NUCLEAR REGULATORY COMMISSION

ORIGINAL

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

LONG ISLAND LIGHTING COMPANY	:	
	:	DOCKET NO. 50-322-OL
(Shoreham Nuclear Power Station	:	

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UNITED STATES OF AMERICA

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BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of:

LONG ISLAND LIGHTING COMPANY : Docket No. 50-322-OL

(Shoreham Nuclear Power Station)

Third Floor, B Building
Court of Claims
State of New York
Veterans Memorial Highway
Hauppauge, New York 11787

Friday, September 17, 1982

The hearing in the above-entitled matter convened, pursuant to recess, at 9:00 a.m.

BEFORE:

LAWRENCE BRENNER, Chairman
Administrative Judge

JAMES CARPENTER, Member
Administrative Judge

PETER A. MORRIS, Member
Administrative Judge

APPEARANCES:

On behalf of the Applicant, LILCO:

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On behalf of Suffolk County:

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* * *

C O N T E N T S

P R O C E E D I N G S

(9:00 a.m.)

JUDGE BRENNER: Good morning.

The only preliminary matter I have is to congratulate Mr. Muller and his family, and welcome him back.

MR. MULLER: Thank you.

JUDGE BRENNER: We heard the good news yesterday.

We can continue with the cross examination, if there is nothing else.

MR. LANPHER: I have no preliminary matters, sir.

MR. ELLIS: No, sir.

JUDGE BRENNER: I guess we are up to Report 21 of 40, just noting our progress here.

MR. LANPHER: To be even more precise, Audit Observation 014, a part thereof. We don't make any predictions, but I think we are going to go a little faster.

Whereupon,

T. TRACY ARRINGTON,

FREDERICK B. BALDWIN,

ROBERT G. BURNS,

WILLIAM M. EIFERT,
T. FRANK GERECKE,
JOSEPH M. KELLY,
DONALD G. LONG,
ARTHUR R. MULLER,
WILLIAM J. MUSELER, and
EDWARD J. YOUNGLING,

the witnesses on the stand at the time of recess, having been previously duly sworn, resumed the stand, and were examined and testified further as follows:

CONTINUED CROSS EXAMINATION
ON BEHALF OF SUFFOLK COUNTY

BY MR. LANPHER:

Q Mr. Eifert, looking at Audit Observation 014, I would like to direct your attention to Item 6, the last of the observations contained on that page. It states that many sources of input are not positively identified by document number, for example, calculation number. And looking farther down the page, the recommended corrective action states to review all calculations and assure that the identities of sources of input are adequate to assure positive traceability.

Do you agree that this is a problem similar to those problems we discussed yesterday, where audit observations noted the lack of positive traceability?

A (WITNESS EIFERT) This is an example of the calculations that did not specifically identify the source document.

Q And this is a violation of EAP 5.3, correct?

A (WITNESS EIFERT) Yes, it is. It is another example of not implementing the detailed administrative control required by the procedure. I would point out that as with all audit observations, complete corrective action was taken for this finding. The calculations were reviewed, and the information was added to the calculations as part of the corrective action.

In addition, if you go back -- it is not clear the way this report indicates it, but I believe the two other areas, mechanical calculations and heat balance calculations, are also indicated in this audit on the first page, and similar problems were not found in those disciplines during this audit.

Q Mr. Eifert, would you turn to Audit Observation 016 of this audit, which I think are the project mechanical calculations? Are you on that page? It is Observation 016, sir.

A (WITNESS EIFERT) Yes.

Q Item 2 there states, the input sources for many calculations are not identified adequately.

A (WITNESS EIFERT) That's correct, sir.

Q Is this the same kind of problem?

A (WITNESS EIFERT) I didn't see that. I'm sorry. If you will give me a moment to read that observation, please.

(Pause.)

A (WITNESS EIFERT) Mr. Lanpher, this observation is different than the others in that the source was referenced via interoffice memorandums, which is the ROM's indicated in the audit observations, so the engineer preparing the calculations had identified where he obtained the source. Again, the specificity that we require and insist on for the strict traceability in the judgment of the auditors was lacking in this case, but there was traceability as clearly identified by the fact that IRM's were in the calculations.

Q But both of these audit observations involved failure to meet the requirements of 5.3 with regard to strict compliance with the traceability requirements, positive traceability requirements?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) Mr. Lanpher, we have indicated in our discussions yesterday that Stone and Webster does maintain these very strict procedural requirements for traceability and identification of the input sources. This is the type of detailed requirement

that we put in our procedures that are beyond QA program commitments and regulatory requirements. They are administrative details which we expect to have problems with. We monitor them and follow up on them rigorously, so in that sense, I just want to keep on the record that that is what they are, keep them in perspective. In reference to your questions, these are examples of discrepancies in the documentation of the requirements in the procedures.

Q Well, this traceability aspect of EAP 5.3 is part of your QA program, is it not?

A (WITNESS EIFERT) Yes. The QA program has many implementing procedures, and what I was referring to was indicating and distinguishing between requirements and detailed implementing methods. The basic program requirement as we apply it at Stone and Webster and in the industry is that we have and maintain traceability for the design. There are lots of different ways to provide traceability. There are various amounts of detail that you can maintain in the specific records to document that traceability.

Stone and Webster chooses to use an implementing method that provides a very precise, immediate, specific reference to the input sources. To understand that, I think you have to understand what

type of documents we are talking about when we talk about source documents. These are not documents that are only available at the Library of Congress. The majority of these documents are the design documents that are being prepared specifically for the project, specifically in this case for the Shoreham project. They are in daily use, active use by the people on the project.

The people understand, know those documents, know the design process that is being used. They know what documents they have to use in their design work on a daily basis. Aside from the specific design documents, the other source documents that we are talking about are the standards and codes which again are readily available and being used on the project, and textbooks which are industry-accepted textbooks that are commonly used by the various disciplines.

The engineers understand that design process. They are working with it. They are communicating face to face on a daily basis within their own disciplines and with the other disciplines that are providing this source information. Both the people preparing calculations and the people reviewing calculations understand this process. The traceability to meet a program requirement is there without a specific

reference. It is there because the design process is standardized such that the information can be located readily.

The specificity in our strict requirements at Stone and Webster is there primarily from the future usability standpoint of the analysis, not from an immediate standpoint of ensuring the accuracy of individual analyses. The accuracy of the individual analyses is always good. The engineers inherently put their effort into ensuring that. They check the input source. The reviewers check the input sources. We have audited that process to verify that the precise accurate input data is being used, and we haven't had findings on that matter. We are talking about the strict traceability for future usability of this data.

Many of the observations are trivial. They are not important to the adequacy of design in any way. One example that we were able to identify last night in talking to some of the auditors, for example, is that in the structural area, the structural designers were referring to a text for information, and they were only identifying on the calculation the author of the text, common text used by this discipline, but only reference to the author.

The requirement was that you identify the

specific text, not just the author of the text. That type of strict adherence is what we are talking to. We are not talking about failure to have traceability. If we were talking failure to have traceability, I am confident we wouldn't have any repetitive nature in this matter at all. We are talking about administrative control, extremely strict requirements. We expect that this type of thing will recur.

Stone and Webster management, although we have talked about lowering the standard, bringing the requirement down, Stone and Webster management decided not to bring that requirement down. We maintain that high requirement because that is what management wants, not because 10 CFR 50 Appendix B requires it, because that is what Stone and Webster management wants. We know it is going to be hard. We have talked about whether we will ever get to a point where we don't have this audit observation, and we don't see where we will never have this audit observation for the strict type of requirement, but as policy we keep that requirement.

Q Earlier, Mr. Eifert, you stated, and it was a while ago, so I am sorry if I paraphrase wrong, but I believe you stated that in all cases, proper and complete corrective action is taken to eliminate these problems. Is that correct? Is that a fair summary?

A (WITNESS EIFERT) Yes. In the context of audit observation, and while I was referring to Audit Observation 14, again, we were able to last night talk to the auditors, and verify that in regard to that specific one the action taken by the group was to correct the existing calculations and to take steps to reinstruct their engineers, retrain them in the strict requirements that Stone and Webster imposes.

One of the problems is that the engineers don't understand why management insists on that. They don't understand the real basis for the future usability. The engineers are concentrating all their efforts on ensuring that the design is adequate today, and we need to constantly communicate with the engineers so that they understand the job of the next engineer or the job of LILCO during operation of the plant, and what advantage it is going to be for those people to use this documentation if it is that precise.

Q Mr. Eifert, the engineers are trained, are they not, or you attempt to train them, that these are requirements that must be complied with. Correct?

A (WITNESS EIFERT) Yes, sir.

Q Now, there is an original engineer who prepares the calculation. He is trained in that. Correct?

A (WITNESS EIFERT) Yes, he is.

Q And there is a reviewer or a checker who is trained in the same way, someone with the same discipline or same skills, and he in essence reviews the calculation and ensures that all requirements for that calculation are present, correct?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) Yes, Mr. Lanpher, we do train the engineers, and as I indicated earlier, engineers inherently are extremely thorough on matters directly related to the adequacy of their work, and they consider these administrative controls as of secondary importance. They are important, but they consider them secondary to the task at hand of ensuring a complete and adequate analysis.

A (WITNESS MUSELER) Mr. Lanpher, let me expand on that a little bit. In the context of examining audit observations which, as Mr. Eifert points out, range from something that might be significant to something in the nature of a person using an author's name instead of the title of the textbook in the particular case Mr. Eifert mentioned, it turns out that for people in the structural discipline, the author's name is a more important indicator than the title of the textbook, but that aside, the purpose of this program, the purpose of

the entire quality assurance program is to make sure that the plant is designed correctly and ultimately built correctly, and just as with everything else in life, there is a hierarchy of importance of things that are contained in the design process and in things that are audited.

In the subject that we are speaking of here, calculations, that hierarchy, and I certainly won't be able to tick off all possible gradations of it, but that hierarchy obviously doesn't like this. Up here at the top is the fact that the calculation gets done. Coming down the list is the fact that the calculation gets done properly, that it gets checked, that it has the proper input data, and as you come down that list, somewhere down here is the matter of, did we use the author's name or the title of the book, and it is just not within the realm of common sense to attribute significant problems to the fact that the engineers who know what are the most important things and what are the least important things slip up occasionally because they are human beings down in this low level activity which has no bearing on the adequacy or the safety of the plant.

I think we have discussed this for two or three days now, and I think Mr. Eifert correctly keeps pointing out that we have not lost traceability, which

is the key, even in this level of the calculations. We did discuss a couple of calculations where the audit finding was significant. The fact that the auditor observed that at that point he thought that a calculation might not have been done, we have only seen one of those in the entire 21 audits we have gone through. That is up here. That is important. We have not found other things that are serious down around the middle.

I believe we may have identified once where there was some concern whether the checking was done, whether the checking was done, and there are literally hundreds and thousands of these calculations that have been audited over the years, and we do not find recurring instances of problems that are up here in the important part of the hierarchy of the design process. We find them down here, which is exactly what one would expect to find when dealing with human beings who hopefully are addressing their priorities in design of the plant in proper sequence.

(Whereupon, counsel for Suffolk County conferred.)

Q Mr. Eifert, would you agree that the key to an adequate quality assurance program lies in the implementation of that program, not in a piece of paper

that describes it, but the actual implementation?

A (WITNESS EIFERT) Implementation is one of many keys to ensuring that a quality plant is designed and constructed.

Q If we make the assumption that on paper the quality assurance program is complete and adequate, you have to make the further step and make an inquiry to determine whether what is on paper is actually implemented, correct?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) One clarification to your question. We don't assume that the program is adequate and the procedures are adequate because they are on paper. Part of the audit process is testing the adequacy of those procedures. It is important, yes, that we implemented our procedures.

Q It is essential, isn't it?

A (WITNESS EIFERT) We consider in implementation all of the requirements of our program, including detailed implementation requirements as important. If you are going to try to use different terms that convey a different level of importance, then I would say that there are different procedure requirements that have different levels of importance. The review and approval, the fact that that is conducted

is important. The fact that correct input data is used is important, is essential, without question. It is essential to the technical adequacy of the product, and we haven't had those kinds of problems. If you are going to play this distinction approach, then those types of things are absolutely essential. Traceability of input, positive traceability is important.

Q You said if I'm going to play this distinction. What distinction are you referring to?

A (WITNESS EIFERT) I said it was important. You wanted me to say that it was essential.

Q Oh, okay. Thank you.

A (WITNESS KELLY) Excuse me. I'd like to add an example of what isn't important: printing your name instead of writing it.

JUDGE CARPENTER: Mr. Lanpher, may I ask a queston?

MR. LANPHER: Certainly.

JUDGE CARPENTER: These calculations are made with respect to some design documents I believe you testified, is that correct? They are standards, codes, textbooks and design documents?

WITNESS EIFERT: Yes, sir. The source information or calculation is contained in other design documents that have specifically been prepared for the Shoreham plant and are being actively used on the project.

JUDGE CAPPENTER: If you can help me, I'm trying to understand, do the design documents change with time?

WITNESS EIFERT: Yes, sir.

JUDGE CARPENTER: If there is a calculation

that doesn't identify the design document from which the input data was taken, how can I understand which calculation goes with which design document? How can I understand the process?

WITNESS EIFERT: The primary control of that situation is from the input document to the calculations. Our design control process ensures that when changes to information that is used by other groups occur, then that information is transmitted to them for use. For example, in a pipe stress analysis, when a pipe stress analysis changes and the loads change, the summary of that stress analysis is transmitted to the pipe support group so that they can look at the load changes against the calculations for those supports and initiate any changes that may be necessary. The primary control is from the input source to the user source.

The engineers in those groups are extremely familiar with their documentation and know what of their work, what calculations in this case are affected by changes to the input documents.

JUDGE CARPENTER: You see, what I'm trying to understand, suppose there was a new employee, a new engineer who wasn't familiar with these calculations that are in the file, and then some new input data came which would suggest that, if I am following you, would

suggest that some of the calculations need to be updated. How would he know which calculation to pursue in the absence of the documentation?

(Witnesses conferring.)

WITNESS MUSELER: Judge Carpenter, the example that Mr. Eifert raised is perhaps one of the better ones to discuss your problem against. In the area of pipe support design, the pipe support design is done at a certain point in time, and it's done against the pipe stress analysis that's available at that point in time.

There are load charts that are associated with each stress analysis that go to the pipe support designers.

Now, if a new employee came in -- and Mr. Eifert will have more to add to this, but I believe your question goes to if a new employee came in, how would he know what pipe stress summary to use to determine whether or not the new input data required him to update that particular pipe support design. In the first place, that information is on the calculation. That's what we have been talking about. We believe it is traceable. But even if it were not on that particular calculation, the fact that the design of the pipe support is associated with a particular stress analysis at a point in time indicates to any engineer who is

working in the pipe support design area that the time period of the calculation is associated with the time period of the stress analysis. If a new stress analysis comes out, superseding the previous stress analysis in the time period that the original pipe support design was performed in, it's obvious to that engineer that he needs to use thew new input data. If he is looking at a support that was designed very recently and is associated with the same load sheets, then it's obvious that he doesn't need to do it. And again, this information on which load sheet -- and I'm not using the correct term in the project, but that is essentially what it is -- that information is included in the design calculations.

I'm just trying to point out that even if it were not, the chances of someone making a mistake in that particular area are minimal.

I think Mr. Eifert has a little more to add to that.

WITNESS EIFERT: With specific reference to your question of new employees, people who don't have experience with Stone and Webster's design process, there are two points I'd like to make. First, we indoctrinate new employees. In the pipe stress and pipe support areas, our engineering mechanics people

thoroughly indoctrinate. They have training presentations that these people are given very early in their careers at Stone and Webster so that they learn Stonew and Webster's process, Stone and Webster's way of doing work. In addition, all the work is managed by supervisors and the terms that we use, lead engineers, which is a supervisory role, and the principal engineer, which is a supervisory role, who have experience. These people are not put to work by themselves without direct supervision by people who have experience and extreme knowledge in our process.

JUDGE CARPENTER: I think using the example is helpful. You see, I was trying to get some flesh on your distinction that you were making earlier, and I was trying to see whether -- how one knew which documents were to be modified as a result of changes in the design documents.

If I'm getting the sense of the flow, the flow is from the design documents, changed design documents produces a whole raft of new calculations.

How do you know which of the new calculations then make some old calculation no longer viable? That's what I was trying to get a feel for.

WITNESS MUSELER: Yes, sir, and I believe again in the stress analysis area, that is an area where

at this point we are finishing up essentially a complete re-evaluation of the entire -- of all the pipe stress and all the pipe support designs as a result of the finalization of some of the loads, the Mark II loads being the primary ones, and all the other input parameters. There's a lot of parameters in the stress analysis besides just the Mark II loads, and all of those resulted in the decision to essentially re-evaluate all of the pipe support and pipe stress calculations on the project. And that came the way you are drawing the distinction. That came from the design documents, back down to the pipe support design group. And in this particular case, it resulted in all of them being redone.

WITNESS EIFERT: Something that I could add, Judge Carpenter, that should give you a little better understanding, we have indicated that there are literally thousands of calculations prepared to support a nuclear power plant, and that is true, but organizationally we have many different disciplines who are responsible for calculations, the calculations in their specific area of expertise. Soi the individual responsibility is limited to their discipline. Their input comes to them, and they have a smaller piece of the overall amount of documentation for calculations to

be concerned about.

I didn't want to leave the impression that we have one or two people who are responsible for thousands of calculations and ensuring that they are kept up to date. That is not the case.

JUDGE CARPENTER: I'm still trying to get some flesh on your notion that acknowledging that every one of these calculations should document the source of the data that is used in the calculation so that an independent reviewer can identify what the source was. I think you were testifying that even in the absence of that, there was still traceability, and I was trying to understand that, and I think it's the thrust, that you can trace it down from the design document, even though you can't trace it back from the individual calculation to the design document if it wasn't identified.

WITNESS EIFERT: No. I have given you the wrong impression. The control is down from the input to the document with respect to changes. Traceability does exist from the calculation back to the input source.

What we are discussing here is the specificity of the specific reference to the input source from the calculation back. Traceability exists because of the knowledge of the process, the availability of the documentation, and the constant use of that

documentation by all the engineers on the project.

Pipe support people know that they have to go to the stress summary to get the loads. The pipe stress people know that they need the valve weights, the component weights. They have to go to the vendor documentation. The power process people know that they have got to get the component performance data curves for pumps, for example, from again the specification and the vendor supply performance curves for pumps. That is the basic function that the engineer has to perform and that he does perform.

When we audit calculations, we are seeing audit observations, we have been discussing audit observations that continually indicate that the input source was not specifically referenced. We don't just audit calculations to see that the input source was referenced. We audit the calculations to see if the correct input was used, and that is the latest input.

In the audit checklist, we have a word that says, it tells the auditor to go check and see if the latest input data was used. In the audit we check to see was there a change in the manufacturer's valve weight that they haven't picked up. That's the purpose of making that kind of a check, is to see if the flow of information on the input changes is getting to the

group. We don't have audit observations in that manner.

In our testimony, as attachments, we have included a copy of the detailed checklist that we use today to audit calculations, and there are specific attributes on there that indicate that the auditor goes back and checks input to see if the correct and the latest input was being used.

So the process works.

JUDGE CARPENTER: Thank you for helping me.

MR. LANPHER: One moment.

(Pause)

BY MR. LANPHER: (Resuming)

Q Gentlemen, if you would turn to Audit Observation 018 of Audit 22, and Observation No. 2 states that "calculations contain input data derived from other calculations but do not identify the calculations from which the input data was taken."

Would you agree that this is an example where the calculation on its face does not provide traceability to the other calculations?

A (WITNESS EIFERT) This is an example of an input force that was not specifically referenced by calculation number, yes.

Q It is also not an example of where the author

was put down instead of the title or something like that, correct? At least from the words on this, that is my impression, that there is just no input source referenced whatsoever.

A (WITNESS EIFERT) He did not identify the input source. The input data was used, however. It does not indicate that he did not use the input data from the calculations.

Q I'd like to go back to Audit 21 just for one moment, the observation we were looking at initially, 014, and page 2 of 2 of that observation, and Observation 9 thereon.

Is it correct that this observation indicates that certain calculations which were required to have been performed had not been performed, not been completed?

MR. ELLIS: What number are you referring to, please, No. 9?

MR. LANPHER: Yes. It is on page 2 of 2 of Audit Observation 014.

MR. ELLIS: Then I object to your characterization. I don't believe that that's what that says. It speaks for itself.

More appropriately, why don't you just ask him what that audit observation means?

JUDGE BRENNER: Wait a minute. What's the objection?

MR. ELLIS: The objection was as I heard his characterization, it did not bear resemblance to what I am now reading as No. 9.

JUDGE BRENNER: All right.

Why don't you just direct him to the observation and then ask the question?

MR. LANPHER: I thought that's exactly what I had done. Let me try again.

BY MR. LANPHER: (Resuming)

Q Referring to Audit Observation 9 -- well, Observatin 9 under 014, sir, is this an instance where some calculations which were required to have been performed or completed had in fact not been completed?

A (WITNESS EIFERT) This is an indication that the project identified the need for some calculations on the index. I indicated earlier that the index is used not only as an index of what has been prepared, but also as an index of what is going to be prepared and who is preparing it, and they have not yet been prepared, yes.

The situation here is that in the auditor's judgment, he felt that at this time in the project, the project should be preparing those calculations and should not be -- should have had him prepared at this

point in time. These calculations were calculations that had been scheduled to verify some aspect of the design, had been prepared in a preliminary fashion. The input data was now available and as a result of this audit, corrective action was taken. The calculations were prepared.

A (WITNESS MUSELER) Mr. Lanpher, this is a good example of an audit observation that, while it is an observation, has no bearing on the quality or even the quality assurance program of the design process. What we are seeing here is calculations which were identified as being required not having been done at the time of the audit. What we are looking at is a timing sequence where the auditor I think correctly observed that these calculations should be done in a more timely manner, but certainly not that they were not going to be done and that the design would not be backed up by the required calculations which were identified in the index as being required.

JUDGE BRENNER: How do you know that, Mr. Museler?

WITNESS MUSELER: That knowledge comes from the discussions Mr. Eifert's people and ourselves had with the auditing people last night when we were able to review this particular audit observation.

WITNESS EIFERT: In addition, Judge --

JUDGE BRENNER: Okay, go ahead, Mr. Eifert.

WITNESS EIFERT: The audit observation indicates that these were listed on the indexes required. The index is a document that lists calc number, title, which is the basic indexing information, and then it goes on to indicate the preparer, reviewer, and provides dates for that information. The way that is used is when a leader, principal engineer assigns responsibility to an individual, that he is going toi be responsible for preparing the calculation, he lists it on the index, and the preparer's name will go on the index, and that is the tool the principal lead engineers use to follow up and progress their work.

JUDGE BRENNER: It's listed on the index before it's done? Is that what you're tellng me?

WITNESS EIFERT: Yes, sir.

JUDGE BRENNER: And then how is that index used as a suspense tool to assure it is going to be done? I don't understand becaue it appears that the auditor is saying it was on the index and not done, from which somebody who doesn't know the details, such as myself, could infer that the complaint is maybe that it shouldn't have been in the index because it wasn't completed. That is, the index is a place for completed

calculations, and that may be the end of it unless it got picked up in the audit report.

I don't understand precisely what you attempted to explain to me, Mr. Eifert, that's my problem, as to why the observation about the index gives assurance that -- assurance of what Mr. Museler has informed me.

WITNESS EIFERT: I'm trying to convey that the index has more than one purpose. We talk about an index for drawings, for example -- I'm hesitating because I'm not specifically familiar with what the latest format for the Shoreham project drawing index is, but typically an index is simply a tool to list the latest available data, and it is used as a reference document by people who use documents so that they can verify that they are using the latest available data.

The calc index, the way it's been used at Stone and Webster, has a dual purpose. It serves that purpose, it lists the calc number, the title, the preparer and the reviewer, and the calc, you know it is a complete calculation when the dates are filled in for the preparer and reviewer. When it is a completed calc, you read the index that way. If the reviewer and preparer's names and dates are not there, then you know the calc is not yet completed, and the lead and

principal engineers then can use that index to progress the work as well as to use it as a basic reference index.

Now, I'm not saying that all calculations are progressed that way, but that is a way that many people have used that index, and it works.

JUDGE BRENNER: I take it from what you said, and I am continuing the dialogue to get your opinion on whether I am understanding your view, that description of observation Item 9, that is Item 9 in the top box on page 2 of 2 of 014, which we have been discussing, means to you simply that the calculation was listed in the index, but the preparer and reviewer's name had not been filled in, as distinguished from an observation that everything looked good from the index, that is, everything was filled in, including the preparer's and reviewer's signatures, but the auditor found to the contrary, that the calculations had not been completed.

WITNESS EIFERT: I'm sure what the auditor observed in the index.

JUDGE BRENNER: You mean the former of what I said rather than the latter?

WITNESS EIFERT: That the preparer's and reviewer's names and dates were not filled in, that he would not have written an observation simply on that

fact.

I'm sure that he talked to the people responsible for those calculations and was able in his own mind to believe that there was basis, that they should be proceeding with this work, and they weren't, and it was with that concern that it became an observation.

The point that Mr. Museler was making is that this is an example of how our auditors look at the process, look at what's happening, look at what the people are doing in addition to looking for the specific procedural compliance. We understand, our auditors understand the process and auditing in this way helps the project manage the work. It helps our executive management at Stone and Webster understand and have confidence that the work is being well managed.

JUDGE BRENNER: And you know that to be the case with respect to this particular audit observation as opposed to just a general comment as to what happens sometimes? Is that what you're telling me?

WITNESS EIFERT: I did not talk to the auditor in this case to establish exactly what he did. That is based on my understanding of what would be expected and what an auditor would go through and what kinds of problems we would discuss at a post-audit conference in

this light for something that isn't a clear, specific procedural violation.

This type of thing, although I don't recall the post-audit conference, this is the kind of thing that we discuss in detail. The management process, the concerns that auditors see, in addition to detailed specific requirements or concerns with implementation of detailed specific requirements.

WITNESS MUSELER: Judge Brenner, I can add to that from my knowledge of what has been going on in the Stone and Webster project over the last year, and that is that as various portions of the discipline designs are finished up in large measure, all of the calculations, along with design drawings and the like, are reviewed for what I will call final clean-up and final verification prior to the closure of what Stone and Webster terms the job books in those particular disciplines.

So this particular audit observation aside, the calculational indices, and more importantly, the calculations themselves, are reviewed because of the length of the project and the time this job has been going on at the end of the major discipline effort in that particular area. That has been going on, as we mentioned, in the stress analysis area, and pipe

supports, all of them, have essentially been redone because of this process, not just because of the calculation sheets, but because of knowledge of changes in input data and the like.

But I do think it is fair to say that it is not only in response to the audit observations that these calculations are kept up to date and finally what I will say verified by the engineering department, which I am sure will be audited again by Mr. Eifert's group.

JUDGE BRENNER: Let me see if I understand what you just said. You are telling me tha at that point where the discipline's work is essentially done, the indices are taken and checked to see that every calculation in the index in fact is available in accordance with all the requirements, including EAP 5.3 among others?

WITNESS MUSELER: Yes, sir.

JUDGE BRENNER: And that comes at a later time than these audits?

WITNESS MUSELER: Yes, sir. Up to that time it is a living process where some calculations require updating at a certain time and others may well be delayed until later on in the process. But at the end, the entire grouping is reviewed and updated as necessary prior to closing he job books on those particular

disciplines.

JUDGE BRENNER: And that's a 100 percent review, as distinguished from an audit?

WITNESS MUSELER: Yes, sir.

WITNESS EIFERT: I am not sure if later in these audit observations we are going to find discussion of one of the requirements that Stone and Webster has instituted for calculation, and that is that if an engineer uses an assumed value, for an example, and confirmation is required at some later date, but there is need to proceed with that analysis at this point, that information is marked on the calculation. We are now also putting that information on the index, and that indicates they have to go back and confirm all that data and change it from a confirmation required to a confirmed status. That is in the context that Mr. Museler was discussing.

Another point I would like to make for further clarification, there are many ways to meet the requirements. We could have procedures that contained the basic requirements that just said you need a traceability and did not provide detailed additional standards. We could have an audit that said, that has the attribute: are things traceable, and if that was the case, we wouldn't have any audit observations.

In addition, you could have an audit program -- and I think quality assurance has been criticized over the years for having audit programs that are just blind checks for paper conformance. Stone and Webster hasn't been doing that, and I think that is evident in the observations we have looked at. We have gone beyond that. We have looked at the process, looked at the way people were doing work, and we've got observations like this that are not procedural paper problems. They are the management problems. Stone and Webster's management has insisted on this type of an audit program since I've been involved in auditing for Stone and Webster, and it seems -- I have to say this. It seems that in this process we could be penalized for going farther, for going beyond requirements. And that is of concern to me. We insist on strict programs, strict adherence. We have had detailed requirements, and we do a lot to ensure that we implement those requirements. We are confident that we have done a good job, we have got thorough auditing, we've got certain types of problems, administrative control problems that are beyond basic requirements, and some of these will always be problems to some degree, not a great degree.

And it seems to me that we could be penalized for being thorough and being strict. And that

frustrates me.

Thank you.

JUDGE BRENNER: It's not uncommon for witnesses to be frustrated during cross examination. We are capable of putting the entire record together at the end of the case, and I think we are aware of the tensions between making sure auditors do a good job to the point of being picayune and then putting everything together to see if there is a pattern, to see what the problem is. And that's one reason I personally am struggling with some of this language, because I need help in separating out what is important from unimportant. And that's what the questions and answers are all about here.

I'll also point out that LILCO has the burden of proof, and if there is language here that can be construed different ways, LILCO had better have the proof as to what really occurred, where it is important, as opposed to generalizations that at times it may have meant this.

BY MR. LANPHER: (Resuming)

Q Mr. Eifert, I'm a little concerned with your last statements, that I may not understand them completely. That really sums up some of your earlier statements that you believe that Stone and Webster, at

least in portions of its quality assurance program, has gone beyond requirements, and I assume you mean Appendix B requirements, correct?

A (WITNESS EIFERT) Yes, sir.

Q Has Stone and Webster performed an analysis of what portions of its procedures or its manual go beyond Appendix B and what portions do not?

A (WITNESS EIFERT) No, not a specific analysis. That has been suggested. It has been suggested in management meetings when we discuss implementation problems as the one we have been discussing with reference to input sources. It has been suggested that maybe we should have procedures, one set of procedures that are just the basic requirements and not the additional detail which we don't consider the basic requirements. It has been suggested that within the individual engineering assurance procedure, we fly to the ones somehow that are the regulatory requirements, to separate those, and that we only audit to the regulatory requirements. Management has consistently said no, all of the requirements and the methods that we specify we consider important. We want them followed. We want them audited. And therefore we haven't made that distinction.

Q Mr. Eifert, I would like to go forward to

Audit 22 again, to the same observation we were discussing before, 018. We talked about the second observation on that page. I would like to turn your attention to the third observation which reads "Computer programs used in some calculations are not fully identified."

Is this the same basic problem that we've been talking about, namely, that input data or data which are used in the calculations are not fully identified on the calculation?

A (WITNESS EIFERT) Yes, sir, this is the same basic problem. The situation here is that or procedures have been upgraded, specifically require additional documentation with respect to computer name, version, and level, which is very specific. The traceability to computer document and computer programs that have been used has always been provided via a reference to a run number. Run number was traceable through the computer records and the documentation with respect to the information was on the computer at the time the calculation was prepared, added an increase in requirements.

Q Mr. Museler, if I could go back to an earlier statement of yours, I believe in response to Judge Brenner, you were discussing the stress analysis review

which is undergoing at LILCO, correct?

A (WITNESS MUSELER) At Stone and Webster.

Q Excuse me, at Stone and Webster.

Is this the same review which is described in your prefiled testimony, sir, at pages 124 to 127? I am looking at the table of contents.

A (WITNESS MUSELER) Yes, sir, it is.

A (WITNESS EIFERT) Excuse me, Mr. Lanpher. If I might add something -- and I will take you ahead to Audit No. 25, Audit Observation 058. I will point out this observation, Item 1, is another example as the one we just spoke of in 018. This indicates that it was a new requirement in May of 1977. That first line where it says effective May 31, 1978 is incorrect. It should be a 7, as is readily apparent from the remainder of the analysis. The procedure was changed in May of '77 to require a specific reference to the computer version and level.

JUDGE BRENNER: Excuse me, May '78?

WITNESS EIFERT: The correct number if '77, Your Honor.

BY MR. LANPHER: (Pesuming)

Q Mr. Eifert, you mean in the first line under description of observations?

A (WITNESS EIFERT) Yes. It says '78 and it

should be '77. The corrective action of this one was to look at calculations prepared since that new requirement. If you go to 018 where you questioned it, that audit was in July of '77, just three months after the new requirement was put in place.

Q Staying with the two observations, while we have them open in that manner, is it your point that Observation 018 from Audit 22 in effect can be explained by the fact that the requirement had only come in very recently before that, about two months before?

A (WITNESS EIFERT) My point is to show that it was a new requirement. I made the statement on the record that it was a change in the requirement. This provides evidence that there was a recent change. Many changes have occurred in our program procedures and our procedure for preparing calculations. We have discussed some, the signature versus initials. This is another. I mentioned the page number input not only to the document but the page within the document. That's another change.

Q Tell me, is the Hydrological Analysis Group the same as the Hydraulic Group or same activity?

I'm looking at 018, and I'm looking at 058, the activity audited. Is that the same group or division or discipline?

A (WITNESS EIFERT) I know that the hydrological analysis is not done by our Hydraulic Division. I believe it's done by Geotech. It may be Environmental. It's either Geotechnical Division or Environmental Division.

Q Looking at 058, since we are open to that anyway, that's an indication, is it not, that a year after the new requirement was put into effect, the hydraulic -- the persons doing hydraulic calculation had not complied with that revision, correct? In fact, they looked at four calculations, they audited four calculations, and apparently each of them had failed to be prepared in accordance with the requirements of EAP 5.3.

A (WITNESS EIFERT) The calculations that we are referring to in Audit Observation 058 were prepared between the time period during the prior year, prior to this audit, so I believe that this was the first hydraulic audit that was performed after the requirement.

I may not have answered your question.

Would you rephrase it?

JUDGE BRENNER: What you saying, I believe, is you are disagreeing with the implication in Mr. Lanpher's question that the persons doing the hydraulic

calculations were still not complying with the change notice a year after the effective date of the change notice because you don't know how soon after May 1, 1977 these calculations were performed.

WITNESS EIFERT: Yes, sir.

BY MR. LANPHER: (Resuming)

Q Gentlemen, I would like to turn to Audit 23 and Observation 030, page 1 of that observation.

(Pause)

Q Have you had a chance to review that, Mr. Eifert?

A (WITNESS EIFERT) Could I have one more moment, please?

(Pause)

A (WITNESS EIFERT) Okay.

Q Mr. Eifert, there's two observations on page 1 of Observation 030. Is it correct that both observations reflect the auditor's concern that an adequate identification of input data used in the calculations has not been noted in the calculations?

A (WITNESS EIFERT) The audit reflects an instance where the auditor observed that the specific reference and positive traceability that we expect in our calculations was not provided.

Q And turning to Audit Observation 031, I think it is two pages later from where you were, sir, do we not get another indication that in another discipline, steel design calculations, this time, where again a problem with positive traceability is identified?

A (WITNESS EIFERT) This is another example where positive traceability was not specifically provided. In this example, as in the prior example, the IOC did demonstrate the transmittal of the information from the source to the individuals using the documentation. Those IOC's typically are maintained in the project files as records.

Q For the record, would you define IOC?

A (WITNESS EIFERT) Interoffice correspondence.

Q Thank you.

JUDGE BRENNER: Not to be confused with IOM, I take it.

WITNESS EIFERT: IOC is a standard form that is typically handwritten. An IOM is a typewritten, more formal letter.

BY MR. LANPHER: (Resuming)

Q Turning to Observation 032, is this not yet another example of the problem with positive traceability and identified in this audit? That is Item Number 1 on that observation. For the record, it is

indicated on this observation that this relates to concrete design calculations.

A (WITNESS EIFERT) Mr. Lanpher, this is another example where we found that they didn't have the specific identification of the input source document. Again, I emphasize that the auditor also looks to verify the correct source information was used, and we did not have an observation with respect to that. No concern here with respect to the technical adequacy of the work.

Q Would you agree, Mr. Eifert, that this problem or this situation with failing to provide positive traceability in accordance with EAP 5.3 was widespread at this point in time, at least?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) From the information available here, we have evidence that the problem has recurred. The extent to which it is widespread in the literally thousands of calculations is not determined. The extent, or being that we have written these as observations and provided for corrective action has indicated that today it is not widespread. Today it has been corrected.

Q I was asking as of that point in time, and I believe your answer is that you are not sure, or was it

yes?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) Mr. Lanpher, I have indicated that the record shows that it has occurred. We reported it in many observations. I do not have the specific data with respect to the corrective action that was taken that would specifically identify how many calculations didn't provide specific reference to input data, so your use of the term widespread, I cannot verify that it was widespread.

Q Mr. Eifert, let me turn your attention to Observation 034 in this same audit. Item 3 of that observation, the first two sentences of that item read, "The audit sample of eight calculations revealed several discrepancies in the sources of input references. The input source reference for at least one of the input values was totally missing on three calculations."

Toward the bottom of the page, in terms of corrective action, they ask for a review of all existing calculations to assure positive traceability, so is it fair to state that this is another example in this audit where the requirements of 5.3 relating to traceability were not met?

(Whereupon, the witnesses conferred.)

Q. For the record, this is in mechanical

calculations.

A (WITNESS EIFERT) Again, Mr. Lanpher, this is not a case where we do not have traceability. This is another example where we do not have the specificity that we expect from documentation, and I call your attention specifically to the example that is included in that audit observation, where the drawing was referenced but the specific number and specific revision of these documents or additions to publications was what was missing from the documentation. Clear, positive traceability in those examples, although we still included those in the calculations that we considered lacking, and again, Mr. Lanpher, every time we have seen one of these audit observations, corrective action was taken, and the calcs have the requisite traceability to the specific requirements of Stone and Webster. The calcs of record for the Shoreham plant contain these requirements.

Q Mr. Eifert, you say in each instance corrective action has been taken. Do you consider it adequate corrective action to be taken where the same kinds of problems are revealed in subsequent audits?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) The first point I would like to make in response to these, we have not established

that these are the same problems. Lack of a specific reference is a problem. Lack of a revision is a separate problem, and I see a difference in those. When I indicate a corrective action --

Q Adequate corrective action --

A (WITNESS EIFERT) -- I was making specific reference to those actions that corrected the calculations that were identified by the auditor and identified to the extent of review of the condition that the project would undergo. They have been corrected. That is the context of my reference to corrective action. Preventive action to ensure that these types of things do not recur is also taken. We have always performed training with respect to calculations preparation.

In the late seventies, we restructured our training presentation to emphasize, rather than detailed procedural steps, but to emphasize to our engineers the importance of some of these requirements, why management has established these requirements, to convey to them that management feels they are important, and they should feel they are important. This type of problem, again, is the administrative controls which engineers by their nature consider of secondary importance. I do. Everyone does. They are important to management. They

are not directly applicable to this technical adequacy of the work.

From a corrective, preventive action standpoint, in our program, I would be concerned and am concerned if we have problems that are significant to the technical adequacy of the work, and to assure that they aren't recurring. The numbers of observations that we have had with respect to input has been a recurring problem. It is something that we have recognized. We have reported it to LILCO. LILCO is aware of it. Management of Stone and Webster is aware of it, and decisions have been made to continue to strive to meet those requirements, to continue to train and orient engineers and emphasize to the engineers the importance of these detailed requirements.

The fact of the matter is, we recognize that if we are going to maintain these strict detailed requirements, we are going to have examples of administrative flops where this condition ends up reported and we are going to follow up, we are going to continue to follow up to ensure that the work is done right, and continue to try to identify new ways to take preventive action with respect to this type of situation.

JUDGE CARPENTER: Mr. Lanpher, before we go

too far, can we go back to audit 032? The one we were talking about just a couple of minutes ago? I believe the discussion was focused on Item 1, which very clearly says that positive traceability was not provided. And then I believe I heard you testify that the auditor did confirm that the calculations were based on proper input data, that the auditor did trace it, and I am thoroughly confused as to why the auditor reports that it wasn't traceable, and then you testify, but we know that he did trace it, and confirmed that there wasn't a problem.

I am having some problem with the logical inconsistency there. Do you see my problem?

WITNESS EIFERT: Yes, sir, I see your problem.

JUDGE CARPENTER: It may be one of semantics, but it is still not clear on this record as to what is going on.

WITNESS EIFERT: The auditor, when he is conducting the audit, one of the attributes that he looks for is positive identification of the source input. Another attribute on the audit is, was correct input used, and is the input the latest? The auditor in verifying the first attribute with respect to identification verifies that simply by looking at the calculation.

The second attribute with respect to correct

and the latest input information, the auditor verifies by going back to the source documents, the same source documents that the preparer and reviewer looked at in developing the calculation. That is what we expect our auditors to do. That is reflected on our audit checklist. It is on that basis that I say there is traceability. Not only can the engineers find it. My auditors can find it. And they do. And if they didn't find it, if they didn't find it correct, it would be written as a finding, and I would be significantly concerned, but this is the case of identification, not a case of lack of traceability.

WITNESS MUSELER: Judge Carpenter, let me just try to add something to that, and Mr. Eifert can correct me if I am using the wrong term, but I believe your question goes to this. If positive traceability is indicated as not being available, how did we know that in fact the data was traceable?

I think the explanation of that goes to the term, what does "positive traceability" mean in terms of the audit? Positive traceability means, as Mr. Eifert pointed out, that in the future somebody who is not on the project, after these calculations have been sitting on the shelf for five or ten years, with no project activity related to Shoreham, could that book be pulled

out, opened to that page of calculations, and someone who is in that discipline but who doesn't have the history and the IDC's and everything else that went on during the design of Shoreham, could he utilize or verify that calculation again.

In that context, the term "positive" means that there has to be enough information to cover that situation. He would have to say, I used a certain textbook for a structural steel calculation. Whereas at the present time traceability -- I guess I am trying to draw the distinction between the term "positive traceability" as used by the auditors to determine whether or not it was met to the term "traceability." In other words, can we trace where that input data came from to verify that it was a right input data at this point in time, while we are working on the project.

I think that is the distinction I would like to try to draw, that we can trace it, that the auditor can trace it, and that the engineers can trace it now, but it might be insufficient for someone, another auditor or another independent reviewer or another engineer who needed it to modify the plant five or ten years from now might not be able to do that based on the information, and the requirements are, the Stone and Webster requirements are that that engineer five or ten

years from now also has to be able to use the input data and not depend on an IOC or something that might be cryptic to him because he wasn't into that particular project.

Does that help?

JUDGE CARPENTER: Yes, I think you made the county's point very well. If I understand what has been testified to here the last half-hour, the auditor within a year or so of finding a calculation can still find the people who did it, and therefore he can trace it, because he can find the people who are knowledgeable. You see, that is the thrust of what I am hearing. I am just trying to be sure the record is clear that you understand how I hear the record and how someone else reading it some months from now, the cold record, will show that clearly the exhibit says lack of positive traceability, and the testimony says, but we could trace it, and I am trying to understand that, and in the context of these reviews which you testified to a few minutes ago, how those reviews could be conducted.

These are only samples, so presumably there are many other case. I don't know how many. I go back to Mr. Lanpher's question of whether it is widespread. I don't know whether it is widespread or not, but certainly the evidence suggests that there might be some

of these that are being found today in the reviews, and I think that is the real issue that I am trying to listen to. That is what I am trying to see, whether I understand. The audit says not traceable, and then you testify that in fact it was traceable in some other way.

WITNESS EIFERT: If I may respond to that, Judge Carpenter, the auditors and any other experienced engineer who understands Stone and Webster's design process and the file structure on the project, locations of the groups, as well as an understanding of what different disciplines are responsible for, can find this information and locate the input documents without the positive identification.

Certainly there are probably situations where an auditor finds it quickly in an audit by talking to the people responsible. I can't say that doesn't happen. If I was the auditor, I would do that, but I would judge whether or not there was traceability. To try to put this in perspective, we had a problem with traceability of input sources on another Stone and Webster project, where they had problems with traceability, and it was a unique situation because of the nature of the work and the documentation was other than the standard process, if you will.

So we were very concerned, especially for future usability. We were also concerned because the auditors had extreme difficulty in going back and finding the documentation. That led us to concerns about the adequacy of the review. If the preparer had this hard time getting the input, and then the reviewer had a hard time getting input, should we be concerned about the analysis and the input?

The auditor spent a lot of time doing that audit, hours, tracking down input, to get the confidence that we wanted to have. We didn't want to take the project's word for it. We, the engineering assurance people, the auditors, wanted to have confidence that the design work was adequate. We spent a lot of hours doing that with people experienced in that type of analysis. As I indicated earlier, my auditors, many of them, are experienced engineers. We were able to find the input. In some cases it might take ten hours to find the input for a given analysis, but we found it all, and it was correct.

Quite frankly, I didn't expect that result, but that's what the result was. That is an example, if you will, of what we are going through. The problem also there was that the engineers who had done the work were no longer with Stone and Webster, so we were able

to find it. We had traceability, but it wasn't the positive traceability, it wasn't the traceability that Stone and Webster insists on to the detail, but it was an efficiency concern.

If positive traceability was there, we could have located it all, gotten it together in less than an hour. In that particular case, it took us ten hours. It is not a question of not having traceability.

JUDGE CARPENTER: Could you help me just a little bit further? I think maybe what you are terming positive traceability, I might term ready traceability. If it is possible to do, it is positive.

WITNESS EIFERT: Exactly, Your Honor.

WITNESS MUSELER: Judge Carpenter, I may have given you the wrong impression a little earlier. The project records, the things like IOC's and other pieces of paper that are not official memoranda are not lost or gotten rid of at the end of the job. They are maintained. So what I was alluding to with the difficulty of an engineer five years from now to reconstruct that particular calculation went to the fact that if he couldn't from reading the calculation, from the data that was there, get very readily to the source of the input data, the input data would have been indicated, but to the source of the input data, he then

would have had to go into the more voluminous project file, maybe even into the archival files to dig out the data. I believe it would still be able to be done, but it would be a much more difficult task.

I think the example Mr. Eifert gave where they actually had to do that indicates that that in fact is what would happen in that particular case. So even then you wouldn't have a lack of traceability, you would have a lack of efficiency in being able to readily reconstruct the source. You wouldn't have any trouble reconstructing the calculation, because the input data is there, but if you needed to get to the source, the data or the timeliness or whatever data was used so that you would know whether you should still use the same data, that would take a lot more work, if you had to go back into the old files.

WITNESS EIFERT: Judge Carpenter, if I might add, I have indicated several times now that the auditors look both for the identification of the input source as well as looking to ensure that the correct and current input data is supplied. That is specific attributes on our audit plans, specific instruction to the auditor to do that, and that is reflected in one of the attachments to LILCO testimony where we have included the manual and computerized calculation audit

checklist, and very specifically, it indicates that the auditor shall select some input values and assumptions from each of the calculations and verify that, and I would just indicate the two attributes. Sources of input that are clearly and completely identified, and then as a separate attribute input values are current, or if the data is not current, have some steps taken to ensure that the calculations are revised, the management aspect of it.

It is a specific attribute of verifying that it is current data as compared with the attribute where we ask the auditors to check the identification.

In reference to your remark about --

JUDGE CARPENTER: Let me interrupt. From what were you reading?

WITNESS EIFERT: This is an attachment to the LILCO submitted testimony. It is Attachment 24, and within Attachment 24 there are several audit plans used by Stone and Webster engineering assurance. The calculation audit plan is the third one in the package.

(Whereupon, the witnesses conferred.)

JUDGE CARPENTER: I didn't mean to break your train of thought, but I thought that traceability was important.

WITNESS EIFERT: I was just going to comment on the distinction between what is termed positive traceability and maybe a better characterization in the future. This type of audit observation, we will probably write it, that the specific identification of the reference document was not provided, to distinguish clearly from traceability.

JUDGE CARPENTER: Thank you, Mr. Lanpher, for allowing me to interrupt for so long, but I find it very helpful to get some perspective on some things that I don't know anything about.

JUDGE BRENNER: I have one or two things, and then we will take the midmorning break.

Mr. Museler, we talked before about that check

that is done by the discipline project people themselves at the time they have essentially completed their work, and I don't recall specifically the wording of my question, so I want to get this, which you answered earlier, so I want to get this detail. That check doesn't include looking at the sources of input data from calculations, does it? Looking to see that there is this positive indication?

(Whereupon, the witnesses conferred.)

MR. LANPHER: Judge Brenner, could I have the question read back, or could you repeat it?

JUDGE BRENNER: Yes. I will even rephrase it, because I have it in my mind, since I had asked the earlier question, and you might not.

Mr. Museler, to help Mr. Lanpher focus, we specifically discussed the fact that the check done by the particular discipline of its work at the time it was essentially completed with its work included checking the index of calculations to ensure that in fact those calculations existed, presumably existed in the location where the index said they existed, and I don't recall whether the wording of my question at that time would have also encompassed the further detail that I am now asking you about, and that is whether that check includes also looking to see whether the sources of

input for the calculation conform to the EAP 5.3 procedure.

(Whereupon, the witnesses conferred.)

WITNESS MUSELER: Judge Brenner, I have my own understanding of what that is, but I would prefer to make sure so we can give you a positive answer and do that either after the break or after lunch at the latest. Your question is, does the final check of the calculations as they are cleaned up, as the job books are finished, does that include a check of the attribute we have been discussing, i.e., an identification of the source, positive traceability of the input data source.

We will get a firm answer to that question.

JUDGE BRENNER: You asked the question much better than I did. I might as well fill you in on the context of what I am thinking of in case there are other things pertinent. I am not asking -- what I am seeking is some insight into, if the auditor misses it, either because of his audit or because as we know the audits are a sample, if the next time there is going to be a problem in the identification of the source of input data will not be until many, many years, when somebody has to go back to the calculation because of a design change or because of a check or something like that, as distinguished from some interim mandated times.

I am not talking about interim opportunity, but interim mandated times. It occurred to me that the cleaning up of the job books time which I learned about from you earlier today, Mr. Museler, might be such a possible time. That is why I asked my question. But there may be other times that I don't know about that you may want to tell me about also.

WITNESS MUSELER: Yes, sir.

JUDGE BRENNER: All right. Let's take a 15-minute break until 10:55.

(Whereupon, a brief recess was taken.)

WITNESS MUSELER: I believe we will have that answer for you after the lunch break.

JUDGE BRENNER: I want it accurate rather than hurried, so you could give it to me next week also.

WITNESS MUSELER: Yes, sir.

BY MR. LANPHER: (Resuming)

Q Gentlemen, I would like to go back, or we were looking at Audit Observation 034, which is part of Audit 23. Paragraph Number 3 under that, the second sentence indicates that the input source reference for at least one of the input values was totally missing on three calculations. This would be an instance, would it not, where ready traceability would be -- well, I am using ready in the sense that we were talking before the

break. Ready traceability or immediately traceability would be highly difficult since there apparently was no indication at all of the source of the input data, correct?

A (WITNESS EIFERT) I wouldn't characterize it as an example where something would be highly difficult. The example I gave before the break with respect to the other project was an unusual situation. The documentation that was being generated to solve the specific problem was not the normal design process documentation.

In this situation, the work that is being done for the Shoreham project, it is the standard design process, the standard documentation. Experienced engineers understand Stone and Webster's design process. They can find this design process without the degree of difficulty, the ten-hour example that I gave. There is now a high level of difficulty. It isn't as easy as if the specific document was there.

I would also point out that typically engineering mechanics calculations, mechanical calculations have many inputs, and this is indicating that only one of those inputs apparently did not have the input traceability identification that we demand.

Q. You have mentioned twice another project.

When did this incident occur on the other project? Approximately, by year.

A (WITNESS EIFERT) I believe 1980.

Q Is this another nuclear plant?

A (WITNESS EIFERT) Yes, it was.

Q Which plant was that?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) I would rather not identify the other plant.

JUDGE BRENNER: Tell me why you need to know, Mr. Lanpher.

MR. LANPHER: I may want to check I&E reports related to that plant, sir.

MR. ELLIS: Judge, that material is confidential, as was this material disclosed in this proceeding.

JUDGE BRENNER: Was this matter already disclosed pubicly in I&E reports, do you know, Mr. Eifert?

WITNESS EIFERT: To my knowledge, it is not. This was a concern specifically identified in our audits, and evolved through our audit process. At Stone and Webster, where we are dealing with a lot of different utilities and a lot of different work, our posture is that we do not make public information with

respect to other work, and that is a confidence that we have with our clients, on the one hand, and it is just a business -- in addition, a business decision. I am advised by our own counsel that it is not something that I should be free with.

JUDGE BRENNER: Okay, I understand your position. I am just trying to identify, as counsel here know, the other side of the balance, that is, the need to know for purposes of this proceeding. If there are no public I&E reports on it, Mr. Lanpher, what would you do to pursue it in terms of the issues you want to get at in this proceeding? You don't have to answer right away. If you want to think about it and talk it over with other counsel, I don't have to pursue it now. I can understand their not wanting to disclose that. On the other hand, if you need it, we will weigh that in the balance. So I want to understand first what we would do with it before will they discuss it.

MR. LANPHER: Let me respond after lunch. My preliminary thoughts are, maybe there is an audit report with a protective agreement that we could look at to see if there was anything that we needed to pursue. We have signed protective agreements before, and if -- I am not interested in raking them over the coals, so to speak, on this, because it was an aside by the witness, but he

did assert there was a problem, and there is also testimony that there is one engineering assurance position at Stone and Webster, and they have a project organization, but it is all the same procedure.

So, I don't know how relevant it is or isn't, frankly. That is part of my difficulty.

JUDGE BRENNER: Okay. Let's leave it where you left it, and if there is a problem in your even getting enough information to determine whether it might be pertinent along the lines you stated, we can talk about it later.

MR. LANPHER: Let me see if I can pursue it informally.

BY MR. LANPHER: (Resuming)

Q Gentlemen, I would like to turn your attention to the first page of Audit 23, and on that page the following statement is made relating to the audit results. One of the most significant items in the audit was "All the disciplines audited for compliance with EAP 5.3 (calculations) exhibited deficiencies in identification of input sources to assure positive retrievability." Do you have any reason to disagree with that statement?

(Whereupon, the witnesses conferred.)

Q. Mr. Eifert, let me ask the question a

different way. I don't want you to have to go through the whole audit to make sure that every calculation error was cited. We can go through that. This observation and the cover memo of the auditor, the report page of the audit indicates, does it not, that a number of the disciplines which were looked at were found to have the same basic kind of problem, correct?

A (WITNESS EIFERT) Yes, sir.

Q Do you know whether the corrective or preventive action taken by Stone and Webster in this instance covered disciplines which are not specifically audited in Audit 23 with respect to this traceability issue?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) Mr. Lanpher, I don't know the answer to the question with respect to any preventive action that may have extended beyond the specific disciplines that were audited in this audit. Training is periodically given on the calculation procedure by the engineering assurance division training group, and that training is given periodically across disciplines, and includes that specific training on that subject, and that would serve as generally preventive action.

Q. Gentlemen, I would like you to turn to Audit

Observation 038, Page 2 of 2. There is an Observation Number 4 at the top of that page.

(Pause.)

A (WITNESS EIFERT) Yes, sir.

Q Mr. Eifert, is this an example where -- would you first of all call this an administrative problem?

A (WITNESS EIFERT) With the information that we were able to obtain last night in talking with auditors and looking at the other records, I would, yes.

Q Well, I will follow up on that in a moment. From reading this, it seems as if the auditor was unable to determine whether the correct input values were utilized. There seemed to be two costs or values, and he didn't know which were correct.

A (WITNESS EIFERT) That is correct.

Q Now, what information did you determine last night?

A (WITNESS EIFERT) We were able to determine that the calculation was correct. It had indeed used the proper value, and it was a nomenclature problem with the calculation, and I would characterize that as an administrative problem. He properly used the value in the calculation. This would be a situation where the auditor didn't have time to fully pursue that specific incident during the audit, so it was written up on the

audit as a finding.

Q And this was an instance where the FSAR was incorrect?

A (WITNESS EIFERT) The FSAR indicates that suppression pool has the capacity of 134,000 cubic feet, and it also indicates -- no, excuse me. The FSAR indicates that the suppression chamber has 134,000 cubic foot capacity, and that the suppression pool has an 81,350 cubic foot capacity. The calculation used the value of 134,000 but used the terminology suppression pool, not chamber.

What the auditor didn't know is if the intent was to use the pool value which is 81,000 or the chamber value in the calculation. As a result of this audit and the corrective action, the objective of that calculation dealt with the capacity of the suppression chamber, so the value was correct. The individual preparing that calculation had inadvertently used the reference to pool instead of chamber. That is in my judgment an administrative problem.

JUDGE BRENNER: Excuse me, Mr. Lanpher. Are you still going to ask about this item?

MR. LANPHER: No, I was going on to another item, sir.

JUDGE BRENNER: Mr. Eifert, is that one of the

things your auditors would typically look at in an engineering assurance audit? That is, spot checking back to the source to see if the input, in addition to whether or not the source is identified, is the proper input to use, given the source?

WITNESS EIFERT: Yes, sir, it is. This would have been a specific input that they selected from the audits, from the calculations that were involved in the audit, and this reflects a check of that.

JUDGE BRENNER: The reason I asked is, the nine attributes that you told us about the other day, this does not appear to include that, unless I am not reading the attributes correctly.

WITNESS EIFERT: The attributes that were discussed the other day were with respect to an audit done in 1970. They are significantly different than the audit that we have used since 1970. The audit that I referenced before the break is many pages of attributes and controls that we look at today that we didn't look at, or at least we didn't record in audit plans. We didn't look at them in that detail in the early days.

JUDGE BRENNER: It looks like you have a pretty good auditor here for this item. Okay, Mr. Lanpher.

BY MR. LANPHER: (Resuming)

Q Gentlemen, I want to turn your attention to Audit 24 and Observation 050, Page 2 of 3.

JUDGE BRENNER: Mr. Lanpher, I am sorry. I guess I didn't follow your reference.

MR. LANPHER: I am sorry. It is Audit 24, Observation 050, Page 2 of 3.

(Pause.)

BY MR. LANPHER: (Resuming)

Q Mr. Eifer, this audit observation --

JUDGE BRENNER: Wait a minute. It looks like they are still reviewing it. Are you ready?

WITNESS EIFERT: Yes.

JUDGE BRENNER: I am sorry.

BY MR. LANPHER: (Resuming)

Q This observation indicates that the auditor was unable to verify that the files correctly represented the response spectra curve due to the absence of identification of the computer program in a computer program that modified certain of the data, correct?

A (WITNESS EIFERT) Excuse me. I had not read Page 2 when I indicated that I was ready. Just one minute.

(Pause.)

JUDGE BRENNER: Maybe this is a good time for

me to observe that I don't want the witnesses to feel under any pressure that they have to reread this in a hurry, or that we are frowning at you while you are taking the time to read it. There are a lot of documents here, and what you have been doing, Mr. Eifert, is very proper. Take all the time you need, because you are being asked a lot about this, and you are going to be held to what you say, so make sure you are ready. We will give you all the time you need, and that will go for all parties' witnesses.

WITNESS EIFERT: Thank you, Your Honor.

Mr. Lanpher, when you started to ask that question, I had indicated to him that I was ready.

(Whereupon, a discussion was held off the record.)

BY MR. LANPHER: (Resuming)

Q Mr. Eifert, let me ask my question again. Let me phrase it differently, too. Is this an instance, Mr. Eifert, where proper identification of input data was not available, thus making it impossible for the auditor to verify that the files correctly represented the amplified response spectra curves?

A (WITNESS EIFERT) This problem relates not to the preparation of a specific calculation. The auditor was able to identify what ARS data was used in the analysis. The program design control process at Stone & Webster provides for maintaining the amplified response data in a computer file for use in the analysis that requires use of the response data.

That file is updated as changes occur to the response spectra. The auditor in this case was looking specifically at the data in the response spectra file on the computer to determine if it correlated with the output from the calculations from the structural mechanics group that generates the response spectra, and found that he couldn't trace it because of a lack of identification of the computer program that -- not NUPIPE that was used for the pipe stress, but the computer program that compiles that response spectra data.

The corrective action with respect to this audit, the group responsible for maintaining that file was able to demonstrate that the file was up to date and provided additional reference to the computer program and computer run, additional tracking, so that, again, more positive traceability was provided.

The auditor -- and I can't explain why, but the auditor could have gone directly from the NUPIPE run to the structural mechanics calculations, and possibly did, to verify the correct response spectra were used in the analysis, but was concerned and wanted to ensure that the intermediate step in that process was complete and adequate.

This is a unique situation to the way computer files are generally maintained for response spectra that are used primarily in pipe stress analysis.

WITNESS MUSELER: Mr. Lanpher, I could add to that just by way of explaining some of this alphabet soup that is on here with the various terms. The last -- I guess not the last paragraph, but in the middle of that paragraph of item 2 it says, "This data is generated by the structural mechanics group and stored in ATS" for the particular computer program we're talking about.

ATS is not quite as sophisticated as it

sounds. It refers to an automatic typing system in Stone & Webster, which is just another one of the files. And what this indicates is that the data -- that the data was in fact available and was being used by the other disciplines, and that structural mechanics and the EMD division, engineering mechanics division, both had what they needed.

But the normal ready reference which is stored in the ATF, in the automatic typing system at Stone & Webster, as it says was not -- or did not have that data either updated in it or readily retrievable from it. I can't tell which.

I just wanted to point out that what we're talking about here is the repository of the storage information for the whole project in this area for this kind of data is the automatic typing system. It was not readily available there. It was, however, available within the structural mechanics division, and the proper data was being utilized by the engineering mechanics division, as I believe Mr. Eifert indicated.

Q Gentlemen, turning to page 3 of that audit observation 050, if you could review the item which is listed on that page.

(Pause.)

Q Mr. Eifert, this observation indicates, does

it not, that there appeared to be a problem in using different input data or input values for a particular parameter from different documents, resulting in the fact that where you may have wanted to use the same value to be consistent, you may in fact have used different values because the different input sources had different values?

A (WITNESS EIFERT) I believe what is indicated, what we are seeing in this observation, is that the data input documents, the flex data sheets and the line designation tables where the normal -- we would normally expect the information to come from, were probably different than the IOC's. I don't know specifically.

The IOC's were probably transmitting changes to those documents to advise the pipe stress design people that a change was in process, and that the line designation table or flex data sheets would be revised in the near future and would be coming down.

Q This observation goes on to note that in the auditor's view this was a problem of not providing traceability as required in EAP 5.3; is that correct?

A (WITNESS EIFERT) The auditor indicated that this was a situation of not providing the traceability provided by EAP 5.3.

Q. Mr. Eifert, there is a note on this

observation which references a design division procedure which apparently did not require the identification of input forces. Now, how do design division procedures relate to the engineering assurance procedures? Does one control over the other or what?

A (WITNESS EIFERT) The engineering assurance procedures are the Stone & Webster standard procedure for implementing our quality assurance program. They are prepared by the engineering assurance division and applied to all our projects.

The EAP on calculations applies to all disciplines who prepare calculations. The individual disciplines can and do supplement the requirements contained in the engineering assurance procedures with additional detail, specific detail or standard methods of documentation or format of calculations for the calculations within their discipline.

The design division procedure that is referenced here would have been that type of procedure, with supplementing detail.

Q Is the supplementing detail, however, is required to be consistent with engineering assurance division procedures?

A (WITNESS EIFERT) Yes, sir. The note here is indicating that the supplemental detail contained in

DP-PWR 29.1 did not specifically have a requirement for the specific referencing of the input data. I'm not sure why the auditors put the note on the audit observation, because I would not expect that that would necessarily be in the procedures, unless there was some reason in the design discipline at that time to have an additional requirement.

I have indicated earlier that in one discipline they specifically require that input sources be referenced not only to the documents, but to the page number. That's in one specific discipline and that requirement is contained in one of the implementing procedures, supplementing procedures to the engineering assurance procedures.

Q Gentlemen, I'd like to turn now to audit 26, and observation 067, page 2 of that observation. In particular, the last part of that observation, which states that "Since there is no cross-reference of pipe support drawings to calculations, there is no way to determine the latest calculation for a given support" because of certain conditions that are noted above.

(Pause.)

A (WITNESS MUSELER) Mr. Lanpher, you're on 067, page 2?

Q. Yes.?

A (WITNESS MUSELER) Thank you.

(Pause.)

Q Mr. Eifert, this observation notes that there appeared to the auditor to be a lack of communication between Boston and the site engineering office, correct?

MR. ELLIS: Where is the reference to lack of communication? I'm sorry.

MR. LANPHER: Page 2 of 3, audit observation 067, at the top of that page.

MR. ELLIS: Thank you.

BY MR. LANPHER: (Resuming)

Q Do you see that reference, Mr. Eifert?

A (WITNESS EIFERT) Yes, I see the reference.

Q Under Stone & Webster procedures, Mr. Eifert, does Stone & Webster attempt to control that interface between the Boston office and the site engineering office?

A (WITNESS EIFERT) Yes, sir, we do control it. The site engineering office is a direct extension of the project engineering headquarters office in Boston. The site engineering office has been staffed with an assistant project engineer who reports directly to the headquarters project engineer. They work under the same procedures as the Boston project.

When activities are delegated to the site engineering office, the specific delegation is identified in procedures and we require that the project ensure that the procedures identify the unique controls that are necessary to ensure consistency of the work and of the documentation prepared at the site as compared to the work being performed at project headquarters.

What we're seeing here is an example of a situation where the work was being done at the site engineering office and the auditor's judgment was that additional coordination of the work with the Boston project was necessary.

Q Mr. Eifert, this audit observation indicates, does it not, that there had been a breakdown in that interface control? For instance, it notes that some calculations in the site engineering file index which had been complete a year earlier had still not been filed in Boston.

(Panel of witnesses conferring.)

A (WITNESS EIFERT) I would not characterize this, Mr. Lanpher, as a breakdown. I would characterize this as an administrative control problem between the work being done in one group at the site versus the work being done in Boston. This control is important. It's important that both offices understand exactly what the

latest design document is.

The auditors identify that the files were not being completely kept up to date, and corrective action was taken to ensure that the duplicate files, if you will, were consistent and up to date.

A (WITNESS MUSELER) Mr. Lanpher, let me add that the coordination of design information, especially when it's being conducted at several locations, which at this time it was -- it was being conducted in the SEO, which is a site engineering office, in Stone & Webster's Boston office, and also in Stone & Webster's Toronto office -- there were at various times over 500 engineers and designers in the engineering mechanics division alone, all working on the stress analysis and the pipe support design for Shoreham.

So the coordination and control of all of the various design inputs and outputs was obviously a very important process, and I think that the measures that were taken at the time in order to ensure that this data was kept up to date and did not get out of control, which it did not, included such measures as weekly trips between the offices by the various Stone & Webster engineers in charge of the stress analysis and pipe support design efforts.

And while it is true that that calculation may

not have been listed at one place or another, at any instant in time the brief amount of examination of these that we have been able to do over the evening period indicated that, at least in one case, in this particular audit the problem was a matter of the latest information being in transit between one office and another. So at the time the auditor looked at it it certainly was a valid observation. The overall control of this data was in fact maintained.

I would also like to add that, as we have said before, the changes in input parameters that Judge Carpenter was speaking about earlier, especially in the stress analysis area, occurred over the life of this project many times, and this type of a process went on almost continuously from 1977 until the present time. And what we are currently engaged in is, hopefully for the last time, making sure that all of that input data is in fact the latest input data, so that the calculations can be brought up to the latest input data if that is what's required, or verified for the last time that the latest input data was in fact used.

The point I'm trying to make is that this was a process that involved literally hundreds of engineers in three major locations and perhaps some minor locations. Further, the one thing, the one thread that

did carry throughout this entire process was that the central control or the organization having the responsibility for making this process work was the Stone & Webster project, and all of the peripheral organizations involved in this, albeit not at the same location, were also Stone & Webster.

So we were dealing with a single system which was imposed on all organizations doing the work, and that system was centrally coordinated so that the types of observations made here were also made in the other locations to ensure that the process was controlled.

A (WITNESS EIFERT) I would like to also add that this situation is where the responsibility for this pipe support work was delegated to the staff of the site engineering office. This observation is merely saying that you're not maintaining your duplicate file of their output in Boston.

There is no indication here that there was any concern with the file in the SEO. It was not getting the duplicate file in place in Boston.

Also, the pipe support calculations that we're talking about, the output is pipe support design. To the best of my knowledge, those calculations do not serve as input to any other aspect of the design. The use of those would have been restricted here to the site

office.

So I would have no design concern at this poin, because of the lack of having the file in Boston precisely up to date at that time, although we did take corrective action and they established a requirement to transmit work completed at the SEO every two weeks at the Boston file to keep that file up to date.

Q Mr. Eifert -- excuse me.

(Panel of witnesses conferring.)

Q Mr. Eifert, the testimony was that there were many hundreds of engineers working on related matters during this time frame. Now, isn't it also your testimony, though, that while they were related matters, none of the calculations that were apparently correctly filed at the site engineering office, but were behind in filing by up to a year in Boston, none of those calculations needed to be used by engineers in Boston?

A (WITNESS EIFERT) That reflects my understanding of the process in this case, yes.

JUDGE MORRIS: Excuse me, Mr. Lanpher. Are you moving on?

MR. LANPHER: Yes.

JUDGE MORRIS: Let me ask a follow-up question. In the very last paragraph of this observation it says, "There is no way to determine the

latest calculation for a given support because of the above conditions."

Is it your understanding that, A, this was true in the Boston office; and if so, was it also true at the site engineering office?

(Panel of witnesses conferring.)

WITNESS EIFERT: Judge Morris, I believe from the information we were able to gain last night that the situation with these calcs within the SEO is that the calc numbering corresponded to the drawing number, and the revision of the drawing number for the support which was being analyzed.

The confusion would have existed in Boston where there were overlapping drawing numbers and drawing revision numbers. So to the best of my knowledge, it would have been confusing in Boston if someone was using those files, not at the SEO, where they were marking the calculations and tieing them directly to BZ drawings with number references.

WITNESS MUSELER: I would add to that, Judge Morris, that Mr. Eifert is correct in that observation. However, during this process, again, this was approaching a very high level of activity in the pipe support, pipe stress area. Both offices, actually all three offices, realized that work would be going on

sometimes on the same component for different reasons in different offices.

And it was my experience, since I was involved at various times with the site extension office and in fact with the Boston area in this discipline, that the engineers who were involved in doing the work knew that at that time, because -- the transmittal difficulty, that they had to check more than their own records to ensure what the latest calculation was.

For instance, if a Boston engineer needed to look at a pipe support calculation for some reason, it was the engineers on the project, they knew that work might be conducted on that same pipe support on the SEO, and they would generally communicate with the SEO to find out whether or not the pipe support had been changed.

The situation, the most common situation was that the pipe support which might be being evaluated in Boston because, let's say there were a new version of the Mark II loads that had to be looked at, might also be being worked on in the field extension office because of some geometrical difficulties in installing it. The field might have asked the site extension office to modify the part in a certain way. So the field would be referring to calculations to see if they could modify

the pipe support at the same time Boston might be required to look at the same pipe support or reevaluate it based on a new stress analysis.

Both of those things just had to go on at the same time. So what I am saying is -- and there was no way that, unless we were linked by computer, which we later were, there was no way to keep a real time communication going. It had to be a transmittal situation, which has an apparent time lag in it. But the engineers knew that and they in fact did communicate with one another to try to ensure that the were working on the latest configuration if the field were doing something with the latest pipe stress analysis numbers, if Boston were doing something.

JUDGE MORRIS: I thought for a minute we could separate this problem by site, but what I understand from what you just told me is that the problem is interrelated among the sites. It's not isolated.

WITNESS MUSELER: Yes, sir. The situation involved the fact that work was going on in three locations at the time.

JUDGE MORRIS: Thank you.

JUDGE BRENNER: Mr. Museler, you mentioned there was a lot going on in the pipe support area. This is August 1978. Let me ask the question: Was this the

period when Stone & Webster had to rework their calculational codes for all their plans for pipe stress analysis? I'm trying to get a handle on what you said was going on in the Boston office that had to be done at the same time.

WITNESS EIFERT: I believe, Judge Brenner, you are referring to the 1979 activities with respect to plants other than Stone & Webster and the NRC concerns with respect to those. This would have been before this time.

And just for the record, you characterized it, reworking our codes. During that effort, there was no reworking of the computer codes themselves.

JUDGE BRENNER: I was wrong in what I remembered, then. Thank you.

JUDGE MORRIS: While we have interrupted you, Mr. Lanpher, and since it's getting close to the break, I wanted to get one more question in before lunch.

With respect to positive traceability, is there a definition of that term in the EAP 5.3?

WITNESS EIFERT: I would have to go back and check to be sure, but I'm 90 percent sure there is not.

JUDGE MORRIS: Are there some criteria listed so that the auditor can tell how that requirement is satisfied? I see a reference in here to a Section

3.1.1.C. Maybe you can look at that over lunch or over the weekend or something.

WITNESS EIFERT: I can look at that and get back to you. The EAP I think provides examples, or at least in words, descriptions of what would be an acceptable method for identifying the input sources. I can get specific information for you, sir.

JUDGE BRENNER: Should we break, now that we have interrupted you, or do you want to finish something up?

MR. LANPHER: I want to finish one short thing on this audit and then I will be done with this audit. And then I wanted to hand out some pages that were missing on audit 28 that we have received. I thought it would be more efficient to hand it out before lunch, if anyone wanted to look at it.

JUDGE BRENNER: Okay.

BY MR. LANPHER: (Resuming)

Q Gentlemen, just briefly, the same audit observation number, but page 3 of 3. Observation 067, page 3 of 3, item 6 thereunder, it states: "In many cases calculations do not reflect the source of the calculation equations methods used. While most of the calculations were found to be based on the LILCO job only special procedures, they have been modified at

times by memos not included in the procedures, such as in the case of load factors used."

Mr. Eifert, is this an example of failure to note the source of information utilized in calculations, or the method, I guess to be more precise in this instance?

(Panel of witnesses conferring.)

A (WITNESS EIFERT) Mr. Lanpher, the proper reference for the source of the input data that was used was indicated on the calculation as being the LILCO job only special procedures. The auditor identifies that there were some changes to that procedure, those procedures, which had been distributed by means of inter-office correspondence, which were not specifically referenced in the LILCO job-only special procedures.

The corrective action involving that was, as an interim, to instruct the engineers, if they are using the interim changes and the interim IOC's, to reference the IOC's. The preventive action was that the LILCO job only special procedures were amended to include these changes.

Q Then the reference to input data or the input methods was not complete in this instance, correct? There was a reference, but it didn't contain all the information needed for positive traceability?

(Panel of witnesses conferring.)

A (WITNESS EIFERT) Mr. Lanpher, the way this observation is written, it's not clear whether the calculations reference the memos or not. Had the memos been referenced, I would have said there is positive traceability because the memos were the advance change documents, so to speak, for the special procedures.

The practice in this situation would be that those memos are part of the discipline's instructions for doing work, together with the procedures that are available on the project, and the engineers were receiving those advance change notices and using them. There was traceability with that respect, and the preventive action was to include those as an addendum to the special procedures.

In summation, I believe there was traceability here. It is again a documentation problem. I believe it -- my concern would be, with my experience in quality assurance, not with the engineers were doing preparing the calculations, but in this case the updating of the LILCO job only special procedures and the action there to amend those procedures to include those kinds of changes is the important aspect of this, in my judgment.

Q. Thank you.

A (WITNESS MUSELER) Mr. Lanpher, let me add to that before we leave this audit. I think it's appropriate to refer to the audit summaries which are now being provided and which you referred to in some of the previous audits. And on the first page of that audit summary, in item B it states that: "The project has made significant improvement in resolving audit observations."

At the time of the last audit there were apparently 16 audit observations still open, and in the immediately previous audit there had been 7 audit observations. And this audit notes that in the case during this audit, when all of those outstanding audit observations were reviewed, that all of them had been satisfactorily resolved.

So that at the point of this audit the only audit observations not closed were those immediately incident to this particular audit. I point that out to emphasize the corrective action, the timeliness of the corrective action that is taken with regard to response to these audits.

MR. LANPHER: Judge Brenner, we are handing out some pages which relate to audit 28.

If you turn to audit 28, observation -- initially, observation 079, the first page which has

been provided to you is page 2 of 3 of that, which was omitted. If you go on to observation 080, page 1 of that was omitted, and page 1 is in the package that was just handed to you.

JUDGE BRENNER: Okay, I think we see it. First of all, I should unstaple it if I want to fit them in. Second of all, I'll just follow the sequence and put them in. Thank you.

MR. LANPHER: Thank you.

JUDGE BRENNER: Incidentally, you apologized once or twice for the condition of these, and we appreciate the apology and also your zeal in fixing it up so that there's no problem.

On the other side of that, I want to note that I have seen cases where parties have taken something like -- I guess we have a total of 70 or so, if you look at the two volumes, and just handed them out one at a time, which could have been done here. And the order in which you have arranged these and presented these has been very helpful and more than compensates for the minor matters, which we have been able to adjust to with little problem.

MR. LANPHER: Judge Brenner --

JUDGE BRENNER: We appreciate the organization. It has been helpful.

MR. LANPHER: If I could just note one last thing, with respect to these pages I handed out, they were provided by LILCO and I thank them for that. I know that some of these have the reply section filled in, so these are a little different than the other ones that we have been using.

JUDGE BRENNER: Yes. I guess I have already recorded my observation yesterday. Maybe I didn't say it in these words. I think it would have been better for the response to discovery to have been these copies, regardless of the preciseness or lack thereof in the discovery request.

Let's break for lunch and come back at 1:00 o'clock.

(Whereupon, at 12:00 noon, the hearing was recessed, to reconvene at 1:00 p.m. the same day.)

AFTERNOON SESSION

(1:00 p.m.)

JUDGE BRENNER: We're back on the record.

This morning we received a filing from Mr. Reveley on the subject of construction schedule, and I thought it would be a good idea for you to mention the substance of that on the record if you want to.

MR. REVELEY: Judge, it's very short. Why don't I simply read it into the record. The company filed this morning a document entitled "Construction Schedule," which states as follows:

"The company announced late yesterday afternoon that the preliminary results of its most recent review of the schedule for fuel load of the Shoreham nuclear power station indicate that the plant will be physically ready for fuel loading during the first quarter of 1983."

That's the end of the document.

JUDGE BRENNER: Okay. We appreciate LILCO's continuing to keep us informed, as they have in the past and now. I note the wording that these are preliminary results.

Do you have any idea of when we will get the more final results, and from that I assume a more definitive time frame within the parameters of the first

quarter of '83?

MR. REVELEY: I think in the next couple of weeks the final results should be available. And you are correct that there will be a date, I believe, picked within the window, although I think the window also will endure as part of the estimate.

JUDGE BRENNER: Okay, thank you.

All right. If there are any other matters that we have to hear about today, let's do it now, because when we stop the testimony we're going to be gone.

(No response.)

JUDGE BRENNER: Hearing none, we can continue with the examination by the County.

MR. LANPHER: Next week we resume our normal schedule at 10:30, right?

JUDGE BRENNER: Yes. I guess I was going to stick around long enough to say that at the end.

(Laughter.)

JUDGE BRENNER: We will be here in this courtroom Tuesday morning at 10:30.

MR. LANPHER: Judge Brenner, during the break for lunch I handed out some missing pages on audit 31. I think you will find them among your stacks of papers. I believe they are self-explanatory. I gave them to all

the parties, and I also advised Mr. Eifert that we would start now with audit 27, observation 072.

Whereupon,

T. TRACY ARRINGTON,
FREDERICK B. BALDWIN,
ROBERT G. BURNS,
WILLIAM M. EIFERT,
T. FRANK GERECKE,
JOSEPH M. KELLY,
DONALD G. LONG,
ARTHUR R. MULLER,
WILLIAM J. MUSELER, and
EDWARD J. YOUNGLING,

the witnesses on the stand at the time of recess, having been previously duly sworn, resumed the stand, and were examined and testified further as follows:

CONTINUED CROSS EXAMINATION
ON BEHALF OF SUFFOLK COUNTY

BY MR. LANPHER:

Q Mr. Eifert, have you had an opportunity to review that?

A (WITNESS EIFERT) I'd like another moment, please.

(Pause.)

JUDGE CARPENTER: I'm sorry, Mr. Lanpher. I

missed the reference.

MR. LANPHER: 072 is the observation number in audit 27.

(Pause.)

BY MR. LANPHER: (Resuming)

Q Mr. Eifert, why don't I go ahead and ask the question. My question may be narrower than the areas that you're trying to prepare for. If you need more time after I ask the question, please let me know.

First, this audit observation notes some disagreements between the calculations and the FSAR's; is that correct? In fact, two areas of disagreement, items number 1 and number 6?

A (WITNESS EIFERT) Item number 6 describes a disagreement between the FSAR -- item number 1, based on the information that I got last night, apparently also is a disagreement between the FSAR and the design.

Q When your engineers, Mr. Eifert, are performing design calculations, which this audit observation indicates these were related to, are they directed to rely upon the design values in the FSAR?

(Panel of witnesses conferring.)

A (WITNESS EIFERT) In our design control procedures, many of our procedures, we have specific requirements that conform to the FSAR. I'm not clear on

my recollection with respect to the procedures for calculation, whether there is a specific reference. The process relies on other documents that are specific control design documents to establish and provide the basis for the criteria, the analysis that the individual designers might use.

In this context, I just can't specifically answer the question.

Q Mr. Eifert, as a general matter would you agree that if a designer is not going to follow a particular value or criterion specified in the FSAR, they're supposed to document their reasons and get a change perhaps in the E&DCR to allow a deviation from that FSAR value?

A (WITNESS EIFERT) Not a deviation, as you say. What we would do when a decision was made to -- or where it was thought that it was needed to proceed with work other than the FSAR, described in the FSAR, a change notice would be processed. In these two specific examples, the results of this audit for the first one was that they did redo this calculation to agree with the FSAR. They did find that the analysis in the design was adequate as originally prepared, but they did revise it to agree with the conditions in the FSAR.

The second example, they found that an

amendment to the FSAR was required and was initiated.

Q On the first instance, I believe you stated that they find that the design and analysis was adequate, but it was then reworked or changed to conform to the FSAR. I believe that's what you stated.

A (WITNESS EIFERT) I indicated that they revised the calculation and identified that there were no problems with the design that was based on those calculations. I don't think that's how I stated it, but that's what I meant.

Q Well, understand now. Thank you.

But that design based on those calculations did not conform to the design value specified in the FSAR, correct?

A (WITNESS EIFERT) No. The design did meet the criteria.

Q Then why was it reworked?

A (WITNESS EIFERT) The calculation was reworked. The design, planned as built, the drawings met the criteria.

(Counsel for Suffolk County conferring.)

Q Mr. Eifert, directing your attention to items 2, 3, 4 and 5 of the same audit observation, 072, would you agree that these are instances where there was lack of an identification of the source of the input value or

information?

A (WITNESS EIFERT) Would you repeat the items for me?

Q Yes. 2, 3, 4 and 5, sir.

Why don't you delete 3. Look at 2, 4 and 5.

(Pause.)

A (WITNESS EIFERT) Mr. Lanpher, item 2 is -- as a result of the action taken, it was not an issue of failure to identify a source document. The corrective action was providing the justification for the assumption used in the calculation. That was the corrective action. It's not characterized as an input source document referencing problem.

Q Before going on to the next item, just so we can keep the record together on it, it was a problem, however, that the calculation was not complete insofar as your procedure 5.3 required that the source or justification for the value be provided, correct?

A (WITNESS EIFERT) Our procedural requirement with respect to assumptions which were made by the engineers requires that the assumption be identified. The extent to which a calculation would contain a justification for the assumption, a basis for that assumption, would depend on the judgment of the engineers preparing and reviewing that, the complexity

of a given assumption.

Many engineering assumptions don't require justification because any experienced engineer in that discipline who can look at the assumption can understand why it's a valid assumption. In this particular case, the auditor was questioning where this information came from, and in the auditor's judgment it was not an obvious assumption that didn't require justification. So the corrective action was that they apparently agreed with the auditors and provided the justification in the calculations.

This is not an input source document. It is a judgment of the engineer versus the judgment of the auditors.

Q The calculation was not clear, though, in terms of what the source of this value was, and that's what the auditor wanted in the calculation.

A (WITNESS EIFERT) It was not clear with respect to the basis of that value.

Q That's right. Thank you.

You were going to go on and respond with respect to item 4, I believe, sir.

A (WITNESS EIFERT) This is similar to the former item, where it was an engineering judgment with respect to how the loads were applied. And the

corrective action again was to go back and put additional explanation in the calculation and why this was being analyzed this way.

Q And with respect to item 5?

MR. ELLIS: He wasn't finished yet.

MR. LANPHER: I'm sorry.

WITNESS EIFERT: I was simply going to say, this was not a reference to input source documents as we have been discussing.

BY MR. LANPHER: (Resuming)

Q Item 5, sir?

A (WITNESS EIFERT) Item 5, the correct action there was to go back and identify the source document.

Q Mr. Eifert, in items 2 and 4, where there was an apparent failure to provide enough details in the calculation itself to justify a value, isn't the purpose for providing those details the same basic purpose as in the traceability instances, namely to ensure that a subsequent reviewer, someone using those calculations later, understands and can follow those calculations, whether it be right on the face of the calculations or by reference to some other materials?

A (WITNESS EIFERT) I would agree that the basic purpose again is to ensure that assumptions or bases such as these were clearly identified such that

documents are readily useable in the future. The difference I see in this example from the specific identification of source document examples is that our requirements are very strict and specific with respect to how we reference source documents.

The situation that we are seeing in these two items is more of a judgment basis on those types of assumptions or judgments or bases that are used in the analysis, that clear explanations and documentations of those explanations are needed in the calculation. In these two cases, the engineering organization agreed with the auditors to add that explanation.

Q Mr. Eifert, I'm going to turn now to audit 28 and observation 079. If you could review that observation, my questions are going to go, initially at least, to items 1 and 2 and the corrective actions thereunder, or the recommended actions thereunder.

(Witness reviewing document.)

Q Mr. Eifert, let me ask you a question, and if you need more time, please take it.

With respect to Observation No. 1, it indicates that a certain calculation index form had not been used at the project.

What is this index form? Are you familiar with that?

A (WITNESS EIFERT) This index form is a standard form that is contained in EAP 5.3 on calculations and has been made the standard form and I believe now made mandatory for all disciplines' use. There was a change, and I'm not clear on the date, but sometime in the late '70s where we developed a standard indexing form and asked that all divisions use that standard form. Prior to that time I believe we had a form in the EAP, and it was presented as a sample to be representative of the information that we would expect to see on indexes.

Q Now, this index was to identify and track calculations which require a confirmation at some later time, correct?

A (WITNESS EIFERT) This was one of the new aspects that was put on the standard form. In the normal course of developing calculations, the engineers develop assumptions based on preliminary information to

proceed with the design information. The practice is to identify that as you are developing the calculation, if it is an assumed value as compared to a standad value. The change to the form reflected a new tracking requirement whereby when that information was -- when a calculation contained such information, it was identified on the calculation index as a calc that requires confirmation.

I believe the format of the form has two blocks, confirmation required and not required, and the form is used. If confirmation is required, it is checked as being required, and it then provides a tool, an additional tool for the discipline's lead and principal engineers to go back and verify when the information is available and confirm that the calculations either confirm that the assumption is valid or revise the analysis.

Q Now, this audit observation indicates that the new information required on the index was a requirement as of March 24, 1978, correct?

(Pause)

A (WITNESS EIFERT) Yes, that's how I would read that.

Q And this audit observation, dated March, early March 1979, March 3 and 8, 1978, indicates that the

auditor could find no evidence that the project had implemented this requirement, correct?

A (WITNESS EIFERT) That's correct.

Q Mr. Eifert, do you know why this new index requirement was enacted for the project?

A change was made in 1978, obviously. I am just wondering was it part of corrective action, for instance, or what?

A (WITNESS EIFERT) I'm trying to recall. There was a major revision to the EAP on preparation of calculations in that timeframe and I believe this change was part of that major change. The format of the procedure was changed. The detailed implementation requirements were expanded, and I believe this was the case at that time. This is not a change in requirement as much as it is the addition of an administrative mechanism for use by the lead engineers to again manage their calculation development process. I do not recall any specific corrective or preventive action that was intended to be addressed by the addition of this aspect of the calculation index form.

Q Mr. Eifert, directing your attention to Item 2 under Observation 079, it's correct, is it not, that this item concerns a lack of references to sources of input to ensure traceability?

A (WITNESS EIFERT) These are examples of nonspecific identification of the source document. Item 2A is an example where the source document was listed but the specific revision and date identification of that document was not listed.

Item B with respect to the Stone and Webster piping drawing, I believe that that is as quoted there specifically what was on the calculation. It is not clear reference the specific drawing number, and as I think we have discussed earlier, the response spectra is a reference to a specific calculation which is a detail that we require in all procedures.

Q It's also true, is it not, that the auditor stated that this was, at least one of these items was similar to an earlier condition that had been reported in February of 1978, and that the auditor concluded that it was indicative of inadequate project preventive action?

A (WITNESS EIFERT) The audit does indicater that the auditor's judgment was that this had recurred since the last audit. It had been reported in the last audit, and the project had indicated that there would be preventive action. This indicates, I believe, very well, how the auditors looked specifically in follow audits to see if the problems that had been identified

and corrected are recurring, and if they do recur, we report the situation again. We don't assume that because we found a problem in one audit and it was corrected that it is not going to happen again. And we continue to follow up. We continue to audit thoroughly to assure that we catch all of the problems, even these administrative problems.

Q Turning your attention several pages on to observation 080, Item 1 under that observation --

A (WITNESS EIFERT) If I can make another comment, please, on Audit Observation 079 with respect to the design drawings there and not using the latest index, the format of those calculations are, I think, as I discussed earlier, they are kept by job books with subcalculation indices. I suspect that the situation there was that it was not clear that it was intended for people to start using a new calculation format at that stae of the design. What exists now is a calculation index which is page numbered and different pages of that index using the different format, and in the judgment of the engineers at that time, it would have been that at this stage of the Shoreham project, there wasn't a need to use the newer index, and that judgment was not in accord with what we wanted.

What I'm trying to say is it is not indicative

that these calcs were not indexed. They were indexed and tracked in these calculations.

Q They weren't being indexed and tracked in precise accordance with engineering assurance procedures?

A (WITNESS EIFERT) With the new requirement, right, but they were indexed. I didn't want to leave the impression that these were not indexed.

Q You know that on personal knowledge or based on discussions? I think you said you suspected or surmised that.

A (WITNESS EIFERT) The audit observation indicates that the new index form is not being used. That was a change. Therefore, if we said they didn't have them indexed, the record would be clear. If the auditors identified that they weren't indexed, it would have been recorded that way.

Q I don't have anything further on that.

Again, if we could turn our attention to 080, page 1, Item 1.

(Pause)

Mr. Eifert, this is an example of where certain calculations had not been reviewed or checked in a timely manner, correct?

(Witnesses conferring.)

A (WITNESS EIFERT) Mr. Lanpher, this is an example of where in the auditor's judgment calculations were not being reviewed in a timely manner. The follow-up with this audit observation indicated that the type of information being generated here by the Structural Mechanics Division was preliminary and they would recognize that the design process would be giving them additional information that would be cause to change that information, and they had not reviewed those calculations on the basis that the information was preliminary and they knew that it was going to be confirmed at a later date.

Q Well, one of these calculations had actually been used to determine the G values in a particular purchase specification, correct?

A (WITNESS EIFERT) Yes, that is correct.

Q Such use -- am I correct in assuming that your procedures requiring checking before use of the calculation in such a specification?

A (WITNESS EIFERT) The Stone and Webster policy is that we should not use the results of calculations as a practice that are not checked. We have established mechanisms to control the situation where it is necessary to use input from preliminary analysis work. Input when it is used is required to be used in a manner

which identifies its status such that people using that understand the basis upon which they are doing work. As a general policy, the company does not allow widespread use of results of unchecked calculations in further developing the design, but on a case basis we allow its use when it is properly controlled.

An example of one of the control mechanisms that you use to control the situation where you have to use it is the confirmation required. So if an input was preliminary, based on an assumption from or a value from a preliminary calculation, the calculation using that data is marked confirmation required.

Q Gentlemen, I would like now to turn your attention to Audit 30, Observation 101, page 1 of that observation. Specifically, look at Item 1, sir.

Excuse me. I'm sorry. Let's go back to 28, just for one moment, the cover page of that audit. Item 1 relates to the -- Item 1 on that cover page relates to the item that we were just talking about, the use of the results of unchecked calculations in the preparation of calculations. They call these among the most significant of the items in this audit. We had discussion yesterday about significance.

A (WITNESS EIFERT) Mr. Lanpher, simply, of all the identified concerns that the audit discovered, they

were the most significant as compared with the others, the use of this term "significant" here in comparing the specific item identified by the auditors among those items, and it is in no way significant with respect to design or design adequacy. It is in that context.

Q Do you consider the use of unchecked calculations to be a significant problem when it occurs?

A (WITNESS EIFERT) Not when it is being properly controlled. That is one of the programs in a complex design process that it takes to design a complex power plant. We recognize that that situation is going to occur and we have allowed for that in our proces.

Q Do you know whether this was properly controlled in this instance?

A (WITNESS EIFERT) I cannot establish, in talking to the auditors, whether or not the specific specification that was referenced was marked at that time in the process last night, but I believe that had the auditor identified that the use of that data was not being properly controlled, they would have added that to the observation as well. The reason I believe the auditor wrote that observation is that you cannot establish a reason or a basis for not checking those calculations.

It turned out, I believe, that it was primarily an allocation of resources as well as an understanding of the upcoming changes that were going to be made to these set of calculations. It was the judgment of the auditors that that was not really the proper interpretation of the spirit of the Stone and Webster policy for when use of preliminary results is an acceptable practice.

Q Well, Mr. Eifert, if there had been proper control and it has been noted on the calculation that it was preliminary or something and it was going to be subject to checking, would the auditor have put this down as an audit observation? Wouldn't that have been in accordance with your procedure?

A (WITNESS EIFERT) Yes, he would have. The basic policy is that we don't use the results of unchecked calculations. When you have to because of compelling reasons, then you are allowed to, and you are allowed to under conditions which control that use.

The judgment of the auditor in talking to the people who performed these calculations in this case, and looking at the documentation, would have been that he didn't feel, the auditor didn't feel that there was justification for not having these calculations checked, and on that basis he would have written the audit

observation.

Q So the auditor concluded that there had been a violation of the procedure, correct?

A (WITNESS EIFERT) The auditor concluded that the intent of the Stone and Webster policy with respect to restricting use of unchecked calculations was not being properly interpreted and applied in that instance.

Q And that's a violation of the procedure.

MR. ELLIS: He said several times policy, and he answered your question with respect to policy, and I think it is fair to put it to him in those terms.

MR. LANPHER: Let me ask a different question, Judge Brenner.

BY MR. LANPHER: (Resuming)

Q Turning your attention, Mr. Eifert, back to Audit Observation 080, last sentence of Item 1, it reads, this, referring to the earlier description, "this violates the requirements of EAP 5.3, Paragraph 6.1."

Do you have any reason to disagree with that conclusion?

(Witnesses conferring.)

A (WITNESS EIFERT) I don't have any basis to disagree with that. I had not read those words. I missed that, by the way. But my only intent is to

explain that that is an interpretable requirement. It is the judgment of the auditor that it is a violation of that requirement.

Q An auditor, when he writes up an audit observation, that observation goes through a review process, I believe. Correct? You were describing it yesterday, how you yourself sit in on audit result meetings and that kind of thing, correct?

A (WITNESS EIFERT) Definitely. That would have been the auditing organization's evaluation. Apparently, the audit organization did agree, because they promptly corrected the calculation that had been used based on the unchecked data

Q Up to Audit 30, now, sir, Observation 101, Item 1.

(Pause.)

Q Mr. Eifert, is it true that this observation indicates a lack of control over changes to completed calculations?

(Whereupon, the witnesses conferred.)

A (WITNESS EIFERT) Mr. Lanpher, in referring to Item 1 of this audit observation -- Is that your reference?

Q Yes, sir. The reference is that seven of the 13 nuclear calculations had been changed since they had been completed and reviewed. Apparently, it goes on to indicate that there wasn't documentation or evidence of review, and there were no reasons, recorded reasons for

the changes, apparently.

A (WITNESS EIFERT) This observation does indicate that there was an apparent lack of documentation. The auditors could not tell if the changes were a part of the original calculation or if they had been made after the calculation. The project in assessing this went back and looked at all calculations and re-reviewed them due to the lack of documentation, and the inability to establish whether or not they had been part of the original documentation or changes afterward, went back and did a full review of all prior calculations in the discipline to ensure that any such changes were acceptable.

A (WITNESS MUSELER) Mr. Lanpher, it was not clear from our discussions with the personnel who are involved with this whether or not anything had really been changed after the original calculations were signed off. There were apparently changes made to the documents, but the auditors felt that that could have been done, and that instead of having a clean copy signed, the copy that had been reworked prior to the signatures had been signed. So this doesn't indicate -- it was never able to be established whether in fact the calculations had been revised after everybody had signed them and then not reviewed.

The engineering department felt that was not the case, that that was never able to be established. The response of the engineering department was to go back and review all applicable calculations of this type that might be suspect in this same manner and re-review them to assure that the second review was in fact done. I think this is an anomaly that we probably never will know the answer to, but it certainly did not appear that this practice was extensive or extended beyond the limited sample that was done.

JUDGE BRENNER: Mr. Museler, would the reply have that information in it, the written reply? That is that it was the project organization, the engineering organizations that prepared these calculations view that the calculations in fact had been signed after being reworked as opposed to the other way around?

WITNESS EIFERT: If I may, Judge Brenner, I don't know the answer to your specific question with respect to this. We talked to a lot of people. We have people working in Boston that we have been communicating with. I suspect in this particular one the reply would simply say that they are going to go back and look at all the calculations. The additional information that we were able to get I believe came from the people who were involved in that audit and who understood the

background specifically.

To understand it -- a further clarification. It is possible that there was more in reply, and it is possible that we asked for more information, and there are memos and other correspondence that is also in our files, as well as notes and the auditors' check lists and so forth that that information might have come from.

I would like to just explain in the audit process with that kind of situation and with other situations, the auditors identify the situation and in many cases it is up to the project to determine the extent and perform the corrective action. After they identify to us that they have corrected it, we go in to verify that they have corrected it, and in many cases we would take an additional audit sample to verify or develop sufficient confidence that they have corrected it.

In many of the cases such as these, the emphasis on the auditor is that they carried out what they indicated and committed to us that they would do, rather than in all cases at least understanding the specifics of the individual items. Only if those situations are such that we think we have what is a really critical situation, something that is extremely important, do we get deeply involved until we are

totally satisfied that the problem is solved.

BY MR. LANPHER: (Resuming)

Q Mr. Eifert, have you had an opportunity to review Observation Number 3 on that same page? The one that starts, "Two of 13 nuclear calculations?"

A (WITNESS EIFERT) Could I have one moment, please?

Q Sure.

(Pause.)

A (WITNESS EIFERT) Yes, I have read that, Mr. Lanpher.

Q This observation indicates, does it not, that when the auditor investigated this situation, that he determined that the specific version level of the computer program that was used had not been qualified as required by EAP 5.25, correct?

A (WITNESS EIFERT) That is correct. This is the kind of situation that I think is very important. Stone and Webster has a program that ensures that we document computer programs, and this kind of a situation we take very seriously. The specific situation that occurred here was also looked at in this division to see if they had other occurrences of this, and from what we have been able to gather, we have not identified that this was from our own engineering assurance records. We

have not been able to identify that this is more than an isolated case.

But nevertheless, we do consider it a serious matter. The project took preventive action in the form of specific training of people in these matters. In addition, I would like to point out that since the time frame of this auditing, we have revised our control mechanisms for computer programs to specifically require that analytical computer programs be used on the computer in terms of what I will call load modules, that when they are put up on the computer, so to speak, the load module mechanism automatically links you to a date and time of that version of the computer program.

We require then that the computer program documentation, one, be linked directly to a load module and a specific date and time to ensure that the computer program specifically -- that the computer program on the computer is the specific one that has been documented and qualified, and then the user manual for the computer program identifies this information, the specific version and level of the program which can then be linked directly to the computer output which is required to print automatically the load module information, the date and time information, so that the users can tie directly or link directly between the computer program

they are using in the user documentation to the program that was actually on the machine via the printout and have total confidence that he is using a qualified program.

Q Mr. Eifert, I am going to turn to Audit 31, Observation 107. I direct your attention to the first two observations.

(Pause.)

Q Mr. Eifert, with respect to Item Number 1, that is an indication that certain of the references in the calculations were not in accord with EAP 5.3 with respect to traceability, correct?

A (WITNESS EIFERT) Yes, it is, Mr. Lanpher. This is the example of where they used the author's name, Blodgett, instead of identifying the text.

Q Now, the second observation notes by the auditor that a particular calculation had used unapproved input from an incomplete calculation, and that neither the index nor the calculation had been matched to indicate that confirmation was required. This is a violation of your calculation control procedures, correct?

A (WITNESS EIFERT) Yes, it is. Mr. Lanpher, I would like to discuss further on this audit observation the example that you indicate in Item 2 where they have

used the input data for an unchecked calculation without controlling that as we had discussed earlier this afternoon, is an area that we consider very important. We need to have control over that situation to ensure that that information, when it becomes available in its checked form, is checked against its use. The project in its corrective action initially took another sample of the calculations themselves to determine if they had more than an isolated case, and they came back and reported to us that it was not -- they could not confirm that it was an isolated case, that there had been 16 calculations completed in this discipline since last audit, and that other, not precisely the same, but other similar problems existed in some of the other calculations based on their sample.

Based on that, they then further committed to us to go back and re-review all of the calculations that they had prepared in that time frame to see if -- to assure that any such situations were corrected. The project also specifically committed to preventive action, preventive action necessary here because this is an important requirement. Again, this is an example of the auditors being thorough, finding the problems, ensuring that they are resolved, and it further is an example of project engineering being responsive to the

audit program and following up, doing their own investigation into the extent of the conditions, and taking corrective and also preventive action.

A (WITNESS MUSELER) Mr. Lanpher, we have discussed before, and I think there have been several questions from both yourself and from the board, regarding when these findings apply to a larger population than just the one that the auditors happen to look at at that point in time. I think we also indicated that we were certain from our experience on the project that when the audit program turned up anything substantive, that it was thoroughly explored, and if we had to go back into the records and recheck calculations or drawings or whatever, that that was always done, and I think this is an example of where a project engineer at Stone and Webster determined that the audit observation did require that kind of vigorous action and looked back to make sure that from a technical standpoint, that the calculations did in fact back up a safe design.

I think we have seen, and I don't know what the count is, but it is probably in the nature of one or two in the process of going through these audits to date that fall into that category where the audit program identified something that did require vigorous technical

and management action to ensure that the design of the plant was in fact consistent with safe operation. This was another one, one or two, I don't know how many we actually had, but it is certainly a very small number of examples where the audit program has pointed out something of a substantive nature to differentiate it from what I will characterize as minor administrative, if not, but not unimportant matters with regard to exactly how the documentation is handled.

JUDGE BRENNER: Mr. Lanpher, are we at a point where we can stop now? Because contrary to my earlier promise, I do have something I want to address before we recess.

MR. LANPHER: We can stop now, Judge Brenner.

JUDGE BRENNER: The subject is our progress and how long it is going to take. We have been emphasizing that there is no promise that you do it in two weeks, so that is not my starting point. However, two weeks is a laugh, because at this case -- let me back up and tell you what my input is and identify the sources of my data.

(General laughter.)

JUDGE BRENNER: I have got your handwritten outline of what you intend to cover, and I don't mean to imply that each item is of equal length, but of course

right now I don't have a good handle on what the differences would be. We are on one category of the documents, that is, just the engineering assurance audits, and we are on the first subject that you are covering with those documents. There are a total of ten subjects, so if we continuing finishing up this subject and go through nine more subjects through these 40 audits which, as I said, is only the first item in the document category list, it is going to take a month just on Suffolk County Exhibit 50, and then there are nine other categories of documents to repeat through these subjects.

It is obvious when you have two lists and you look at the permutations and combinations that we are going to be here a mightly long time. We had hoped that during the break one of the things that would be addressed would be a focus on how to approach the litigation of this matter. I certainly had no illusion that this subject was going to be settled. However, I had hoped that there would be stipulations of fact as to certain things or agreement on how to extract this information in some summary form and then present it in some sort of summary table or some sort of summary extract or something of that nature.

From the questions and answers I have heard

for the last day and a half, it seems to me that there would have been some possibility of doing that. Sure, you still would have had cross examination and followup, but you would have gotten agreement that findings in 20 audits represent essentially the same type of finding, and you would have had your questions as to what this might have meant, and the witnesses would have given their answers, but we could have done it as to these 15 items instead of item by item, maybe.

If you can't do that, I can see on cross examination when you are springing for the first time, you have to put something together and we have to be keyed in also. But I hope that there is room for doing that. I also know you will have a lot of work to do on the other subjects during the break, which we appreciate, and sometimes even on this subject you can't complete what I am talking about until you have fully prepared all the details of your examination, and maybe until you have seen what type of witnesses you have before you and whether you feel comfortable in taking that kind of approach based on your initial questioning.

But we have now got some of that additional input, so I want everybody to talk to each other, and come up with some way, and I have got to believe that

there is a way, without settling any issues on your views, of a different presentation so that the county is able to put everything before us that it wants to, and we certainly do want this information before us. I just want to be able to get it in a more efficient manner without losing any of the substance.

I don't know how soon you could do that, and I am certainly not going to expect a miracle to happen between now and Tuesday morning, but maybe something can be worked out for the future subjects as soon as possible. I don't know if something could be worked out before the end of next week, but after that there is a two-week break, and it is my prediction you are still going to be cross examining. Am I wrong? Are the other eight subjects going to be so much quicker than the first subject that I a misapplying data?

MR. LANPHER: I think you are right that this is going to take, going this way is going to take a lot longer than I ever predicted. As a matter of fact, the calculation subject matter, just the number of items that I have identified in the audit reports is, I would estimate, about three times as numerous than the nearest next one. That doesn't mean that there is not a lot. So I think your comments make some sense, and I will take them very seriously this weekend.

I was going to be in touch with the LILCO representatives late Sunday, no later than Monday morning, as you had asked anyway, and I will give it very serious thought whether, for instance, the next item that I am intending to go to on E&DCR's, I could maybe categorize five E&DCR's doing X and four doing Y, and do my very best to get something much more responsive to your present comments, going next week rather than wait until after the break.

I think you are right also that I will not complete next week.

JUDGE BRENNER: Okay. I will note also that I think if you find a way together with counsel for other parties, you may help your case substantively, because your case is a pattern, and although we are trying very hard to pay attention, and I think we are, you may do yourself a service by showing the pattern, if there is a pattern, more clearly in some other form of presentation, although that is not the main reason I have raised it, because we are certainly capable of going through the written record later to extract whatever pattern you allege in your findings.

Okay, well, we appreciate your all doing your best on it.

We will recess now and be back, as I said, at

10:30 on Tuesday morning in this courtroom.

(Whereupon, at 2:15 p.m., the board was recessed, to reconvene at 10:30 a.m. on Tuesday, September 21, 1982.)

NUCLEAR REGULATORY COMMISSION

This is to certify that the attached proceedings before the

ATOMIC SAFETY AND LICENSING BOARD

in the matter of: LONG ISLAND LIGHTING COMPANY (Shoreham Nuclear Power Station)

Date of Proceeding: September 17, 1982

Docket Number: 50-322-OL

Place of Proceeding: Hauppauge, New York

were held as herein appears, and that this is the original transcript thereof for the file of the Commission.

Susan A. Harris

Official Reporter (Typed)

Susan A Harris

(SIGNATURE OF REPORTER)