years. So, what I'm -- the point I'm trying to make is that there really wasn't a problem.

Q Uh-huh.

A (Witness Crockett) We inspected it, we thought it was bigger because of the sensitivity of the instrument. We went and replaced it, but in retrospect it was not a problem.

Q And can you just explain a little bit, how you inspect these pipes? Go through radiography and ultrasound testing.

A (Witness Crockett) In the early stages of utilities, we're talking in the '70s, the accepted technique was radiography. Now in the -- we have more modern state-of-the-art techniques, ultrasonic testing is much more conclusive in characterizing any flaws. And we use UT to look at those welds.

Q You say you think it's conclusive?

A (Witness Crockett) UT?

Q Uh-huh.

A (Witness Crockett) Yeah, it's more sensitive, it helps more characterize the shape and the depth of the crack. Whereas in radiography you have to be exactly right over a crack.

Q With ultrasound you put a probe inside the pipe and --

A (Witness Crockett) No, you can do it externally; you can do it externally and internally.

Q Uh-huh. How did you do it in this case? Both?

A (Witness Crockett) I think it's external.

Q It's external, okay. So, you don't go inside the pipe. For one thing you can't see inside the pipe, right?

A (Witness Crockett) It's an enclosed pipe.

Q It's an enclosed pipe so you can't see what cracking there might be inside?

A (Witness Crockett) No, but the UT examination looks at the -- it's the entire length. It doesn't look at the surface for cracks, it looks over the entire thickness of the wall of a pipe. And it can see any internal cracks or external.

Q Uh-huh.

A (Witness Giffin) But one thing else, you can also

look inside the pipe. And you do that with a baroscope. There's a, you know, there's places where you can put a small camera in. So, we did look inside the pipe for the visual, but the non-destructive examination technique, that UT, then goes through the metal so that you don't have to open it. But we also went through a place in the pipe where we could stick a camera to look at it visually, as well.

Q Oh, there was one place where you could look at it with a camera?

A (Witness Giffin) Yes, there's a place that has a cap. You can take the cap off and put in the camera on a long cable.

A (Witness Crockett) It's called a gamma plug.

Q But that doesn't show you the entire area, does it?

A (Witness Giffin) It shows what you want to look at. I mean the camera has about a, was is it, 20 or 40 foot, so, if you have a specific area that you wish to look then you just put the camera in and look at that area. But what is used to determine the acceptance of the pipe is not the camera, it's the ultrasonic testing device.

Q These view graphs that are attached to the NRC report, Exhibit 116, to me they look like some kind of joint preparation of PG&E and NRC, is that true?

A (Witness Crockett) These --

Q I thought I saw Mr. Crockett's name on one, you know, and now I can't find it.

A (Witness Crockett) Yeah, this is -- when we gave a presentation to the NRC these were the overheads, these were the transparencies.

Q Okay. Oh, that you presented to the NCR, okay.

A (Witness Crockett) Yeah.

Q On, let's see --

A (Witness Crockett) Both in Walnut Creek and Washington, D.C., Bethesda.

Q Let's see, on enclosure one, which starts the view graphs, on the one, two, three, four, five, six, seven, eight, on the ninth page there's a page that says, "Elbow Examination Summary".

MR. REPKA: The pages do seem to be duplicated twice, but --

MS. CURRAN: They're duplicated?

MR. REPKA: Yeah. It looks like a printing error, a personnel error.

MS. CURRAN: Oh, no, a personnel error.

BY MS. CURRAN:

Q Well, why don't I just try asking you about this and if we need to -- it's pretty brief. I just want to ask you what is the elbow?

A (Witness Crockett) Let's see if we can refer to

one of these other drawings, I think if you just, if you look like about the second page back, you see kind of a cross-section of a pipe?

Q Uh-huh.

A (Witness Crockett) I think it's like, just, on the second page.

Q Oh, uh huh.

A (Witness Crockett) Okay?

Q Okay.

A (Witness Crockett) The nozzle is this cross-section part. The pipe, when it makes that first bend, that first bend in the pipe is called the elbow.

Q Where is it, right there, okay.

A (Witness Crockett) Right there where it makes the first bend. There's a horizontal run of the pipe and then it makes a turn.

Q Okay. Well, I just want to ask you about, there's one page on the view graph, well, of course, these are all just little phrases with bullets and it says,

"Elbow examination summary",

and there's a bullet and it says,

"Access for prep/exam difficult."

What does that mean, can you tell me? And I'll give you a copy of it, if you don't have it.

A (Witness Crockett) I think that was referring to

the physical access to the, to that well.

Q Was there any difficulty in doing the test on it?

A (Witness Crockett) No.

Q Okay. Now further down in here there's a page that says, "nozzle/pipe crack and conclusions", and it says,

"Observed crack in the unit --"

A (Witness Crockett) Wait a minute, I have to find where --

Q Well, why don't I just try asking you because you may be able to clear it up?

A (Witness Crockett) Okay.

Q It says,

"Observed cracking in Unit 1 significantly below code allowables."

Is that before you -- is that what you concluded before you did the other test that you made think --

A (Witness Crockett) No, we -- when we looked at it with the first examination, with the first UT examination, because of the sensitivity of it, it showed that the crap -- the crack -- strike that.

[Laughter.]

The crack depth was, I think in the worst case was .37 inches, and based on that one of those was beyond code and we cut the pipe out and replaced it. Subsequent to that, when we had it analyzed in the lab, the crack depth was not

that deep, it was a tenth --

Q Okay.

A (Witness Crockett) -- in fact it was a tenth less.

Q All right, I just wanted to clarify that. Now you say somewhere here that you're planning to put sleeves inside all of these pipes, inside the nozzles?

A (Witness Crockett) That's correct.

Q Okay. Are you at all concerned about the intersection of the sleeve, the edge of the sleeve and how that may corrode because there's now this new surface --

A (Witness Crockett) Well, it isn't, yeah, it isn't corrosion, it's --

Q Or is there a water --

A (Witness Crockett) -- an erosion -- yeah. Well, you want me to answer the first question about --

Q Yeah.

A (Witness Crockett) -- the sleeve? When we inspected Unit 1 the first time, as Bryant said, to have the gamma plug, it's an access that you can get into the pipe and put a camera downstream into the pipe. And we had noticed some, an erosion/corrosion effect on the leading edge of the thermal sleeve. Thermal sleeve, if you want to look at the same picture, if you look at that second page, thermal sleeve is a sleeve inside the nozzle and it protects

the nozzle from temperature gradients. And the leading edge of that thermal sleeve, we identified it looked like it had some erosion/corrosion effects, that is a flow induced. It's not corrosion, it's erosion of the pipe.

And we did an analysis of it --

Q I'm sorry, what did you say? It's not a what effect?

A (Witness Crockett) It's not an eros -- it's not a corrosion effect, it's an erosion effect.

Q Could you explain the difference?

A (Witness Crockett) Well, corrosion, in terms of galvanic corrosion, it wasn't a galvanic corrosion like rust, it's not rust. It was flow induced erosion.

Q The water wears the metal away?

A (Witness Crockett) That's right.

Q Okay.

A (Witness Crockett) On the leading edge we saw some evidence of that. We did an analysis that said that the thermal sleeve was still protecting the nozzle and we established a plan to replace that thermal sleeve and put a more improved design. In fact, it's connected a little bit different so that there wouldn't be anymore erosion, potential erosion.

Q How long do you expect those thermal sleeves to last?

A (Witness Crockett) The ones that are in there?

Q Uh-huh.

A (Witness Crockett) We found the same thing on unit two, to a smaller extent. But at least the analysis, as a minimum, said they would last another cycle. So, this coming refueling outage on Unit 1 we're going to replace those thermal sleeves.

[Pause.]

MS. CURRAN: I don't have anymore questions on this.

JUDGE BECHHOEFER: Staff?

MS. HODGDON: No, no questions.

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: I would just like to pose what I would call maybe a worst case hypothetical. I believe, Mr. Crockett testified that it would be another seven years, is that correct, before the code allowables would be exceeded? I want to make sure I understood your testimony correctly.

MR. CROCKETT: That's correct.

JUDGE BECHHOEFER: Maybe it wasn't you, maybe it was somebody else.

MR. CROCKETT: It's in the document also. It says there's -- I have to correct myself. It isn't -- it says, next several years, but I think specifically it says --

JUDGE BECHHOEFER: I thought someone had commented that --

MR. CROCKETT: It said four years --

JUDGE BECHHOEFER: Pardon?

MR. CROCKETT: It says several years, and specifically it says four years.

JUDGE BECHHOEFER: Right. I see. Now I take it that the next required inspection would have been within four years?

MR. CROCKETT: It was the next refueling outage.

JUDGE BECHHOEFER: Yeah. But I would say that is within four years. Now if you start at the beginning, however, say you replace it, and some -- there was testimony that this would be looked at only once every ten years. Now maybe I'm misunderstanding something, but as a worst case, could not the same circumstances arise again and escape detection prior to the time when they could have -- when they would exceed the code allowables?

MR. CROCKETT: The way the ASME code is set up, it's over the 40 year lifetime of the plant, there are some wells, and every -- it's really split up into four intervals, four ten year intervals, and the interval for this particular well was, that we had to test it in that first ten year interval. The growth of the cracks are slow enough, or the growth of the effect, or the cause and effect

is so slow that the code, ASME, allows us to only inspect it once every ten years. So, we've already had, we are at the end of this interval and that inspection was coming do.

JUDGE BECHHOEFER: Right. Assuming that everything gets replaced then, and if it's possible to exceed -- four to five years, maybe I'm misunderstanding something, before the next inspection, could not the code allowables be exceeded?

MR. GIFFIN: No. And the reason is, if you'd look at the Exhibit marked 117, it says that,

"We have conservatively decided to perform NDE during each refueling outage on the MFW, which is main feed water piping, adjacent to and including the steam generator, feed water pipe to nozzle welds."

So, we've conservatively decided to continue to look at that and make sure that it could not happen again.

JUDGE BECHHOEFER: So, it wouldn't go another ten years?

MR. GIFFIN: No, sir, it would be looked at each 18 --

JUDGE BECHHOEFER: Oh, I understand.

MR. GIFFIN: Each 18 months we have our normal refueling outage.

JUDGE BECHHOEFER: Right, correct.

MR. GIFFIN: So, each 18 months we will look at these wells.

JUDGE BECHHOEFER: But absent something like this you would only go back every ten years, presumably, during a refueling outage. So, this really supersedes the ten year criteria for your facility?

MR. GIFFIN: Correct. But it's an example how that we don't only look at just what happens at Diablo Canyon, we try to look at what's occurring in the industry and then bring that experience back. So, if another unit was doing their 40 year or their, you know, ten year, ten year inspections and they saw a problem that they thought was worthy of note, then the industry shares that information, then you determine whether maybe you want to change your program as well. So, it's not -- we're not just in this little island by ourselves.

JUDGE BECHHOEFER: And if your engineer happened not to have gone to Sequoia, I guess you said, or --

MR. GIFFIN: It was Sequoia.

JUDGE BECHHOEFER: Yeah, if happened not to have gone there, you still, by the time you inspected your's would not have gone below the code allowable, above or below, however you look at it?

MR. GIFFIN: We would not have exceeded it, yes,

sir.

JUDGE BECHHOEFER: Exceeded it, that's correct.

MR. GIFFIN: That's correct.

JUDGE BECHHOEFER: Right.

BY MS. CURRAN:

Q So, you would not have exceeded it because you were going to be examining it at the refueling outage?

A (Witness Giffin) Well, the next refueling outage it was scheduled. We inspected the piping one outage early because of what my engineer saw at Sequoia.

Q Right.

A (Witness Giffin) So, if he hadn't of gone, which he did, so, it's kind of hypothetical, if he hadn't have gone we still would have found out when we inspected it in 18 months. So, that the way that the code was established, the inspection frequency would have caught it.

Q Assuming that the rate of propagation of the crack was constant over time, is that what you're saying?

A (Witness Giffin) Based upon the analysis that were performed, yes.

Q I have a follow-up question. I'm a little bit confused about the sleeve issue. You were planning to put sleeves into these nozzles at the next refueling outage, right?

A (Witness Crockett) That's correct.

Q Okay. It says, at the top of page 93, "To minimize future potential problems in this area a design change is being developed to install a thermal sleeve device inside the pipe and nozzle connection."

Is that the same sleeve you were talking about?

A (Witness Crockett) That's the same sleeve, yeah.

Q But it sounds like you don't have the design developed yet, is that right?

A (Witness Crockett) The design is developed.

Q It is, okay.

A (Witness Giffin) And it's really immaterial whether the design is developed or not, we said that we're going to put in new sleeves and there are several different design options. There's several ways that you can go to do it. So, that we are going to install one of them, and right now I'm not sure which of the designs or which of the types of thermal sleeves will be installed.

Q Okay.

[Pause.]

MS. CURRAN: I don't have any other questions. We -- if the Board has no more questions, we'd move Exhibits 116 and 117 into evidence.

[Judges confer.]

And we will provide corrected copies of the view graphs to everyone if there's a problem.

MR. REPKA: That's not really necessary.

JUDGE BECHHOEFER: Yeah, the Board has no further questions. So, I --

MR. REPKA: One follow-up question real quick?

JUDGE BECHHOEFER: Oh, sure, I'm sorry.

REDIRECT EXAMINATION

BY MR. REPKA:

Q Gentlemen, when you presented your analysis of this issue to the NRC did they conclude that it was reasonable?

A (Witness Crockett) That's correct.

MR. REPKA: I have no further questions and I have no objection to these documents.

MS. HODGDON: No objection, no questions.

JUDGE BECHHOEFER: We'll withhold ruling on the Staff --

MS. CURRAN: Oh, yeah.

JUDGE BECHHOEFER: -- document, but 117 is admitted at this time, 116 we'll hold for later.

[MFP Exhibit 117 was received in evidence.]

MS. CURRAN: I don't know if we need to deal with this, but the view graphs that are attached to 117 are not

the NCR's.

JUDGE BECHHOEFER: I think the NRC could affirm that those were attached to its --

MS. CURRAN: Okay.

MR. REPKA: I think that's clear on the face of the exhibit because it's a cover letter transmitting the view graphs from the meeting.

MS. CURRAN: Okay.

MR. REPKA: So, I don't think that's an issue.

JUDGE BECHHOEFER: I think the most important thing is we're not going to require you to set up a slide projector, let us look directly.

MS. CURRAN: Okay.

JUDGE BECHHOEFER: 117 is admitted. Why don't we take a fairly short break before we get into the next one. Let's try to take a ten minute break, we don't have an awful lot of time.

[A brief recess from 10:40 a.m. to 10:55 a.m.]

JUDGE BECHHOEFER: We're back on the record.

JUDGE BECHHOEFER: Ms. Curran, are you ready?

MS. CURRAN: Yes. Okay. All right. The next category is procedural controls during shop cleaning operations, and the Exhibit is 118 NCR NOV and NRC Inspection Report 92-26, dated November 13, 1992.

[Pause.]

MR. REPKA: Whenever you're ready, gentlemen, just give me a signal.

[Pause.]

DIRECT EXAMINATIION

BY MR. REPKA:

Q Okay. This document that's been identified as MFP Exhibit 118 appears to be an NRC Inspection Report?

A (Witness Giffin) That's correct.

Q And do you know what the focus of that inspection was? And let me direct your attention to -- well, it's Bates page 119363, the summary, "Areas Inspected."

A Yes.

Q It states,

"As a routine inspection of occupational exposure controls"?

A Yes.

Q What did the NRC state about occupation radiological controls in general, based on this inspection?

A This inspection report, the cover sheet --

Q Well, let me direct your attention to the results page on that same page, the results paragraph. It says,

"The overall degree of radiological controls in place to safely perform major outage tasks was exemplary"?

A That's the same that's on the cover sheet.

Q Oh, okay.

A In both places. The NRC -- this is a routine radiological inspection, which occurred during two weeks during our outage, and on the first page and also on the summary page it says that,

"Your overall control of radiological hazards encountered during steam generator work in Unit 1 outage appears exemplary."

However, they were concerned about one incident which came up, and that's where --

Q That was the one violation cited regarding radiological controls during a shot peening operation?

A That's correct.

Q Now, did that violation affect in any way the maintenance and surveillance of that equipment?

A No, it did not. It was -- it was how some of the equipment was blowing air through the generator, but it didn't have anything to do with the shot peening or the eddy current examinations that were in progress.

Q So this doesn't reflect on the success of the shot peening in any way?

A No, it does not.

Q During the last break, I identified and passed out to all, a document which I've marked as PG&E Exhibit 22. Do

you have that in front of you, Mr. Giffin?

A Yes, I do.

Q That's a document that is a December 14, 1992, letter from Gregory M. Rueger of PG&E to the USNCR, PG&E Letter Number DCL 92-275. Does this document represent PG&E's response to this one violation?

A Yes. It's a reply to the Notice of Violation.

Q Okay. And it included corrective actions?

A Yes, it does.

Q Now, during the next outage following the one where this violation occurred, did you do any shot peening?

A Yes. Shot peening was we're going to do -- we did it twice, once on Unit 1, once on Unit 2. The first time that we had the problem that was in the Notice of Violation, the corrective actions that we put in place after Unit 1's outage were implemented successfully in Unit 2's outage, and we will not do this evolution again.

Q Okay. And that was a --

A One time for each unit.

Q Okay. And during the second execution of this evolution, you didn't have anymore of these radiological controls problems?

A No, I did not.

MR. REPKA: I have no further questions.

MS. CURRAN: Okay.

CROSS EXAMINATION

BY MS. CURRAN:

Q On page 9 of the inspection report, it refers to three incidents that happened during this shot peening operation, doesn't it?

A That's correct, it does.

Q And after the first two incidents, according to PG&E Exhibit 22, which we've just been provided, on page 3, you took some corrective actions, didn't you?

A Yes, we did.

Q Okay.

A And we also go on to say if we had done what we wanted, after the first incident, the corrective actions we put in place was adequate, if the people had followed the procedures that we gave them. After the second time, we changed. We added more corrective actions, but if they had followed the procedures, we would not have had the other incident.

Q So you made some changes after the first incident --

A Yes, we did.

Q The next day there was another incident, and you made some more corrective actions?

A Yes, we did.

Q And then a third incident happened on October 2nd?

A Yes, it did. At that point --

Q And the problem was that the people carrying out the operation didn't follow directions?

A I'm not sure if they didn't follow directions. There was two groups performing work. One group was doing sludge -- or eddy current inspections, and one was performing the shot peening, and that was, sort of, an interface problem that occurred between the two groups where they weren't talking to each other.

So, after the third time, we stopped, got everybody together and said, "Okay. This particular supervisor is responsible for this evolution, and let's finish it with no further incident."

Q And is it true that after the second -- during the second incident, several workers received up-takes of radiation? That's also on page 9 of the --

A That's on page 9, and it says,

"Several workers received up-takes from this incident. The highest up-take was approximately 15 MPC hours. Containment was at a negative pressure relative to the outside atmosphere, and no release occurred to the outside atmosphere."

MS. CURRAN: That's all the questions I have. If there's no other questions, we --

JUDGE BECHHOEFER: Does the Staff have any?

MS. HODGDON: No questions.

MS. CURRAN: Does the Board have any questions?

JUDGE BECHHOEFER: No, we don't.

MS. CURRAN: If there are none, we move Exhibit 118 into evidence.

MR. REPKA: I will not object but I'll point out that the witnesses have testified that this violation has no bearing on the maintenance and surveillance of equipment, and, number two, the contention on radiological protections for occupational exposures was ruled inadmissible.

So the relevance to this particular Contention 1 appears to be have from nonexistent to tenuous, but I don't object.

MS. CURRAN: Well, maybe I need to get some clarification as to whether shot peening constitutes maintenance work.

MS. CURRAN: Wasn't maintenance work performed on the steam generators? And maybe Mr. Giffin can clarify that for us.

MR. REPKA: I think he stated that it was during a shot peening activity, but it was --

JUDGE BECHHOEFER: I think the question is, is shot peening a maintenance activity?

MS. HODGDON: Judge Bechhoefer, I thought that the

answer -- the Staff said they had no questions. The Staff didn't say that they didn't object to the introduction of this document. This is a Staff document and should not --

JUDGE BECHHOEFER: No, no, no. We realize that.

MS. HODGDON: Oh, okay.

MS. CURRAN: Oh, that was my mistake. I'm sorry. Yeah.

MS. HODGDON: We have an agreement that they'll come in through the Staff.

MS. CURRAN: Yeah.

MS. HODGDON: So I don't know what the argument is about.

MS. CURRAN: Yeah.

MR. REPKA: Actually, I don't think there is an argument, because I didn't object to the document. I --

JUDGE BECHHOEFER: Well, I think the witnesses ought to at least state whether they believe that shot peening is a maintenance-type activity or operation.

MR. GIFFIN: I believe that the performance of shot peening was a maintenance activity. I contracted it. I had someone do it to resolve an issue, and so it's a maintenance activity.

I would also like to clarify one thing. On the inspection report, in the same paragraph, where it says,

"Several workers received up-takes.

Highest up-take was 15 MPC,"

In order for 15 MPC -- the Maximum Permissible Concentration, depending upon what the nucleate is, an individual can work in that environment for 40 hours prior to any limits exceeded. So this is 15 of 40, so there were no limits exceeded. We don't like to have up-takes, but there were no limits exceeded.

[Judges confer.]

MS. CURRAN: Shall we go on.

JUDGE BECHHOEFER: Okay. Does PG&E wish to move in --

MR. REPKA: Yes.

MS. CURRAN: Oh.

JUDGE BECHHOEFER: We'll hold the other.

MS. CURRAN: Okay.

JUDGE BECHHOEFER: We'll rule on the other, but I think at this point, if PG&E wishes that document in --

MR. REPKA: Yes. We'll move into evidence PG&E Exhibit 22. That's the December 14, 1992, letter from PG&E to the NCR.

JUDGE BECHHOEFER: Any objection to that?

MS. CURRAN: No.

THE COURT: So at this point PG&E Exhibit 22 will be accepted into evidence. We'll withhold on the other until the Staff witnesses get here.

[PG&E Exhibit No. 22 was received in evidence.]

MS. CURRAN: The next category is unplanned ESF actuation, and the exhibits are 119, which is NCR DC 1-92-TI-NO39, dated October 2, 1992. Exhibit 120, which is LER 1-92-013-00, dated October 2, 1992; Exhibit 121, which is NCR DC 1-91-0P-N038, dated May 3, 1991.

Exhibit 122, which is LER 1-91-011-0C, dated August 1, 1991; Exhibit 123, which is LER 1-91-009-00, which is dated June 17, '91, and Exhibit 124, which is NCR DC 1-91-TI-N047D4, which is dated January 24, 1992, and Exhibit 125, which is LER 2-91-006, dated November 1, 1991.

Exhibit 126, which is NCR DC 2-91-TI-N088D2, dated October 30, 1991; Exhibit 127, which is LER 2-91-007-00, dated November 1, 1991.

MR. REPKA: Okay. Do we have them all? No.

[Pause.]

MR. REPKA: Mr. Vosburg, I think you're the designated respondee on these?

MR. VOSBURG: Yes. I'll respond to these.

DIRECT EXAMINATION

BY MR. REPKA:

Q Are you familiar with these documents?

A Yes, I am. In general, I've reviewed them.

Q Let's see if we can cut through this pile of

documents pretty quickly. Let me start by asking you, what is an unplanned ESF actuation?

A Well, an ESF is an Engineered Safeguards Feature, and those are, basically, systems at the plant that were part of the plant design to specifically deal with postulated accidents that are in the FSAR accident analysis.

At Diablo Canyon those would be systems like the fuel handling building ventilation system, the containment ventilation isolation system, the safety injection system, the emergency diesel generators, several systems like that.

Q And, in general, what is the significance or importance of an unplanned ESF actuation?

A That would depend on the particular engineered safeguards feature that you're discussing. In general, actuation of an ESF feature at Diablo Canyon has little or no effect on the plant.

The one exception that would come to mind would be, of course, the safety injection system, and an unplanned actuation of a safety injection system would not be a -- it would cause a reactor trip, and then the operators would have to deal with the plant trans income, but, in general, ESF systems like the ventilation systems are benign with respect to challenging the operators.

Q But are unplanned actuations reportable to the NRC and LERs?

A Yes. Any time that you have an unplanned actuation of an Engineered Safeguards Feature, it's required to be reported to the NRC.

Q Now, have you reviewed these documents, which appear to list several unland ESF actuations? Have you reviewed the documents?

A Yes. I've been through them, and, in general, there's, I believe, about nine documents here that deal with six different unplanned ESF actuations. Three of the -- three of the six events dealt with maintenance personnel performing surveillance tests and actuating an incorrect opponent.

Two of the tests or the events here dealt with operations personnel performing a surveillance test, and similar personnel errors were made in which a wrong component was actuated, and the last event here dealt with operations clearing a piece of equipment, and they cleared the wrong piece of equipment and caused an ESF actuation.

In that case, it did not involve surveillance testing or maintenance in any way.

Q So we have six ESF actuations, three by maintenance during surveillance, two by ops doing surveillance and one by ops with nothing to do with --

A Totally unrelated, yes.

Q I don't want to get into the details of each one

of these at all, but just for the record the sake of the record, could you try to correlate the nine documents into the six incidents starting with, I think, Exhibits 119 and 120 relating to the first one?

A Oh, yes. Documents 119 and 120 relate to the same incident.

Q And that was an incident of an ESF actuation caused by a maintenance person doing a surveillance?

A That was an INC technician performing a surveillance test, yes.

Q What is the second one?

A Document Exhibit 121, that dealt with an operations person performing a surveillance test on the solid state protection system in which the operator simply actuated -- in the solid state protection system, there's a bank of switches on the output panel that, basically, allows you to test the equipment in place.

The operator for performing the test turned the switch adjacent to the one he had intended to turn and started a piece of equipment other than what he had planned to do. I think, in reviewing this, it was found that there was -- there was no problem with the surveillance test itself or the surveillance program.

It was simply the operator turned the wrong switch, and there are no corrective actions to be taken

other than counseling the operator -- there were no corrective actions found here necessary to the surveillance program to enhance it in any way such that this would not happen again.

Q Okay. Let's on to the third. Is that in Exhibit 122?

A Let's see, the third, yes, is Exhibit 122, and I guess 122-A. That was another event where -- let me get these straight. There's a lot of them -- where operations was performing again a test in the solid state protection system.

In this case, the operators did part of the test in train A of solid state protection system. They stopped. They came back to perform the rest of the test, and inadvertently went to train B of the solid state protection system, again actuated a wrong switch.

In this case, the same as the last, there were no problems with the surveillance procedure. There were no corrective actions relative to their surveillance program. It was purely an operations error.

Q The fourth one appears to be in Exhibits 123 and 124, am I right?

A Yes. 123 and 124 deal with the same event, yes.

Q And this one is one of the three maintenance personnel?

A Yes. This was an incident where an INC technician had pulled a fuse on one of the channels of nuclear instrumentation and initiated a reactor trip.

Q Okay. And the fifth one is in Exhibit 125; is that correct?

A Yes. The last one is -- I guess not the last but -- yeah. The next one was Exhibit 125, and that dealt -- this is the one that dealt with operators clearing a piece of equipment. It was an inverter, one of the vital instrument inverters.

The operators, when they cleared it, they went to the inverter adjacent to the one they were intending to clear, and, again, they weren't performing a surveillance. They were just clearing the equipment. They went to the wrong inverter, inadvertently de-energized it, and that caused an ESF actuation.

Q Okay. This is the one, then, that had no connection at all to either a maintenance or a surveillance test?

A In any way.

Q The test he was doing was not an STP?

A No. It was not a surveillance test.

Q Okay. Exhibits 126 and 127, do they describe the last ESF actuation?

A Yes. This dealt with INC technician who were

working again on the solid state protection system. They are reconfiguring the system for procedure. They failed to correctly follow the procedures and, again, initiated -- actuated an Engineered Safeguards Feature.

Q Okay. In total, these six unplanned ESF actuations, do they suggest a systemic problem in this area?

A No, I don't believe so. They were personnel errors. Looking at the volume of surveillance test, in this case, equipment clearances that are processed in the plant, I think the number of events cited here is relatively low, and there is little relationship between the events, other than that they involve personnel errors, and, in this case, they involve actuations of ESF equipment.

Q When the company analyzes an unplanned ESF actuation, for example, in an NCR --

A Yes.

Q Do you look at all aspects of the problem and ways to minimize personnel errors in the future?

A Yeah. We go through, generally, quite extensive evaluations. Actually, any nonconformance report results in a Technical Review Group, what we referred to as a TRG here, that looks into all the possible causes.

Especially when there's personnel error, it's very hard to, you know, to make sure you found all the factors that could contribute to this. As an example, one of these

that we just discussed, I believe it was the first event, where an INC technician had gone to a wrong rad monitor, he was performing a test.

We have two rad monitors that monitor the fuel handling building area, and they will transfer the fuel handling building ventilation system from the normal mode to the iodine removal mode.

All that does is, basically, route the exhaust flow from the system through a charcoal filter. The INC technician was performing the test. You do two checks on the rad monitor. You de-energize it to verify that, if it fails, the system will transfer it to the iodine removal mode.

The procedure then had operations reset the ventilation system, and then he would come back and give it a high radiation signal and again verify that that one rad monitor would transfer the system.

One of the things that came out, in going through this, is that the INC technician felt that, by him having to stop -- he went to RM 58, initiated the test, then he had to stop and wait for ops to reset the system.

So he had to -- he felt that having to stop contributed to him getting back into it and going to the wrong monitor. It gave him a chance to fail. So we went ahead, and we changed that surveillance test such that we

would perform all the tests on that particular rad monitor before we stopped and had operations reset the system.

So even small things like that we take into account and make changes in the procedures in the plant.

Q It didn't mean the procedure was defective the way it was before?

A No, it wasn't, but, as part of the investigation, the individual felt that might help. So we went ahead and changed the procedure accordingly.

Q Can you give me one other example of how personnel error created similar --

A I can think of one from several years ago involving operations. Operations -- again, this dealt with the four channels of nuclear instrumentation, the power range channels. Between the racks where these four channels are, there's a -- there's about a two and a half, three-foot area, and right behind there there's a wall.

The operator was performing a test on one of the channels and, in doing his self-verification, he would put his hand -- he'd read the procedure, figure out which switch he needed, put his hand on it, verified that he had the correct switch per the procedure, and then actuate it.

As he was doing that, he grabbed the switch, looked at the procedure, and, as he did it, he stooped down, and he hit his back on the wall, and there was a bolt head

protruding from the wall. When he bumped it, he stood back up let go of the switch.

When he went back down again, he grabbed the wrong switch. Because of something that simple, we actually went and did a design change in the plant to put covers over those bolt heads so something hike that couldn't happen again. So I think it shows to the degree that we will go to to try to prevent these personnel errors.

MR. REPKA: I have no further questions on these documents.

JUDGE BECHHOEFER: I'd like to inquire, does Mothers for Peace have extensive examination, because we're getting very close to the time when we have to break. We could resume cross-examination on these documents across the hall at 1 o'clock.

MS. ZAMEK: I'd say it would be about five or ten minutes.

JUDGE BECHHOEFER: I think we'd better not run that risk, because we have to clear out and have everything out of here prior to 12 o'clock.

MR. REPKA: If it's five minutes, I'd love to finish this one.

MS. CURRAN: It depends how long we -- one word answers will be great, but --

MR. VOSBURG: I'll try, but I can't promise.

JUDGE BECHHOEFER: Well, we have three minutes legitimate anyway.

MS. ZAMEK: So we're stopping?

MR. REPKA: We're going.

MS. ZAMEK: Oh, we're going.

JUDGE BECHHOEFER: We're going to try and do this one.

CROSS EXAMINATION

BY MS. ZAMEK:

Q Is an unplanned ESF something that a nuclear power plant tries to avoid, then?

A Oh, absolutely, yes.

Q And why is that?

A Well, it depends, again, on the particular safety function you're actuating. Certainly, a safety injunction is something you would never want to inadvertently have actuate. With regards to the bulk of the Engineered Safeguards Feature at Diablo Canyon, actuating them simply puts a system in a more conservative mode.

The containment ventilation isolation, for example, there's about eight valves that penetrate containment. When you get a CVI, it simply closes those valves.

At power, all but a couple of those valves are normally closed. The only ones that are open are the ones

that go to the radiation monitor outside containment that's monitoring inside containment.

So all that happens when you actuate it is those valves close. You reset the CVI signal, and you open the valves to the rad monitor again. There's no challenge to the operate force. It doesn't cause a plant transient.

Q Right. You mentioned that before, that there's no challenge to the operators, then it's little significance, it's benign, but what about the effect on the equipment?

A Well, for example, the inadvertent actuation of the fuel handling building ventilation system, that was the next -- you know, he went from RM 58 to RM 59, got the wrong rad monitor. That would have been the next rad monitor he tested in that procedure. You normally test both of them.

He did them out of sequence. That's an error. He inadvertently actuated it. That was called an ESF actuation. He was going to do it anyway in the -- you know, the next rad monitor.

Q But it wouldn't have caused the ESF actuation?

A It wouldn't have caused? Oh, yes. He would have done exactly what he did later on, but he did it when he didn't intend to. Therefore, was an error, and it actuated an Engineered Safeguards Feature.

So it was reportable, and that's another reason that we, you know, definitely don't want to have these

happen, because it does cause, you know, TRGs, NCRs, reportability, and it deals with personnel errors. We take it very seriously, and we put a lot of work into trying to find out the causes for these and correct them. So it takes a lot of resources from the plant whenever this happens, too.

Q In Exhibits 123 and 124, discuss the incident with the safety injection, which you were saying is absolutely horrible, and you don't ever want to do. Is that --

A No. I didn't say absolutely horrible.

Q But you try to avoid. I'll rephrase that.

A Definitely, we try to avoi tripping the plant.

MS. ZAMEK: I don't know if we should stop here, or if I should go on a few more minutes.

BY MS. ZAMEK:

Q On page 7 of Exhibit 124 discusses of overcooling problems that occurred in that event. Can this have --

A Well, this was the event where the INC technician caused a reactor trip by pulling the wrong fuse on the NI channel. After the reactor tripped, the normal response of the steam dump system is, since the turbine's tripped, the steam then bypasses the system, and it's dumped into the condenser.

Two of the valves in that steam dump system had a problem that allowed them to leak excessively, and it

resulted in not -- you know, it resulted in excessive cooling to the point where the cool-down caused the safety injection in the ESF actuation.

The direct action of the tech didn't cause it, but it was a result of the reactor trip, which the technician did cause.

Q And are you aware --

A So it was an equipment problem that existed in the plant that, you know, that was found, you know, after the plant trip due to the INC technician's actions.

Q But the root cause is on page 6, and it says it was determined to be, again, personnel error. The INC technicians did not perform self-verification.

A Yes. That was the -- the INC technician did not perform self-verification. He was working on --

Q Which caused the reactor trip?

A Which caused the reactor trip, then. The cool-down and the safety injection was caused by the valves in the steam dump system failing, not directly from the tech's actions. He caused the reactor trip.

Q Okay. And each time -- is it true that each time you have an unplanned ESF and the safety injection that it puts wear and tear on the system?

A It causes components to operate that generally aren't operating. I wouldn't -- you know, safety injection

pumps start. RHR pumps start. Those pumps don't normally run, and once you have an inadvertent safety injection, they may run for a few minutes before it's reset and the pumps are shut down, and there's really no significant wear in that time period relative to the pumps.

Q After multiple or repeated actuations, does the reliability of these components decrease at all, then, do you think?

A No, it does not.

Q And after many years of this, is there any kind of procedure or any provision you have of maintaining, increasing the maintenance because of the repeated actuations?

A No. There are very few actuations here. I think starting a pump that -- an SI pump that normally does not run this number of times certainly did not increase the wear on that pump to the point where a maintenance program would be enhanced, you know, for wear-related causes.

Q Okay. I'd like you to turn your attention to Exhibit 124, pages 14 and 15.

A I'm sorry.

Q Exhibit 124, pages 14 and 15. It's the very last sentence of page 14 that goes into 15.

"The root cause of the event was a lack of self-verification on the part of an

INC technician during the performance of a SGP. This has been a generic problem at DCCP and in the rest of the industry."

Would you agree with that statement?

A Well, I don't agree that -- well, let me put it in perspective. We have a procedure at the plant that deals with independent verification, and it applies to everybody, maintenance personnel, operations personnel, and it, basically, says that -- well, there's three times of verification.

There's self-verification where an individual working alone goes through a set -- it's a pattern you go through. In other words, if I'm going to actuate this switch by this procedure, I look at the procedure. I find the correct switch. I put my hand on that switch. I then verify, yes, that is the switch the procedure says.

I anticipate what I expect to happen when I turn, actuate the switch. I actuate it, and then I verify what I expected to happen actually did happen. So we have a procedure that applies to everyone so that any time a personnel makes an error -- person makes an error where he actuates a wrong opponent, you can go back and say, "He didn't follow the independent verification procedure, or that wouldn't have happened."

So, because of the large, extremely large number of activities where you can have that happen, yes, there are cases where people simply do not remember to do the right thing, and had they do it it wouldn't have happened. So there will be cases --

Q Well, based on the number of previous similar events, would you say that the existence of the self- and concurrent verification program that you have is effective?

A Yes, I believe it is. We continually -- you know, any time -- we watch the number of times this occurs. If it looks like there's a trend where there's been a few cases where it's happened recently, we do a lot of things to make sure that the people are aware that they have to perform this.

There's an example in here, where, when an INC -- I forget which one it is -- an INC tech made an independent verification error. We stopped all the work in the plant that the INC techs were doing. Stopped everything, got everybody together -- I wasn't there, because I wasn't in the INC department.

They got everybody together to tailboard everybody in the department to make sure that everybody understood that it was required to do this, which caused, again, delays in work. So that's the extent that they take this seriously.

Q I think I just have one more question, and it has to do with your statement about the bolts when you, you know, that you put a barrier to prevent these things.

A Yes.

Q On page 7 of Exhibit 119, there was a -- this was where there was a problem operating the wrong channel, and at the bottom of the page it says, the last paragraph,

"The TRG discussed and decided not to implement physical barriers over the switches similar to those installed over many of the other radiation monitors as a result of previous wrong channel personnel errors."

So would you still say that PG&E implements every possible --

A Yes, we do. The TRG, this is one of things -- these, again, are the TRG minutes, and they looked at -- they looked at all the possible things they can do. Putting physical barriers over the front of these rad monitors, for one, obscures -- you know, any time an operator wants to read it, then he's got to remove this barrier to look to see it.

So it's a balancing act, and, in terms of the fuel handling building ventilation system, the consequences of having, again, an ESF actuation in the fuel handling

building ventilation system is simply that the system transfers to a more conservative mode.

All that happens is dampers open, and it reroutes the exhaust flow through a charcoal filter. The only -- you know, the reason we do that is the charcoal filter has to be replaced based on how much flow it's had through it. I mean, it gets used up.

Q So there is some increased maintenance required, then?

A Well, no. That's why the system's designed normally not to put flow through it. So had that not been a problem, we would always have flow through it, and there wouldn't be any actuation required.

A (Witness Giffin) The statement that causes increased maintenance. So it causes increased maintenance does not necessarily degrade. It just makes sure that the equipment is again looked at and make sure that it's good. So causing increased maintenance is just a burden upon me and my people. It doesn't have anything to do with the efficiency or the operating of a piece of equipment.

Q Okay. I have --

A (Witness Vosburg) Well, and I'd like to finish, because your question dealt with the barriers, and not only is it -- you know, it inhibits people looking at those monitors, but you have to remove the barrier.

There were -- part of the considerations, when we put barriers in front of the power range channels that cause some of these other problems is that you may -- just removing the barrier potentially cause something to go wrong.

So you weigh all -- you weigh the benefits and the risks. In this case, we were replacing those rad monitors in the future, and because of the absolute lack of significance to having an ESF on that particular system, it was -- it was deemed that it was not the correct thing to do, and that's why it was written down here in the minutes.

MS. ZAMEK: Okay. Thank you. Are there any further questions from the Board?

JUDGE BECHHOEFER: Does the Staff have any questions?

MS. HODGDON: No, I don't think so. Not at this time.

JUDGE BECHHOEFER: I have one. We got to go. I only have one question. I hope we don't have a big argument over documents. On Exhibit 124, page 8, under item 5-B, has this particular investigation been carried out, and has any result -- is there any results or have any changes been made as a result? It's paragraph 5-B on page 8.

MR. GIFFIN: I know that we have done an investigation on how can we improve the performance to make

sure that people use self-verification. In a training class, when an INC tech goes through training and using mockups, the instructors watch him to make sure that he uses self-verification techniques in the training building.

So it's included now as part of the training to make sure that he demonstrates to his instructor that he's demonstrating self-verification. Also, in my testimony, it talks about errors and the personnel errors, that we are trending these errors -- the errors in personnel are trending down.

So we're seeing personnel verification, if you don't do it, you can errors, and the number of errors are decreasing. So we believe that what we're doing is quite adequate.

JUDGE BECHHOEFER: Did the change in training that you just described follow this particular matter?

MR. VOSBURG: That particular change he described is in one or two of these events as a corrective action that I remember reading --

MR. GIFFIN: It's in this particular event that we're talking. It's item 4, bottom of page 9.

JUDGE BECHHOEFER: I see. And that item for has been done?

MR. GIFFIN: Yes, sir.

JUDGE BECHHOEFER: That's all I have. I guess

that's all the Board has. Any follow-up questions?

MR. REPKA: None here.

MS. ZAMEK: Then I'd like to offer these exhibits.

JUDGE BECHHOEFER: Well, are you offering 125? I have somewhat of a problem with 125, just offhand. The others -- well, we'll have to hear what the parties say, but 125, I --

MR. REPKA: I have no objection to any of these except for 125. So maybe -- I mean, that's the one that has no --

JUDGE BECHHOEFER: Yeah. I see some problems with 125, and I wondered you're still going to offer it, given the testimony about it.

MS. ZAMEK: I don't have a problem with removing this.

JUDGE BECHHOEFER: With removing? Okay. Let me get my numbers straight. So MFP is offering 119 through 127, but minus 125, not including 125, and there's no objection to that, it take it?

MR. REPKA: Right. No objection.

JUDGE BECHHOEFER: Okay. Staff doesn't object?

MS. HODGDON: No objection.

JUDGE BECHHOEFER: Those documents other than 125, which has been withdrawn, those documents will be admitted into evidence.

[MFP Exhibit Nos. 119 through 124 and 126 through 127 were received in evidence.]

JUDGE BECHHOEFER: We'll break now for lunch but more significantly for a little moving work.

[Whereupon, a luncheon recess was taken.]

AFTERNOON SESSION

JUDGE BECHHOEFER: Okay. If you can't hear me, just scream or shout. Okay. Since we don't have microphones, if you can't hear me or anybody else here, let me know. We're back on the record. We're in the alternate location that we published in our notice several days ago.

Mothers for Peace may proceed.

MS. CURRAN: All right. We're moving on to Exhibits 128 and 129. Exhibit 128 is NCR DC 2-92-EM-N026-D8, dated September 17, 1992, and Exhibit 129 is LER 1-92-010-00, dated October 15, 1992.

DIRECT EXAMINATION

BY MR. REPKA:

Q Mr. Ortore, do you have a copy of those documents?

A (Witness Ortore) Yes, I do.

Q And are you prepared to discuss them?

A Yes, I am.

Q Do these two documents relate to one instance of a Limittorque valve operator failure?

A Yes. They refer to the same incident.

Q Okay. And this was an incident of an operator failure during the performance of a MOV test?

A Yes, a failure of a motor operated -- motor operator, yes.

Q Of a motor operator during the test?

A Yes. This was a part of the DCPP's MOV testing program.

Q Okay. And it failed, it was determined subsequently, due to improper assembly of the operator?

A That is correct.

Q And was there a root cause determination made as to why it was assembled improperly?

A Yes. The root cause was due to personnel error during the assembly.

Q And was the situation corrected?

A Yes. There was corrective actions, and it was corrected.

Q Do you have confidence that other similar components have been assembled correctly?

A Yes. We have looked at those that were assembled by that individual, and they have all been corrected.

MR. REPKA: I have no further questions.

CROSS EXAMINATION

BY MS. CURRAN:

Q Mr. Ortore, I just want to clarify that these Limittorque motor operators were -- they weren't originally installed in the plant, right? These were replacement components, weren't they?

A No. It was only -- we only preassembled the

spring pack assembly, and those were installed in the operators. The operator itself was in the plant, and we installed assemblies.

Q And you installed the assemblies during the second refueling outage? Was that -- let me see where I --

A It was Unit 2. It was during the fourth refueling outage.

Q Okay. All right. So a mistake was made during this assembly of the -- of the motor -- motor -- of the motor, right?

A Yes.

Q Of the motor operator. Okay.

MS. CURRAN: I don't have any other questions.

MR. REPKA: Let me just follow-up on that quickly.

REDIRECT EXAMINATION

BY MR. REPKA:

Q It was installed during 2 R-4?

A Correct.

Q And it was picked up in a test when?

A Sometime after the outage.

Q The outage being 2 R-4?

A Right.

BY MS. CURRAN:

Q Can I ask how long after the outage? It says on June 2nd.

A Right. And I'm not sure when the outage was completed. I'm not positive how long that was.

MR. REPKA: I think the documents can speak to that.

MS. CURRAN: Okay.

MR. REPKA: Okay. I have no objection to admissibility.

MS. CURRAN: Okay. We move Exhibits 128 and 129 into evidence, unless the Board has questions.

JUDGE BECHHOEFER: Well, I have a minor clarifying question. What is signature testing, as distinguished from some other kind of testing?

MR. ORTORE: As part of our MOV program, that is where we would get a phrase of the valve as a signature for the -- to document as part of our MOV testing program the performance of the -- of the valve, of the operator and the valve.

JUDGE BECHHOEFER: The Board has no further questions. Any follow-up?

MS. CURRAN: No.

JUDGE BECHHOEFER: If not, Documents MFP Exhibits 128 and 129 will be admitted into evidence.

[MFP Exhibit Nos. 128 and 129 were received in evidence.]

MS. CURRAN: Okay. Exhibit 130 is NCR DC 2-91-EM-N095-G6, dated September 24, 1992.

[Pause.]

DIRECT EXAMINATION

BY MR. REPKA:

Q Okay. Gentlemen, do you have that document, MFP Exhibit 130?

A (Witness Otore) Yes, I do.

Q Mr. Ortore, are you prepared to talk about it?

A (Witness Ortore) Yes, I am.

Q This was a case where a particular aux feeder breaker failed to open?

A (Witness Ortore) That is correct.

Q And that occurred during a test or during operation?

A (Witness Ortore) That occurred while we were aligning the power towards the end of the second -- the fourth refueling outage for Unit 2, 2R4.

Q And you -- after it failed you disassembled the component?

A (Witness Ortore) Yes, we did.

Q And did you determine a root cause?

A (Witness Ortore) Yes, it was -- it appeared to be a misalignment of the trip-coil.

Q And how did that misalignment occur?

A That occurred during reassembly of the breaker when it was overhauled.

Q Now the documentation I believe states that there was a -- the procedure was not clear in some way as to how that alignment should be done, is that true?

A (Witness Ortore) Yes, the root cause was determined to be insufficient information in the procedure. However, this is an activity that's been performed many, many times at the plant and this was the first time that we've had a misalignment.

Q Okay. So, even though this procedure has been successfully applied many times you revised the procedure to make it more clear?

A (Witness Ortore) That is correct.

Q Mr. Vosburg, did you have something to add to that?

A (Witness Vosburg) Well, the point that I wanted to make was that sometimes you write procedures that are used repetitively correctly and what maybe correct to the majority of the people may not be completely clear to an individual. And I think in this case, where the procedure had been used repeatedly and correctly in the past, there was one individual using it who -- there was not enough detail probably in the procedure for him to understand exactly how to set it up. I believe that's what occurred

here.

Q So, that detail was provided?

A (Witness Vosburg) Right. So, we went back and enhanced the procedures to try to cover all the possibilities.

MR. REPKA: Okay. I have no further questions.

CROSS EXAMINATION

BY MS. CURRAN:

Q Mr. Vosburg, it states at page five of the exhibit that MPE-63.18 does not discuss a method for alignment of the breaker trip-coil. Do you -- does that seem correct to you?

A (Witness Vosburg) This statement?

Q Yeah.

A (Witness Vosburg) Yes, well, I --

Q Okay.

A (Witness Vosburg) -- I believe it's correct as written here, yes.

Q And can you tell me, in the summary of this document the word "vital" was used. Let's see, it's called a "vital bus H auxiliary feeder breaker", can you tell me why the word "vital" is used?

A (Witness Vosburg) Yes, we have three what we call the safety related buses that supply power to the plant. We have a bus F, bus G and bus H. Those buses have essentially

three power sources, what we call the auxiliary power source, a diesel generator and then a start-up power source. And "vital" is a term that we use synonymous with safety related in this case.

Q Okay.

MS. CURRAN: I don't have any other questions.

[Pause.]

If the Board has no questions, --

JUDGE BECHHOEFER: Yeah, I have one.

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: Maybe just to clarify whether there's a difference between a couple of numbers here. On page five, the statement is that,

"MPE 63.1A fails to discuss certain things."

On page 11, it seems to say that MPE 63.1C is going to be revised. I wondered why when there's a problem with whatever procedure 1A is you revise procedure 1C?

MR. ORTORE: On page 11, I think if you read down further there is a reference to 63.A and when the corrective action was actually performed they realized that that was the proper procedure. The procedure for overhauling rather than performing the maintenance.

JUDGE BECHHOEFER: Yeah. Well, will it become clear to the people who have to carry out the functions

then?

MR. ORTORE: I'm sorry, it all --

JUDGE BECHHOEFER: Pardon?

MR. ORTORE: It says down at the bottom that both procedures, it says, 63.1C and 63.1A will also be revised

JUDGE BECHHOEFER: Oh, okay.

[Pause.]

MS. CURRAN: Oh, this document is moved into evidence.

MR. REPKA: Oh, before I answer that, can I ask one more follow-up?

JUDGE BECHHOEFER: Oh, certainly, I'm sorry.

REDIRECT EXAMINATION

BY MR. REPKA:

Q Mr. Vosburg, was the procedure for this adequate, or Mr. Ortore, prior to that revision or inadequate?

A (Witness Ortore) In my opinion the procedure was adequate. This was performed many, many times like I said, without any problem. However, as Mr. Vosburg explained before, during our root cause analysis sometimes we tried to take, to look at every single possibility and make the procedures as good as they can possibly be.

MR. REPKA: Okay, I have no objection to admissibility.

JUDGE BECHHOEFER: Okay. Staff, no objection?

MS. HODGDON: No, objection.

JUDGE BECHHOEFER: Exhibit 130 will be admitted into evidence.

[MFP Exhibit 130 was received in evidence.]

MS. CURRAN: Our next exhibit is number 131, which is LER 1-92-015-00, dated September 11th, 1992.

DIRECT EXAMINATION

BY MR. REPKA:

Q Mr. Giffin, are you prepared to address this document?

A (Witness Giffin) Yes, sir.

Q Does this LER address a maintenance issue?

A (Witness Giffin) No, this LER does not address a maintenance issue.

Q What was the issue addressed in this LER?

A (Witness Giffin) The issue is that qualification files were not updated and maintained by the design engineering group.

Q So, was there any impact on any piece of equipment? Let me strike that.

Did this reflect any design problem with respect to a piece of equipment?

A (Witness Giffin) The way that I read this it is

all maintaining and updating seismic files, not with putting and changing equipment in the plant.

Q Maintaining and updating seismic files, is that a responsibility of the maintenance department or --

A (Witness Giffin) That's the responsibility of the design engineering organization in San Francisco.

Q Now this particular case where the design documentation needed to be updated, was the design of the as installed component acceptable?

A (Witness Giffin) In this particular -- they're talking about a boric acid tank level transmitter and the way I read this is that the transmitters were qualified when they went back and looked at them.

Q So, they just needed to update the qualification file, the documents to reflect that qualification?

A (Witness Giffin) That's correct.

Q You said that's correct?

A (Witness Giffin) Yes, I did.

Q Are there, as a result of this LER, are there any changes you could make to your maintenance or surveillance program that would prevent a similar recurrence?

A (Witness Giffin) No, there is not.

Q And would this qualification documentation issue in any way affect your maintenance on the piece of equipment that was at issue?

A (Witness Giffin) No, the files have nothing to do with how we maintain or keep something operating. It's just to make sure that the qualification file states what's in the plant.

Q Does this LER in any way have anything to do with plant material conditions?

A (Witness Giffin) In my opinion this has nothing to do with plant material conditions. It only has to do with paper files that are located in San Francisco, nothing to do with what's installed at the plant.

MR. REPKA: I don't have any further questions.

MS. CURRAN: Okay.

CROSS EXAMINATION

BY MS. CURRAN:

Q Yes -- was it yesterday or the day before yesterday, we were talking about the program at Diablo Canyon for reviewing DCM category 1 equipment and determining whether there were changes to the -- any changes to the maintenance program that needed to be made as a result. Isn't that true?

A (Witness Giffin) I believe we were talking about design criteria, yes.

Q Right. And let me just paraphrase it and you can correct me, that in effect the program is to review equipment specifications for class one equipment to make

sure that you haven't missed anything in there that would relate to maintenance and surveillance, is that a correct --

A (Witness Giffin) That's one of the reasons why the review is being done is the reconstitution or the design criteria being reviewed and looked at. One of the things that we're looking at is to make sure that the maintenance activities and surveillance activities go between the two.

Q And say for this class one equipment, isn't the starting place for making that kind of a review the equipment qualification records that are kept on the class one equipment?

A (Witness Giffin) I'm not sure how the engineering department is doing the review in San Francisco. They caught this themselves, so, apparently in their review process they found the error in their files and corrected it. So, they did find it.

Q What error are you speaking about?

A (Witness Giffin) The LER that you gave us for PG&E determined that the boric acid tank level transmitter was --

Q Oh, that's not what I was asking you about right now. I was just trying to --

A (Witness Giffin) Oh, I thought we were still talking about the exhibit.

Q Well, no, I'm trying to get a little more

information about this review program that you've already instituted on the class one equipment. So, when you did that review, the DCM review, or in the process of doing that review, isn't the source of the information that's relevant to you documentation that's kept by PG&E regarding the qualification of that equipment?

A (Witness Giffin) No.

Q No. What is it?

A (Witness Giffin) This documentation, in this particular example or exhibit --

Q I'm not talking about this particular exhibit, I'm asking you something else.

A (Witness Giffin) You're asking me a general question about all design criteria?

Q Yes. I'm asking you about the review that was referenced in your testimony on Thursday.

MR. REPKA: I think the question ought to be directed to this example, and the question ought to be as in this example is, we're trying to see if this example affects the maintenance schedule for the equipment at issue. That ought to be what the question is. Let's stick to the subject at hand here.

BY MS. CURRAN:

Q Well, what I'm trying to find out is whether or not there's a similar program in effect for seismically

qualified equipment as there is for class one electrical equipment as was discussed on Thursday? Maybe you can just tell me that?

A (Witness Giffin) So, the question is again, please?

Q Is there a program for review of seismic equipment of what do you call it, seismically qualified equipment that is comparable to the review program that was referenced in your testimony on Thursday with regard to MCR DCO-93-TNN-006?

A (Witness Giffin) I'm not sure if there's any programs such as you speak, but if you read the corrective actions in the exhibit --

MR. REPKA: Which exhibit, Mr. Giffin?

MR. GIFFIN: 131, the one we were talking about. It says,

"The Hosberry Report was reviewed to identify any other seismic qualification commitments. Files demonstrating qualification to the Hosberry earthquake have been established or updated as necessary."

So, I believe the engineering department has looked at the particular files that are referenced in this exhibit and this voluntary license event report.

Q But that was -- it was seen as a problem that that wasn't done immediately as it needed to be done, isn't that right?

A (Witness Giffin) It was determined that there was no problem. The problem was that the files weren't maintained. There was no problem in the equipment that was maintained and installed in the plant.

Q That's right, I'm not referring to that problem, I'm referring to the documentation problem?

A (Witness Giffin) Apparently there's a, as stated in the licensing event report, there was a concern that the files were not being maintained by the engineering department in San Francisco.

Q How would you get information, if you needed to do any kind of additional maintenance on a piece of seismically qualified equipment as a result of changes in seismic qualification, how would you get that information? Who would give it to you?

A (Witness Giffin) If -- to do normal maintenance on a piece of equipment doesn't make a difference whether it's seismic or not. Maintenance procedures will specify how to take it apart and how to put it back together. So, the seismic qualification does not matter when you're taking something apart or putting it back together. If I needed information I would contact the engineering department. But

I don't need it - that type of information I don't need in determining what maintenance is to be conducted.

Q Even if you found out that perhaps the wrong material had been used and needed to be replaced because it wasn't seismically qualified?

MR. REPKA: There's no foundation that that occurred here, so --

JUDGE BECHHOEFER: I'm not sure I understand that question.

MS. CURRAN: Uh-huh.

JUDGE BECHHOEFER: If the wrong material were found in a piece of equipment it would be the wrong material and they would replace it, wouldn't it?

MR. GIFFIN: Yes, sir, and in order to do that the engineering department would issue a design change memorandum that would tell me that what was in it should be replaced with that. And that's how I get information from engineering.

JUDGE BECHHOEFER: And you wouldn't have any way of saying, oh, gee, this thing has the wrong kind of stainless steel, it's obviously not seismically qualified, you wouldn't be able to tell it by looking at it, would you?

MR. GIFFIN: No, sir, I would not. I rely upon the engineering department.

MS. CURRAN: Well, that's the point, he couldn't

tell. That's the point that I think is important here, is that he needs to get that information from engineering which keeps this documentation.

MR. CROCKETT: Let me try to clear this up again. If there's a change to a piece of equipment that might affect its seismic qualification, that change is transmitted down to the plant through a DCN, design change --

JUDGE BECHHOEFER: Ms. Curran?

MR. CROCKETT: With this --

JUDGE BECHHOEFER: Ms. Curran, why would the maintenance person need to know anything about seismic qualification to know that it's the wrong piece of equipment?

MS. CURRAN: Well, shall we take an example, maybe it would help to go through an example?

JUDGE BECHHOEFER: Yeah.

MS. CURRAN: Okay.

BY MS. CURRAN:

Q Let me find one and then maybe we can -- okay, all right. On page five of 12, under "Other Issues", second bullet, it says,

"Position switches internal to various safety related valve motor operators were inappropriately designated as design class two."

And they should have been design class one, okay. Are your maintenance procedures different for class one equipment sometimes and for class two? Are they any more rigorous?

A (Witness Giffin) Yes, the procedures are different in some cases for class one and class two equipment due to the purchasing of spare parts, that's the only difference between the two procedures.

Q Would you explain that?

A (Witness Giffin) If you have a class one component and you're going to replace something in it you need to replace that with a class one component.

Q All right. So, this is information that whether something was class one or class two is information that you would want to have from the -- wherever you got it?

A (Witness Giffin) It's information that I get from the engineering department, yes.

Q Right. But if the engineering department had not kept this record correctly then you wouldn't have the information, isn't that right?

A (Witness Giffin) It is possible that, but in this case I believe that this issue is not -- does not impact the seismic qualification. So, in this issue it was not. In the last sentence in your paragraph.

Q Uh-huh.

[Pause.]

Well, how about the next bullet, let's go on to that one?

JUDGE BECHHOEFER: Where is it?

MR. GIFFIN: Still on page five?

MS. CURRAN: Yes.

JUDGE BECHHOEFER: Okay.

[Pause.]

MR. GIFFIN: Last sentence,

"This issue was not discussed further in this LER as there is no evidence that maintenance practices have impacted the seismic qualification of these operators."

BY MS. CURRAN:

Q But it also says that,

"As part of the design change process PG&E will verify the appropriate maintenance activities have been performed on these valve operators.",

doesn't it?

A (Witness Giffin) That's what it says.

Q So, that the failure of the engineering department to timely update the seismic qualification records on these components could have had an impact on your maintenance of those seismic components, isn't that true?

A (Witness Giffin) They could have, yes, but as

evidenced by this report, they did not.

Q Okay.

MS. CURRAN: I don't have any other questions on this.

JUDGE BECHHOEFER: Staff?

MS. HODGDON: No, I have no questions.

REDIRECT EXAMINATION

BY MR. REPKA:

Q Mr. Giffin, where was the responsibility for closing out this LER?

A (Witness Giffin) This is an engineering LER and an engineering non-conformance report and responsibility for closing this out was with the engineering foreman.

Q Okay and just to make sure I'm entirely clear here, the equipment that was installed in the plant was appropriate?

A (Witness Giffin) That's correct.

Q And the equipment was appropriately maintained?

A (Witness Giffin) That's also correct.

Q And the designation of seismic qualification was, as far as your treatment was concerned, it was appropriate?

A (Witness Giffin) That's also correct.

Q It's just a matter of the documentation file needed to be updated?

A (Witness Giffin) That's also correct.

MR. PEPKA: I have no further questions.

MS. CURRAN: I'd like to ask a follow-up question to that.

RECROSS EXAMINATION

BY MS. CURRAN:

Q Isn't it true, Mr. Giffin, that this review involved more than mere documentation, that some analysis had to be done to verify that this equipment was seismically qualified, isn't that right?

A (Witness Giffin) That's also correct.

Q Okay. So, it wasn't just a matter of writing something down that was already somewhere else, someone had to do a calculation and make a determination?

A (Witness Giffin) That's --

Q At least in some of the cases?

A (Witness Giffin) That's also correct.

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: In terms of operation, operational activity, is there any use made at all by the company of the seismic qualification files for a particular piece of equipment? In terms of every day running of the plant?

MR. GIFFIN: Every day running of the plant, from an operations point of view or a maintenance point of view, not to my knowledge. The engineering department may do

something with the files that I'm not aware of. I know that when you order a replacement part you check the files to insure that whatever requirements that were unique to that analysis were incorporated in the piece of -- or the components you bought. But the day to day operation, no, it could be used, however, when you replaced something.

JUDGE BECHHOEFER: Does the NCR staff ever audit the files that you referred to?

MR. GIFFIN: I don't know the answer to that.

JUDGE BECHHOEFER: The ones in San Francisco?

MR. GIFFIN: I don't know the answer to that.

JUDGE BECHHOEFER: Yeah.

JUDGE KLINE: If you'd been called upon to repair one of these level transmitters prior to the time that the seismic qualification documentation was remedied, would that have handicapped your repair effort in any way?

MR. GIFFIN: No, we would have repaired it using the equipment that was installed. I can't go out and do maintenance on something and change a component without the engineering department's approval. I can change like for like, part for part. So, in this case, if I had to replace one I would have had to have replaced it like for like. And if I --

JUDGE KLINE: You didn't need this documentation in order to do a repair?

MR. GIFFIN: That is correct, I did not.

JUDGE BECHHOEFER: Well, if you were replacing something part for part would it matter then what was listed as the proper part in your qualification files? If you had the wrong listing and you were replacing part for part, would you might order the wrong part?

MR. GIFFIN: Well, I -- if it's installed, as these were, and determined to be qualified, as long as I maintain those level transmitters the way they were it was all right. If I wanted to order a different level transmitter I couldn't do that, I'd have to get engineering approval and then they would have had to go through their files and tell me what else to buy.

JUDGE BECHHOEFER: Right. But if you wanted to order the same one and you picked -- happened to pick the one that was in your qualification file and ordered whatever it listed in that file, could that amount to a mistake because it might be different from the item actually in service?

MR. GIFFIN: Well, I don't usually -- when I order something --

JUDGE BECHHOEFER: Let's say you had to replace it or --

MR. GIFFIN: -- I don't go to the file, I go to what's in the plant and then I try to order that component.

And if for some reason somebody doesn't make that anymore then I find out what's a substitute, then I work with engineering to determine what's a valid substitute. So, I replace, try to replace what's in the plant. So, I -- the only time the file would be used would be if engineering was trying to find a substitute.

JUDGE BECHHOEFER: I see, okay. Do you have anything further? Any follow-up?

MS. CURRAN: Just one minute.

JUDGE BECHHOEFER: Okay.

[Pause.]

MS. CURRAN: I don't have any other questions and unless there are other questions we would move Exhibit 131 into evidence?

MR. REPKA: I'll oppose admission of this exhibit as having no bearing on maintenance.

MS. CURRAN: Well --

JUDGE BECHHOEFER: I want to hear what you have to say.

MS. CURRAN: Okay. In the LER itself, at least for one of the examples, it says that as part of the design change process PG&E will verify that appropriate maintenance activities have been performed on these valve operators. Now it may be that for in this particular instance that nothing changed in the maintenance program because it turned

out that the equipment was seismically qualified anyway.

I think the point here is that PG&E needs to have some process for incorporating this information into the maintenance program and verifying whether changes do indeed need to be made and that there is a shortfall here, a failing in that the engineering department did not do this in a timely manner. And there's no evidence that there's any systematic program to do a kind of review, the same kind of review that was done for the class one electrical equipment.

MR. REPKA: There's no evidence here of any maintenance failing and there's no evidence that says that the files are important to the day to day maintenance of the equipment.

[Pause.]

JUDGE BECHHOEFER: This one we don't think is relevant to the Contention, so, we will not admit this document.

MS. CURRAN: We would like to object to your ruling and offer this as a proffer of evidence of the inadequacy of the maintenance program at Diablo Canyon for the reasons that I stated a minute ago.

JUDGE BECHHOEFER: Right. Yeah, that's, I think anytime we reject a document I don't think you have to repeat it for the record, but you're welcome to.

MS. CURRAN: Okay.

JUDGE BECHHOEFER: You automatically can take exception to that without your so noting on the record.

MS. CURRAN: All right. The next category -- well, the next Exhibit is number 132, which is LER 1-91-021-00, August 28th, 1992.

JUDGE BECHHOEFER: Do we have this one?

MS. CURRAN: Oh, we don't have it?

[Exhibit 132 passed out.]

MR. REPKA: Does everyone have that?

MR. ORTORE: We're ready.

DIRECT EXAMINATION

BY MR. REPKA:

Q Okay, Mr. Ortore, this LER reports, does it not, an incident of a sheared motor pinion key in a Limittorque motor operator?

A (Witness Ortore) That is correct.

Q When did that sheared key incident occur? Not so much in time, but was it during a test or during operation of the operators?

A (Witness Ortore) That was found during a test while the unit was shut down for refueling outage.

Q And do we know why that the key sheared?

A (Witness Ortore) Yes, it appears that the key material was not hard enough or did not have enough

strength. In further discussions with the vendor the vendor believes that the key was of the proper material but has changed their design and is now using a harder or stronger material.

Q Did you look for any other similar sheared keys when this occurred?

A (Witness Ortore) Yes, we did look at other similar type actuators that could possibly have the same key and we changed all the Unit 2 keys as appropriate.

Q Did you find any more that were sheared?

A (Witness Ortore) Yes, we did, there were two other actuators that did have sheared keys and we did replace those.

Q Were those actuators operating or operable?

A (Witness Ortore) Yes, we found after our analysis that all the operators were operable to perform their safety function.

Q Indeed this was a voluntary LER, was it not?

A (Witness Ortore) Yes, this was voluntary. Again, sometimes we submit voluntary LERs just to let the NRC know what's happening in the different plants so that if they need to inform anybody they can.

Q Because of the generic implications where equipment is involved?

A (Witness Ortore) Correct.

MR. REPKA: I have no further questions.

MS. CURRAN: Okay.

CROSS EXAMINATION

BY MS. CURRAN:

Q Mr. Ortore, isn't it true that this defective key was only found through a mistake in the test -- the way the test was done, isn't that so?

A (Witness Ortore) The scenario that we went through that there was a miscommunication between the maintenance personnel performing the test and the operations personnel in the control room and as a result a much higher stress was put on this key than would normally be put on during normal operations.

Q So, that's true, it was a mistake in the test that led to this discovery?

A (Witness Ortore) I believe it was called a miscommunication.

Q The other motor operators that were also discovered to have defective keys, did they perform the same function or a redundant function to valve SI28809B?

A (Witness Ortore) No, they performed a completely different function.

Q Okay.

A (Witness Ortore) And they were found to be operable even with a sheared key.

Q Okay. On page three, it describes the -- how you determine that the motor operators, these other two motor operators were operable and it says,

"The motor operators were still capable of stroking the valves due to friction caused by contact between the motor drive shaft and a pinion gear."

Was that how the valve was supposed to work?

A (Witness Ortore) I guess the key actually just increases that friction, it just -- it's just a more positive lock for that -- where the pinion gear is around the shaft. And that's why I stated before that the valve operated even with the sheared key.

Q Right. And when you test these valves there was no pressure differential across the valves, right?

A (Witness Ortore) These particular valves are open prior to operation and they are -- the breakers are racked out, power is removed from the breaker and these valves are not used during operation of the plant.

Q They're just safety, they're just for use during an accident?

A (Witness Ortore) No, they are not used during an accident. They have no use during plant operation.

A (Witness Vosburg) They have no automatic function. If you had a large break LOCA, at some point

operators may want to close the valves after the accumulators had discharged. However, at that point there would be no difference in the pressure. So, it would be operating under the same conditions of no DP that were described here.

Q Are there any accident conditions under which these valves might be operated under high pressure?

A (Witness Vosburg) Not that I know of. As Steve stated, these valves at normal operation are open and the breakers for the -- just to insure that they don't close, the breakers for these valves are open. So, when the plant's normally operating there's no power to these valves to operate, to insure that they can operate.

Q So during, say a main steam line break, would that be the kind of accident where you might see high pressure through these valves?

A (Witness Vosburg) No, these valves -- on a main steam line break these valves wouldn't be operated.

Q Okay.

A (Witness Vosburg) Now we are talking about 8808A and B here, right? Okay, I just wanted to --

JUDGE KLINE: It's accumulator discharge --

MR. VOSBURG: Yes, 8808A, yes.

JUDGE KLINE: That's not true of 8809B.

BY MS. CURRAN:

Q Wait a minute. I'm talking about the ones that are mentioned on page three, which is -- which are SI28808B and 8808D.

A (Witness Vosburg) Yeah, those are the accumulator outlet valves, yes.

Q Okay. And what you said applies to those valves?

A (Witness Vosburg) Yes, that's what I was talking about when I said that, yes.

Q Okay. But as far as the first one that was found, is the same thing applicable to that? The same -- that it wouldn't be subject to high pressure during an accident?

A (Witness Vosburg) And the first one was?

Q 8809B.

[Pause.]

Oh, wait, I guess that -- now I'm confused because I thought there were two -- I thought there were three altogether.

JUDGE KLINE: It's a cold -- like isolation valve, 8809B.

MR. VOSBURG: There's a long analyis on 8809B in the back I wanted to do.

[Pause.]

Well, the function of 8809B is to close when we're transferring from a cold leg injection to a hot leg recirc mode. And to determine whether or not there's -- or any flow through the valve at that point, I'd have to review the

operating procedure to be sure. I believe the flow is secured when it's closed, but I can't state that for sure. I'd have to review that. I think the analysis however, shows that the torque that's applied to the pinion gear on the shaft that had the sheared key, to evaluate it that the force on the pinion and shaft would not be applied until the valve had closed. It was when the valve would then torque close, tightly close that the force would be applied and it could potentially slip. However, at that point the valve would be fully closed. So, I think that the analysis shows that the valve would close. As far as the DP, I would have to review the procedures to answer that for sure.

BY MS. CURRAN:

Q Okay. And finally, I'd just like to clarify that the sheared pins found on these valves were not found until -- well, let me retract that, were these valves the valves originally, or these motor operators the motor operators originally installed on this valve?

A (Witness Ortore) Yes, they were.

Q They were, okay. So, that the defect wasn't found until sometime later?

A (Witness Ortore) The sheared key was not, again, the vendor does not think that there was a defect there.

Q Right. Okay, the sheared key was not found.

MS. CURRAN: That's all the questions I have on

this. And if there are no --

MR. REPKA: A quick follow-up, just to put a coin on it.

REDIRECT EXAMINATION

BY MR. REPKA:

Q Does this voluntary LER reflect, in your opinion, a maintenance deficiency in any way?

A (Witness Ortore) No, not at all. With the exception of the miscommunication with operations during the test.

Q Thank you.

MR. REPKA: No further questions.

JUDGE BECHHOEFER: Staff?

MS. HODGDON: No questions.

JUDGE BECHHOEFER: I have a couple.

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: There's a statement first, page two, I guess, the second page that I got anyway, where it says that the miscommunication resulted from inadequate procedures. And then later on there's a statement on the last page, page 7 of 7, it's the last one,

"That maintenance procedures will be revised."

Could -- can any of you explain what the problem was with the procedures and how, if at all, they are or will be

revised?

MR. VOSBURG: Remembering back, I believe what the problems with the procedures was is that the control switches for these motors are the type that have a closed and then a center neutral position and then an open position. And the switch does not return to neutral but can be left in either the closed or the open position. Normally, when you close say for one of these valves, you close this valve, operators are supposed to return the control switch to the center position. If they leave it in the closed position, what happens is the valve closes and then it torques and the torque switches pick up and stop the valve from closing.

If you leave the control switch in the closed position and then go down to the valve and try to manually operate it, the first thing you do is, is on a Limittorque, is you lift the lever that disengages it and puts it in a manual operation mode. When you lift that lever, it relaxes those torque switches. So, if that switch is still in the closed position, it immediately picks up and tries to close the valve again. Well, the valve was already fully closed, so now it tries to drive it in a little further and it puts additional pressure on the key and that's where they feel the key was sheared from.

And so, I don't remember if there was a

maintenance procedure that coordinated the box that they changed to put this caution in. I remember that, I don't know if we changed the procedure, or put something out in our -- in what we call our standing orders on operation of these valves to highlight that point to the operators that these switches have to be left in the neutral position. So, I believe those are the procedures.

MR. GIFFIN: So, it's a note in both procedures so that it won't happen again. It's a note in the maintenance procedure to remind and also in the operator's procedure.

JUDGE BECHHOEFER: Right. And that has been done?

MR. ORTORE: Yes, that has been done.

JUDGE BECHHOEFER: I'm just wondering about some language on page 4 of 7, in paragraph 3B. There's a statement that the key material is inadequate. The key material is outdated, but it's still acceptable. Now isn't that somewhat of an inconsistency? It's all in the same paragraph.

MR. ORTORE: I think the reason is that the vendor -- they no longer use this material; however, they felt that it was still sufficient to perform its function. The outdated part was that that material is no longer used.

MR. GIFFIN: We felt that it wasn't strong enough and when we talked to the vendor he said it was, but he doesn't use that anymore, he uses a stronger material. But

he'd never say that the material that was in there wasn't strong enough. So, it is kind of confusing, but that's what it means.

JUDGE BECHHOEFER: Okay, thank you. Any follow-up on my questions?

MR. REPKA: No.

MS. CURRAN: One more question.

RECROSS EXAMINATION

BY MS. CURRAN:

Q Have you done investigations to determine whether these defective pins exist in any of the other motor operators?

A (Witness Ortore) We examined the design to make sure that this material was not used any place else and those operators that did have this material -- did have keys made of this material, all the keys were changed.

JUDGE BECHHOEFER: I guess we're through with that.

MS. CURRAN: Okay. If there's no other questions then we move Exhibit 132 into evidence.

MR. REPKA: No objection.

JUDGE BECHHOEFER: Okay. MFP Exhibit 132 will be admitted into evidence.

[MFP Exhibit 132 was received in evidence.]

MS. CURRAN: Okay. The next set of exhibits are, Exhibit 134, -- oh do you have -- you don't have -- you do have them?

JUDGE BECHHOEFER: Yes, we have that.

MS. CURRAN: Which is PG&E's reply to NOV dated August 5th, 1992. Exhibit 135, which is LER 1-91-004-02, special report 91-02-R1, diesel generator 1-1 failure to load within TS limits, dated July 29th, 1992. And Exhibit 136, which is NCR DC1-91-MM-N028, which is dated October 23rd, 1991. And then Exhibit 137, which is inspection report 92-16, dated July 7th, 1992. And Exhibit 137 was passed out yesterday in connection with the thermolag issue and so --

MR. REPKA: Does it have a thermolag number?

MS. ZAMEK: No, it's 137.

MS. CURRAN: Passed out as 137.

MS. ZAMEK: And I have one extra.

MS. CURRAN: Would you like to look at our extra copy? Okay.

[Document reviewed.]

JUDGE BECHHOEFER: Would the Mothers of Peace check Exhibit 134, we're not sure whether it's a missing page or whether page three should be page --

[Off the record.]

JUDGE BECHHOEFER: Back on the record.

MR. REPKA: Okay, MFP has introduced what's been identified as MFP Exhibits 135, 136 and 137. And the way I understand it, what was previously identified as MFP Exhibit 134, the PG&E reply to an NOV, that that document dated August 5th, 1992, MFP is withdrawing that one. And what I'd like to do is identify that document previously identified as MFP Exhibit 134 as PG&E Exhibit 27. And do the witnesses have a copy of all four of those exhibits in front of them?

MR. GIFFIN: Yes, we do.

MR. REPKA: Is everyone ready?

MR. GIFFIN: We, think so.

DIRECT EXAMINATION

BY MR. REPKA:

Q Okay, gentlemen, these documents together appear to address two separate issues, is that correct?

A (Witness Giffin) Yes, they do.

Q What are those two issues?

A (Witness Giffin) The two incidents are a 1991 loss of off-site power caused by a mobile crane coming in close proximity with a 500 kV line that was energized. The second is the final rigging and adjusting the lid on a rig shipping cast, and those are rigging incidents.

Q Okay, with respect to the first of those incidents, the 1991 loss of off-site power, was that event the result of a personnel error?

A (Witness Giffin) Yes, it was.

Q And was the error made by a person in performing maintenance work?

A (Witness Giffin) Yes, it was.

Q And were corrective actions taken?

A (Witness Giffin) Yes, they were.

Q Have you had any subsequent losses of off-site power?

A (Witness Giffin) No, we have not.

Q Or any subsequent cases of mobile crane booms coming too close to power lines?

A (Witness Giffin) No, we have not.

Q Did PG&E receive a notice of violation for that loss of off-site power event?

A (Witness Giffin) No, we did not.

Q Let me turn to the second of the two incidents, the incorrect chain-fall incident?

A (Witness Giffin) Yes.

Q Was that also an instance of personnel error?

A (Witness Giffin) That was an instance of personnel error.

Q Was that error made in the conduct of maintenance activities?

A (Witness Giffin) Actually not. They were -- there was a cask and they were putting the lid on it and

getting it ready for shipping. So, it was not performing maintenance on a plant system, on a -- no plant SSEs were having maintenance performed on them when this occurred.

Q And it was a case where the seating of the cask lid was not performed correctly?

A (Witness Giffin) Yes, what the -- the shipping cask has a lid that goes on it and it's a tight fit, it's like putting a glass stopper in a bottle and if it goes in at an angle then it won't, but it's a real tight fit. And they were putting it down and they had slings on it and the slings didn't have the cask lid level. It was sitting on it and they took two of the slings off and put two chain-falls on it to level it and then put it down in place. And it only had two more inches to go to seat.

Q So, was that two inch discrepency then identified?

A (Witness Giffin) Yes, it was. The issue was that the two chain-falls that were being used were one ton chain-falls and after we went back and looked at it they probably had about 2400 pounds on them, each, instead of the 2,000 pounds that the chain-falls were -- that the basic rating of the chain-fall.

Q And that error was the subject of a notice of violation from NRC?

A (Witness Giffin) Yes, it was.

Q And was PG&E's reply to that NOV, was that the

document that we've identified as PG&E Exhibit 27?

A (Witness Giffin) Yes, it is.

Q Now standing back and looking at these two separate incidents, the loss of off-site power and the incorrect chain-fall episode, are they related to each other in any way?

A (Witness Giffin) I don't believe they are. When we answered the notice of violation we added an enclosure where we stated that we did not believe that the two were related.

MR. REPKA: I have no further questions.

CROSS EXAMINATION

BY MS. ZAMEK:

Q I'd like to bring your attention to Exhibit 136, page 10.

A (Witness Giffin) Yes.

Q Mr. Giffin, you mentioned that the incident was the result of personnel error, but doesn't it also say that the foreman did not follow the accident prevention rules and did not recognize the electrical safety issues during job planning and execution?

MR. REPKA: So that the record is clear, can I ask what incident we're referring to specifically here?

MS. ZAMEK: The one in Exhibit 136, it's the loss of off-site power.

MR. GIFFIN: It's loss of off-site power, October, '91.

MR. REPKA: Thank you.

MR. GIFFIN: Or March of '91. It says the root cause is personnel error in that. I still stand by it was personnel error on the part of the foreman, crane operator mainly. The rigger just happened to be there. Regardless of what this says, it was the foreman and the crane operator's fault, not the riggers.

BY MS. ZAMEK:

Q Okay. And under contributory causes, the foreman was not adequately involved in the task. Would you consider that as part of the root cause?

A (Witness Giffin) We consider that as a contributory cause. So, --

Q So, they're different?

A (Witness Giffin) Yes.

Q I noticed in that event that there were other systems that were affected?

A (Witness Giffin) Oh, yes, when you lose off-site power, a lot of systems are affected. We lose all non-vital -- lights go out, things don't -- that used to be working, stop working because it doesn't have power.

Q There's a list here, I'm trying to find it on page five, under "D",

"Other systems or secondary functions affected."

It lists on the next few pages, up through page nine, it lists 18 affected systems. Can you read through them and then tell me which ones are significant to safety?

A (Witness Giffin) Sure.

[Pause.]

A (Witness Vosburg) Well, the first system listed is the auxiliary building ventilation system. That system's primary function is to, in the event of an accident, provide cooling to safety related pumps and motors located in the auxiliary building. In this case there was a failure of a capacitor in a power supply and I believe it's in the logic panel that controls that ventilation system and so the system did not restart when power was restored.

Q And that also is a safety significant --

A (Witness Vosburg) In this case there was no accident and there was a loss of off-site power, there was not an accident where you had to operate ECCS pumps and motors at all, let alone for long-term, long time periods with hot fluid in them. So, there was no safety connection there.

A (Witness Giffin) The second issue is not a safety issue even though the system is safety related, but ventilation mode just shifted to another mode.

[Pause.]

A (Witness Vosburg) In the control -- there's the emergency lighting system in the control room, there's a seprate inverter that feeds the emergency lighting for both Unit 1 and a different one for Unit 2. When this happened, and non-vital power was lost, the lighting on the unit, this is a common control room, and the lighting on the half of the control room that unit one is on, the emergency lighting did not come on. So that would be normal lighting supplied from that inverter. So there are, the lighting on the other side of the room was on, there was plenty of light in the control room and there was additional emergency lighting, battery operated lights that all come on in the control room when the back-up emergency isn't there.

MR. REPKA: Ms. ZamEk, do you really want to go down all of these?

BY MS. ZAMEK:

Q No, I do not want to go -- I just wanted you to kind of briefly go through and just say numbers one and five and six and --

A (Witness Giffin) In order for me to do that, or for Mr. Vosburg, we're going to read each paragraph, determine what the plant was doing and then make the decision.

A (Witness Vosburg) Some of them may be quicker.

Q All right, so maybe you can just get back with me tomorrow on that?

A (Witness Giffin) The licensing event report goes through the safety analysis and does what we're doing now. We can -- I'll go through it one at a time I guess.

Q All right.

A (Witness Giffin) Whatever.

MR. REPKA: I suggest we just let the document speak for itself on that because the safety analysis is there and --

MS. ZAMEK: There is a safety analysis here, so, okay, let's move on.

BY MS. ZAMEK:

Q Let's turn to Exhibit 137, regarding the chain-fall incident on page three. Well, I'd like to point out something on page four.

[Pause.]

Somebody said that these two incidents weren't related but I related them because in this inspection report, I quote,

> "The inspector acknowledged that two different groups of personnel were involved, but noted that both events appeared to involve weakness in the pre-planning and control of lifting or rigging activities."

Would you agree with that, that they are connected in that way?

A (Witness Giffin) No, I do not. And as I stated in our reply to the notice of violation, we took exception with that. And if you'll read even in this document it says the manager of maintenance services disagreed with that. I disagreed with it then, we disagreed with it when we sent in the notice of violation response and I disagree with it today.

Q Okay.

MS. ZAMEK: I don't have any further questions.

[Pause.]

MR. GIFFIN: There's one thing I'd like to add about this and it's the first event, the loss of off-site power event. As you go through that we did a couple of really -- we looked at this as soon as it happened, we were really concerned about the usage of cranes, that people could really be hurt. I mean 500,000 volts is a tremendous problem. We were in the middle of an outage. We stopped work on the outage for 24 hours and made the crews and their foremen get together and talk about safety. So, in the middle of this outage that we wanted to complete in 60 days or so, we stopped all the work so that we could stress the importance of safety and following the rules.

The plant manager and I and the outage manager all

talked to all supervisors that day and told htem hcw we wanted to get that information to their people. We instituted an event incident plan, I think, an EIT we call it, where we have a senior manager come down and look into this. The NRC sent an AIT to look into this. And when the AIT got on the site almost all the work had already been done for them so it made the investigation a lot easier.

We took this very seriously and I think that the corrective actions that we've implemented have been very good.

[Judges confer.]

JUDGE BECHHOEFER: Are these, any of these being offered at this time?

MS. ZAMEK: Yes, I was waiting to see if you had any questions. Yes, --

JUDGE BECHHOEFER: Pardon?

MS. ZAMEK: -- they're being offered into evidence.

JUDGE BECHHOEFER: Yeah, all except, I guess there's a Staff, 137 is a Staff.

MR. REPKA: I'd like to also offer PG&E Exhibit 27.

JUDGE BECHHOEFER: So, we have 134, 5 and 6 and PG&E 27.

MS. HODGDON: Judge Bechhoefer, I'd like to make

a --

JUDGE BECHHOEFER: Oh, no, not 130 -- let's see, 135 through 137, plus PG&E 27.

MS. HODGDON: Except not 137, it's a Staff document.

JUDGE BECHHOEFER: Yeah, yeah. 137 is still before us but it is not offered at this time.

MS. HODGDON: Judge Bechhoefer, I'd just would like to make an observation and that is with regard to the extended questioning about these incidents being related or unrelated. And that is in the Board's pre-hearing conference order of January 21st, 1993 in which it rejected Mothers For Peace Contention Two regarding personnel errors. That the Board made the observation -- the basis, amongst other things was this document that's offered in evidence as Exhibit 137, the Staff notice of violation.

It says that we agree that these incidents or statements represent unrelated and widely diperate personnel incidents that collectively do not appear to amount to a failure of either the personnel program or related training programs. Unlike the numerous incidents cited in Contention One that relate, for the most part, to the specific maintenance and surveillance programs, the incidents cited here have no apparent common focus. For that reason, we are rejecting Contention Two.

That's, I mean I don't know how the rule of the case applys to this, but it was and in any event all of these incidents were rejected as a basis for Contention Two.

[Pause.]

JUDGE BECHHOEFER: I was trying to see if we said anything about ones that might also be applicable to One.

MS. HODGDON: You did, but it didn't include those. You said --

JUDGE BECHHOEFER: That's what I wanted to check.

MS. HODGDON: -- to the extent that the CFCU was in maintenance but the personnel mistakes there should be considered in Contention One. Did you want a -- I have the unpublished version, I can't remember what page it was on.

JUDGE BECHHOEFER: That's what I'm reading.

MS. HODGDON: It's on page 26. What I was reading from is on page 30 and the part you want to find is right, the next sentence, "we note however". The second full paragraph on page 30.

JUDGE BECHHOEFER: Yeah, the note however is what I want to see what I said.

MS. HODGDON: Yeah, the note however is where you want it to start, I think.

JUDGE BECHHOEFER: Yeah.

MS. HODGDON: Where I left off.

[Judges confer.]

JUDGE BECHHOEFER: I'd like to inquire whether the Staff, in particular, but any party is objecting to these documents being put in under Contention One, notwithstanding the fact that we did not accept them as a basis for a separate contention and we did not specifically mention them either?

MS. HODGDON: You did not specifically mention?

JUDGE BECHHOEFER: These as specifically litigable under One.

MS. HODGDON: No, they were specifically excludable under Two, was my point.

JUDGE BECHHOEFER: Right.

MS. HODGDON: Not that they were specifically admissible under One.

JUDGE BECHHOEFER: Right, but this is sort of a grey area. I guess we just --

MS. HODGDON: My point was that it was not a grey area, that this Contention hasn't been rejected on -- for the rationale that because these documents did not support the theory now offered by Mothers For Peace. That's the reason this Contention Two was rejected. It seems odd that they should now come in for another when it's already specifically been found that these incidents were not related, particularly the one that's now said to be, the two that are now said to be related, the chain-fall incident and

the loss of off-site power event. Those were two of the incidents already considered by the Board and the Board found that there was no relationship between them.

JUDGE BECHHOEFER: To each other, but is there a relationship to maintenance and surveillance?

MS. HODGDON: I don't see it.

JUDGE BECHHOEFER: That's the question I'm raising, because it bears upon whether we admit the documents or not.

MR. REPKA: Let me state for the record that the witnesses have already testified that the incident regarding the chain-falls has no bearing on maintenance, it wasn't maintenance personnel and it wasn't a maintenance activity. The loss of off-site power did involve maintenance personnel. And I think the record is also clear that there's no relationship between the two events.

In the interest of time here, I'm not objecting to the admissibility of these documents and in fact move also that PG&E Exhibit 27 be admitted, but I would like to reserve the opportunity in findings to cite to the Board's prior ruling with respect to these events as an additional factor to be considered in addressing these particular documents.

JUDGE KLINE: I want to just observe that we are being flooded here with literally hundreds of pages of

documents a day. There isn't the remotest possibility that we can digest these documents as they're presented. And for that reason I would just prefer to be liberal in accepting them and not get into an argument. We are not screening effectively these documents, we understand that. There isn't any possibility that we could. So, my inclination is that unless they're just utterly out of the picture is to go ahead and take them. We're going to have to screen them later anyway.

JUDGE BECHHOEFER: Yeah, I might add that --

JUDGE KLINE: We're at a terrible disadvantage here because we've never seen these things before.

MS. HODGDON: Neither have we.

JUDGE KLINE: Yeah. And there's hundreds of pages a day. So, there's no point in making a pretense that we're really analyzing these things as they come in. We just can't be doing that.

JUDGE BECHHOEFER: Right. We are asking questions occasionally to see how they tie in to surveillance, maintenance, et cetera, which is the subject of the contention.

MR. REPKA: I would like to also state for the record, though, that the conduct of the proceeding is not exactly how we would have foreseen it back in January. I think it was clear that at that time that the incidents to

be relied upon would have been identified much earlier in the process so that we could have prepared direct testimony on those.

We are faced with a lot of information, a lot of documents. The witnesses have been doing a yeoman's effort not only on the witness stand but in advance and preparation for these hearings to filter through these documents and try to understand what they are.

We are trying, through as brief a cross examination as we can do, to do some kind of screening for the Board, but he also feel we are at a bit of a disadvantage by the conduct of the proceeding.

MS. CURRAN: Well, as long as yeoman's efforts are at issue here, I would like to -- I would like to commend Ms. ZamEk who has, as a nontechnical person, singlehandedly reviewed this mountain of documents in what I must say is a very short period of time.

Was not -- this schedule was not Mothers for Peace's choosing. We accepted it. It was a very limited schedule, and Mothers for Peace has attempted to collect and digest this massive information as quickly as they could. It was not our choice to do it in such a rushed manner, but PG&E seemed to be in a hurry to get this decision made. The Board wanted to make a decision, and here we are.

[Applause.]

JUDGE KLINE: All my comment is that we're making decisions that favor Mothers for Peace, I think, by liberal admission of documents, and I don't see how we can screen them more critically. However, I believe that had there been time we could have screened them more critically.

MS. HODGDON: Excuse me. If I may, just one other observation from the Board's pre-hearing conference order, and that is the sentence at the bottom of page 25 at the end of the ruling on Contention 1 where it says,

> "To the extent that MFP is asked to do so, however, it must identify prior to hearing all of the incidents on which it intends to rely on advancing and going forward with its contention."

MS. CURRAN: And that Mothers for Peace did.

JUDGE BECHHOEFER: Yeah. I did receive a very lengthy list of documents, which I didn't get through most of.

MS. CURRAN: And the documents were organized according to incident, and later on we provided --

JUDGE BECHHOEFER: To some extent.

MS. CURRAN: As soon as we could after that, we provided PG&E with a list of exactly what in those documents.

MR. REPKA: Just so the record is clear, I'm not

questioning anybody's effort by the Board, PG&E, the NRC Staff or anybody. The fact is we asked for an identification of incidents in our discovery requests very early in this proceeding. We were told on several occasions by Mothers for Peace that that couldn't be done yet, and we heard that several times.

In June, we received a list of documents, a very lengthy list of documents with no effort to show what exactly the incidents were. We could prepare our direct testimony only on the incidents we knew of.

With respect to the later identification of what the incidents were and how the documents related to those incidents, we got that only last week. Now, that document did, in fact, represent a tremendous effort by Ms. Curran, and we've noted that amongst ourselves many times, but the fact of the matter is we only got that last week and couldn't address them in direct testimony. So, you know, that's just the reason why we are where we are.

JUDGE BECHHOEFER: Right. And, of course, we didn't get this until we showed up here.

MS. HODGDON: Neither did we.

JUDGE BECHHOEFER: Right. So I'm not trying to fault or blame anybody, but we've tried to do our best in a very short time before the questioning to digest these documents. We would not have succeeded by any means, and

the questions we asked are often just what we see on the face real quick, and, if we thought about it a little more, we might have more. So that's the way --

MR. WARNER: And PG&E certainly concurs with Judge Kline's and the Board's sentiment, in terms of moving this process forward, and it's really only where the Board itself may identify on the face of a document that it does not relate to maintenance such as maybe in this chain-falls case that the Board itself may want to take that approach, but, Mr. Repka stated, it's important just to move forward, and we understand the approach in order to do this in as efficient a manner as possible.

JUDGE BECHHOEFER: All right.

[Judges confer.]

MS. CURRAN: Is there an objection on the table?

MR. REPKA: Not from me. I stated my position. I have no objection subject to the right to use the Board's decision later as a basis to argue as to the relevance and weight of the evidence.

MS. HODGDON: Well, I understood the Board to say that they would rather admit a relatively worthless document than to reject one that might not have anything in it that was relevant, and, on that understanding, I wouldn't object either with the caveat recited by Mr. Repka.

JUDGE BECHHOEFER: Well, the Board has decided to

accept this package, but note that we do perceive certain differences, particularly between loss of off-site chain-fall, and we may well treat them differently, notwithstanding that we're not going to take the scissors and try to cut out paragraphs dealing with one or the other.

We do find a difference and, of course, in proposed findings, the parties can deal with that. So subject to that, perhaps, caveat, we accepted those into evidence. Well, the Staff report is not before us right now, but, other than that.

Let me just go over the ones we're accepting. We're accepting PG&E 27, and I guess Mothers for Peace 135 and 136. Those documents are admitted into evidence.

[PG&E Exhibit No. 27 was received in evidence.]

[MFP Exhibit Nos. 135 and 136 were received in evidence.]

MS. CURRAN: Judge Bechhoefer, I just want to let you know, there's quite a few documents in the next topic. So, in you want to take a break now or later, it just may take a little while to get through the next topic.

JUDGE BECHHOEFER: Let's take our afternoon -- let's take our break for 15 minutes.

[Recess taken from 2:55 p.m. to 3:10 p.m.]

JUDGE BECHHOEFER: Are you, Mothers for Peace, going to rely now on more than -- I was looking at your road map -- 138 to 140?

MS. CURRAN: That's where I'm headed next?

JUDGE BECHHOEFER: Or does it go through 142?

MS. CURRAN: I'm sorry. Did you say?

JUDGE BECHHOEFER: It's 138 through, what is it, 142, the group?

MS. ZAMEK: Yes.

JUDGE BECHHOEFER: Okay. I just wanted to determine that.

MS. CURRAN: Yeah. Okay.

[Pause.]

MS. CURRAN: So let me go through these. The exhibits are Number 138, which is NCR DC 1-92-EM-N010, dated July 29, 1992; Exhibit 139, which is Inspection Report 92-05, dated April 17, 1992; Exhibit 140, a letter from Zimmerman to Rueger, dated April 16, 1992, enclosing Inspection Report 92-13, dated April 15, 1992; Exhibit 140-A, which is LER 1-92-002-00, dated April 3, 1992, and Exhibit 142, which is NCR DC 1-91-TI-N045, dated June 10, '91.

Exhibit 141 turned out to be a duplicate, so we admitted it.

MR. REPKA: Okay. We have those documents, and

I'd just like to point out for the record that Exhibit 140 is not an inspection report. It's a summary of a management meeting.

MS. CURRAN: Okay. Let's see. Oh, well, let's see here. Yeah. The reason that we called it an inspection report was it gave a report number, but maybe that's not an inspection report.

MR. REPKA: It has a report numbered 92-13, but it's not an inspection report.

MS. CURRAN: Oh, see here, over on the enclosure list on the back of the letter, on the back of the enclosure letter, it called it an inspection report.

MR. REPKA: Well, whatever. The cover letter says --

MS. CURRAN: I don't care what you call it.

MR. REPKA: The NRC can tell us what to call it, but --

MS. CURRAN: We don't care what you call it. Why don't you tell us, Ms. Hodgdon, what we call it?

MS. HODGDON: Excuse me?

MS. CURRAN: Why don't you tell us what we call this.

MS. HODGDON: Ms. Miller knows about this. I don't. What do you call this?

MS. MILLER: It's a management meeting, but our

tracking system is our writings on the document.

MS. CURRAN: Okay. So it's an inspection report. Can it be identified as an inspection report? Okay.

MS. HODGDON: It's, apparently, just a convenience.

MS. CURRAN: All right. With that in mind, let's move on to --

MS. HODGDON: It's an administrative detail.

MR. REPKA: Okay. Gentlemen, do you have those documents in front of you that Ms. Curran has identified?

MR. GIFFIN: I think so.

MR. REPKA: Whenever you're prepared to address them, you can give me a high sign.

[Pause.]

MR. REPKA: Who wants to take ownership?

MR. GIFFIN: I will.

MR. REPKA: Okay.

DIRECT EXAMINATION

BY MR. REPKA:

Q Mr. Giffin, there's a mass of documents here and a lot of pages. Is there a way you can spare us all a lot of reading and try to characterize what this all relates to?

A (Witness Giffin) There's two events that are in these documents. Including the management meeting, the management meeting is -- as you know, it's where we go and

talk to the NCR, and there's several issues, but there's one issue in here that corresponds to the others.

So that's in the main feedwater pump trip issue. So that these documents refer to main feedwater pump trip issues, a nonsafety-related piece of equipment, and there are two particular problems, one with the inverter for the power supply to the speed probes and one failure of a track and hold board so that if you lose, it will stay at the same speed. So those are the issues that are in these documents.

Q The second was a failure of a what?

A Track and hold board. I don't know what the number is. I guess it's 142, Nonconformance Report DC 1-91-TI-N045 142. That nonconformance report is -- because it's not a safety-related system, if we want to have a nonconformance, then, by management direction, in this case I directed that a nonconformance be written.

Q Okay. Was the problem with the track and hold board resolved?

A Yes, it was. It was just a component failure.

Q Now, with respect to the inverter to the power supply, I gather that that has a little more of a convoluted history?

A Yes, it does. There were several cases where -- I'm looking, trying to find a list of dates.

A (Witness Vosburg) Look at 138.

Q Well, forget the dates for right now. Just tell us, you know, in general terms what was the history of this inverter.

A (Witness Giffin) The diverter is a power supply to the speed probes for the feedwater pump, and, in an effort to make the pump more reliable sometime in the early '90s, late '80s, probably 1989, we put a modification in to have a power supply that had an inverter so it was a more reliable power supply.

There were several failures with this system, and we determined that it was less reliable. Then, the last time that it failed, we made some modifications so that it is a more reliable power supply now, but, in the management --

Q So what you have -- before you go on, what you had was we're trying to make a modification to make the component more reliable?

A Yes.

Q And then it turned out subsequent to that modification it, in fact, failed on more than one occasion?

A Correct.

Q And so, then, you continued to work on it until it was resolved?

A That's also correct.

Q And then did you ultimately achieve where you

wanted to be with that component?

A Yes. We have it now so that the power supply is redundant to the speed probes and from two different redundant -- to the speed probe -- the speed probes are redundant and a power supply for the speed probes is also redundant, and, if you lose power supplies from one pump, you can then use the power supply from the other pump. So we finally got to where we wanted it to be.

Q So, could I characterize this as putting in a -- making a component modification and then troubleshooting that component?

A Yeah. Yes. There was a tendency to try to make the design work instead of looking and reassessing the design. We waited too long and continued to try to fix it when it failed instead of just putting in a new design.

Q Was it a design issue with a revived component, then?

A Yes. It was a design issue.

Q Okay. And then you were going to refer to the management meeting. I think maybe --

A Yeah. It's the Mothers for Peace Exhibit 140, on page 3, section B, first paragraph, last sentence, Mr. Fujimoto, who is the vice president of our nuclear engineering construction services department noted that,

"Since the equipment had been redesigned

in February of 1989, there was a tendency to continue to try to make the new design work rather than reassess the design."

Q Did this whole -- this whole chronology with the inverter to the power supply, did that reflect a maintenance and surveillance issue in any way?

A Not in my opinion. It was that we just tried to make the design work, replacing components and troubleshooting and trying to find why it wasn't working.

Q Did you work with the vendor on this issue?

A Yes, we did. After about the second or third failure, we got the vendor involved, and he said, oh, there was a problem with the board. So he redesigned the board. Then we get involved with the vendor again, and he gave us another component and some more things to do. So we worked with him throughout this evaluations or throughout these evolutions.

Q Was there safety significance to the inverter failures along the way?

A No. The main feedwater pump is a nonsafety related piece of equipment.

Q So, was that part of the equation in deciding that you could continue to work on this design?

A No, I don't think so. We still wanted to make the

feed pump work. I mean, you do that for plant reliability. So the issue of whether it was safety related or not didn't come into play in how we addressed it.

MR. REPKA: Okay. I don't have new further questions.

MS. CURRAN: Okay.

CROSS EXAMINATION

BY MS. CURRAN:

Q You were saying, Mr. Giffin, that you installed this component, this inverter, as a means of improving the reliability or the operability of the -- I guess the feedwater system. Is that it?

A The reliability of the speed control for the main feedwater pump.

Q Okay. But when the component failed, when the inverter failed, it wasn't just that it failed and the plant continued to do what it needed to do, that there was -- power was lost to the main feedwater pump, right?

A (Witness Vosburg) Well, in one instance -- I believe there were two instances in there there are two inverters. If one fails, it will transfer to the other. There were two cases, I believe, there, where it did not transfer.

In the other failures, there was no real effect on the operation of the unit. One inverter failed. It

transferred to the other successfully, and there wasn't an impact other than the inverter failure, fixing the first inverter.

Q So, in other words, in this instance, there were two serial failures here? One thing failed, and then the next thing was supposed to --

A Yeah. The design is that such that if one inverter loses power, it will automatically transfer to the inverter for the other pump. There's two main feed pumps.

Q So they both went down?

A (Witness Giffin) No.

A (Witness Vosburg) Not both inverters. The one pump area inverter failed, and the transfer scheme to transfer the power to the other -- to the other inverter as a power source, the transfer mechanism didn't work.

Q Okay.

A So the one pump lost power to its speed probes.

Q And isn't it also true, as stated on pages 2 to 4 of Exhibit 138 that there are nine other occasions in which this inverter failed between 1990 and 1992.

A (Witness Giffin) Yes. It says there were nine failures.

Q Okay. And on December 3, 1991, it states on page 3, wasn't the seventh failure, didn't that also include a failure to transfer, just as had happened on the March 6,

'92 event?

A (Witness Vosburg) Well, the December 3rd event was 1991.

Q Uh-huh.

A Yes. And that was the first event where it failed to transfer to the other inverter.

Q So there was more than one event where there was a failure of an inverter and also a failure to transfer to the other inverter?

A Yes.

A (Witness Giffin) That's correct.

A (Witness Vosburg) Different causes, but, yes, there were two times when the transfer was not successful.

Q And that happened again -- oh, no. Never mind. Okay. Isn't it also true, as stated in section E on the bottom of page 10 of Exhibit 138, that a letter was written in February of 1986 addressing the potential for loss of both speed channels due to the loss of a single power supply?

A In 19 -- I'm sorry, where are you referring to?

Q I'm referring to section E on page 10 of Exhibit 138, which is at the bottom of the page.

A Yes. That was prior -- see, the initial design feed pumps, the power supplies, there were no inverters. It was just the power was supplied from a non-vital bus,

essentially, a lighting panel in the turbine building. That was recognized, and it's documented here, and that was one of the reasons that we looked at improving the power supply or the reliability of the design to put in inverters and this transfer capability to make it more reliability.

That's one of the things that went to -- you know, inputted to the decision to grade the power supply system.

Q Oh, okay.

A (Witness Giffin) Because the one that failed isn't the 1986 edition. It's the 1989-'90 edition.

A (Witness Vosburg) Right.

Q Do you agree with the NCR in Exhibit 139, page 6, that the inverter failure, the history of inverter failures is a long-standing problem at Diablo Canyon?

A (Witness Giffin) Where are you?

Q I'm in paragraph 3 under "Inspector Findings," in Exhibit 139 on page 6.

A Well, I can't find it, but I agree, as I said, there was -- we have nine failures. So it was a long-standing problem from 1990, when it first had a failure. The first failure was in May of 1990.

So, from then, until we replaced it, I'm not sure I'd say long-standing, but that's the period of time that we were having problems with the inverters.

[Pause.]

Q You were saying before that you kept trying to make this component work, right?

A That's correct.

Q Uh-huh. Do you have some kind of criteria for when you keep trying to make something work and when you start to take a work and reevaluate whether the component should be replaced?

A We don't have a criteria, per se, but if we have a problem that -- make sure that the engineering department, that the design engineers get involved quicker so that they can help us in this and work with the plant engineers.

In this case, the first two or three failures were -- the first failure wasn't a problem with the design. It was a problem of water intrusion. So that one we just said, okay. That's -- water got inside of it and failed.

The second one was a -- there was a fire or a high temperature inside that melted something, and we considered that that was an isolated event. So we really should have been more -- after the third failure is when we got the vendor involved, and that's when we started to think that we had an issue with the inverters.

Q So you agree this issue should have been dealt with earlier?

A Hindsight is 20/20, and if I had to look back at what I was going to do then now, I would have made a

different decision, yes.

A (Witness Vosburg) I guess, you know, dealt with earlier, it was being dealt with all along. We were working with the vendor and actively looking at a resolution to these power supply problems. I mean, the feedwater pumps and the feedwater control system is probably the single most cause of trips throughout the nuclear power industry.

So we're very sensitive to making sure that the P pumps are as reliable as possible.

Q You ultimately replaced these inverters?

A (Witness Vosburg) No, we did not. We changed where the inverters were getting their power from. The power supplies we made the source of, essentially, where you plug into the wall redundant. So it was a redundancy in the power supplies. We also the location of some of the components to assist the design better.

Q Was that an expensive change to make?

A I don't know whether it was expensive or not. I don't know how much it cost. I don't have the vaguest idea.

Q Do you agree with the TRG, which says on page 18 of 25 of Exhibit 138 that,

"In the previous failures, the reason that the power supply wasn't changed was because of money."

A I'm sorry. I'm trying to find where you are.

Q Page 18, Exhibit 138.

A I'm on page 18.

Q Paragraph L.

A I disagree with that. That's the minutes of the TRG, and that -- they don't make decisions on money. I make decisions on money, and the other managers make decision, not members of the TRG. That's just a comment that's not true.

JUDGE BECHHOEFER: Even if they don't make decisions, do they report what they believe is the case?

MR. GIFFIN: We expect them to do that, and we expect it to be an open discussion, and people put down what they think, and then we review that to determine what makes sense, and those that do get implemented, and those that don't, don't.

Sometimes, we're not -- we don't go back in and say that we disagree with these statements. They just -- it stays as it is.

JUDGE BECHHOEFER: I see. Okay.

MR. REPKA: Just so the record it clear, we're referring to minutes of the TRG meeting, and the items -- it states that they were the items. "We considered the following items." It didn't say that that's what they decided. If you look on page 17 of 25, the lead-in number 2 there,

"On March 19, 1992, at 9 a.m., the TRG reconvened and considered the following items."

MS. CURRAN: Mr. Giffin.

MR. REPKA: Excuse me for a second.

MS. CURRAN: I'm sorry.

[Pause.]

MR. REPKA: Go ahead.

BY MS. CURRAN:

Q Have there been any systematic or procedural changes made in response to -- as a means of correcting the delay in changing the power supply for this pump, for this inverter?

A (Witness Giffin) I don't believe there are any procedures involved. It's more of an education process that we need to make sure that our engineers understand that they're not there by themselves be that we have a complete, large organization that's there that exists to help.

So it's more of a reemphasizing that it's necessary to get the design engineering organization in a little quicker just because -- don't treat it that -- don't try to make something work that's not deserving to be made to work.

In other words, get some other people and say, "This doesn't look like it's worth -- let's try to get it

fixed." So it's not a procedural thing. It's more of a I want my engineers and my senior engineers to work more closely with the design engineering organization, and by doing that these types of timeliness issues don't come up as much.

Q When you refer to engineers, which engineers? Are they engineers in the maintenance department?

A I have engineers in the maintenance department as well -- then there are the design engineers as well. So my engineers in the maintenance organization work with the craft to assist the craft in the technical parts of their job.

The design engineering organization is in San Francisco, and they're responsible for designing and providing the plant staff and different design, and by having the two organizations work together, then we can get a new design in quicker.

Q That's kind of an informal process at this point. The change is an informal one. You've spoken to your staff, is that it?

A We continue to emphasize the necessity of working with the two -- the organizations working with each other to try to improve communications. We do it at the plant staff as well as the engineering department does it in their organization.

MS. CURRAN: Okay. Thank you. I don't have any other questions.

MR. REPKA: I'd like to follow-up quickly.

MR. GIFFIN: Before you -- there may be, and we'll check on this, but there's -- I think I said that we kept the inverters and tried to fix them. Dave was looking through this. We probably replaced them with something else, but we'll check to make sure, but, in either case, whether we did major repairs on the inverters or replaced them, the problem has been resolved.

REDIRECT EXAMINATION

BY MR. REPKA:

Q Mr. Giffin, Ms. Curran characterized the history of this issue as involving a delay. The way I understand it, couldn't it be better or differently characterized as -- strike that.

Throughout the course of this, isn't it true that you were working on it all the time?

A Oh, yes, we were. If you go through the chronology, each time that it failed, we worked on it; we worked with the vendor, trying to figure out what and why and what we had to do to make the system work as we wished it to.

So it wasn't that we were sitting waiting for it to fail again. Like I said, I guess, in hindsight, I would

have done something different.

A (Witness Vosburg) I think, yeah, the shortcoming was not giving up on those inverters soon enough. We kept working with the vendor trying to fix the problem thinking we had, and we didn't.

Q The engineers working on this issue, you've referred to the two engineering organizations. We they your maintenance engineers or the engineering department in San Francisco?

A (Witness Vosburg) Initially, they are the engineers in the plant, the plant maintenance engineers, and then, as we got more into it, after about the third failure, that's when we involved the design engineers in it as well. The first failure was, you know, the water intrusion. The second failure we believed to be an isolated event.

Then, after that is when we got the design engineers, and the two groups worked together. It's not that the engineering organization was not aware of it.

MR. REPKA: On the document that's been identified as MFP Exhibit 138, page 24, item G, it states that,

"Any CS electric engineering will issue a departmental memo to describe the event as a lesson learned."

Do you know if that's been done?

A It says that -- ECD is Estimated Completion Date.

The estimated completion date was over a year ago. So I would assume that that action had been completed.

MR. REPKA: I don't have any further questions.

JUDGE BECHHOEFER: Staff have any questions?

MS. HODGDON: No questions.

JUDGE BECHHOEFER: I'm not sure whether I missed something here, but, on Exhibit 139, the cover.

MR. GIFFIN: 139, yes, sir. Just the cover letter, the Staff talks about apparent weaknesses in maintenance. Now, can those weaknesses be traced to a programmatic weakness.

MR. REPKA: That reference is to the backdraft damper issue, which is a different issue.

JUDGE BECHHOEFER: Oh.

MR. REPKA: Which we addressed elsewhere.

MR. GIFFIN: We talked about that one yesterday, I believe two days ago.

JUDGE BECHHOEFER: Oh, okay. Okay. Forget that question, then. I didn't track it.

[Judges confer.]

JUDGE BECHHOEFER: Okay. I guess the Board doesn't have any further questions, since my question relate to an earlier topic. What does -- some of these are staff documents, but what does -- do you plan to move in the others?

MS. HODGDON: We're moving in Exhibits 138 and 140-A.

MR. REPKA: And 142 also?

MS. HODGDON: No. 142 we're not going to move.

MR. REPKA: In the interest of time and expediency, I'm not going to object to these. With respect to the weight of the exhibits, however, I would point out that this is primarily, as the witnesses have testified, a design issue and one that relates to a nonsafety-related system.

MS. HODGDON: Whenever you're ready to move on, Judge Bechhoefer. Oh, I'm sorry. You haven't ruled on these.

JUDGE BECHHOEFER: I haven't ruled yet. I guess it's only two documents I've ruled on right now, 138 and 140-A, and absent a formal, express objection, at least, we accept those two documents into evidence.

MS. HODGDON: Okay.

[MFP Exhibit Nos. 138 and 140-A were received in evidence.]

MS. HODGDON: All right. The next exhibits are Exhibit 100, which is NCR DCO-92-MM-N022, dated January 4 -- oh, my goodness. I'm in the wrong place. Okay.

MR. REPKA: Backwards is one direction I don't

want to go.

MS. HODGDON: No. Believe me, I don't want to go that way either. Okay. I'm on Exhibit 144, which is LER 1-92-005-01, dated July 20, 1992; Exhibit 145, which is NCR DC 1-92-PI-N020, dated June 24, 1992; Exhibit 146, which is LER 1-91-013-00, dated September 6, 1991.

Exhibit 147, which is LER 2-91-001-00, which is dated August 13, 1991; Exhibit 148, which is NCR DC 2-91-TI-N062, dated August 9, 1991; Exhibit 149, which is LER 1-91-006-00, which is dated April 25, 1991, and I'm reading the road map. This must be 149-A? Okay. 149-A, which is NCR DC 1-91-EM-N041, dated April 25, 1991; Exhibit 150, which is LER 1-90-019-00, dated January 28, 1991, and Exhibit 151, which is LER 2-90-004-00, dated May 17, 1990.

JUDGE BECHHOEFER: Are you doing anything about 150-A?

MS. CURRAN: I must have missed that. Exhibit 150-A is NCR DC 1-90-WP-N093, dated January 18, 1991. I read 151. Oh, there's a 151-A? Okay. Exhibit 151-A is NCR DC 2-90-TI-N025, which is dated October 11, 1990.

JUDGE BECHHOEFER: So we've got 11 documents right now. Oh, the reporter advises us that you did not mention 146-A.

MS. ZAMEK: 146-A is NCR DC 1-91-TI-N068, October 3, 1991.

[Pause.]

JUDGE BECHHOEFER: So my earlier remarks are changed to make it 12 documents. It's better than 11.

[Pause.]

MR. REPKA: Whoever gets the short straw over there.

MR. VOSBURG: Yeah. I think I'm, in general, familiar with the majority of the documents.

DIRECT EXAMINATION

BY MR. REPKA:

Q Okay. These documents seem to relate to a number of Containment Ventilation Isolation or CVI signals?

A (Witness Vosburg) Yes, they do. They're all related to events that caused a Containment Ventilation Isolation.

Q So every time this occurs, that's reportable by an LER to the NRC?

A Under present day -- under 10 CFR 5072 and 73, as it stands today, not all of these would necessarily be reportable. During the time that these occurred, however, they were reportable. There was a change to the law last year, I believe in October, that changed the threshold for reporting CVIs due to the -- again, as we discussed earlier, it's a fairly benign event, and the number of reporting events throughout the industry that I think were being sent

into the NRC.

Q So each time you had a CVI, there was an LER and also an NCR that corresponds?

A An NCR, yes. A TRG and an LER.

Q So, if I'm reading this correctly, the 12 documents, then, would equal six separate CVIs? There seems to be one LER and one NCR for each?

A I count of seven separate events that are covered by these --

Q Okay. So it's a number of events, but they're all unrelated?

A Yes. They are all unrelated, other than that they all deal with CVIs. Of the seven events, six of the events dealt with personnel working in the plant and causing an arc to be generated on one of the vital instrument buses. Anywhere in the plant it can occur, and these rad monitors that put this system into its safety-related mode are extremely sensitive.

They're extremely sensitive to the power supplied to them, and if there is any noise, electrical noise, generated, it can cause them to go into their safety-related mode and cause a CVI, and most of these, except for one case, were related to personnel working in the plant, both maintenance personnel and general construction personnel and things like they're working inside a panel. They have a

pair of pliers, and they pump a te. ? nal, and it causes a little spark, and that sets the rad monitor off and causes a CVI.

The only one that doesn't really, I guess, fall into that category is of a personnel error where they were working was Exhibit 149, and that simply dealt with a failure of the motor that's associated with RM 11, which is one of the rad monitors that actuates the system.

When they started the motor, the pump that the motor deprive seized, there was an arc in the motor, and, again, it spuriously initiated a Containment Ventilation Isolation.

Q That arc rated some electrical noises, which causes --

A Again electrical noise, yeah.

Q -- the CVI?

A For example, even normal operations such as switching in the 500 yard, it's probably three-quarters of a mile from the plant -- these are the big breakers that control the routing of the power leaving the plant, just opening and closing those breakers that far away in the past has set these rad monitors off.

Q You've stated before that a CVI is relatively benign?

A Yes.

Q What do you mean by that?

A In terms of any significance to -- with respect to safety or a challenge to the operations crew, as I stated before, there's about eight or ten valves associated with a CVI. They're all containment isolation valves, one in -- every penetration that goes through the containment has a valve on the inside and the outside that closes when it gets his CVI signal to close off the containment.

Normally, the majority of these valves are closed when the unit's at power. The only ones that we operate with open are the ones that supply a sample of the containment atmosphere outside to these rad monitors that we're talking about.

When you have a CVI, it closes those valves, and that's, really, the only active component that moves in the plant when you have those.

Q Could a CVI cause a transient?

A No, it could not.

Q And do these CVIs, could they result in any wear and tear on equipment?

A No. Again, the valves are designed to actuate hundreds of times, and probably a valve that sits there and is never stroked is probably less likely to perform correctly than one that is actuated periodically. So there's really no significance as far as wear and tear on

the equipment from these CVIs.

Q At Diablo Canyon do we have a problem with personnel errors causing CVIs, a systemic problem in any way?

A We had had cases where people working in the plant have caused CVIs. If you read through these there's things like they're working in a panel, and they have a screwdriver. It's a type of screwdriver that's designed to hold the screws so they can put it in. It falls, and it hits something in the panel and causes a little arc on the terminal strip.

There were cases, as I talked about, where a GC personnel was working, and he accidental bumped the terminal strip with his pliers. So there are those type of occurrences. INC does an awful lot of work in the plant where they are working on energized instrumentation, and, inside the panels, there are places where you have to be careful that you don't, you know, draw an arc anywhere and touch anything, and, occasionally, it does happen.

Q Is there training or any other measures to try to minimize CVIs?

A Well, it's in the training of, you know, the general work practices that people are expected to follow when working inside these panels. There are policies, for example, the reason some of these are deemed to be personnel

errors is that, normally, when you work inside a panel with a pair of pliers, you'll tape the pliers to keep this from happening.

In this one case, the GC, General Construction person who is working there, did not take the pliers. So this happened. So there are -- as part of the training of INC techs, maybe one of you can speak more authoritatively.

A (Witness Giffin) After one of these things occurs, as Mr. Vosburg said, we have a nonconformance report, which generates why did it happen. Then we look at those root causes and try to implement some corrective actions to prevent it.

We include those items if it's of interest to the entire INC department. Then we issue a bulletin, and we talk to the department about it. Routinely during quarterly updates, we train maintenance personnel about those events which would go on in the plant, and give them the lessons and what could we do and things like taping -- taping pliers, if -- you know, put some rubber barricades.

We've also, besides just training, the rad monitors that are in here that caus[illegible]he CVI, as David said, were kind of sensitive. We have an we're in the process of installing a new digital radiation monitoring system, and these components, RM 14, 28 and 11, which were causing these CVIs, no longer do that function anymore, and a more easier

to work on more sensitive RM 44 and 44-A are now the instruments that cause it.

So some of these problems with the sensitivity to voltage transients that were causing CVIs before won't cause the CVI again.

JUDGE SHON: What were they earlier, just count rate meters? Were they just count rate meters or things like that?

MR. VOSBURG: Yes. They are radiation monitors that have --

JUDGE SHON: Yeah. The CRM.

MR. GIFFIN: Yes. Right.

JUDGE SHON: It's a CRM with some sort of a relay on it?

MR. GIFFIN: Yes.

MR. VOSBURG: Yes.

JUDGE SHON: They bounce all around.

MR. VOSBURG: They bounce around, and if they happen to hit an alarm setpoint, it trips a bi-stable, and it initiates the CVR.

MR. REPKA: I have no further questions.

MS. ZAMEK: I do.

CROSS EXAMINATION

BY MS. ZAMEK:

Q Mr. Vosburg, are you trying to tell me, then, that

CVIs are no problem whatsoever, and it doesn't matter whether they occur or not?

A (Witness Vosburg) No, I'm not. We take all these very seriously. Again, as you look at the documentation, a lot of it produced as a result of a Technical Review Group that met to determine the causes of these personnel errors and inadvertent CVIs, we do spend a lot of time looking spoke this and trying to come up with root causes and corrective actions to prevent it.

Q Okay. Is it an ESF?

A Yes, it is.

Q And similar to the other ones we were talking about?

A Similar in what way? There are various Engineered Safeguards Features destined into the plant. This is a ventilation system.

Q Okay. You said earlier about the ESF, the earlier ESF being a problem was that, because, when it happened, you had to fill out all these forms, the NCRs, the LERs, and the TRGs, and now you say that you don't ever have to do that for the CVIs. Is that true?

A Spurious -- as I said, the federal law was changed last year to reduce the threshold for which you have to report these, and it was mainly changed, to, I believe, eliminate the reporting of spurious CVIs. I'm not sure what

exactly without reading the Code of Federal Regulations, how they define "spurious," but I know they did relax the report requirements.

Q So that means if it's a personnel error it's no longer reported?

A No. I can't say that. I don't know if that -- exactly what the records are in the Code of Federal Regulations.

A (Witness Giffin) Let me interject one thing. Whether it's reportable if we have a personnel error that causes an actuation of something, it doesn't matter whether it's reportable or not. We will still investigate why a person made a mistake and make whatever changes are necessary.

Reportability are not -- because, as you know, most of these issues that are being brought forward today are not items that are reportability to the NRC.

Most of these are all documents which we do ourselves, and we don't have to -- no reportability is required, but we still take actions ourselves. So reportability is not an issue.

JUDGE BECHHOEFER: So you prepare an NRC if something like that happened?

MR. GIFFIN: Yes.

MR. VOSBURG: One of the -- yeah. Any time you

have to make a report or write an LER, you will always have an NCR, but we have NCRs --

JUDGE BECHHOEFER: Yeah. But this where you don't need an LER, presumably.

MR. VOSBURG: Yes. We write NCRs for many other things that aren't reportable, though.

JUDGE BECHHOEFER: Yeah. And this would continue to be one.

MR. VOSBURG: Yes.

MR. GIFFIN: Yes.

MR. REPKA: And that should be quite clear from all the conduct of the proceeding. There are many, many NRCs.

JUDGE BECHHOEFER: But I was just conferring that these type continued to be prepared.

MS. CURRAN: You're not testifying, are you, Mr. Repka.

MR. REPKA: Just observing.

BY MS. ZAMEK:

Q You made mention of the overly-sensitive system. Is it in your testimony -- I was looking on page 69 on the radiation monitoring system, the upgrade. Does that have anything to do with this system?

A (Witness Giffin) That's the -- when I said that we were replacing; we're putting in a new radiation

monitoring system?

Q Uh-huh.

A This project, yes.

Q And that's scheduled to be completed by 1995?

A Yes.

A (Witness Vosburg) Well, there are many rad monitors in that system that are being replaced. Some have already been replaced. Some are being replaced now. The rad monitors associated with the CVI, RM 11 and 12 in particular that we're talking about, I believe, are already replaced.

A (Witness Giffin) RM 44 and 4-A have been installed.

A (Witness Vosburg) Now have the CVI function, but not with the old monitors.

Q Exhibit 146-A on page 11, on the very first sentence, it says that,

> "It was determined that CVIs occur more frequently at DCCP than at any other U.S. power reactor. However, due to differences in reporting and interpretation of an ESF, the number of other CVIs at other plants may not directly correlate to the number of CVIs at DCCP."

A (Witness Vosburg) Well, I guess that tells me that there is some room for interpretation of 10 CFR 5072 and 73, and that we tend to report more of our CVIs than, maybe, other plants. They may interpret the regulations differently and not have the same threshold for reporting we do. I don't know if that's true, but that's what that says to me.

Q But can I assume, then, that there are numerous CVIs that have occurred at DCNPP?

A Oh, yes. I mean, we just looked at several here, and, as I stated, there are others in the past history, and simply switching in the 500 kV arc can set off the old monitors. That can't happen now, but, historically, years ago, that did occur.

Q In Exhibit 150-A, page 7, under "Previous Similar Events," can you assume that this has been in occurrence since 1986?

A Well, this specific event, I don't know what caused it. I assume it to be similar as the other inadvertent CVIs we're talking about, and yes, you can assume that.

MS. ZAMEK: I don't have any further questions.

JUDGE BECHHOEFER: Staff?

MS. HODGDON: No. No questions

[Pause.]

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: Let me ask one question here of, perhaps Mr. Giffin but maybe not. On Exhibit 150-A, front page last paragraph, first sentence, what's the significance of the nondistribution that was referred to in that paragraph? Does that in itself constitute a problem?

MR. GIFFIN: Let me look and see what --

MR. VOSBURG: This was the event I referred to where a general construction person was working and caused a particular CVI, and rather than -- I think what we did here is we went back and took some of the previous maintenance bulletins that the plant had written concerning some of its CVIs and made sure that the GC personnel had those so they could also learn from past experience.

MR. GIFFIN: During the performance of this one, this work that occurred while this CVI happened was the modifications for -- to put in the new radiation monitoring system. That work the maintenance crew did not do. That work we had general construction contract electricians do.

After this occurred, like Mr. Vosburg said, they had one. We wanted them to be able to benefit from all of the lessons that we had learned instead of learning each one by themselves.

JUDGE BECHHOEFER: I see. So, is your general construction division or office now on the general

distribution list for maintenance bulletins.

MR. GIFFIN: Yes, they are.

[Judges confer.]

JUDGE BECHHOEFER: That's all the questions the Board has on these.

MR. VOSBURG: I would like to just make, as a clarification, I'm not sure it matters or not --

JUDGE BECHHOEFER: Please do.

MR. VOSBURG: When I said earlier that there were seven events, I counted the first one twice. It was on two pages, and there were really six events.

JUDGE BECHHOEFER: I think that confirms Judge Shon's earlier observation.

MS. ZAMEK: At this time the Mothers for Peace would like to offer the following exhibits into evidence: 144, 145, 146, and 146-A, 147, 148, 149, 149-A, 150, 150-A, 151, and 151-A.

MR. REPKA: No objection.

MS. CURRAN: No objection.

JUDGE BECHHOEFER: I'm just checking. None of these are Staff documents.

MR. REPKA: There are not.

[Pause]

JUDGE BECHHOEFER: Okay. Okay. The Board will accept those documents into evidence.

[MFP Exhibit Nos. 144-151-A were received in evidence.]

MS. CURRAN: Okay. Shall we go on? The next exhibit is 154, which is LER 1-92-004-00, dated May 20, 1992.

[Pause.]

JUDGE BECHHOEFER: There's just one.

MS. CURRAN: There's just one piece of paper, Exhibit 154.

JUDGE BECHHOEFER: Oh, okay.

[Pause.]

MR. REPKA: Mr. Vosburg, are you ready?

MR. VOSBURG: I'm close.

MR. REPKA: Okay. This looks like one of your issues to me.

MR. VOSBURG: Operations.

[Pause.]

MR. VOSBURG: Okay. I think I can discuss this.

DIRECT EXAMINATION

BY MR. REPKA:

Q This exhibit that's been identified as MFP Exhibit 154 is an LER?

A (Witness Vosburg) Yes, it is.

Q And it addresses a turbine trip subsequent reactor

trip?

A Yes, it does.

Q Can you tell me a little bit about what happened here?

A Yes. Unit 1 was curtailed to 50 percent power to do some, I believe, work on a main feedwater pump. In the process of clearing the main feedwater pump, operations had trouble with taking the pump out the service such that they started to lose vacuum in the main condenser.

The main feedwater pumps exhaust the steam that drives the turbine exhaust to the main condenser, and there's a ceiling steam system on the shafts of that turbine. When they were taking that ceiling steam system out of service, they began to experience air leakage into the turbine -- or into the condenser, I'm sorry.

If you -- and that causes a degradation in the vacuum in the condenser. If the degradation continues to a certain point, it will cause a turbine trip and a reactor trip. Operations was concerned. They thought that they may have a trip about to happen.

We have a backup pump called a Nash vacuum pump. It's a motor-driven pump that will pull a vacuum on the main turbine. They sent an operator down there to put that pump in service as soon as possible.

The way that pump operates, it has a ceiling water

system in it that without that ceiling water system it won't function as a vacuum pump. The operators went down to put the pump in service. They did not cut in the ceiling water to the vacuum pump, and when they then open up the line from the condenser to that vacuum pump, it allowed air to be drawn back through the vacuum pump into the condenser, made conditions worse. Vacuum continued to degrade&it caused a turbine trip reactor trip.

Q So this trip occurred because of the actions of operations?

A Yes, I did.

Q And were those actions in any way related to maintenance and surveillance activities?

A No, they were not.

Q So they weren't performing maintenance?

A No. They were placing the Nash vacuum pump into service and they did it incorrectly.

Q Were they performing an STP?

A No, they were not.

JUDGE SHON: What started the degrading that connects the vacuum to begin with? Do you know -- that happened during maintenance, didn't it?

MR. VOSBURG: No. It doesn't happen during maintenance. It happened while operations was clearing -- to pre re for maintenance, they have to shut it down. They

have to close the large butterfly valve in the discharge of the turbine to the condenser and take the shaft ceiling steam out of service, and it was during that operation, and I don't know exactly what problem they had had caused it.

They began to -- they created an air-in leakage path into the condenser while clearing the turbine.

JUDGE BECHHOEFER: The air ejector couldn't keep up with it, so you started --

MR. VOSBURG: Oh, yeah. This was a fairly large unit. Yeah. The air ejectors did not keep up. So they had a degrading vacuum condition in the condenser. So they sent the operator down to put the vacuum pump in service.

BY MR. REPKA:

Q In this chronology of events, were there any component failures that occurred?

A There is a -- on the line that goes from the condenser to the Nash vacuum pump, there is a check valve in that line to prevent flow of air back to the condenser from the Nash vacuum pump. That valve was determined to be leaky, and so when they improperly placed the Nash vacuum pump into service, it allowed air, of course, to flow back through the pump to the condenser through that check valve, through the leaky check valve.

So it contributed, then, to letting more air into the condenser.

Q Was the leaky check valve operable?

A Operable -- it's not a safety-related component. It did leak. There's no what's operable, what's not. There's not a surveillance test that you would perform on a component like that. It did not -- you know, it allowed air to flow back through it to the condenser.

Q Do you think there should have been any surveillance performed on that valve?

A On the check valve?

Q Right.

A A surveillance test?

Q Or any other kind of test?

A It's a secondary nonsafety-related component. You don't normally ever use a Nash vacuum pump. As the Judge stated, we have steam air ejectors that are normally in service to maintain the vacuum in the condenser. So it's not a component that you'd expect to rely on at the plant operating.

It's used mainly for start-up, when you first start up the plant to initially pull a vacuum into the condenser, and it alone is not capable of maintaining vacuum low enough in the condenser to operate the plant. You still need the steam air ejectors.

Q Following this incident, was the check valve fixed?

A Yes, I --

A (Witness Giffin) In both units, they're inspected and repaired.

Q Okay. Does this LER in any way undermine your confidence in maintenance and surveillance activities at the plant?

A (Witness Vosburg) No.

A (Witness Giffin) No, it does not.

MR. REPKA: I don't have any further questions.

CROSS EXAMINATION

BY MS. CURRAN:

Q Was the condenser vacuum pump being used when this event occurred?

A (Witness Vosburg) At the beginning, when they were clearing the main turbine or the feed pump turbine?

Q Uh-huh.

A No, it was not. It's not normally used when the unit's on-line.

Q Was it used at any time during this event?

A They attempted to use it, but because they improperly put it in service, all they did was make the situation much worse.

Q They shouldn't have tried to use it?

A Oh, no. It wasn't a bad idea not to try to use it, because they had a degrading condition going on, but

they did not follow the procedure for placing it in service, and, essentially, all they did was open up another hole to the condenser by not having the seal water on the pump.

Q So did it make any difference that it was leaking?

A Are you referring to the check valve?

Q Yeah.

A I can't say for certain. They were losing vacuum at the time with problems at the feed pump. This contributed to, you know, exacerbating the problem even further. It certainly didn't help.

Q Sometimes you'll use a piece of equipment that you're not necessarily meant to use, but you might wind up relying on it anyway, right?

A It's not that you're not necessarily meant to use it. It is there to remove noncondensable gas from the condenser. In normal operations, you use the steam jet air ejectors. It can be used, but, again, as I said, it alone won't support operation of the plant. It won't maintain a low enough vacuum to operate the plant.

MS. CURRAN: I don't have any other questions. If the Board has no questions, I'll move Exhibit 154.

JUDGE BECHHOEFER: One minute.

MS. CURRAN: Okay.

QUESTIONS BY THE JUDGES

JUDGE BECHHOEFER: Let me ask you one thing.

You've probably been asked this before by Judge Shon, but when it says on page 2 of 6 of the LER under 2-A, the second paragraph, it says,

"MFP 11 was secured for maintenance."

I think you were asked before whether it was in maintenance or whether it was in service, but does this "secured for maintenance" mean that it was going to be in maintenance or --

MR. GIFFIN: It was going to be, yes. We were -- we brought the unit down to 50 percent, and then they were in the process -- when I say -- when Mr. Vosburg says "clearing it," that means we have operations line it up so then they can turn that piece of equipment over to maintenance to work on.

We were looking at a lube oil issue that was bothering us. It wasn't -- the pump was operable, and, when we came down, we took it off to look at it to see what was wrong, and during the process of getting ready to isolate a opponent is when the reactor -- the loss of vacuum occurred.

JUDGE BECHHOEFER: But the phrases "secured from maintenance"?

MR. VOSBURG: That means -- I think what they mean is the turbine was off-line. Each main -- we have two main feed pumps. Each one can support about 50 percent of full power operation. So, at full power, you need both. So, to

secure and work on one of the pumps, you first come down to 50 percent power, take the pump off line or secure the pump, then you clear the pump, which takes all the steam sources away, isolates it, makes it safe to work on.

Operations does all that. Once it's cleared, they turn it over to maintenance so they can do the work on it.

JUDGE BECHHOEFER: The Board has no further questions?

MS. CURRAN: Then we'll move this exhibit into evidence.

JUDGE BECHHOEFER: 154?

MS. CURRAN: Uh-huh.

MR. REPKA: Could I ask Ms. Curran to state for what purpose she's moving it into evidence?

MS. CURRAN: To demonstrate that there was a condenser vacuum pump that was, apparently, suffering severe leakage.

MR. REPKA: May I ask the witness was there a vacuum pump suffering severe leakage?

MS. CURRAN: Well, the check valve. I'm sorry.

MR. VOSBURG: There are two different components. There was no problem with the vacuum pump, other than the way it was operated. Had it been operated correctly, there would have been no problem with this.

MR. GIFFIN: That's correct. The check valve, as

Mr. Vosburg said, probably added to the problem because it was leaking, but if the pump had been placed in service to reduce vacuum correctly --

MR. VOSBURG: The check valve would have no meaning.

MR. GIFFIN: It would make no difference. So I guess there was a component that needed repair, but the reason for the reactor trip was not a maintenance issue.

MR. REPKA: I think the witness has also previously testified that there was no basis to believe the check valve was inadequately maintained, but, having said that, I won't -- in the interest of expediency, I won't object to this document coming in, but I think it should be entitled to little or no weight.

[Judges confer.]

JUDGE BECHHOEFER: Absent objection, we will admit 154. I assume the Staff to not object?

MS. HODGDON: No.

[MFP Exhibit No. 154 was received in evidence.]

MS. CURRAN: The next exhibits are Exhibit 155, which is LER 1-91-002-01, dated May 17, 1991; Exhibit 156, which is NCR DC 1-91-WP-N012, dated May 13, 1991, and that's it.

[Pause.]

MR. REPKA: Ready, Mr. Giffin?

MR. GIFFIN: Yes, I'm ready.

DIRECT EXAMINATION

BY MR. REPKA:

Q Do these two exhibits that have been identified as Exhibits 155 and 156 relate to one incident?

A (Witness Giffin) Yes, they do.

Q And that was a reactor trip?

A It was a reactor trip, that's correct.

Q And what caused the trip?

A The cause of the trip was a low steam generator level in two steam generators, and that gave the necessary input for a reactor trip. Now, the cause of the low steam generator level was caused by personnel error.

What happened, we were erecting a scaffold, and the scaffolding was being erected near to the feed -- or near one of the feedwater reg valves, and the carpenter who was erected scaffolding was carrying six-foot planks, and, as he was carrying it in the plant, he, apparently, turned or moved somehow, and one end of the plank hit a very small valve; it has a little handle.

It was a 90 degree throw, and, when he hit that, he didn't realize it because a small valve, large plank. Later, when we talked to him, he said he heard a noise, and the noise he heard was the air escaping from the feed reg

valve in the bypass.

So it secured -- it secured feed flow to two steam generators. The operators recognized they had a decreasing level, attempted to open the valve, but the air was secured, and then the reactor tripped.

Q I take it you looked into this?

A Yes, we have.

Q And identified some corrective actions?

A We've identified some corrective action which include training and modifications as well to -- so that this type of a personnel error -- try to minimize somebody bumping into something that's sensitive causing a shutting a valve or something that could cause an air supply to be shut or a reactor trip to occur. Yes. We've looked into it and done things.

Q I would imagine you're particularly sensitive to things that could lead to a reactor trip?

A Oh, yes.

Q Are you satisfied with the corrective actions that have been taken here?

A Yes, I am.

MR. REPKA: I have no further questions.

CROSS EXAMINATION

BY MS. CURRAN:

Q Okay. Mr. Giffin, turning to the LER, which is

Exhibit 155, at page 3 describes four other systems or secondary functions that were affected by this event, doesn't it?

A (Witness Giffin) Yes, it does.

Q And those were, first -- well, I don't want to read it, but why don't I let you just explain each one briefly.

A Circulating water pump of a nonsafety-related piece of equipment, when the reactor tripped, the pump didn't automatically restart. The operator started it. 25 kV motor operator disconnect is something that connects the output of the main generator to the transformers, and there's a -- it's a large thing that just opens to separate the generator from the distribution system.

They had taped -- painters, in fact, had taped pieces of plastic wrap on the drive shaft of this thing. So when the operators went to open the disconnect, it didn't open.

The second one was, again -- third one, rather, was a nonsafety-related component that had a fan fail. There was some guess at what the reason was. Because it was nonsafety-related, we just changed out all the starters, and the third one -- the fourth one, rather, I'm sorry, was a main steam stop valve failed to close fully, and that was determined to be a brass bushing that was dry, and it was

replaced.

Q So, as a result of this one person hitting the valve with a beam, you had not just this event that that caused, but you had a series of events that either happened or were supposed to happen and didn't happen after that, right?

A That's correct. There were these four incidents that we talked about or that I just briefly talked about.

A (Witness Vosburg) Well, actually, the motor operator disconnect is not something that automatically happens --

A (Witness Giffin) Yeah, that was later.

A (Witness Vosburg) -- when the reactor trips. That's something that the operators do later on to realign the off-site power source to the plant, and it wasn't directly tied to the reactor trip.

Q It was done in response to the reactor trip, is that what you're saying?

A Yes, at a later point in time.

Q Okay. Does this number of system failures give you concern as a maintenance manager? When the one person makes one mistake, and it has all these ripple effects, does that give you a concern as to the adequacy of your maintenance program?

A (Witness Giffin) No, it does not. It's

nonsafety-related equipment. There were some problems, and we were able to deal with them appropriately. I don't see that that's an issue.

Q Does this happen often?

A No. We don't have many reactor trips. In fact, we have a good operating record that we'll talk about later.

Q Would you say that these failures were random failures, or were they related to the initial event, the initial hitting of the valve with the beam?

A Of course they were all random. The shutting of air has to be a random event when a 12 kV motor doesn't restart. So all of these were random occurrences. They just happened after the first one. The shutting off the air to the feed reg valves had nothing to do with any of the four events that occurred.

They happened because they happened but not -- they happened because the air was secured, but they don't -- there's no relation between the two.

MS. HODGDON: I don't have anymore questions about this.

JUDGE KLINE: I guess I didn't understand that last response, though. Why are they listed in this --

MR. GIFFIN: When we do a nonconformance or an LER, we go through and before start-up, went to see how things -- what happened. When the unit tripped, there's a

lot of independent systems that are required to function, both safety-related and nonsafety-related things that you would expect to come back on line or do something.

So, after each event like this, we take the computer printout from the control room. We interview operators. We interview maintenance people. We interview anybody that knows about it to determine if anything else occurred after the unit tripped.

That's why that they're all listed. Each time something failed, we'll look at it and investigate it to try to determine why that did fail. The cause of the trip was the shutting of the air supply, and then, after the unit tripped, these other events occurred.

They weren't -- I mean, one didn't -- the air didn't cause the motor. The motor caused from its own separate reason.

FURTHER CROSS EXAMINATION

BY MS. CURRAN:

Q To follow-up on Judge Kline's question, you used the term "other systems or secondary functions affected." "Affected" implies there's a relationship between the first event and the other event, but that's not really what you mean; is that right?

A (Witness Giffin) I mean that because the unit tripped the other thing failed, but, if I turned off air and

then turned it back on, nothing else would have failed.

Q Oh, I see. It was related to the trip?

A Yes. Not to the turning off of the air.

JUDGE KLINE: Yeah. Okay. I understand.

MS. CURRAN: I do have another question. I'm sorry.

JUDGE KLINE: Okay. And I do, too.

MS. CURRAN: Okay.

BY MS. CURRAN:

Q In Exhibit 156 at page 9, under "Safety Analysis," it states that,

"The failure of CWP 1-1 and other recent failures of the CWPs to auto restart caused the reliability of the CWPs to be questioned."

Do you see that? It's in paragraph 4-A towards the bottom.

A (Witness Giffin) Yes.

Q Do you agree with that?

A Yes. And we went out and looked at it to try to figure out why didn't that circ water pump restart. It's supposed to restart. There's a timer, and if it doesn't start within five seconds by itself, it'll time out so it on't start.

So we wanted to understand why that particular

pump didn't start. So, yes, we were concerned with why didn't it start.

Q Did you figure it out?

A (Witness Vosburg) Yes, we have, and that problem has been fixed in the plant.

Q What was the problem?

A It was a problem in an electrical relay. What happens is, when the plant trips, the -- most of the operating loads in the plant are being supplied by the main generator on the unit. When the plant trips, that power source goes partnership, and the electric busses transfer from the on-site power source to an off-site power source, the start-up breaker we talked about earlier when one of the ops breakers didn't open.

Because -- the way the system is designed, the very large load on the bus, when that transfers to the off-site power source, it trips off both of those large circulators and then allows one of them to re-start so you don't have an excessive load on the electrical bus.

So there's a relay, a timed delay relay, that has to actuate to restart that one circulator, and there was a problem with that timed delay relay they found that they fixed and stopped it from restarting.

MS. CURRAN: Okay. I'm finished.

JUDGE BECHHOEFER: The LER, page 8 of 8, I guess

this concerned more the side effects, but does the statement under paragraph 5 on that page indicate any deficiency in the preventative maintenance program -- predeficiency before this change in the preventative maintenance program? Take your pick.

MR. VOSBURG: Well, I don't think it indicates a deficiency. I think it's described in our testimony, when we talk about the preventative maintenance program, it's described as a living program. As we operate the plant and we find that, in cases like this, we found where a brass bushing had caused the valve to be slow to close.

We evaluate that, and we look at the frequency that we do maintenance, preventative maintenance, and we may adjust that frequency based on operating experience, and this is an example of that. When we see things like this, we will then go back and adjust the PM program to both in-plant operating experiences, things we -- information, new information we may get from a vendor, experiences that we find from other power plants flout the industry.

So we are continually improving the PM program, and this is an example where we found the bushing probably should be lubricated for frequently, and we adjusted the PM program to accommodate that.

JUDGE BECHHOEFER: Yeah. I take it the program did not cover this previously.

MR. GIFFIN: I read it the same way. I'm not sure, but that's how I read it.

JUDGE BECHHOEFER: Now, is that the same thing as -- well, this is will be a little different. I guess I'd better ask that separately. Has this been done yet or not?

MR. GIFFIN: Yes, it has.

JUDGE BECHHOEFER: Okay. This next one may be different. Maybe it isn't either, but, on page 7 of the Exhibit 156, there's an indication that a particular form has to be changed and should be changed.

I think APC 59 is a form -- maybe I'm wrong. It's under paragraph B1-B of that document. My question is, what does that involve, and has that been done?

MR. VOSBURG: I don't know specifically what changes or improvements were made to APC 59. That's a procedure that, whenever we go out to do work in the plant that involves putting up scaffolding to do the work, one of the things it includes is a licensed operator or an operations department person to go out.

They have a form they fill out that shows the area in the plant where the scaffold needs to be built and a description, a footprint where in the room it would be, how tall it would be.

The operator then takes that form and goes out and walks the area down and looks for things that could be

bumped, valves that may need to be operated by operations where the scaffolding might interfere with their ability to get to it and recommends changes to the scaffolding their proposing based on those kind of things.

It also includes other things such a· probably OSHA requirements on how the scaffold's built and tagged and things like that, but as far as putting scaffolding in the plant for operational and safety reasons, there's an operations representative that reviews that form, and, apparently, at this point, that form -- I don't know what the details are, but it said it wasn't completely filled out, and they made some procedure enhancements to that program to help correct that, but I don't know what the specifics are.

MR. GIFFIN: I think it was the sketch was missing on the form showing how they were going to erect the scaffolding. If I remember correctly, that's the part that was missing on the form and then enhance it so it requires a better walk-down and sketch.

JUDGE BECHHOEFER: Has that been done?

MR. GIFFIN: Yes, sir. C 59 has been revised.

JUDGE BECHHOEFER: Any follow-up questions?

[No audible response.]

JUDGE BECHHOEFER: If not --

MS. CURRAN: We'll move Exhibit 155 and Exhibit

156 into evidence.

MR. REPKA: No objection.

JUDGE BECHHOEFER: Okay. Without objection, 155 and 156 will be admitted.

[MFP Exhibit Nos. 155 and 156 were received in evidence.]

[Pause.]

MS. CURRAN: We're skipping to 168.

JUDGE BECHHOEFER: Do we have time for one more? Because I gather they're going to close the building up at 5:00.

MS. CURRAN: Well, we can start. We're skipping all the way to 168 now. So we're on page 28 of the road map, and the others are not -- the ones that precede that are not going to be offered. Shall I try to get through this one?

JUDGE BECHHOEFER: Yeah. I was going to say, we better have five minutes, though, to clear out. At least we were told they want the building closed.

MR. VOSBURG: I am, I think, the one that was designated to address this, and it'll take me a few minutes to read through this. 168? Is that --

MR. REPKA: 168.

MR. VOSBURG: Yeah.

[Pause.]

MS. CURRAN: Exhibit 168 is NCR DCO-891-EM-N009, dated November 22, 1991.

[Pause.]

MR. REPKA: Mr. Vosburg, I understand you're going to need some time to look at this?

MR. VOSBURG: Yes. You're jumping ahead. I hadn't had time to try to get a little bit ahead here.

JUDGE BECHHOEFER: Maybe we should just close for the day and start again --

MS. CURRAN: Do you want to start with that Monday?

MR. REPKA: Let me just ask Mr. Vosburg. Would you prefer to just --

JUDGE BECHHOEFER: Oh, okay. I'm --

MR. VOSBURG: I would prefer it, yes.

JUDGE BECHHOEFER: I'm told the reporter needs ten minutes to clear the equipment out, too.

MR. REPKA: Let's break here, then. In view of that last quantum leap, I'm willing to break here.

JUDGE BECHHOEFER: So we'll start with 168 tomorrow -- Monday morning. I might say that we'll start a little later than I anticipated. I anticipated 9 o'clock Monday. It looks like it'll take a few minutes for the reporter to set up in a new location, and it might be

delayed a few minutes after 9:00, no later than 9:30.

MS. CURRAN: I'd like to ask, is it possible, on Monday, if it looks like we're almost to the end but we're going to go past 5 o'clock, is there somewhere to arrange to stay there until we're finished?

JUDGE KLINE: No. The limited appearances are Monday night.

MS. CURRAN: Oh, that's right. Okay.

JUDGE BECHHOEFER: And we're going to need at least two hours for getting out of there and getting dinner and getting back and all that.

MS. CURRAN: So are you going to stop at 5:00 Monday?

JUDGE BECHHOEFER: Yes, 5:00 or even slightly before but no later, because we won't have time. It's almost impossible to make it. We also have several other panels and other witnesses, and by the time they get sworn and get put on the stand -- I see some time taken on that, and we have a Staff panel, which I have a few questions already, some of which may be asked -- but, anyway, let's adjourn until -- let's make it 9:30 sharp, though.

(Proceedings Concluded at 4:50 p.m.)

REPORTER'S CERTIFICATE

This is to certify that the attached proceedings before the United States Nuclear Regulatory Commission

In the Matter of:

NAME OF PROCEEDING: In the Matter of: PACIFIC GAS & ELECTRIC COMPANY (DIABLO CANYON, UNITS 1 & 2)

DOCKET NUMBER: 50-275/323-OLA-2

PLACE OF PROCEEDING: San Luis Obispo, California

were held as herein appears, and that this is the original transcript thereof for the file of the United States Nuclear Regulatory Commission taken by me and thereafter reduced to typewriting by me or under the direction of the court reporting company, and that the transcript is a true and accurate record of the foregoing proceedings.

Official Reporter

Ann Riley & Associates, Ltd.