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UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY & LICENSING BOARD

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 In the matter of: :  
 :  
 COMMONWEALTH EDISON COMPANY : Docket Nos. 50-454  
 : 50-455  
 (Byron Nuclear Power Station, :  
 Units 1 and 2) :  
 :  
 -----x

Conference Room B  
U.S. Nuclear Regulatory  
Commission  
Region III  
799 Roosevelt Road  
Glen Ellyn, Illinois

Wednesday, June 20, 1984

Deposition of RAY S. LOVE, called for examination  
by counsel for Applicant, beginning at 9:50 a.m., pursuant  
to agreement, before Ann Riley, a Notary Public in and for  
the State of Maryland.

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APPEARANCES:

On behalf of Applicant:

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-and-

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Also Present:

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Chicago, Illinois

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## P R O C E E D I N G S

1  
2 MR. MILLER: Let the record reflect that this is  
3 the deposition of Mr. Ray Love, taken at this time and place  
4 pursuant to agreement of counsel and of the witness.

5 Bill, I understand that you wanted to reflect  
6 on the record the statements you made about discovery.

7 MR. PATON: Right. The parties have had a  
8 brief discussion about the status of the discovery requests  
9 made by the Applicant on June 8. What we did this morning  
10 was, I advised the parties of two books, two notebooks, that  
11 we obtained from the site. We have decided to produce for  
12 each of the other parties a copy of each of these books, so I  
13 will describe only the first page in each one.

14 The first book has on the front of it 82-05, Book  
15 No. 1. The first document is dated June 24th, 1982, and it  
16 is the first page of Inspection Report 82-05. It is about  
17 three quarters of an inch thick.

18 The second notebook has on the front 82-05, Book  
19 No. 2. The first document is dated March 9th, 1984. It is a  
20 memorandum for C. E. Norelius from R. L. Spessard. It is  
21 about an inch thick.

22 Those two notebooks came from the Staff's office

1 at the site.

2 The third group of papers that we discussed is  
3 in a folder labeled 82-05-19, Reinspection Program Audits.  
4 It is about an inch thick. The first piece of paper is  
5 an index with the words at the top "Interpretations Summary."

6 The Applicant and the Intervenor are going to  
7 discuss this folder at the break to determine the extent to  
8 which they are going to ask the Staff to produce copies of it  
9 for them.

10 MS. WHICHER: I have a correction to that. My  
11 understanding is that Mr. Miller will verify whether in fact  
12 documents in that folder have already been produced to the  
13 Intervenors by Commonwealth Edison, so that in order to  
14 relieve us all of the burden of having to review the entire  
15 folder. That way we will be in a position to request  
16 copying only of those documents that have not been produced  
17 to us by Edison, if there are in fact any such documents in  
18 that folder.

19 MR. PATON: Okay. Now Mr. Wilcove is going to  
20 address discovery about Systems Control Corporation, but  
21 before he does that, does anybody else have anything to say  
22 about the three documents I have just discussed?

1 MS. WHICHER: Mike, does my understanding comport  
2 with yours?

3 MR. MILLER: Correct. I will tell you, as I  
4 believe to be the case, that the interpretations, audits  
5 and surveillance of the reinspection program have been turned  
6 over. I just ran through that folder, and it looks like that  
7 is what is in there, but I am not making any representation  
8 as to what is in the folder.

9 MS. WHICHER: Perhaps I misunderstood our agreement.  
10 You are not going to look through the folder again to make  
11 sure that's what in the folder has been produced to us?

12 MR. MILLER: No.

13 MS. WHICHER: No?

14 MR. MILLER: I will tell you what we have produced.  
15 That folder has a title. I riffled through it quickly. It  
16 looks like it's interpretations, audits and surveillances.  
17 If, as I believe to be the case, they have been turned over  
18 to you by our client, I will so inform you. But I am not  
19 going to guarantee that there is something in the NRC folder  
20 besides those documents.

21 MR. PATON: Jane, give me a second.

22 (Discussion off the record.)

1           MR. PATON: The parties have had further discus-  
2 sion of the third document that I discussed, or the third  
3 folder called "Audits," and the NRC has agreed that we will  
4 produce copies of this entire file for the Applicant and  
5 for the Intervenor.

6           MR. WILCOVE: With respect to Systems Control  
7 Corporation, there are a number of documents here at  
8 Region III headquarters that are available for the inspection  
9 of both parties, and they will be available. They don't  
10 necessarily have to be looked at today or tomorrow. We  
11 will make copies of whatever is requested by either party.

12           My understanding of this -- and if I'm incorrect,  
13 I will subsequently correct the statement -- is that these  
14 documents -- physically they came from the site and they are  
15 the files of Mr. Connaughton and probably Mr. Hayes.

16           It is the Staff policy not to turn over draft  
17 notes or other Staff-generated documents with respect to a  
18 pending matter, which Systems Control Corporation is. So  
19 there are no documents to that effect in the documents  
20 currently here at Region III.

21           If I have left anything out, I will ask Mr. Miller  
22 or Ms. Whicher to speak up.



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MR. MILLER: No.

(Discussion off the record.)

Whereupon,

RAY S. LOVE

was called as a witness and, having been first duly sworn, was examined and testified as follows:

E X A M I N A T I O N

BY MR. MILLER:

Q Mr. Love, would you state your name for the record, please.

A Ray S. Love.

Q By whom are you employed, sir?

A United States Nuclear Regulatory Commission, Region III.

Q In what capacity?

A As a reactor inspector.

Q For how long have you been employed by the U.S. NRC?

A Just a little over three years. It was three years in April.

Q Has your entire employment with the NRC been as a reactor inspector?

1 A Yes, sir.

2 Q Have you been assigned to Region III throughout  
3 that time period?

4 A Yes, sir.

5 Q Prior to the time you were employed by the NRC,  
6 by whom were you employed?

7 A The last employer, I worked with L. K. Comstock  
8 Engineering Company.

9 Q In what capacity?

10 A As a quality assurance manager.

11 Q At what location, Mr. Love?

12 A At the Perry Nuclear Power Plant.

13 Q For how long were you employed by Comstock at  
14 Perry?

15 A I've got to refer to notes here, I'm sorry.

16 Q That's quite all right.

17 MS. WHICHER: I would ask if the witness refers  
18 to anything, it be made available to counsel.

19 THE WITNESS: I'm just looking for employment  
20 dates here.

21 MS. WHICHER: I repeat my request, that if the  
22 witness refers to any notes or documents during his

1 deposition, that those notes and documents be made available  
2 to counsel.

3 MR. PATON: I have no problem.

4 THE WITNESS: Does that include my handwritten  
5 notes?

6 MS. WHICHER: Yes, sir, it does.

7 MR. MILLER: We were about to get into that, but --

8 THE WITNESS: That's a resume. I have no problem  
9 with that.

10 MR. MILLER: Let me continue for just a second.  
11 There is a question pending. Now why don't you answer that,  
12 which was how long you were employed by Comstock as a QA  
13 manager?

14 MR. PATON: Do you need that document right now?

15 THE WITNESS: Just for dates, if they want dates.

16 MR. PATON: If you get to the point where you need  
17 it, and you use it, then we are going to have to go make a  
18 copy of it. If you need it, fine, I'll make a copy of it.

19 MR. MILLER: We can wait for the copying.

20 BY MR. MILLER:

21 Q But having looked at your resume, is your memory  
22 refreshed as to what the dates were?

1 A From, I believe it was September '79 through  
2 April '81.

3 Q Let's get the employment history out of the  
4 way.

5 Prior to Comstock, by whom were you employed?

6 A ~~MORRISON-KNUTSEN Company,~~  
~~Morris Knutsen & Company.~~ *AK*

7 Q At what location, sir?

8 A At the home office in Boise, Idaho.

9 Q And what was your position there?

10 A I was the division quality assurance manager,  
11 was the last position.

12 Q What division was that?

13 A That was in the Power Group.

14 Q What does that comprise at ~~MORRISON-KNUTSEN~~  
~~Morris & Knutsen?~~ *AK*

15 A Basically power plant construction, both fossil  
16 and nuclear.

17 Q And for how long were you employed by ~~MORRISON-KNUTSEN~~  
~~Morris & Knutsen?~~ *AK*  
18 *Knutsen*  
*Knutsen?*

19 A From 1974 -- I don't remember the month -- until I  
20 left them to go to Comstock. It would be in mid-'79.

21 Q And prior to your employment by ~~MORRISON-KNUTSEN~~  
~~Morris & Knutsen,~~ *AK*  
22 by whom were you employed?

1 A Bechtel Power Corporation.

2 Q And at what location?

3 A At the Duane Arnold Plant, Trojan Plant, and the  
4 FFTF. That's Fast Flux Test Facility.

5 Q What was your position or positions with Bechtel?

6 A As a QC inspector.

7 Q In what area, sir, what discipline?

8 A Electrical instrumentation.

9 Q How long were you employed by Bechtel?

10 A It was approximately three years from -- I don't  
11 know, working back, what it would be

12 Q That would be approximately 1971?

13 A Yes.

14 Q Let me see if I can cut this short. Prior to  
15 1971, were you ever employed by an electric utility company?

16 A No, sir.

17 Q Were you ever employed by a manufacturer of  
18 steam supply systems?

19 A No, sir.

20 Q Does your resume purport to give your entire  
21 employment history?

22 A My entire employment history?

1 Q Yes.

2 A It starts out in 1945, when I entered the Navy.

3 Q Okay. That sounds like it's pretty complete.

4 If you wouldn't mind, let me take a look at that, and let  
5 me just see if we can cut this short.

6 MS. WHICHER: I think if we can just pass it  
7 around the table.

8 MR. MILLER: Sure.

9 MS. WHICHER: Let's go off the record for a second  
10 while Mike is looking at the document.

11 (Discussion off the record.)

12 BY MR. MILLER:

13 Q Mr. Love, just in scanning your resume, I take it  
14 that you do not have a degree from a college or university;  
15 is that correct?

16 A Yes, sir, that's correct.

17 Q All right, Mr. Love. I see that you have in front  
18 of you, oh, two brown envelopes with documents in them and  
19 what looks like the report on the Byron QC inspector  
20 reinspection program. Could you just briefly describe for us  
21 what the contents of those two contents those two file folders  
22 are?

1           A       The first file folder has my 84-09 and 84-27  
2 inspection reports, and some miscellaneous data that I picked  
3 up in conjunction with those.

4           The other folder contains the inspection reports  
5 83-16, 83-37 and 83-48, and also some information on the  
6 Byron reinspection program of 82-05.

7           Oh, and there's also, I think, two, three sheets  
8 of paper there on System Control.

9           Q       I'm sorry, go ahead.

10          A       And also I have the book on the -- it's the CECO  
11 report on the Byron QC reinspection program.

12          Q       Is that your personal copy of the report, sir?

13          A       Mr. Williams and myself.

14          Q       Does it have handwriting in it? Did you make notes  
15 as you went through it, you or Mr. Williams?

16          A       I may have made some notes on the inside of it.  
17 I can't say for sure, sir, without reviewing it.

18          MR. MILLER: Mr. Paton, have the contents of those  
19 two folders been made available to counsel?

20          THE WITNESS: Yes.

21          MR. PATON: Now wait a minute, wait a minute.

22          MR. MILLER: I don't mean have they been made

1 available to you, but have only been made available to the  
2 Applicant and the Intervenor for discovery?

3 MR. PATON: Why don't you ask Mr. Love?

4 BY MR. MILLER:

5 Q Have they been made available, sir?

6 A Yes, sir. Copies of them have been provided. I  
7 assume that Mr. Paton turned them over to you.

8 MR. PATON: All right, let's stay on the record  
9 right now --

10 THE WITNESS: With the exception of this.

11 MR. PATON: I cannot from my own personal knowledge  
12 say that is true. Who did you give your documents to?

13 THE WITNESS: Well, I'm sorry, I guess it was Mr.  
14 Lewis. Now that excludes some of the handwritten notes that  
15 I have in here that I have been working on in testimony,  
16 et cetera.

17 MR. PATON: You're going to have to get it some  
18 other way. Right now I can't provide that answer. He gave  
19 it to Mr. Lewis. Whether Mr. Lewis gave it to you, I can't  
20 be certain.

21 MR. MILLER: I don't want to take the time at this  
22 point to go through the contents of the file folder.



1 BY MR. MILLER:

2 Q But, Mr. Love, the handwritten notes that you  
3 referred to, do they constitute a draft of your prepared  
4 testimony in this reopened proceeding?

5 A I believe two of the sheets are -- two of the  
6 pieces of paper pertain to a draft of my testimony. Others,  
7 for example, on my -- actually expense account deal for the  
8 dates that I traveled to Byron, and things of this type  
9 constitute some of them.

10 Q Are there any others other than expense accounts  
11 and drafts of testimony?

12 A There are some notes that I made here, for  
13 example, my handwritten notes on, I believe it's the last  
14 reinspection.

15 Q All right. To my knowledge, and Jane Whicher  
16 can correct me, I don't believe that those handwritten notes  
17 on the last reinspection were turned over to us.

18 MS. WHICHER: I don't believe so. There are  
19 other things among the group of notes that he has just listed  
20 that have not been turned over to us as well.

21 MR. MILLER: Right. At a break, would you mind  
22 looking at those handwritten notes, Bill, and making a

1 determination as to whether or not you will produce them?

2 MR. PATON: Okay. Handwritten notes -- say again.

3 MR. MILLER: I'm certainly not interested in Mr.  
4 Love's expense account, or necessarily in draft testimony,  
5 except insofar as it is within the scope of our document  
6 request. But I will let you make the draw on that.

7 MR. PATON: In other words, you want me to look  
8 at the handwritten notes he has in these two folders and see  
9 which of them we are willing to give up?

10 MR. MILLER: Correct.

11 MR. PATON: Because is it your statement that so  
12 far you have not received any handwritten notes from Mr. Love?

13 MR. MILLER: That's correct.

14 MS. WHICHER: Yes. The Intervenors concur in  
15 that annotation and in the request as well, and we are --  
16 to the extent Mr. Miller's comments may have been taken as  
17 excluding handwritten notes pertaining to draft testimony,  
18 our request would not exclude that. We would ask you to  
19 review all handwritten notes in the file that have not been  
20 produced to us, to see what you will be willing to produce.

21 MR. PATON: Okay.

22 MR. MILLER: All right.

1 BY MR. MILLER:

2 Q Mr. Love, in your capacity as a reactor inspector  
3 for the NRC, have you specialized in any area or discipline?

4 A In the electrical instrumentation area.

5 Q At the Byron site, what does that involve, sir?

6 A Well, that would involve essentially the installa-  
7 tion of all the cable trays, the associated hangers, conduit,  
8 equipment, the connecting of equipment, and then on the  
9 instrumentation -- to clarify here a little bit on this, the  
10 welding, for example, we do not check. The other discipline  
11 takes care of that. But as to configuration and this type  
12 thing, we do check on the instrumentation. Again, on the  
13 instrument sensing lines, another group checks the welding  
14 of it, but we do check configuration, i.e., slope, this  
15 type of thing, connections to the transmitters, the instrument  
16 transmitters, and then of course checking the instrument  
17 cables through the rack until their termination.

18 Q At the Byron site, that comprises the work of  
19 Hatfield and Powers-Azco-Pope; is that correct?

20 A Yes, sir.

21 Q Hatfield is the electrical contractor?

22 A Hatfield is the electrical contractor, yes, sir.

1 Q Mr. Love, I take it that you report to Mr.  
2 Williams? He is your supervisor; is that right?

3 A Yes, sir, section chief.

4 Q Section chief. Are there other reactor inspectors  
5 whose responsibility it is to check the electrical contractor's  
6 work at the Byron site besides yourself?

7 A Yes, sir.

8 Q Could you list those for me?

9 A Well, some of them are no longer with the  
10 Commission, but the ones that I'm aware of that have checked  
11 at the Byron site was, I think, Paul Barrett was there;  
12 Mr. Naidu; Ron Gardner was there; Roger Mendez; *Anil Gautam* ~~Neil Gottam~~ *AG*  
13 and just lately Ed Christnot.

14 Q Were these individuals reporting to you, or were  
15 they your peers in terms of inspection activities?

16 A Peers. All of us report to Mr. Williams.

17 Q Okay. Fine.

18 Did you have any specific area of responsibility  
19 with respect to the work of Hatfield Electric as opposed  
20 to these other men you have identified?

21 A No, sir. Basically all of us look at the same  
22 items.

1 Q Okay, Mr. Love. Have you had an opportunity to  
2 review the decision of the Atomic Safety & Licensing Board  
3 in the Byron operating license proceeding that was issued  
4 on January 13th, 1984?

5 A Here I'm going to have to go to counsel on that.  
6 I'm not sure whether --

7 MR. PATON: Do you understand the question?

8 THE WITNESS: Yes, I understand the question.

9 MS. WHICHER: Let me show you -- let me make a  
10 statement that I'm showing the witness just the cover of --

11 MR. PATON: I think he is familiar with the document.  
12 I see he doesn't understand. You'd better try it again.

13 BY MR. MILLER:

14 Q Well, you are aware that the application for a  
15 license, for an operating license for the Byron plant, was  
16 denied by the Atomic Safety & Licensing Board?

17 A Yes, sir.

18 Q Have you read the decision, the written decision  
19 of that Board, in which that license denial was made?

20 MR. PATON: Let the record show that I am showing  
21 to the witness, supplied by the Intervenors, the cover of a  
22 document which is called "Initial Decision, January 13, 1984,

1 The Byron Nuclear Power Station."

2 THE WITNESS: No, sir, this is the first time I  
3 have seen that book.

4 BY MR. MILLER:

5 Q Okay, Mr. Love. Do you know that there has been  
6 a decision by an Atomic Safety & Licensing Appeal Board  
7 reversing -- well, remanding the record and calling for  
8 further hearings before the Licensing Board on certain issues?

9 MR. PATON: Mr. Miller, I request that you ask  
10 the witness does he understand what you just said.

11 MR. MILLER: Well, if he doesn't, he'll say, "I  
12 don't know, I can't understand the question."

13 BY MR. MILLER:

14 Q Really, I'll tell you, lawyers typically get  
15 tangled up in their words, on some of these questions, and  
16 please just tell me that you don't understand it, and I'll  
17 do my best to rephrase it.

18 A Yes, sir.

19 I am aware that it went to the Appeals Board and  
20 I know it was remanded back to the ASLB.

21 Q Okay. Have you read that decision, the decision  
22 of the Appeal Board?

1           A       To the best of my knowledge, no, sir.

2           Q       Okay. Mr. Love, what role, if any, did you  
3 personally have in the quality control inspector reinspection  
4 program at the Byron Station? And I'd like to take it in  
5 increments. I'd like to start with the time period prior  
6 to March of 1983. Did you have any role at all?

7           A       March 1983? Well, on the 82-05 inspection where  
8 this came up, I was part of that team, although I was not  
9 involved in the inspector qualification aspects of it. I  
10 had performed inspections between the 82-05 inspection and  
11 your March of 1983, but without referring to inspection  
12 reports, I couldn't tell you which ones.

13          Q       You kind of anticipated my next question, which  
14 was did you have any role in the so-called CAT inspection  
15 effort insofar as it dealt with qualifications of quality  
16 control inspectors?

17          A       The CAT, you're referring to the team inspections?

18          Q       Yes, sir.

19          A       No, sir, I did not. Not as to the qualification  
20 of personnel.

21          Q       Did you have any role in reviewing the proposals  
22 that were made by Commonwealth Edison Company to address

1 the item of noncompliance involving lack of inspector  
2 qualification?

3 A This one here I'm going to say I qualified, yes,  
4 on it because in some of your responses where you discuss  
5 the qualifications of personnel, you also address some of  
6 the concerns that I had. Normally on a review of those  
7 I look at the concerns that I had on the program, and let  
8 the other inspector with his concerns look at them.

9 So, I don't know right now whether I looked at  
10 any of those specifically or not.

11 Q Well, were you asked by Mr. Williams or any other  
12 section chief or other management person at Region III  
13 whether the reinspection program that was proposed by  
14 Commonwealth Edison Company was satisfactory or adequate, or  
15 anything like that?

16 A Not that I can remember.

17 Q Okay. And if I understand the previous answer,  
18 just to clarify it a little bit, you would, just as a matter  
19 of your own interest, read the responses from Commonwealth  
20 Edison Company that related to the reinspection program,  
21 even though you had no direct responsibility for it, is  
22 that correct?



1           A       Yes, sir. I probably read some of them. In fact,  
2 I know I read some of them, but I can't say that I read all  
3 of them.

4           Q       But that was just more a matter of curiosity  
5 rather than having a specific responsibility for evaluating  
6 that portion of the reponse; is that correct?

7           A       Not actually. After the program had been, if  
8 you will, finalized as to what was going to happen -- here  
9 again, being as Hatfield Electric Company and Powers-Azco-  
10 Pope were basically the responsibility of the group that  
11 I'm in, there I did look specifically at what they were  
12 required to do, the number of inspectors and this type  
13 thing, and did <sup>go</sup>~~get~~ back and look at, in fact, some of the *Ref*  
14 data for both companies.

15          Q       We are going to get to that.

16                    So it is a fact that, really, until the program,  
17 as you say, had been finalized, and both the NRC Staff  
18 and Commonwealth Edison Company understood what was required,  
19 you really had no role in evaluating the program as a program?  
20 You were more concerned with its implementation; is that  
21 correct?

22          A       Yes, sir.

MILLERS FALLS

1 Q Now, how did you receive your assignment with  
2 respect to the reinspection program? Did Mr. Williams  
3 tell you that this was ongoing corrective action by the  
4 Applicant, and you would have some responsibility in  
5 inspecting it?

6 A Basically the way we work in the group, Mr.  
7 Williams assigns certain personnel to the various different  
8 plants in the region, and it is up to us to follow anything  
9 and everything that's going on with our contractors there.

10 Q And so this reinspection program then just  
11 naturally came to you, because you were assigned to the  
12 Byron Plant?

13 A Yes, sir.

14 Q And had Hatfield and Powers-Azco-Pope as part  
15 of your responsibility; is that correct?

16 A Yes, sir.

17 Q Did you have an inspection plan with respect to  
18 following up on the corrective action for this one item of  
19 noncompliance on inspector qualification?

20 A As an inspection plan. Now, the plan would  
21 consist basically of saying that the follow-up on the  
22 reinspection program under item of noncompliance, I believe

1 it was 82-05-19 --

2 Q Well, did you have any more specific than that  
3 which indicated to you what records you were to review, what  
4 personnel you were to interview, or anything like that?

5 A No, sir, not specifically.

6 Q So it was pretty much up to your discretion as  
7 to how you conducted your inspection of the corrective  
8 action for 82-05-19?

9 A Yes, sir.

10 Q All right. Now, when was the first time that you  
11 went out to the Byron site to conduct an inspection of that  
12 item of noncompliance?

13 A Without referring to inspection reports, I  
14 believe -- I think it was 83-16. I think 83-16 was the  
15 first inspection that I was on in the reinspection program.

16 Q All right.

17 MR. MILLER: Why don't we mark as Love Deposition  
18 Exhibit 1 a document which is a cover letter dated May 31st,  
19 1983, and attached to that is Inspection Report 83-16.

20 MS. WHICHER: Can we go off the record for a  
21 minute?

22 (Discussion off the record.)

MILLERS FALLS

B &amp; R A

COTTON CONFIDENTIAL

(The document referred to was  
marked Love Depo. Exhibit No. 1  
for identification.)

(Recess.)

BY MR. MILLER:

Q Mr. Love, I show you a document that has been  
marked Love Deposition Exhibit No. 1 for identification,  
and ask if you would look that over and then tell me whether  
that inspection report refers to the first inspection you  
conducted of the reinspection program.

MR. PATON: Take as much time as you need.

THE WITNESS: Yes, I understand.

I think this is the one that I basically mentioned  
that the reinspection program had started in a very short --  
yes, on page 8, there is a short section on the summary of  
PAP reinspection effort as of April 3rd.

And likewise, on page 10, there is a short summary  
of the Hatfield reinspection effort as of April 3rd.

BY MR. MILLER:

Q And the reason those are so short is that there  
really hadn't been very much done at the time that you  
conducted your inspection; is that correct?

bu2

1 A Yes, sir.

2 Q Okay. Now, after May 31st, 1983, when was the  
3 next time that you conducted an inspection of the reinspection  
4 effort at Byron?

5 A I believe that was in the 83-37 report, where I  
6 remember it went into a little more detail on both of the  
7 units, and both --

8 Q I'm sorry?

9 A Both contractors, rather.

10 MR. MILLER: I'd like the reporter to mark as  
11 Love Deposition No. 2 for identification a document which  
12 has a cover letter dated September 29th, 1983, and attached  
13 to that letter is Inspection Report 83-37.

14 (The document referred to was  
15 marked Love Depo. Exhibit No. 2  
16 for identification.)

17 BY MR. MILLER:

18 Q Mr. Love, I show you a document that's been  
19 marked Love Deposition Exhibit 2 for identification, and  
20 ask if that is the inspection report to which you referred  
21 in your previous answer.

22 A Yes, sir, it is.

1 Q Now, Mr. Love, would you turn to page 5 of  
2 the inspection report?

3 A All right, sir.

4 Q If you look at the bottom of the page, you will  
5 see that there are attribute numbers listed, Attributes 1  
6 through 9.

7 Can you tell me which of those attributes you  
8 were responsible for inspecting?

9 A Basically Attributes 2 through 9.

10 Q And Attribute 1 is the visual weld inspection.  
11 Who was responsible for that, to your knowledge?

12 A I know Mr. Ward was involved, and I'm not sure  
13 what other welding type inspectors were there on that.

14 Q I take it that Mr. Ward was not with you when  
15 you conducted this inspection in September; is that right?

16 A Mr. Ward was there part of the time, because our  
17 inspections overlapped.

18 Q I see.

19 I guess the only thing I want to know is where  
20 you got the statistics that are found on page 5 under  
21 the column heading "Attribute No. 1"?

22 A Attribute 1 was a compilation of the data

1 provided to me by the Hatfield Electric Company.

2 Q I take it that is true for Attributes 2 through 9  
3 as well, in terms of the compilation; is that right?

4 A Yes, sir.

5 Q If we turn in the inspection report to page 6,  
6 once we get to Attribute No. 2, there is a discussion there  
7 of the rejectable items that had been turned up in the re-  
8 inspection effort; is that correct?

9 A Yes, sir.

10 Q Did you personally go out and observe the  
11 rejectable items, or was this based on your review of the  
12 records of Hatfield's reinspection?

13 A This is primarily a review of Hatfield's  
14 reinspection effort, just to look at the records themselves.

15 Q When you say "primarily," did you do any looking  
16 in the plant at all?

17 A As part of the routine inspection, you make a tour  
18 of the plant. No, I did not, during the tour of the plant --  
19 I may observe some of these given attributes. I don't  
20 remember specifically, but I believe this was a two-week  
21 inspection or -- yes, this was a two-week inspection, and  
22 normally a minimum of two days to three days would be spent

MILLERS FALLS  
ERASE

1 in the plant, just looking at equipment.

2 Q Is it fair to say that as of the date of this  
3 inspection report, Love Deposition Exhibit 2, you had not  
4 reached any conclusions with respect to the reinspection  
5 effort and you were simply reporting what Hatfield had found?  
6 Is that accurate?

7 A Yes, sir, up to that, like you said, to the  
8 point in time where -- as of September 9th, 1983.

9 Q Following September 9th, 1983, when was the next  
10 time that you conducted an inspection of the reinspection  
11 effort at Byron?

12 A Specifically the reinspection effort -- I believe  
13 the remaining of that effort was to compare the CECO reports  
14 as to the findings, as to what I had found in this inspec-  
15 tion. In other words, at Hatfield at that time, outside of  
16 the welding area, if my memory serves me correctly, they  
17 were just about done with the inspectors that was involved  
18 in attributes basically 2 through 9.

19 Q You mean as of September of 1983, is that --

20 A Yes, sir.

21 Q When you said you made this comparison between  
22 the Commonwealth Edison report and these statistics in



1 Report 83-37, did you just check them for consistency, or --  
2 well, what was the nature of the review or comparison that  
3 you did?

4 A Of the comparison?

5 Q Yes.

6 A Well, at the point that this inspection was made  
7 as part of the reinspection program, they were going to have  
8 in many cases an independent review. In other words,  
9 after a Hatfield inspector rejected an item, then there was  
10 a third party come along and -- I can't even remember now  
11 who the third-party inspector was -- but they would look at  
12 the item and see whether they agreed or disagreed with the  
13 inspection of the Hatfield inspector.

14 Q Well, Mr. Love, are you familiar with the  
15 differentiation between subjective inspections and objective  
16 inspections, as Commonwealth Edison used that term in the  
17 reinspection report?

18 A Yes and no. As I remember, the subjective had  
19 primarily to do with welding, and I believe the objective --  
20 my Items 2 through 8 or 2 through 9, rather, would be under  
21 the objective inspection effort.

22 Q All right. Do you recall that the third-party

1 review that you described in a previous answer applied only  
2 to the subjective examinations; that is the visual weld  
3 examinations?

4 A Yes, sir.

5 Q Okay. Now let me go back and ask what sort of  
6 comparison you made between the reinspection program report  
7 and Inspection Report 83-37.

8 A All right. Here again, basically I looked at  
9 the number -- again, even though it was outside my area, if  
10 you will, in the welding area, I still compared the number  
11 of items inspected vs. the items rejected, as well as Items  
12 2 through 9, the number of increases in the inspection vs.  
13 the number of defects noted.

14 Q This comparison would have taken place some time  
15 in the first quarter of 1984, after the report on the QC  
16 inspector reinspection program was issued; is that right?

17 A There was a preliminary -- I think it was referred  
18 to as a preliminary report. I think it was January of 1984.  
19 That was also utilized.

20 Q After you made this comparison, what conclusions,  
21 if any, did you come to?

22 A That basically on, again, Attributes 2 through 9,

MILLERS FALLS  
RELEASE  
COTTON CONTENT

1 the number of rejects increased slightly, as I remember, on  
2 some of the items. On the as-built drawing, if my memory  
3 serves me correctly, they increased quite a bit.

4 Q That's attribute number what, sir?

5 A Attribute No. 9.

6 Q All right. And did you reach any conclusions  
7 about the reinspection effort?

8 A As to what, sir?

9 Q Well, let me back up and ask a preliminary question.  
10 What did you understand the purpose of the  
11 reinspection program to be?

12 A The purpose of the reinspection program, as I  
13 understand it, was twofold:

14 One, what was the acceptability, if you will, of  
15 the equipment installed that had been inspected by, in  
16 Hatfield's case, A through V, I think it works out to what,  
17 22 inspectors. First, I believe it's three months' work,  
18 and with that reinspection, if you will, determining the  
19 qualifications of those given inspectors during that first  
20 three months of their work.

21 Q Let me take the question in pieces. I think you  
22 said your understanding of the purpose was twofold:

1           The first one was the acceptability of the  
2 equipment installed?

3           A       Yes, sir.

4           Q       All right. When you made this comparison, did  
5 you reach any conclusions about the acceptability of the  
6 equipment installed by Hatfield?

7           A       Again, items -- let's just take Items 2 through 8,  
8 in that they deal with the equipment. In the items  
9 identified, from my review of them, I couldn't see any there  
10 that was of safety significance.

11           Again, this is my personal opinion of it.

12           Q       And as a result of not finding any safety  
13 significance, you concluded that the equipment installed by  
14 Hatfield was acceptable?

15           A       Yes, sir.

16           Q       All right. What conclusions, if any, did you  
17 reach on the second part of your understanding of the  
18 purpose, that is the qualifications of the QC inspectors?

19           A       That one I don't know about, because it can be  
20 one of two things, either there were real good craft out  
21 there that was putting the items in, or that the inspectors  
22 were good and they found the items on previous inspections

1 and they were corrected, or a combination thereof.

2 Q Let's just chase those two possibilities for a  
3 second.

4 If the crafts people -- it was the crafts people  
5 who had done an outstanding job, would you expect to find  
6 any deviation reports or nonconformance reports written up  
7 by Hatfield or Commonwealth Edison?

8 A If they were doing a perfect job, no, sir, I  
9 wouldn't expect to find either one.

10 Q In fact, what has been your observation of the  
11 quantity of deviation reports and nonconformance reports  
12 with respect to Hatfield work?

13 A Here again, if my memory serves me correctly,  
14 at the time -- timeframe of these reinspections, Hatfield  
15 did not have a DR program. I think that was instituted  
16 after the 82-05 inspection. As to the number of non-  
17 conformance reports, that, without going back into the --  
18 some previous inspection reports, I just don't remember how  
19 many there were.

20 Q Well, let's assume for the sake of my question  
21 that there were quantities of --

22 A Nonconformance reports?

REBRAYE  
COTTON CONTENT

1 Q -- nonconformance reports, would that indicate to  
2 you that the crafts people were doing a super job, or that  
3 the inspectors were doing -- take out the word "super."

4 MR. PATON: Did you say there were quantities?

5 MR. MILLER: Assume that there were quantities.  
6 I don't know whether there were 300, 1000, but there are  
7 numbers of documented deficiencies in construction.

8 BY MR. MILLER:

9 Q Would that indicate to you, given what you know  
10 about the results of the reinspection report, that it was  
11 the crafts people or the quality control inspectors who were  
12 doing their job?

13 A As you describe the situation, I would say it  
14 was the quality control inspectors doing their job.

15 Q I just want to ask a question, Mr. Love, about  
16 something you said in the previous answer. You said that  
17 you did not recall that prior to 1982, Hatfield had a DR  
18 system -- that's a deficiency report?

19 A Yes.

20 Q Did they have a documented -- let me strike the  
21 question.

22 To your knowledge, did they have a system which

EXHIBIT  
COTTON CONTENT

1 documented nonconforming conditions that were found in the  
2 field prior to 1982?

3 A Do I understand that in conjunction with the  
4 nonconformance reports?

5 Q Well, I don't know what they called it, but  
6 whatever it was, was it a documented way of keeping track  
7 of nonconforming conditions that they found in the field?

8 A Well, let me explain to you how it is now, and  
9 maybe that will help us both to understand. Right now they  
10 have a nonconformance report. This is a nonconforming  
11 condition that would need the Licensee's and in some cases  
12 the AE's approval prior to implementing the resolution of it.

13 They also have a DR system or a deficiency report  
14 system where this document can be resolved in-house. In  
15 other words, it's a -- a cable pan is damaged, and resolution  
16 of it is take the cable pan out, scrap it, and install a new  
17 one. That's something that can be handled within the  
18 Hatfield organization.

19 And when I made the comment that I don't think  
20 they had the DR program prior to that, I think that prior to  
21 '82, that all they had was the nonconformance report system.

22 Q I see. But they did have a system of tracking

1 discrepancies that were found in the field and making sure  
2 that corrective action was taking place, and so on?

3 A Yes, sir.

4 Q So that we could go and look at the statistics  
5 on how many nonconformance reports, or later on, deviation  
6 reports -- deficiency reports, I guess it is?

7 A Deficiency reports, yes, sir.

8 Q -- look and see how many deficiency reports were  
9 filed and see which of the possibilities that you expressed  
10 in a prior answer was more likely to be the case; correct?

11 A Yes.

#2 12 Q Following this comparison that you did between  
13 both the preliminary and final version of the reinspection  
14 report in Commonwealth Edison Company and your Inspection  
15 Report 83-37, did you make any further review of the results  
16 of the reinspection program as it applied to Hatfield?

17 MR. PATON: Could I ask a question? You said  
18 any further review of the reinspection program. Do you mean  
19 reinspection program or the --

20 MR. MILLER: I thought I said report.

21 THE WITNESS: Do I understand you correctly, then,  
22 that any other reviews of this after that one time?



1 BY MR. MILLER:

2 Q Yes, sir.

3 A I reviewed it yesterday in preparation for this,  
4 for example.

5 (Laughter.)

6 Q Okay. Quite apart from your responsibilities as a  
7 witness, have you done that in the normal course of your  
8 duties as an inspector?

9 A I think we have had some discussions about -- here  
10 again, myself, other inspectors and whatnot, you know, what's  
11 your feeling of this and what's your feeling of that type  
12 deal. But to the best of my recollection, I don't think I  
13 have documented in another inspection report on the Hatfield  
14 reinspection effort.

15 Q Have you discussed the results of the reinspection  
16 effort with respect to Hatfield with Mr. Ward, for example?

17 A Mr. Ward? Yes, sir, we've had numerous discussions  
18 on it.

19 Q How about with Mr. Little?

20 A I cannot remember discussing with Mr. Little, no,  
21 sir.

22 Q Mr. Muffett?

1 A No, sir, I can't remember discussing it with Mr.  
2 I att, either.

3 Q Mr. Williams?

4 A Mr. Williams, yes, sir.

5 Q Mr. Keppler?

6 A No, sir.

7 Q Any other electrical inspectors?

8 A Right offhand, I'd say the chances are good that  
9 I discussed it with Mr. Christnot, Mr. ~~Gottham~~ <sup>Gautam</sup> and Mr. AB  
10 Mendez, in that I worked closest with those gentlemen, and  
11 I'd say the odds are real good that I did discuss some of it  
12 with them.

13 Q Did any of the people with whom you discussed  
14 the results of the Hatfield reinspection effort disagree  
15 with the conclusions which you have expressed here today?

16 A None that they've expressed to me, no, sir.

17 MR. MILLER: I'd like the reporter to mark as  
18 Love Deposition Exhibit 3 a document that has a cover letter  
19 dated April 16th, 1984, and attached to that is Inspection  
20 Report 84-13.

21 (The document referred to was  
22 marked Love Depo. Exhibit No. 3  
for identification.)

1 BY MR. MILLER:

2 Q Mr. Love, I show you a document that has been  
3 marked as Love Deposition Exhibit 3 and I'd like you to glance  
4 at it, and then I want to ask you a few questions about it.

5 A (Witness reading document.)

6 Do you desire that I read the entire thing, sir,  
7 or is there some specific item?

8 Q If you looked at the cover letter, let me then  
9 direct your attention to a specific -- I call your specific  
10 attention to the conclusions which are found on page 5 of  
11 the inspection report, and why don't you just look those  
12 over for a second.

13 A (Witness reading document.)

14 All right, sir.

15 Q First of all, before I showed that document to  
16 you today, had you ever seen it before?

17 A No, sir.

18 Q Did you know that people in the region were  
19 writing an inspection report that purported to deal with the  
20 overall issue of the reinspection program?

21 A Specifically, no, sir, I didn't know that, for  
22 example, this was being prepared. Of course, it's a

1 foregone conclusion that if you're in the office, you're  
2 writing a report.

3 Q Let me just take a look at that for one second.

4 A Sir, if I could drop back a minute. You asked  
5 me one question, have I ever discussed this reinspection  
6 program. In sitting here thinking, I believe there was  
7 one or two meetings down here in the conference room on  
8 the reinspection program.

9 Q All right. Were Mr. Muffett or Mr. Little  
10 involved in those discussions?

11 A I can't remember whether Mr. Little was down here  
12 or not, but it runs in my mind that Mr. Muffett and Mr. Ward  
13 were here, and I can't remember who else was involved in it.

14 Q Did these meetings that you have just referred  
15 to take place this year?

16 A Yes, sir. I believe it was after this CECO  
17 February '84 report came out. I was just trying to think  
18 back in my own mind whether it was the preliminary report  
19 that we are reviewing or this final report.

20 Q Okay. At this meeting that took place in the  
21 conference room in Region III, did you express your opinions  
22 during the course of the discussion, as you have here today?

1 A Yes, sir. As I remember, basically.

2 Q Okay. Do you know whether or not Mr. Muffett  
3 or Mr. Little were going to rely on those discussions in  
4 creating an inspection report on the overall reinspection  
5 program that we have now seen as Love Deposition Exhibit 3?

6 A Are you saying did I know that a report was going  
7 to be prepared at that time and by whom?

8 Q Yes.

9 A No, sir.

10 MR. PATON: Wait a minute, wait a minute. You  
11 can't say yes because that's a different question. Either  
12 one or the other.

13 MR. MILLER: That is a somewhat different question,  
14 but I want to know the answer to that one, too.

15 MS. WHICHER: You're going to let him ask his  
16 own questions, too?

17 MR. MILLER: Sometimes they are better than my own.  
18 Let me start over again.

19 THE WITNESS: All right, sir.

20 BY MR. MILLER:

21 Q When you had the meeting in this conference room,  
22 did you know a written inspection report was going to be

1 prepared on the overall reinspection effort?

2 A That one I think I'll have to answer as a no,  
3 although I know an inspection report would have to be  
4 prepared to close the item.

5 Q That's standard procedure in the region; correct?

6 A Yes, sir.

7 Q Did you know when you attended this meeting  
8 that comments you made were going to be relied on by Mr.  
9 Muffett or Mr. Little in reaching their own conclusions  
10 with respect to the reinspection program?

11 A I would assume that they would take that in.  
12 Here again, I can't answer for them.

13 Q It's just an assumption, no one said in words  
14 like this, "We want to get you all together here and get  
15 your views on this so that we can draw some conclusions  
16 ourselves"?

17 A Basically, as I remember the question, did I have  
18 any problems with it.

19 Q And that was a question that was asked by whom?

20 A Here again, I don't remember.

21 Q Well, was it one of your peers, or was it somebody  
22 in management?

1 A As I remember, it was one of supervision.

2 Q And was that Mr. Williams who might have asked  
3 the question, or was it Mr. Muffett?

4 A No, I believe -- I don't believe Mr. Williams was  
5 in the meeting and, of course, Mr. Muffett is not in super-  
6 vision. I'm sorry, I just don't remember who all was in the  
7 meeting, sir.

8 Q Fine.

9 Do you keep a diary?

10 A No, sir.

11 Q All right. I don't mean anything elaborate. All  
12 I mean is one of those vest pocket things that kind of keeps  
13 dates and times straight.

14 A No, sir.

15 Q Was there an attendance list passed out at this  
16 meeting?

17 A To the best of my knowledge, no, sir.

18 Q Was there anybody who was the informal secretary  
19 of the meeting who was supposed to take notes of what was  
20 said?

21 A Again, I don't remember anyone taking notes or being  
22 on a distribution for a report that discussed that.

MILLERS FALLS  
ERASE

1 Q And you have never seen any reports or minutes  
2 of that meeting; is that right?

3 A To the best of my knowledge, no, sir.

4 Q Mr. Love, as far as you know, the item of non-  
5 compliance, 82-05-19, is now closed; is that correct?

6 A Yes, sir, it's my understanding it is.

7 Q Are you aware of any additional information that  
8 Commonwealth Edison Company committed to provide when it  
9 submitted this report on the reinspection program?

10 A No, sir, I'm not aware of any.

11 Q In your personal judgment, was any further  
12 information deemed desirable by you, in addition to what is  
13 in this report?

14 A No, sir, ~~not~~ <sup>not</sup> again *in* my areas of concern. *PL*

15 MS. WHICHER: I'd like the record to show that  
16 when Mr. Miller was referring to "this report," he was  
17 referring to the final February 1983 report.

18 MR. PATON: '84.

19 MS. WHICHER: '84. I'm sorry.

20 MR. MILLER: Yes. Right.

21 I'd like the reporter to mark as Love Deposition  
22 Exhibit 4 for identification a document which -- well, there's



1 a letter and I think the date is probably March 10th, but  
2 it may be March 19th, 1984, and attached to it is  
3 Inspection Report 84-09.

4 (The document referred to was  
5 marked Love Depo. Exhibit No. 4  
6 for identification.)

7 BY MR. MILLER:

8 Q Mr. Love, I show you a document that has been  
9 marked Love Deposition Exhibit No. 4 for identification, and  
10 ask you whether you have seen that document before?

11 MS. WHICHER: Can we go off the record for just a  
12 second and let me have that document?

13 (Discussion off the record.)

14 MR. MILLER: There is a question pending.

15 THE WITNESS: Yes, sir. This is my inspection  
16 report.

17 BY MR. MILLER:

18 Q I am correct, am I not, that there was an item  
19 of noncompliance assessed against Commonwealth Edison  
20 Company in this inspection report because of a deficiency  
21 that you noted in terms of a review of documentation relating  
22 to overtensioning of certain electrical cables?

1 A Yes, sir.

2 Q Mr. Love, do you know whether cable pulling by  
3 Hatfield was an attribute that was reinspected in the  
4 reinspection program at the Byron Station?

5 A No, sir, to the best of my knowledge, it was not.

6 Q And what was the reason for that? Why wasn't it  
7 reinspected?

8 MR. PATON: I'm sorry, you mean why wasn't it  
9 reinspected by the Applicant, or why wasn't it looked at --

10 MR. MILLER: Yes. If he knows.

11 THE WITNESS: That I can't answer, but right now,  
12 just thinking back in the timeframe, I'm not even sure that  
13 cable pulling was safety -- safety-related cable pulling  
14 was in progress at that time.

15 BY MR. MILLER:

16 Q And so in fact the original cable pulling would  
17 be a nonrecreatable event; isn't that right?

18 A Yes, sir, it is, except for routing.

19 Q And do you recall whether or not the QC inspector  
20 reinspection program excluded inaccessible and nonrecreatable  
21 attributes from the scope of the program?

22 A As I remember, those words were in there, and as

1 that relates to cable pulling, I don't know whether it's  
2 addressed or not. I don't remember.

3 Q Well, we can go back and take a look at Love  
4 Deposition Exhibit 2, Report 83-37, and if we look at the  
5 attributes that are on page 5 of that report, would you  
6 agree that there are none that refer to cable pulling?

7 A I agree that there was none looked at in cable  
8 pulling, yes, sir. As to whether it was mentioned in the  
9 report and specifically included or excluded by those  
10 words, that I don't know.

11 Q All right.

12 Mr. Love, returning to Inspection Report 84-09,  
13 you reviewed quite a number of nonconformance reports,  
14 both those issued by Commonwealth Edison Company and those  
15 issued by Hatfield, did you not?

16 A Yes, sir.

17 Q Now all those nonconformance reports related  
18 to overtensioning of cables; correct?

19 A Possible overtensioning of cables, yes, sir.

20 Q You also looked at approximately 1000 Hatfield  
21 deficiency reports; is that right?

22 A I don't remember that exact number. I'd have

1 to verify that in here.

2 Q If you'd look at page 9, sir.

3 A Yes, sir, it would be approximately 1000.

4 Q Did all of those 1000 deficiency reports relate  
5 to possible overtensioning of cables?

6 A Oh, no, sir. That was just deficiency reports  
7 from here to there (indicating).

8 Q I just wanted to make sure that I understand that.  
9 How many deficiency reports in that number, that  
10 1000 population, related to possible overtensioning of  
11 cables?

12 A (Witness reading document.)

13 Without going back and counting right now I  
14 can't -- I can't give you an answer on that, sir.

15 Q We know from the inspection report there was at  
16 least one.

17 A Yes, but going back through in the NCRs, I also  
18 make the comment in there that with respect to possible  
19 overstressing of safety-related cables during the installa-  
20 tion or rework, all DRs except the 3382 were subsequently  
21 documented on NCRs and are addressed in paragraphs A and B  
22 above. So what I'd have to do is go back through A and B

1 above and count the number of DRs.

2 For example, right there at the top of the page I  
3 refer to DR -- well, in fact that one's outside the scope of  
4 that review. That's 3518, and then 3523.

5 Q Right. And there are other DK numbers that are  
6 found in the body of the inspection report; correct?

7 A Yes, sir.

8 Q Did you regard the number of deficiency reports  
9 and nonconformance reports that had been written with respect  
10 to possible overtensioning of cables as an adverse reflection  
11 on the Hatfield program?

12 A No, sir. In fact, it would be the other way  
13 around.

14 Q Why is that?

15 A If I didn't find any, I would question the  
16 quality.

17 Q Do you regard the number of NCRs or deficiency  
18 reports with respect to cable overtensioning to be high when  
19 compared to the number of cables that were pulled in the  
20 plant as a whole?

21 A With the interruption, would you rephrase that now  
22 for me, sir?

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1 Q Let me see if I can reproduce it.

2 Did you regard the number of NCRs and DRs that  
3 were issued to be high when compared to the number of cables  
4 that were pulled in the plant as a whole?

5 A No, sir.

6 Q Is this a situation that you have encountered at  
7 other nuclear power plants that you have inspected for the  
8 NRC? I'm talking about --

9 A The overtensioning? Overtensioning, if you will,  
10 is a common problem.

11 Q Is the Hatfield experience, at least as reflected  
12 in this inspection report, abnormal in any way, when  
13 compared to the experience of electrical contractors at  
14 other sites?

15 A No, sir. I'd say it's probably normal.

16 Q Looking at the Inspection Report 84-09, would  
17 you agree that for every NCR and deficiency report related  
18 to possible overtensioning of cables, Hatfield processed  
19 the documentation properly?

20 A If I understand you correctly, no, sir, I can't  
21 make that statement. For example, I cited one in there that  
22 wasn't processed properly which resulted in an item of

1 noncompliance.

2 Q Were there any others that you observed that were  
3 not processed properly?

4 A In this inspection report, again going from  
5 memory, that's the only situation I found in this report.  
6 Again, I would have to go back through and review other  
7 inspection reports to see whether the same situation came up.

8 Q Well, maybe you could explain in your own words  
9 what the problem in the processing of the documentation on  
10 Hatfield DR 3382, which is referred to on page 9 of  
11 Inspection Report 84-09, was.

12 A As I understand, you want, if you will, a brief  
13 history on that one.

14 Q Yes.

15 A On this given situation, they were in the process  
16 of pulling back one cable out of a conduit, I believe that  
17 contained 12 additional cables. It had 13 cables in it  
18 altogether. And I believe that was, if my memory serves me  
19 correctly -- it's also documented in another NCR in here --  
20 that that cable had been overtensioned at some portion of  
21 the installation, and the decision was to remove the cable  
22 and replace it. With the lubricant that is used to install

1 cables in conduit, at times it sets up and this appeared to  
2 be what the situation was, an attempted pull-back of  
3 this cable 1VA709, which was a two-conductor cable, and  
4 at that point in time on pull-back of that one, they  
5 couldn't get the cable out of the conduit after they exerted,  
6 I believe, if my memory serves me correctly, 500 pounds  
7 tension on the cable.

8 At that point in time in that section of conduit,  
9 they decided to cut it off and abandon it and pull in the  
10 other cable in accordance with this other NCR that I  
11 reference at Hatfield -- yeah, I mean Hatfield. NCR 605 and  
12 CECO NCR F821.

13 That cable 1VA709 was subsequently replaced.  
14 The inspector wrote up the DR indicating that this 500 pounds  
15 tension had been exerted on that cable.

16 In discussions with the people involved, and  
17 especially the engineer that made the inadequate disposition  
18 on this DR 3382, I guess it is, that he was under the  
19 impression that they were attempting to pull all of the  
20 cables out, i.e., all 13, to get that one cable out of the  
21 conduit.

22 And here again, after discussions with the people



1 that was actually involved in the cable pull, it was as I  
2 described it where they were only attempting to pull that  
3 one cable out of the conduit. And due to the, if you  
4 will, combination of errors, one in that the QC inspector  
5 did put an inadequate description of the nonconforming  
6 condition on the DR, and two that the engineer didn't, if  
7 you will, dig deep enough into it to find out the actual  
8 problem, there was an inadequate disposition put on the NCR,  
9 in that they basically accepted all the cables as is.

10 Now as noted in here -- and here again, I believe  
11 all the cables in that conduit were two-conductor 16s. Just  
12 a fast glance, it looks like all of them were two-conductor  
13 16s, where the maximum pulling tension on a single cable is  
14 58.8 pounds. And when in fact in pulling that one cable  
15 out, one or more of those cables of the remaining 12 cables  
16 was under a tension up to 500 pounds on it, which resulted  
17 in an item of noncompliance for an inadequate disposition  
18 of the DR.

19 Q Well, if I understand the situation, Mr. Love,  
20 in fact the DR was properly initiated. The description of  
21 the nonconforming condition, however, on the DR was unclear;  
22 is that right?

1 A Yes, sir.

2 Q And that led to --

3 A No, wait a minute. Did you say disposition?

4 Q Description of the nonconforming condition.

5 A The description was not clear, yes, sir.

6 Q And that led to an improper analysis by the  
7 engineer who was asked to disposition the DR; is that correct?

8 A Yes, sir.

9 Q Do you know what the corrective action was for  
10 this item of noncompliance?

11 A Yes, sir. That's documented in 84-27, in that I  
12 think I give the -- yes, Hatfield prepared NCR 841 during  
13 the -- after we had identified the problem and the corrective  
14 action on 841 was to go back and replace all 13 cables.

15 Q Do you regard this item of noncompliance as  
16 indicating some sort of programmatic deficiency in Hatfield's  
17 quality assurance program?

18 A No, sir. As near as I can tell, that was an  
19 isolated case.

20 Q So did you consider this item of noncompliance --  
21 well, let me back up. I've got to ask a preliminary question.

22 It's a fact, is it not, that Hatfield has had

1 other items of noncompliance assessed against it in connection  
2 with possible overtensioning of cables over the years?

3 A Without going back and doing research on that,  
4 I can't answer that.

5 Q You just don't recall whether that's the case?

6 A I don't recall.

7 Q Do you recall an item of noncompliance involving  
8 the -- exceeding the maximum sidewall pressure on cables?

9 A I remember an item of noncompliance where the  
10 procedure did not address sidewall pressure. I can't  
11 remember any off the top of my head where they exceeded  
12 sidewall pressure.

13 Q Well, returning to the item of noncompliance  
14 that's addressed in Inspection Report 84-09, do you regard  
15 the incident that led to the item of noncompliance as part  
16 of a pattern on Hatfield's part of failure to properly  
17 document nonconforming conditions and see to it that they  
18 are properly dispositioned?

19 A Again, I think this is the same question you  
20 asked me before, and I think I indicated this was, as near  
21 as I could tell, an isolated case.

22 Q Okay.

1 MR. PATON: Mike, could we digress for a second  
2 and talk about time so I could talk to the folks this  
3 afternoon?

4 MR. MILLER: Oh, we're moving right along. I  
5 would hope to finish within an hour.

6 How much examination do you think you're going  
7 to have?

8 MS. WHICHER: I don't have a great deal. I am,  
9 however, one of those people that if I don't eat on a  
10 regular basis, I get faint. Not enough reserves, I guess.

11 MR. GALLO: I think we should skip lunch.

12 (Laughter.)

13 MS. WHICHER: Well, I don't. So I guess --

14 (Discussion off the record.)

15 (Recess.)

16 T.3 BY MR. MILLER:

17 Q Mr. Love, I really just have one more question  
18 on 84-09.

19 Did anything that you observed during the course  
20 of this inspection, including the item of noncompliance,  
21 cause you to change the conclusions that you had previously  
22 reached regarding the adequacy of the Hatfield work, that you

1 reached as a result of the reinspection program report?

2 A Based on this report, no, sir.

3 MR. MILLER: I'd like the reporter to mark as  
4 Love Deposition Exhibit 5 a document which has a cover letter  
5 dated June 6, 1984, to which is attached Inspection Report  
6 84-27.

7 (The document referred to was  
8 marked Love Depo. Exhibit No. 5  
9 for identification.)

10 BY MR. MILLER:

11 Q Mr. Love, I show you a document that has been  
12 marked Love Deposition Exhibit 5 for identification, and  
13 ask you if you have ever seen this before.

14 A Yes, sir. This is the inspection report of  
15 Mr. Christnot and myself.

16 Q What portions of this report were you personally  
17 responsible for?

18 A I was responsible for everything in this report  
19 except there's one reference to the closure of a 50.55(e)  
20 that Mr. Christnot worked on by himself.

21 Q Well, let me get right to the bottom line:

22 Were you responsible for those portions of the

1 report that assessed two items of noncompliance against  
2 Commonwealth Edison Company?

3 A Yes, sir.

4 Q I'd like to first turn to the Severity Level V  
5 item of noncompliance, and that I believe -- the discussion  
6 of that begins on page 7 of the inspection report.

7 First of all, Mr. Love, Severity Level V item  
8 of noncompliance is one that has minor safety significance;  
9 is that correct?

10 A Yes, sir.

11 Q It was your determination to categorize this  
12 item of noncompliance at Severity Level V; correct?

13 A Yes, sir. Let me rephrase that. It was my  
14 recommendation.

15 Q Your recommendation?

16 A The bosses make the final determination.

17 Q I see. That's Mr. Williams on up; is that correct?

18 A Yes, sir.

19 Q It's a fact, is it not, that the cognizant  
20 Commonwealth Edison and Hatfield engineering personnel  
21 were made aware of the requirements of a Note 48  
22 on a certain drawing, but were not made aware, according to

1 this inspection report, of the requirements of a Note 47  
2 on that same drawing; is that right?

3 A I think that needs to be rephrased, sir, that  
4 they were aware of --

5 Q I'm sure of that.

6 A -- were aware of 48, but didn't appear to be  
7 aware of 47.

8 Q Well, rather than me trying to characterize this,  
9 what was the thrust of Note 47 in that drawing? What did  
10 that say to the engineers and crafts people who were  
11 installing cable pans and covers?

12 A Basically whenever you are installing cable  
13 tray, there is a tolerance provided the constructor. In  
14 other words, he can't get it in plus or minus nothing. As a  
15 result of utilizing these tolerances, they will violate the  
16 minimum separation criteria of three inch horizontal, 12  
17 inch vertical, and basically what this note said that as  
18 Hatfield is installing cable tray and they violate the  
19 separation criteria, then they should install a cable pan  
20 cover in accordance with another Sargent & Lundy standard  
21 which tells them how to fabricate and install covers.

22 And then once this cover is installed, why, the

1 tolerance then drops to one inch separation, both horizontal  
2 and vertical.

3 Q Are there any other circumstances other than  
4 the one that you just described where cable pan covers  
5 must be installed by Hatfield?

6 A Yes, sir. In the ones already identified, the  
7 separation problems -- it may be in the design stage or it  
8 may have been in the construction stage, due to the walkdown,  
9 that they found separation problems <sup>OR</sup> ~~where~~ by drawing PST  
10 prepared by Sargent & Lundy, that Hatfield was directed to  
11 install cable tray -- cable pan covers, and likewise  
12 instrumentation pans all have covers on them.

13 Again, now, we are only talking safety-related.

14 Q The one inch separation still was supposed to be  
15 maintained even after cable pan covers were installed; is  
16 that correct?

17 A Yes, sir.

18 Q And Note 48 on this drawing, which is referred  
19 to in the inspection report, required Hatfield to inform  
20 Sargent & Lundy if that one inch separation could not be  
21 maintained?

22 A Yes, sir.



1 Q That is -- is that a one inch vertical separation,  
2 a one inch horizontal separation, or both?

3 A Both, sir.

4 Q And was that made clear in Note 48, that it  
5 referred to both the horizontal and vertical separation  
6 distances?

7 A Yes, sir, as I remember the note, it did.

8 Q Mr. Love, doesn't Note 48 by implication suggest  
9 to the person who is reading it, that when there is  
10 approximately a one inch separation, that a cable pan cover  
11 should be installed?

12 A By Note 48, by itself?

13 Q Yes, sir.

14 A No, sir, in that -- to explain that a little bit,  
15 for example, Sargent & Lundy has designed cable pan covers  
16 which in discussions with the engineer what this was -- the  
17 main thrust of Note 48, again if I'm going to install a  
18 cover on a cable pan, and Hatfield used the construction  
19 tolerances, they could come within the one inch, and this is  
20 what Sargent & Lundy was concerned about.

21 Q Mr. Love, do you know what the corrective action  
22 for this item of noncompliance is likely to be?

1           A        What? The corrective action for that item?

2           Q        Yes.

3           A        The first logical thing that they have to do is  
4 go back in and reinspect the cable tray that was installed,  
5 I believe it's after February 1983. And here again, after  
6 they have made that determination, then on any of them  
7 that violate the three inch, 12 inch separation criteria,  
8 to install covers.

9           Q        Once again, do you regard this item of noncompliance  
10 as some sort of programmatic weakness in either the Hatfield  
11 or Commonwealth Edison quality assurance program?

12          A        No, I wouldn't say programmatic.

13          Q        Well, okay, how would you characterize it?

14          A        I'm not sure whether you can put it -- a title  
15 on it. For example, like we said, Note 47, Note 48. As  
16 you've seen by the report, they were implementing Note 48,  
17 but they were not implementing Note 47, which appears on  
18 the drawing. Note 47, as I remember, was the top one, and  
19 Note 48 was directly underneath it. Laziness, lack of  
20 observation? I don't know how you'd classify it.

21                   MR. MILLER: Can I have just one minute, please.

22                   (Pause.)

1 BY MR. MILLER:

2 Q How are notes on drawings translated to  
3 instructions to the crafts people and inspectors of the  
4 contractor?

5 A The Hatfield organization would take the note off  
6 a given drawing and instructions out of that drawing and  
7 translate it over into procedures.

8 Q Is there a document called an engineering change  
9 notice? Have you ever heard of that document used at the  
10 site?

11 A Engineering change notice is primarily for  
12 changing drawings. Now they do have another, I don't  
13 remember the name of it. It's, if you will, a quickie  
14 change to a procedure.

15 Q I see.

16 Do you know whether there is a procedure that  
17 requires the engineering staff and the quality assurance  
18 staff to review changes to drawings?

19 A Again, here on memory -- and it's been a while  
20 since I looked at that drawing -- this would be on the  
21 receipted<sup>of</sup> drawings. Yes, sir, there is someone ~~on it~~ that's <sup>of</sup>  
22 supposed to review all changes to the drawings.

1 Q Let me turn to the item of noncompliance that  
2 was Severity Level IV.

3 MR. MILLER: This has a cover letter dated  
4 January 11, '83 to which is attached Report 82-17. Why  
5 don't you mark this as Love Deposition Exhibit 6 while we're  
6 waiting.

7 (The document referred to was  
8 marked Love Depo. Exhibit No. 6  
9 for identification.)

10 BY MR. MILLER:

11 Q Mr. Love, I show you a document that has been  
12 marked Love Deposition Exhibit 6 for identification, and  
13 ask if you are familiar with that inspection report?

14 A Yes, sir. That appears to be my inspection report.

15 Q And it was in that inspection report that the  
16 question of checking for hanger configuration where portions  
17 of the hanger were covered by fireproofing first arose; isn't  
18 that right?

19 A I can't say it's the first, but it's the first I  
20 remember documenting it myself.

21 Q It is correct, is it not, that the inspection  
22 effort by the NRC arose as a result of an allegation?

1 A Yes, sir.

2 Q In looking at 82-17, can you tell us what the  
3 nature of the allegation was?

4 A Well, this addressed numerous allegations. We  
5 discussed the allegation pertaining to --

6 Q That ultimately led to Inspection Report 84-27,  
7 which is dated June 6, 1984. And I call your attention to  
8 page 16 of Love Deposition Exhibit 6, and ask you if at  
9 the bottom of that page is the allegation that led to a  
10 separate reinspection effort and ultimately to your  
11 Inspection Report 84-27?

12 MS. WHICHER: I'm sorry, Mike, I missed the page  
13 reference on Exhibit 6.

14 THE WITNESS: 16. And the question was, again,  
15 sir?

16 BY MR. MILLER:

17 Q Is that the allegation that led to a separate  
18 reinspection program and ultimately to the Level IV item  
19 of noncompliance that's found in 84-27?

20 A Yes, sir.

21 Q It's a fact, is it not, Mr. Love, that in  
22 Inspection Report <sup>82</sup>~~84~~-17, Love Exhibit No. 6, there are two

1           Would you just describe briefly in your own  
2 words what the allegation involved and what the focus of  
3 your inspection in Inspection Report 82-17 on that allegation  
4 was?

5           A       Basically the allegation -- to back off a little  
6 bit, at the time there was a reinspection program going  
7 on in the Hatfield organization as a result of NCR 407.  
8 This is Hatfield NCR.

9           At some point in time the QA manager of Hatfield  
10 come out with Memo 295, which basically said that -- here  
11 again, as you have stated earlier, this was primarily for  
12 connections, cable tray hanger connections that was under  
13 fireproofing. And part of the inspection program is to  
14 determine the type of detail or connection that is installed  
15 between the hanger and the auxiliary steel.

16           And there is also an inspection of the acceptance  
17 of the welds, and this is normally performed by separate  
18 personnel, i.e., a weld inspector and a QC inspector.

19           The weld inspection in most cases had been  
20 performed ~~on the inspection~~ on the given hanger, but in *MSJ*  
21 many cases the QC inspection had not been performed as to the  
22 type of detail installed and the configuration of it.

1           This brought about Memo 295 which basically said  
2 that if there is a weld traveler card indicating that the  
3 weld inspector had in fact inspected the weld, that the  
4 detail should also be accepted, even though there was no  
5 mention of the detail.

6           During this 82-17 report, in the follow-up of  
7 this allegation, that was the allegation that the allegor  
8 didn't think that Memo 295 should be considered valid, in  
9 that he thought that a true inspection of the connection  
10 detail should be made.

11           After reviewing it and discussion with people,  
12 I basically agreed with the allegor, except that I did make  
13 the clarification in there that if the weld inspector had  
14 in fact noted the detail number on the weld traveler, that I  
15 could basically live with that. But if the inspector did not  
16 put that detail number on the traveler, then they would have  
17 to -- it was my opinion they'd have to go back in and remove  
18 the fireproofing and look at it.

19           In discussions with the Licensee personnel on  
20 site, there was a -- oh, if you will, agreement type deal  
21 reached that they would do a sampling of it, and depending  
22 upon the results of the sample, that they would go back in

1 and remove fireproofing as required. And as it worked out,  
2 the rejects and whatnot -- and here again, this is verbal  
3 discussion, I don't believe it's documented anywhere -- that  
4 in discussions with -- I think his title is the Senior  
5 Electrical Engineer. Just a minute, please.

6 Project Electrical, <sup>or as is.</sup> ~~Supervisor,~~ *RF*

7 Q That's Mr. Binder?

8 A Supervisor. Yes, Mr. Binder. At the site he  
9 indicated to me that they were identifying some problems,  
10 and that they would go back in and remove the fireproofing  
11 and do an inspection of these welds where it was in fact  
12 not documented, either in inspection report or on the weld  
13 traveler, as to the type of detail.

14 This data then was subsequently transferred to  
15 CECO in a column-type report, "On this date we did 'X'  
16 number of inspections and identified these number of  
17 problems and 'X' number of them were under fireproofing,"  
18 et cetera.

19 And basically that is where we left that item, as  
20 an unresolved item in 82-17, awaiting the final review and  
21 closeout of NCR 407.

22 Q Let me back up and get a few dates. NCR 407



1 was issued by Hatfield early in 1982; is that correct?

2 A I'm not even sure I mention the date in here of  
3 when --

4 (Witness reading document.)

5 I'm sorry, sir, I don't -- it appears I was  
6 remiss in mentioning the date that the original NCR was  
7 prepared.

8 Q To the best of your recollection, was it some  
9 time prior to your inspection? It would have had to be,  
10 because you do refer to the NCR by number. So presumably  
11 it was issued some time before --

12 A It was issued prior to August 16th, 1982; that  
13 much we know.

14 Q Okay. The NCR related, did it not, to all  
15 hangers installed by Hatfield, not just those covered with  
16 fireproofing?

17 A Yes, sir.

18 Q The corrective action for that was to conduct a  
19 complete reinspection of all hangers installed by Hatfield  
20 up to that point, to check for connection detail, is that  
21 correct, as well as welding?

22 A Yes, sir. As I remember, it did.

1           Q       So that's the reinspection program we are  
2 talking about now. It was going to go back and look at, if  
3 you will, all attributes of the hanger as installed, the  
4 connection detail, and so on.

5                   Do you recall that there was a Hatfield form  
6 that was devised at about this time to cover the reinspection  
7 of these hangers?

8           A       There was a form that was --

9           Q       9A-1?

10          A       I can't remember the form number. And here again,  
11 I don't remember exactly when that form came out, but I  
12 believe it was along about the time of this inspection,  
13 either right before or right after this inspection; I don't  
14 remember.

15          Q       Prior to the use of that form, the documentation  
16 of hanger inspections was really pretty loose, wasn't it?

17          A       Yes, sir, it was.

18          Q       In fact, there was no way of going back and  
19 determining whether a specific hanger had or had not been  
20 inspected; is that right?

21          A       Not actually. What this revised form done, it was  
22 a go-no go -- the first form was a go-no go type form. The

1 inspector went out and looked at it, and in many cases it  
2 was a Level 1 inspector.

3 Configuration, for example, was marked "Sat.,  
4 Unsat." or "Not Applicable" or words to that effect. And  
5 he duly signed it at the bottom.

6 And Level 2 went in and countersigned it, looked  
7 at it and says, "Yeah, all the blanks are filled out," and  
8 signed it.

9 The form that you're alluding to is a two-part  
10 form in that the Level 1 or Level 2 inspector that actually  
11 goes out into the field, he actually puts the details down  
12 on the inspection <sup>form</sup> in that he says it was "X" number of <sup>RF</sup>  
13 inches from here to there. That <sup>material</sup> requires <sup>int</sup> traceability, that <sup>RF</sup>  
14 this number was <sup>on</sup> it, et cetera, and <sup>whose</sup> torqueing was required, <sup>RF</sup>  
15 torque wrench <sup>number</sup> was recorded. <sup>RF</sup>

16 And then that sheet went in and the Level 2 reviewed  
17 it, and then made out a check sheet similar to the one that  
18 was in existence before that, that says, "Yes, it was good  
19 or no good or not applicable, based on the information  
20 provided by the man that went into the field."

21 MR. MILLER: Bill, could we take a break?

22 These are original documents. I thought I'd make

1 copies of them, and I really wanted to use them as examples.

2 (Discussion off the record.)

3 MR. MILLER: I'd like the reporter to mark a two-  
4 page document. The top sheet is labeled Hatfield Electric  
5 Company, Byron Units 1 and 2, Class I Cable Pan Hanger  
6 Inspections Checklist, From HP-9A-1, Revision 4, dated  
7 September 1st, 1981.

8 The second sheet is a sketch of a hanger and  
9 there is also space on the form for notations of various  
10 data regarding the hanger.

11 (The documents referred to were  
12 marked Love Depo. Exhibit No. 7  
13 for identification.)

14 MR. PATON: Are those two papers together, those  
15 together are No. 7?

16 MR. MILLER: Right.

17 BY MR. MILLER:

18 Q Mr. Love, looking at what's been marked as Love  
19 Deposition Exhibit 7, can we agree that these two pages  
20 together were the Hatfield form that was used for hanger  
21 reinspections that were done pursuant to the item we have  
22 been discussing in Inspection Report 82-17?

1           A        I don't know that this given form was in use  
2 throughout the reinspection program under NCR 407. I know  
3 it is in use at the present time, but I don't know if it  
4 went all the way back.

5           Q        I see.

6                    Well, the second page of this does contain the  
7 information that you described earlier, that is the actual  
8 connection data under the column that's headed "Connection,"  
9 about a third of the way down the page, the various  
10 dimensions of the hanger under the column that's headed  
11 "Dimension," and so on.

12                   To the best of your knowledge, Mr. Love, are these  
13 two-page forms the inspection checklist, if you will, for  
14 inspecting hangers at the Byron site that were installed by  
15 Hatfield today?

16           A        Today, yes, sir.

17           Q        There is nothing else that's an inspection check-  
18 list?

19           A        They have various different other inspection  
20 checklists, but for the pan hanger installation, I believe  
21 this is the prime one.

22           Q        Okay. Now, returning to the reinspection program

1 that was committed to as a result of this Hatfield NCR 407,  
2 there was in fact a special problem, as you described it,  
3 with hanger connections that were covered by fireproofing;  
4 that is, you couldn't see what the detail, the connection  
5 detail was; is that correct?

6 A Yes, sir.

7 MR. MILLER: I'd like the reporter to mark as  
8 Love Deposition Exhibit 8 for identification a memorandum  
9 from Mr. Buchanan to Mr. Koca which is identified as QA-QC  
10 Memorandum 295, dated September 27, 1982.

11 (The document referred to was  
12 marked Love Depo. Exhibit No. 8  
13 for identification.)

14 BY MR. MILLER:

15 Q Mr. Love, the first -- well, first of all, did you  
16 see this memorandum at or about the time you conducted  
17 Inspection 92-17?

18 A Yes, sir.

19 Q The first sentence of the text of the memorandum  
20 starts:

21 "Since beginning the cable pan reinspection."

22 And so forth. That's the cable pan reinspection

1 that is the corrective action for Hatfield NCR 407; is  
2 that correct?

3 A Yes, sir.

4 Q And the third paragraph of this in fact says  
5 that if there is a weld traveler that the inspector shall  
6 note the traveler on the hanger reinspection report and  
7 shall accept the detail on that basis for details that are  
8 covered by fireproofing; correct?

9 A Yes, sir.

10 MR. MILLER: Now I'd like to mark as Love  
11 Deposition Exhibit No. 9 for identification a two-page  
12 letter from James O. Binder to Mr. Buchanan, dated September  
13 22nd, 1982.

14 (The document referred to was  
15 marked Love Depo. Exhibit No. 9  
16 for identification.)

17 BY MR. MILLER:

18 Q Mr. Love, can we agree that this is the letter  
19 that is also referred to in Inspection Report 82-17?

20 A Yes, sir. The words look similar.

21 Q Now, did you see this letter at or about the time  
22 you conducted Inspection Report -- or the inspection that's

1 memorialized in Inspection Report 82-17?

2 A Yes, sir. In fact, I documented it on page 17  
3 and I think it appears to be just about verbatim, items 1  
4 through 6 that I have discussed there. This is 82-17.

5 Q The second paragraph of the letter that is Love  
6 Deposition Exhibit 9 really endorses the use of Memo 295,  
7 does it not?

8 A Yes, sir.

9 Q Now it also refers to Memorandum 216, and just so  
10 we have got everything in front of us, I'd like the reporter  
11 to mark as Love Deposition 10 for identification a document  
12 that's entitled Hatfield Electric Company, QA/QC Memorandum 216,  
13 dated August 16th, 1982.

14 (The document referred to was  
15 marked Love Depo. Exhibit No. 10  
16 for identification.)

17 BY MR. MILLER:

18 Q Had you ever seen this document before, Mr. Love,  
19 Love Deposition Exhibit No. 10?

20 A No, sir. I believe this is the first time I  
21 have seen this one.

22 Q All right. Quite apart from this memorandum, you



1 know, do you not, that the Hatfield weld travelers at about  
2 this point in time were incomplete in that you could not find  
3 a traveler for every connection; is that correct?

4 A Yes, sir. I think I have also documented that in a  
5 report or two.

6 Q And Hatfield was to where they could not find a  
7 traveler for a particular connection, was to go out and  
8 reinspect the weld and create a new traveler; correct?

9 A Yes, sir.

10 Q Just for the record, what is a weld traveler?

11 A What is a weld traveler?

12 Q Yes.

13 A A weld traveler is, if you will, a work order  
14 and documentation, if you will, to install in some cases a  
15 single weld, in some cases an entire hanger.

16 On it, the welder would put his weld ID number,  
17 of course the hanger number, and then there was a space on  
18 there for the weld inspector to perform <sup>his</sup>~~its~~ inspection and ~~sign~~  
19 sign off.

20 Q So it's kind of the basic document that tells you  
21 the status of the weld on a particular hanger; correct?

22 A Not necessarily the status, but in progress, if you

1 will, and complete.

2 Q Now returning to Love Deposition Exhibit No. 9,  
3 which is Mr. Binder's letter to Mr. Buchanan, he asks Mr.  
4 Buchanan to accumulate six different categories of data; isn't  
5 that right?

6 A Yes, sir.

7 Q And Category 2, am I correct, is the hangers  
8 which were accepted on the basis of Memo 295?

9 A Yes, sir.

10 Q And Category No. 5 were the hangers for which  
11 fireproofing had to be removed in accordance with Memo 216?

12 A 216?

13 Q That's Love Deposition Exhibit --

14 MS. WHICHER: 10.

15 BY MR. MILLER:

16 Q -- 10.

17 A Would you repeat that again, please.

18 Q I said Category 5 on Mr. Binder's September 22nd  
19 letter, Deposition Exhibit 9, are hangers for which the  
20 fireproofing had to be removed in accordance with Hatfield  
21 QA/QC Memorandum 216, which is Love Deposition Exhibit 10.

22 A Yes, sir, it appears that way.

1           Q       Okay. Now I think in your earlier answer, you  
2       said that your discussions with Commonwealth Edison personnel  
3       led to some sort of oral understanding that they would do a  
4       sampling of the results and then make a determination as to  
5       whether fireproofing had to be removed to check the  
6       connection detail on all the hangers that were covered by  
7       fireproofing; is that right?

8           A       Yes, sir.

9           Q       Approximately what date did that conversation  
10      take place?

11          A       If my memory serves me correctly, just looking  
12      at the inspection reports here, I believe that took place  
13      either right before or right after the September 22nd memo.  
14      That's Exhibit No. 9.

15          Q       Is that oral understanding reflected in the  
16      inspection report anywhere?

17          A       No, sir. Wait a minute. Let me back off. I don't  
18      think it is, but let me. . .

19                   (Witness reading document.)

20                   I think it's alluded to here in the bottom of page  
21      17.

22                   MS. WHICHER: Are you referring only to 82-17?

1 MR. MILLER: At this point, that's correct.

2 THE WITNESS: In 82-17, at the bottom of page 17,  
3 where I stated that the Licensee stated the above data  
4 would be evaluated upon completion of the reinspection  
5 program, and one of the following actions taken.

6 It's been a while since I looked at this. I was  
7 thinking it had been strictly an oral, that this was oral,  
8 not in writing, although I did document it.

9 BY MR. MILLER:

10 Q Yes, sir. The statement you just read refers  
11 to an evaluation that would take place at the conclusion of  
12 the reinspection program?

13 A That's affirmative.

14 Q And the reinspection program was for all Hatfield  
15 hangers; correct?

16 A I don't remember the full content of NCR 407. I  
17 believe there was something in excess of 4300 hangers  
18 installed.

19 Q And all of those hangers were subject to the  
20 reinspection program; correct?

21 A The 4300 were.

22 Q And the hangers that were yet to be installed were

1 to be inspected in accordance with these upgraded procedures;  
2 isn't that right?

3 A Yes, sir.

4 Q So they wouldn't be subject to the reinspection  
5 program. My question, Mr. Love, is:

6 It really wasn't a sample, then, it was going to  
7 await the conclusion of the entire reinspection program of  
8 the 4300 hangers before an evaluation would be made as to  
9 whether or not the fireproofing had to be removed. Is that  
10 right?

11 A Yes. But here again it was still in my terms --  
12 maybe you and I don't agree on what a sample is, but if I  
13 don't inspect all hangers underneath fireproofing, that's a  
14 sample. If I do 90 percent of them and don't do the other  
15 10, that's still a sample. All right?

16 In this case here in the original September 22nd  
17 memo, they weren't going to remove the fireproofing of all of  
18 them, but they were going to do an evaluation of the sample --

19 Q That they did remove fireproofing on?

20 A -- that they did remove fireproofing from.

21 Q For example, if on the ones they did remove the  
22 fireproofing from, there was 100 percent correct connection

1 detail that was installed, that would give you some  
2 confidence that the connection detail on those for which  
3 the fireproofing had not been installed were probably okay,  
4 too?

5 A Yes, sir.

6 Q Okay. I think that -- let me just back up.

7 This understanding that you had, this oral  
8 understanding, was that with Mr. Binder?

9 A Yes, sir.

10 Q I think you also said in a prior answer that Mr.  
11 Binder at some point in time reported to you that there  
12 were problems, and that they would therefore be removing  
13 the fireproofing from hangers; is that right?

14 A I can't remember whether he said all hangers or  
15 an additional sample of hangers.

16 Q Do you recall the time when that was reported to  
17 you?

18 A No, sir, I don't, because Mr. Binder and I talked  
19 so often that --

20 Q Well, was it at about the time of Inspection  
21 Report 82-17, or was it some months or years after that?

22 A It would have had to have been after 82-17 had



1 dated November 10th, 1983, to which is attached Report 83-48.

2 (The document referred to was  
3 marked Love Depo. Exhibit No. 11  
4 for identification.)

5 BY MR. MILLER:

6 Q Could you direct me to the page in that document  
7 which has now been marked Love Deposition Exhibit 11, where  
8 the open item from 82-17 is referred to?

9 A Yes, sir. If you go to the top of page 4 of the  
10 body of the report where I discuss unresolved item 82-17-04.

11 Q That's the -- just so we're tracking, it's the  
12 first paragraph on the page, not the second one; correct?  
13 First complete paragraph?

14 A Yes, sir, there is a typo. It's the first page,  
15 or the first paragraph, yes.

16 MS. WHICHER: I must be either on the wrong page  
17 or -- is this the right page?

18 MR. PATON: Page 4.

19 THE WITNESS: Right at the top of the page.

20 MS. WHICHER: Okay. We're talking about which  
21 paragraph?

22 THE WITNESS: First paragraph there. I see now



1 there is a typo in the report. I believe that second item  
2 should be 82-17-05, just looking at it. I'd have to go  
3 back and verify that. In sequence it appears to be 5.

4 BY MR. MILLER:

5 Q At the time that you prepared Inspection Report  
6 83-48, Love Deposition Exhibit 11, did you know whether or not  
7 hangers that were covered by fireproofing were still being  
8 accepted on the basis of Memo 295?

9 A Here again, I don't remember discussing Memo 295  
10 during that <sup>inspection</sup> We may have. *ABP*

11 Q Okay. Now, then, Mr. Love, let's go back to  
12 Inspection Report 84-27, which is Love Deposition Exhibit 5.  
13 Let's go to page 3 of the report. Under item -- paragraph  
14 C, there is a sentence that begins, "At that time," and so  
15 on.

16 A Is this the -- we're reading from the left of the  
17 page, "reinspection required by HECO NCR 407. At that  
18 time" --

19 Q Yes, with that sentence.

20 A All right, sir.

21 Q I guess I'm a little bit confused. You knew  
22 when you wrote 82-17 that they were still going to use Memo

1 295 to accept hangers covered by fireproofing; isn't that  
2 right?

3 A Yes, sir. Let's go back and look at Memo 295  
4 again. Memo 295 says that if the -- if it's covered by  
5 fireproofing, then you go back in and look at the weld  
6 traveler.

7 Q Right.

8 A All right. I have no problems, as I stated here  
9 and in the 82-17, I have no problems of utilizing the weld  
10 traveler, providing that weld traveler also referenced the  
11 detail utilized as well as the weld inspection.

12 Q Right. Now that doesn't appear -- your instruction  
13 about what information had to appear on the weld traveler  
14 was not reflected in Memo 295, was it?

15 A No, sir, it was not.

16 Q And it wasn't reflected in Mr. Binder's letter to  
17 Mr. Buchanan, either, was it?

18 A No, sir, I don't think it was.

19 Q Well, in fact, it says specifically -- this is  
20 Love Deposition 9 -- that your Memo 295 accurately described  
21 the actions required to be taken when hanger connection detail  
22 cannot be visually verified due to the installation of

1 fireproofing.

2 I guess my question to you, Mr. Love, wouldn't  
3 you have expected Mr. Binder to have specifically directed  
4 Hatfield in writing to accept hangers that were covered by  
5 fireproofing on the basis of the weld traveler, only if the  
6 weld traveler identified the connections? Shouldn't he have  
7 made that specifically known to the Hatfield inspectors?

8 A Yes, sir. In retrospect, in discussions with  
9 Mr. Binder, during the reporting of 84-27, during that time  
10 frame, Mr. Binder indicated that he thought Memo 295 had in  
11 fact been cancelled. And if my memory serves me correctly,  
12 in 84-27, I make the comment somewhere in the report, I  
13 believe, that Mr. Binder did in fact direct them to cancel  
14 or void, or words to that effect, Memo 295.

15 Q Yes. It's found on page 7. You were under  
16 the impression that Memo 295 had at least been clarified  
17 back in 1982?

18 A Yes, sir.

19 Q In 1982, did Mr. Binder or anybody else tell you  
20 that they were going to clarify it to make certain that only  
21 weld travelers with connection details on them would be  
22 utilized to accept hangers where the connections were

1 covered by fireproofing?

2 A I don't remember.

3 Q Okay.

4 Mr. Love, let me just understand, when you came  
5 out to conduct the inspection that is documented in  
6 Inspection Report 84-27, you were hoping to close the unresolved  
7 item from 82-17; correct?

8 A Yes, sir.

9 Q And in fact, Licensee, through Mr. Binder, told  
10 you that they had now collected all the data and it was set  
11 to be closed out. Did they inform you of that prior to the  
12 time you came out on site?

13 A No, sir. A typical inspection, at our entrance  
14 we ask the Licensee to identify any and all unresolved or  
15 open items, <sup>or</sup> ~~of~~ noncompliance that they think are ready for ADP  
16 closure, and through that means is basically <sup>how were</sup> ~~are~~ told that  
17 82-17, I believe it's 04, was in fact ready for closure.

18 Q There were 4308 hangers that were reinspected  
19 pursuant to the disposition of HECO NCR 407; correct?

20 A Yes, sir.

21 Q Out of that total population of 4300-some-odd  
22 hangers, how many were found with the wrong connection detail?

1           A        I don't remember that the report identified that,  
2 per se. The area of concern was on the ones under fire-  
3 proofing, and if my memory serves me correctly, that there  
4 was three identified that were nonconforming, if you will,  
5 but did not give the details in the report as to what the  
6 problem was.

7           Q        Okay. And the final step in closing out 82-17  
8 was when the reinspection program was complete, they were  
9 going to analyze the data and determine whether they could  
10 accept the hangers that were covered by fireproofing, whether  
11 they'd remove all the fireproofing and conduct a complete  
12 reinspection. Weren't those the alternatives that were  
13 suggested in 82-17 as ways of ultimately closing out this  
14 unresolved item?

15          A        Yes, sir.

16          Q        Okay. Now, when you got out to conduct this  
17 Inspection 84-27, had Commonwealth Edison and/or Sargent &  
18 Lundy gone the step of analyzing all the data and having a  
19 recommendation as to how to disposition those hangers that  
20 had not been -- as to which the fireproofing had not been  
21 removed?

22          A        This, here again, goes back to a conversation

1 that Mr. Binder and I had, where they indicated they had  
2 been removing more fireproofing, and I was under the impres-  
3 sion at the start of 82 -- or 84-27, that where the data  
4 from the inspection reports was not conclusive, if you will,  
5 as to the acceptability of the hanger, that the fireproofing  
6 had in fact been removed.

7 Q I see.

8 Did you know that fireproofing was being removed  
9 from some hangers so they could be inspected for the quality  
10 control inspector reinspection program?

11 A Yes, sir, I did.

12 Q It's a fact, is it not, that Commonwealth Edison  
13 was accumulating data on the status of those hangers,  
14 regardless of the reason that the fireproofing was removed?  
15 That is, if they got information -- if a hanger had fire-  
16 proofing removed from it because of the quality control  
17 inspector reinspection program, they would do a complete  
18 reinspection for purposes of the disposition of Hatfield  
19 NCR 407. Did you understand that that was taking place?

20 A I know they were accumulating data for both, but  
21 to the best of my knowledge, those two are separate and  
22 distinct items. This was discussed yesterday with Mr. Binder

1 and Mr. Tuetken at the site, and basically my question to  
2 them was, in the reinspection of 84-27, were -- and  
3 primarily the hangers that had been rejected, that they  
4 identified subsequent to the 84-27 -- were any of those  
5 hangers in fact reinspected and accepted under the February  
6 -- or the 82-05-19 program?

7 The only ones that they could tell me for sure  
8 on, as of yesterday -- and again, this is verbal -- that  
9 as far as configuration, et cetera, goes, none of the hangers  
10 inspected under Hatfield NCR 407 were inspected under the  
11 82-04-19 -- or 82-05-19, I guess it is.

12 Q Okay. Returning to the NCR 407 reinspection  
13 program -- maybe you answered this, and if so I apologize --  
14 but am I correct, the analysis that was supposed to take  
15 place when all the data was accumulated still has not been  
16 done in any formal sense?

17 A I don't think it's been a formal analysis,  
18 although Mr. Binder again was running an analysis as reports  
19 were received, if you will.

20 Q Did you, in your judgment -- let's focus on the  
21 131 hangers that are referred to on page 3 of Report 84-27  
22 for which fireproofing was removed.

1 A All right, sir.

2 Q The indications were that three of them were  
3 rejected after the fireproofing was removed. Did you regard  
4 that as an unacceptable rejection rate?

5 A No, sir, not at all.

6 Q I know you went and then looked at the inspection  
7 packages for each of those three hangers, and it would  
8 appear to you to be some deficiencies in the packages.

9 Hypothetical question:

10 If the documentation had been complete when you  
11 made your examination, would you have requested that the  
12 fireproofing be removed from all other hangers that had  
13 been accepted on the basis of Memo 295?

14 A I don't follow your question, sir.

15 MS. WHICHER: I'd like to hear it again, too.

16 BY MR. MILLER:

17 Q You say that three out of 131 is not an unacceptable  
18 failure rate, if you will, for hangers that were covered by  
19 fireproofing; is that correct?

20 A Yes. I could buy the three out of 131.

21 Q Did that rate of failure, three out of 131, have  
22 any influence on your judgment that fireproofing had to be



1 removed from all the hangers where the weld traveler did  
2 not have the connection detail noted on it?

3 A The way you have asked the question, sir, I've  
4 got to give you yes and no.

5 Q That's not surprising.

6 A In that backing up, you asked the question if  
7 the weld traveler didn't note the detail on it, would I  
8 accept it based on this three of 131. The answer is no.

9 Q Okay. That's not a yes and no, that's a no.

10 (Laughter.)

11 A I know, but the way you asked the question, sir,  
12 you also asked in the same light is three out of 131  
13 acceptable.

14 Q Right. Assume for purposes of my question that  
15 in fact the three of 131 -- that the three rejects were not  
16 in fact rejects; that upon further analysis those three  
17 hangers are shown to be in conformance with the requirements  
18 for connection detail, would you -- so that instead of three  
19 of 131, it would be 131 inspected, fireproofing removed,  
20 and no rejects -- would you still say that all the other  
21 hangers where connections were covered by fireproofing and  
22 the weld traveler did not have the connection detail

1 specified, would have to have the fireproofing removed?

2 A Yes, sir.

3 Q So your position has been consistent from 1982  
4 right up till today?

5 A Yes, sir.

6 Q Unless the weld traveler has it, has the  
7 connection detail, you can't accept it on the basis of the  
8 weld traveler; correct?

9 A Yes, sir.

10 Q I'd like you to turn for a second to page 6 of  
11 Love Deposition Exhibit 5, and there is a tabulation of what  
12 was found when in fact the fireproofing was removed from  
13 some 295 hangers that had fireproofing on them; is that  
14 right?

15 A Small clarification there. I don't think all 295  
16 had the fireproofing on, in that as a result of that rein-  
17 spection program -- that being the --

18 Q QC inspector reinspection program?

19 A QC inspector reinspection program. And the  
20 finishing of this reinspection program to 407, I don't think  
21 all of them had been fireproofed at that point in time.

22 Q Okay.

1           A       In other words, on the 295 they may have only  
2 had to remove fireproofing in 250 or something to that effect.

3           Q       I'm with you.

4                    There is a number there, 91 discrepancies that  
5 were identified as involving welding fit-up. Is welding  
6 fit-up an attribute that is found in the inspection check-  
7 list for cable pan hanger? It's Love Deposition Exhibit 7.

8           A       (Witness reading document.)

9                    No, sir, I don't believe -- or I don't see any  
10 notation of weld fit-up on that sheet. In fact, this given  
11 sheet here I wouldn't expect fit-up to be on it. In fit-up  
12 there would be a welding inspector's inspection and not a QC  
13 inspector's inspection -- or attribute to look at, if you  
14 will.

15          Q       Do you know whether or not Hatfield QC inspectors  
16 since, oh, some time late 1983 or early 1984, have been  
17 writing up what they believe to be deficient conditions,  
18 even though the deficiencies were not called out on any  
19 inspection checklist?

20          A       I don't know, sir.

21          Q       Would you agree with me, Mr. Love, that the number  
22 of deficiencies that are listed on page 6 of Love

1 Deposition Exhibit 5, could change over time depending on  
2 the disposition of the various NCRs that are identified at  
3 the bottom of the page?

4 A Would the number of deficiencies change depending  
5 upon the disposition?

6 Q Yes.

7 A No, sir, the number of deficiencies would not  
8 change. The acceptability of those deficiencies may change,  
9 based on an NCR.

10 Q Do you know whether -- how much research into --  
11 well, for example -- I'll strike the question.

12 All right, now, Mr. Love, as a result of this  
13 inspection report --

14 MS. WHICHER: Which one?

15 BY MR. MILLER:

16 Q I'm talking about Love Deposition 5, and the two  
17 items of noncompliance that you identified there. Have you  
18 changed your conclusions about the acceptability of Hatfield  
19 work or the qualifications of the inspectors?

20 A Do I understand you correctly, you want to know if  
21 I have changed my position on the qualification of Hatfield  
22 personnel inspectors based on this inspection report?

1 Q That's one question, yes, sir.

2 A No. Generally I think Hatfield has pretty good  
3 inspectors.

4 Q Have you changed your conclusion regarding the --  
5 I don't remember quite the words you used -- the adequacy or  
6 acceptability of Hatfield's work itself as a result of this  
7 inspection in Love Deposition Exhibit 5?

8 A Again, -- and for both these answers, no, I don't  
9 think I have changed my mind, but let me make one clarification.  
10 If you go down through and look at these deficiencies,  
11 these are primarily weld deficiencies, and here again I am  
12 going to have to bow ~~whether~~ to the <sup>expertise of</sup> our welding people. *RF*  
13 But looking at the type of deficiencies and discussions  
14 with personnel, no, basically my opinion has not changed.

15 Q Mr. Love, are you aware of an issue involving  
16 the butt splicing of certain cables --

17 A Yes, sir.

18 Q -- at the Byron station.

19 Could you just describe briefly what your under-  
20 standing of that issue is?

21 A From the start to finish, if you will?

22 Q Sure.

1           A       All right. Originally the problem -- a problem  
2 was identified at the CECO LaSalle Station with butt splices.

3           Q       Just for the record, what are butt splices?

4           A       Butt splices is a -- I knew I should have brought  
5 it down -- a butt splice, if you will, and here I've got to  
6 use my hands -- is you have two conductors or two wires,  
7 for example, the wires in your home are normally like a  
8 No. 12 or a 14 wire.

9                   All right, to splice those two wires together,  
10 they have a connector that these two conductors go in and  
11 then they are physically clamped or crimped around each  
12 conductor, and that is commonly referred to as a butt splice.

13          Q       And I take it on a much larger level, that's  
14 what occurs with cables in a nuclear power plant? That is,  
15 the crimping device is much larger, the size of the conductor  
16 is much larger, and so on?

17          A       No, sir. In fact, most of them are -- the ones  
18 they found the problem with in the crimp was in fact No. 12  
19 and No. 14 wires.

20          Q       The problem was first identified at LaSalle. How  
21 did this relate to the situation at Byron?

22          A       At Byron, as a passing comment, I asked the quality

1 assurance -- the CECO quality assurance engineer that I was  
 2 with if based on the LaSalle experience, had Byron Station  
 3 considered doing a reinspection of the butt splices at the  
 4 Byron Station.

5 The engineer told me, yes, it had been considered.  
 6 In fact, there was a report centered on that -- I need to go *AK*  
 7 to the report here to give you dates.

8 MS. WHICHER: Mr. Love, which exhibit are you  
 9 referring to?

10 THE WITNESS: I am in Exhibit 5. I'm now back  
 11 on page 12 of that exhibit.

12 MS. WHICHER: Fine. Thank you.

13 THE WITNESS: That between March 13th and 16th,  
 14 1984, CECO did in fact go in and do a random sample of 221  
 15 safety-related butt splices.

16 Of that 221, there was 27 that was covered with  
 17 tape or heat-shrink material, which about the only way you  
 18 can remove it is to destroy the splice.

19 As a result of that, they inspected ~~the~~ 194 of *AK*  
 20 those splices. They found one that failed the tug test,  
 21 and that's basically what it is, you get ahold of both ends  
 22 of the wire and pull on it. And 16 of the other remaining

1 splices had defects.

2 In the process of replacing those 17 butt splices,  
3 reading the reports it appeared that the Hatfield people --  
4 and here again, I don't know whether it was the craft or  
5 the QC inspectors -- that identified an additional 10. That  
6 was also repaired.

7 So basically on the 194 splices, there were 27  
8 defects that had ~~been~~<sup>been</sup> corrected. And of the 27 defects out  
9 of 194, to use percentagewise, is a 13.9 percent reject rate. *AB*  
10 And the -- as a result of this inspection that was performed  
11 there, CECO also prepared NCR 899, and basically this --  
12 there is another problem identified that the -- due to the  
13 size of the insulation around the cable supplied by ~~geonite~~<sup>OKonite</sup>, *AB*  
14 that the insulation would not fit inside the barrel of this  
15 butt splice connector, and they prepared that NCR 899, <sup>and</sup> ~~as~~ attach- *AB*  
16 ments to that, was also the CECO surveillance report.

17 After reviewing that data, then it became a  
18 concern with a 13.9 percent reject rate, I asked CECO to  
19 consider -- ~~considering~~ doing 100 percent reinspection of *AB*  
20 butt splices.

21 And as documented here, CECO did in fact prepare  
22 a potential 50.55(e) report, and I don't remember the date



1 on it. And in that report they also give us a criteria, if  
2 you will, for the reinspection of the butt splices which, in  
3 a cover letter, we concurred with CECO's reinspection plan  
4 of the butt splices, and with the exception of a 30-day  
5 response that was received, that basically is where documenta-  
6 tion was, where the report stands now.

7 At the end of this report I also referred you to a  
8 future inspection report which will be prepared by Mr.  
9 Christnot and Mr. Mendez, in that those two inspectors were  
10 basically following CECO's butt splice reinspection program.

11 BY MR. MILLER:

12 Q As far as you know, sitting here today, is the  
13 corrective action for the Commonwealth Edison NCR -- does it  
14 seem acceptable?

15 A I haven't seen the disposition on -- you're  
16 referring to NCR 899?

17 Q Yes.

18 A I have not seen the disposition on that NCR, sir.

19 Q In your judgment, is Commonwealth Edison Company  
20 acting responsibly in the way they are dealing with this issue  
21 of the apparently defective butt splices?

22 A Yes, sir, I think they are.

1 Q This was an item that was in fact discovered by  
2 Commonwealth Edison quality assurance, rather than uncovered  
3 by any NRC inspector during the course of a routine  
4 inspection; correct?

5 A The reason I am hesitating, there was one other  
6 inspection report, and unfortunately I don't have the number  
7 of it, by one of our other inspectors that referenced butt  
8 splices in it, in that I think Mr. Mendez made it an  
9 unresolved item, that he had identified butt splices that  
10 he couldn't find any inspection reports on it.

11 Now I don't know when that inspection took place,  
12 as vs. when this action was taking place. But as far as  
13 identifying defective ones, yes, CECO did take the initial  
14 action.

15 Q Mr. Love, the reason we are here today, the reason  
16 you have been subjected to my questions so far is that I  
17 understand you are going to be a witness in the reopened  
18 proceedings; is that correct?

19 A That's my understanding, yes, sir.

20 Q Could you just describe for us briefly what you  
21 understand the scope of your testimony is going to be?

22 A The scope of my testimony, as I understand it

1 right now, will be for sure on the reinspection program that  
2 we had discussed. If my memory serves me correctly,  
3 Attributes 2 through 9.

4 Q You're talking about the QC inspector reinspection  
5 program?

6 A QC inspector reinspection reports. For sure, I  
7 think that's the only item that I've been asked to testify  
8 on, although I was warned to prepare testimony on the butt  
9 splice reinspection program, and also on cable tensioning,  
10 i.e., the inspection reports combined, 84-09 and 84-27.

11 Q Are you going to be making any further inspections  
12 of any of those items between now and the time that your  
13 testimony is submitted, which is July 2nd? I'll just tell you  
14 that's the present schedule.

15 A Hopefully, I plan in getting two, three days at  
16 Byron, basically to follow up on these items, so I can be  
17 more clear to the Board, or get into the written testimony  
18 that's being submitted on the 2nd.

19 MR. MILLER: If I could have 30 seconds to look at  
20 a few pieces of paper, I think we're done, or I'm done.

21 (Pause.)

22

1

BY MR. MILLER:

2

Q First of all, did you have anything to do with inspecting any aspect of the Systems Control Corporation situation?

3

4

5

A Systems Control? No, sir, except for as it relates to the boards supplied by Systems Control. Are they in the right location, et cetera, are they wired properly. But as far as the receipt of them, the problems identified with them, no, sir.

6

7

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10

Q When you say "the boards," are you talking about the local instrument panels, the main control boards, or both?

11

12

A Yes to all the above.

13

Q In other words, as part of our routine inspection program, we go in and verify that panel A is where it's supposed to be in the plant, and the electrical cables going to it, or instrumentation cables, that they are in fact routed to it and properly terminated, et cetera.

14

15

16

17

Q Do you inspect every such panel?

18

19

A At one time or another, I think <sup>between</sup> all of our inspectors, we eventually <sup>hit</sup> ~~had~~ all of the panels, not necessarily 100 percent.

20

21

Q Have you personally observed any discrepancies in

22

## MILLERS FALLS

1 the wiring or the way the cables are routed?

2 A I can't -- I think a while back that we -- yes, I  
3 know we did, we identified cable separation problems inside  
4 the panels which has nothing to do, if you will, with Systems  
5 Control except in the design of the panel, where they have  
6 to run nonsafety and safety basically together to get from  
7 here to there.

8 Q I've just got a few documents to talk to you  
9 about that probably won't take very long.

10 Love Deposition Exhibit No. 12 for identification  
11 is a five-page document that appears to be undated, and  
12 the first page has the page number 25 on it. It bears --  
13 well, our identification number 10000480 on the first page.  
14 It's item No. 24 of the items supplied by the Staff to us  
15 in discovery.

16 (The document referred to was  
17 marked Love Depo. Exhibit No. 12  
18 for identification.)

19 MS. WHICHER: Does it concern Systems Control?

20 MR. MILLER: No, it's Hatfield. I just want to  
21 know what it is. I've never seen anything like it.

22 MS. WHICHER: It has page number 25 at the top?

1 MR. MILLER: Yes, that's it.

2 BY MR. MILLER:

3 Q Mr. Love, I show you a document that's been  
4 marked as Love Deposition 12 for identification. It comes  
5 out of your files, or so we're told. Do you know what it is?

6 A Yes, sir, at least the first page. During one  
7 of the inspections this is a mark-up, I believe this one  
8 eventually ended up in the preliminary inspection report of  
9 January 1984, the CECO report, and this is the pages -- you  
10 can see that there is some ink changes in it, and if my  
11 memory serves me correctly, those were provided by Mr.  
12 Klingler of the CECO organization who was working on this  
13 at the time.

14 Q Does your handwriting appear on any of the four  
15 pages of that exhibit?

16 A Yes, sir.

17 Q All right. Where?

18 A On page 33.

19 Q Can I come around and look? I'm sorry. Yes, sir,  
20 which --

21 A Basically just a fast look-see, all the pen and ink  
22 changes made on page 33 -- that's of Table B.5 -- are my

1 figures.

2 Q So they're basically percentage calculations?

3 A They're percentage calculations. And likewise  
4 over -- well, they vary depending on where I had room to put  
5 them.

6 For example, under what they identify as Inspector  
7 A, in my report that was my Inspector E.

8 Q I see.

9 So you're just correlating the data to your  
10 own observations?

11 A To my own report, and with the way they used the  
12 figures here. For example, going down to the bottom, here  
13 again where they indicate that there is a 21662/23350,  
14 they give me the number inspected and the number accepted,  
15 and I was interested in the number of rejects. So, here  
16 again, two minus one equals one, or in this case, 1688.

17 Q Turning the page, again is that your handwriting?

18 A No, sir, except for the marking, 82-05-19.  
19 That other pen and ink change appears to be Mr. Klingler's  
20 of CECO.

21 MR. PATON: You might indicate we are now on  
22 page 34. We just went from 25 to 33.

1 BY MR. MILLER:

2 Q Okay, sir, would you turn the page. These last  
3 two pages of this exhibit are titled "Failure Mode  
4 Analysis." Is that a Hatfield form?

5 A This I don't remember, but looking at the stamp  
6 there, that is a stamp very similar to what Hatfield uses  
7 to enter it into their computer program.

8 Q No, if you're looking at these numbers that are  
9 right in the first column, I represent to you that those  
10 are numbers put on by our office.

11 A By your office? Okay. It's very similar to the  
12 numbers that Hatfield uses whenever they enter --

13 MR. MILLER: You don't have it on your copy  
14 because these are numbers that we put on when we got it  
15 from the NRC. But the exhibit as reproduced will have the  
16 numbers there.

17 MS. WHICHER: Okay.

18 BY MR. MILLER:

19 Q Does your handwriting appear anywhere on there?

20 A Yes, sir, at the top where I made the note there  
21 that this refers to Inspection 82-05-19.

22 Q Otherwise it does not?



1           A       Otherwise, as near as I can tell, I have made  
2 no comments on there.

3           Q       Do you know whose handwriting it is?

4           A       No, sir, I don't know. I have no idea. I don't  
5 remember.

6           MR. MILLER: I have no further questions of the  
7 witness at this time. Thank you very much, Mr. Love.

8                   (Whereupon, at 1:15 p.m., the deposition  
9 was recessed, to reconvene at 2:15 p.m., this  
10 same day.)

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## 1 AFTERNOON SESSION

2 (2:25 p.m.)

3 Whereupon,

4 RAY S. LOVE

5 resumed the stand as a witness and, having been previously  
6 duly sworn, was examined and testified further as follows:7 MS. WHICHER: Let the record show this is the  
8 afternoon session of Mr. Love's deposition, reconvening at  
9 2:25.

## 10 E X A M I N A T I O N

11 BY MS. WHICHER:

12 Q Mr. Love, you realize you are still under oath  
13 from this morning; is that right?

14 A That's right.

15 MS. WHICHER: I'd like to make a statement for  
16 the record. I was informed by Mr. Lewis that Mr. Love's  
17 testimony would be limited solely to an evaluation of the  
18 work of Hatfield Electric Company, and would not encompass  
19 the reinspection program.20 I'm making that statement for the record because  
21 it may not be possible for me to cross-examine Mr. Love  
22 today on every aspect of the reinspection program, as I

1 would if I had known ahead of time exactly what the scope  
2 of Mr. Love's testimony will be, as it was described by  
3 Mr. Love this morning.

4 MR. PATON: I have no response. Do you have any  
5 response, Mike?

6 MR. MILLER: I don't have any response.

7 MR. PATON: Are you finished? Shall I go with  
8 this other item?

9 Both the Applicant and Intervenor apparently want  
10 to see all the handwriting that Mr. Love has placed on  
11 documents, as I understand it, that he brought with him  
12 today, regardless of whether they have been introduced as  
13 exhibits or not.

14 Is that your request?

15 MR. MILLER: Yes.

16 MS. WHICHER: Yes.

17 MR. PATON: We are willing to show you those  
18 except for his initial drafts of his testimony.

19 Let me ask you to describe very, very briefly  
20 your initial drafts of your testimony. Is that what you  
21 would call the initial drafts of your testimony?

22 THE WITNESS: Yes, sir, and then it's my

1 handwritten notes on tablet paper. And to the best of my  
2 knowledge, I am the only one that's seen them to date.

3 MR. PATON: Okay. I don't think we want to give  
4 you that, but -- in fact, I think you indicated that was not  
5 within the scope of your request, but -- Mr. Miller, I believe,  
6 did not ask for that, but Intervenor did ask for it.

7 MR. MILLER: I regard it as privileged material.

8 MR. PATON: We don't intend to supply that. But  
9 if you want to go through, we'll pull them out and show them  
10 to you, if that's what you want to do, all these other things.

11 MR. MILLER: Yes.

12 MS. WHICHER: Let's go off the record for a  
13 minute.

14 (Discussion off the record.)

15 BY MS. WHICHER:

16 Q Mr. Love, I'd like to ask you when was the last  
17 time you reviewed the handwritten notes that you have for  
18 your draft of your testimony?

19 A When is the last time I reviewed it?

20 Q Yes.

21 A Approximately 30 minutes ago, at 2:00 o'clock  
22 today.

1 Q You looked at that over the lunch hour?

2 A Yes, ma'am.

3 Q You looked at that in preparation for this  
4 afternoon's session?

5 A Yes, ma'am.

6 MS. WHICHER: Okay, on that basis, I think we  
7 would renew our request that the witness produce those  
8 documents. He reviewed them in preparation for his deposi-  
9 tion, and I think that gives us more ample reason to have them.

10 MR. PATON: You say you looked at them in  
11 preparation for this afternoon's session. I assume that  
12 was in response to -- that had to do with the request to  
13 produce the document, didn't it?

14 THE WITNESS: Yes, sir.

15 MR. PATON: In other words, I don't construe his  
16 statement as being he reviewed that in order to assist him  
17 to prepare for this afternoon's session, substantively. He  
18 was trying to get ready for your request.

19 BY MS. WHICHER:

20 Q Mr. Love, did you read through the draft of  
21 your testimony?

22 A No, ma'am.

1 Q You did not?

2 A No, ma'am.

3 Q What did you do?

4 A I looked at it, saw it was draft testimony, laid  
5 it aside, and went on to the next page as to what it was  
6 pertaining to.

7 Q You did not read it?

8 A No, ma'am.

9 Q When was the last time you read it?

10 A I was working on it yesterday, so possibly as  
11 late as 5:00 o'clock last night.

12 Q Did you write it yesterday?

13 A I was in the process of writing it, yes, ma'am.

14 Q Mr. Love, do you know when Hatfield Electric came  
15 on site at Byron?

16 A No, ma'am, I don't.

17 Q And you have been inspecting at Byron for three  
18 years; is that correct?

19 A My first inspection was in 1981. I don't remember  
20 the time frame.

21 Q About how many inspections of Hatfield Electric  
22 have you done?

1           A       As a guess, seven or eight. Some of them were  
2 one week and others were two-week type inspections.

3           Q       Mr. Love, is it possible for you to evaluate,  
4 let's say, on a yearly basis for the three years over the  
5 course of which you've been inspecting Hatfield, to evaluate  
6 Hatfield's performance? And if you can, to evaluate that  
7 performance for each of the three years on a scale of 1 to 10,  
8 if you like, if you can do that.

9           A       Do I understand you want to know, for example,  
10 in 1981 what I thought of their quality program then as  
11 versus now?

12          Q       Exactly. And I'd like to break that down year by  
13 year, if it's possible. Otherwise, we'll break it down in  
14 whatever way you feel is more appropriate.

15                 MR.MILLER: I'm going to object to the form of  
16 the question. The question as asked is an evaluation of  
17 performance. I think that's much too general. It's vague.

18                 BY MS. WHICHER:

19           Q       Are you able to answer the question?

20                 MR. PATON: You can answer the question unless I  
21 instruct you not to answer it.

22                 THE WITNESS: About the best evaluation I could

1 make, I can see a definite improvement between 1981 and the,  
2 say, 1984.

3 BY MS. WHICHER:

4 Q When did you detect the improvement start to take  
5 place?

6 A In a given area, I would say from inspection to  
7 inspection. You may find -- to clarify that a little bit,  
8 you go in and you look at one area hard today. As a result  
9 of our inspections, they have made improvements in their  
10 program in that area.

11 At the same time, in that same inspection, you may  
12 identify a weakness, if you will, in some other aspect of  
13 their program. So the program, from my involvement in it  
14 from 1981 on through, as a result of open items, unresolved  
15 items, and especially items of noncompliance, there has  
16 been a definite improvement in their quality program.

17 Q Can you characterize in any way the quality of  
18 Hatfield's work when you first started inspecting them in  
19 1981?

20 A To give you an honest answer, I don't think I  
21 could.

22 Q Can you characterize the quality of that work at



1 this time?

2 A The quality of the work at this time, here again,  
3 with the improvements that they've made, both in their  
4 training of craft personnel and the training of the  
5 quality personnel, it's definitely increased.

6 For example, with the improvements that they  
7 made, both in craft and quality, I don't expect to see near  
8 the problems in Unit 2 that we identified in Unit 1.

9 Q Is that as close as you can come to characterizing  
10 your opinion of the quality of their work at this time?

11 A Yes, ma'am, I think it is.

12 Q Let me tell you, Mr. Love, a lot of my questions  
13 are asked through ignorance and to help me understand, okay?

14 A No problem.

15 Q I don't want you to think I'm picking away at  
16 something that doesn't matter. I am doing it because I want  
17 to understand what you're telling me, and to make very  
18 certain that I'm clear about what it is that you are saying.  
19 So there's no misunderstanding, can we agree that if you  
20 don't understand a question, that you will tell me, so that  
21 we can work out any misunderstandings?

22 A Yes, ma'am.

1 Q Can we also agree that if it occurs to you during  
2 the remainder of your deposition that an answer you have  
3 previously given to me may have been incomplete or wrong in  
4 some respect, that you will correct that answer as soon as  
5 it occurs to you that that answer was incomplete or wrong  
6 in any respect?

7 A Yes, ma'am. As an example, in the reinspection,  
8 I completely forgot about the meetings we had here in the  
9 conference room until some time after the question had been  
10 asked.

11 T.6 Q Okay. Mr. Love, how many noncompliances have  
12 been assessed against Hatfield since August 12th of this year?

13 MR. PATON: Now wait a minute. August 12th of  
14 this year?

15 BY MS. WHICHER:

16 Q I'm sorry, last year, of 1983.

17 A How many items of noncompliance against Hatfield?

18 Q Yes.

19 A I can't answer that without going back and  
20 researching the records.

21 Q Okay. Can you describe -- we've gone through  
22 already today some specific items of noncompliance assessed

1       against Hatfield; correct?

2           A       Yes, ma'am.

3           Q       Can you recall without looking through your  
4 records any others aside from the ones that Mr. Miller  
5 discussed with you this morning?

6           A       There's one against the Licensee. This is since  
7 August of last year?

8           Q       Yes, August 12th, approximately.

9           A       No, ma'am, I can't, without going back through  
10 and reviewing the other inspector's work.

11          Q       Okay. Mr. Love, what is your opinion of  
12 Commonwealth Edison's oversight of Hatfield Electric  
13 Company?

14          A       Here again, certain people -- and here again I  
15 have to characterize it with individuals -- there is some  
16 extremely strong, and then there is some others that I guess  
17 I'd have to classify as weak.

18          Q       Can you give your opinion as to the general  
19 oversight without dealing with it on a person-by-person basis?

20          A       In reviewing CECo's audits and surveillances of  
21 Hatfield, the ones that I reviewed appeared to be in depth.  
22 They had some good findings, and the corrective action that

1 was required by Hatfield appeared to be appropriate to the  
2 circumstances.

3 Q Do you consider Commonwealth Edison's oversight  
4 of Hatfield Electric to have changed over the course of  
5 your involvement at the Byron Plant?

6 A Yes, ma'am.

7 Q In what manner?

8 A For example, I don't know or don't remember when  
9 it started, CECO came out with a program not only of Hatfield,  
10 but all the contractors on the site, that as near as I could  
11 equate it, it would be a CAT team type of affair. For  
12 example, on one that I observed, it was taking place at the  
13 same time I was there. I think it involved 34 or 35 personnel.

14 And here again, we are looking at all contractors.  
15 And if my memory serves me correctly, there was like four  
16 or five people devoted strictly to Hatfield.

17 Q This is an NRC inspection?

18 A No, ma'am, this is a CECO inspection.

19 Q You know about when this was?

20 A No, I don't, but it runs in my mind that I have  
21 documented an inspection report, and I don't remember which  
22 one. The best I could do is research that and get back to

1 you.

2 Q Do you remember whether there was a name of the  
3 group that came out to look at the Byron Plant?

4 A The name?

5 Q Yes.

6 A I don't know that they had a name, that they --  
7 that they come up here -- that they called themselves. All  
8 I know, it was an inspection team.

9 Q Were they Edison employees?

10 A Yes, ma'am.

11 Q Mr. Love, you are aware, are you not, that along  
12 with or in connection with closing out the noncompliance  
13 82-05-19, there was, in addition to a reinspection program, a  
14 program to recertify inspectors on site? Were you aware of  
15 that?

16 A Yes, ma'am.

17 Q Were you involved in that?

18 A No, ma'am.

19 Q You have no involvement in that at all?

20 A No.

21 Q So you don't know how many Hatfield inspectors  
22 needed retesting or retraining?

1 A No, ma'am, I don't.

2 Q Some of the questions that I'll be asking you  
3 this afternoon, Mr. Love, may go back to testimony that  
4 you've given this morning. If I mischaracterize that  
5 testimony in any way, please correct me. And if I repeat  
6 things that were asked this morning, I apologize, but it's  
7 merely to get firm in my own mind exactly what it is that  
8 you said. So I don't mean to be repeating Mr. Miller's  
9 questions.

10 A Understood.

11 Q Is my understanding correct that you have never  
12 read the initial decision of the Licensing Board?

13 A No, ma'am, if that's the gray book that I believe  
14 that you presented. No, ma'am, that's the first I have seen  
15 of it.

16 Q And you don't recall even seeing portions or  
17 excerpts of it; is that correct?

18 A No, ma'am, I don't remember seeing anything out  
19 of it.

20 Q You do know that the license was denied?

21 A Yes, ma'am.

22 Q Do you know why the license was denied?

1           A        In -- I believe it was Mr. Keppler's briefing  
2       at a general Region III meeting, that we had here, if my  
3       memory serves me correctly, it had -- that the Board had a  
4       concern about the reinspection program. I think that was  
5       the main concern. And here again, it's my understanding it  
6       was primarily, I believe, Hatfield and Hunter Corporations.

7           Q        Mr. Love, do any of your inspection duties deal  
8       with Hunter Corporation?

9           A        There's a possibility, I can't remember, on  
10      82-05, that was a team inspection, and as the team inspection,  
11      one of the items I was looking at was the proper closure of  
12      items of noncompliance. At that time I may have looked at  
13      Hunter; I don't know.

14          Q        Outside of that one involvement, has your work  
15      included Hunter Corporation?

16          A        No, ma'am.

17          Q        Has it included Pittsburgh Testing Laboratories?

18          A        Pittsburgh Testing Laboratories, I looked at them  
19      one time, and this was basically to see the number of rejects  
20      of Hatfield work. This was a follow-up on an allegation.

21          Q        Was this in connection with the 82-05-19 program?

22          A        No, ma'am. I think it originally came out in the

1 82-17 and the allegations that -- I think the allegation was  
2 that Hatfield's training program -- I forget the words the  
3 alleged used.

4 Q Mr. Love, why don't we give you back your stack  
5 of exhibits here.

6 A All right.

7 Q I will tell you that Love Exhibit 5 is Report  
8 82-17, and perhaps you can -- 6, I'm sorry, Exhibit 6, and  
9 perhaps you can refresh your recollection by looking at that  
10 report.

11 A Yes. On page 6, paragraph 4, where the alleged  
12 stated that Hatfield has an extensive training and retraining  
13 program which doesn't accomplish anything.

14 Q Okay. And how does that relate to PTL, Mr. Love?

15 A As PTL, going back through with the training of  
16 the craft and the QC inspectors by Hatfield, the over-  
17 inspection program that PTL was doing of Hatfield, they  
18 identify "X" number of items that the Hatfield inspectors  
19 failed to identify. And what I was doing at PTL is going  
20 back through and reviewing the reports to see whether  
21 the number of items being picked up by PTL was increasing,  
22 decreasing, or constant, et cetera.



1 Q So you were looking at PTL's overinspections in  
2 order to determine the validity of this allegation; is that --

3 A Yes, ma'am.

4 Q Is that the only involvement you had with PTL at  
5 Byron?

6 A As PTL, yes. There were a couple of instances  
7 where PTL inspectors, individual inspectors, now, had been  
8 assigned to the contractors and were doing work. Basically --  
9 Hatfield, for example, they were assigned temporary to  
10 Hatfield to assist them, and there I was looking at  
11 individual PTL inspectors as to the items that he was  
12 inspecting.

13 Q Mr. Love, are you referring to the circumstance  
14 under which PTL would essentially hire people for Hatfield  
15 Electric and working, as I believe the term, job shop for  
16 Hatfield? Are you referring to that situation?

17 A No, ma'am. This is a situation that Hatfield  
18 was behind in their inspections and the Licensee selected  
19 "X" number of PTL people to be assigned to Hatfield,  
20 train under their procedures, qualify under their procedures  
21 and, if you will, act as Hatfield employees for a limited  
22 time.

1 Q When was this?

2 A I believe this occurred in 1983.

3 Q Was it in connection with the 82-0519 reinspection  
4 program?

5 A I don't remember.

6 Q What kinds of things were the PTL employees who  
7 were working as Hatfield employees, what kinds of things  
8 were they doing?

9 A The ones that I was interested in would be the  
10 inspection of cable tray, the inspection of cable installa-  
11 tions, inspection of terminations.

12 Q Is it your testimony that you don't recall whether  
13 they were doing reinspections or initial inspections?

14 A No, I don't remember. I do remember of going out  
15 and observing some of them, but I can't -- it runs in my mind  
16 it was in cable pulling, so it would not be in reinspection.  
17 But I just don't remember for sure.

18 Q Are these the only contacts you've had or only  
19 occasions you've had to inspect PTL's work?

20 A Yes, ma'am, to the best of my knowledge.

21 Q Mr. Love, you don't have any background in  
22 statistics or sampling, I take it; is that correct?

1           A       That's true.

2           Q       So you have no opinion, I assume, on the  
3       statistical validity of the reinspection program?

4           A       No, ma'am.

5           Q       And that includes those portions of the program  
6       about which you testified this morning pertaining to Hatfield?

7           A       Statisticalwise, no, ma'am.

8           Q       Do you have any opinion on the validity of the  
9       sample size of the Hatfield reinspectors -- the number of  
10      Hatfield inspectors that were chosen to be reinspected?

11          A       No, ma'am, I have no -- know nothing on that.  
12      Like I say, I'm not a statistical-minded -- so --

13          Q       Mr. Love, if you don't know, that's a perfectly  
14      reasonable answer, so don't be afraid to tell me that you  
15      don't know.

16          A       Oh, I'm not afraid.

17          Q       I assume, then -- and is my assumption correct --  
18      that you would have no opinion on the validity of the sample  
19      size of different attributes that were selected to be  
20      reinspected?

21          A       I'm not sure that there was a sample size of the  
22      attributes. That was depending on what the inspector

1 inspected. In other words, if he only inspected 10, that's  
2 all you can go back *x and look at.* *th*

3 Q Let's -- I think maybe my question wasn't very  
4 well put.

5 Is my understanding correct that you don't have  
6 any opinion about whether there were a sufficient number of  
7 any particular attributes picked up in the reinspection  
8 program to make reinspection of that attribute valid?

9 A Your statement -- you asked me if it's true. It  
10 is true. I have no comment on it.

11 Q Mr. Love, this morning during your testimony  
12 you were asked several times by Mr. Miller whether you regarded  
13 certain noncompliances to indicate a programmatic weakness  
14 on the part of Hatfield Electric. Do you recall questions  
15 of that nature?

16 A I think that occurred on one instance, as I  
17 remember, and I think I indicated at that time that -- that  
18 had to do, I believe, with the cable pulling -- that that was  
19 the one instance that I identified where the disposition on a  
20 DR was not adequate, and I indicated at that time, I thought,  
21 that it was an isolated occurrence.

22 Q But you do recall answering questions about whether

1 certain things you considered to be programmatic weaknesses?  
2 Do you recall that?

3 A Well, that was one of them.

4 Q You don't need to recall each instance. I just  
5 went to refresh your --

6 MR. PATON: I've got to object. Let me just state  
7 my objection. You've asked him several times, do you  
8 recall instances. His testimony clearly is that he recalled  
9 an instance. And then you tell him, well, you don't have  
10 to recall all of them. But it's clear that he said that he  
11 recalls one.

12 BY MS. WHICHER:

13 Q Mr. Love, what is a programmatic weakness?

14 A What is a programmatic weakness? I would  
15 classify that as a weakness where a trend analysis indicated  
16 that an event was reoccurring because of primarily a lack of  
17 a good program, a good procedure.

18 Q So in order to determine whether something is  
19 programmatic, you need to look at a trend analysis; is that  
20 right?

21 A A trend analysis helps, yes, ma'am.

22 Q Have you ever identified any programmatic

1 weaknesses with respect to Hatfield Electric?

2 A If my memory is correct, it was -- I think it  
3 was identified as a programmatic weakness, again back into  
4 Inspection Report 82-05. And again, if my memory serves me  
5 correctly, this had to do with the improper voiding of NCRs,  
6 and that was not clearly addressed in the program, and we did  
7 classify that, I believe, as a programmatic weakness.

8 Q Mr. Love, is it possible for you to identify  
9 something as a programmatic weakness without looking at a  
10 trend analysis?

11 A Yes, there's -- there are various different -- I  
12 would classify it severity levels of programmatic weakness.  
13 For example, the last one that we discussed here earlier  
14 this morning was, if you will, a programmatic weakness, in  
15 that Note 47 on a given drawing had not been incorporated  
16 into a procedure. The programmatic weakness being there  
17 that the personnel doing the review of the drawings, whenever  
18 they were received, both by CECO and by Hatfield, that  
19 inadequate review was made. That would be a form also of  
20 programmatic weakness.

21 Q So that would be another programmatic weakness  
22 that you have identified within Hatfield Electric Company;

1 is that right?

2 A Yes.

3 Q Can you think of any others?

4 A Another one again on the minor severity level  
5 would be on the cable tray separation is one.

6 Q Why is that one?

7 A Why is that one?

8 Q Why is that a programmatic weakness?

9 A In that the program did not require -- I'm sorry,  
10 that's back into 47, Note 47. My apologies. We're talking  
11 the same one.

12 Right now, truthfully, I can't think of any others  
13 that comes to the top of my head, if you will.

14 Q If you didn't have a trend analysis, Mr. Love,  
15 what kinds of things would you look at to see if a programmatic  
16 weakness existed?

17 A Besides trend analysis, we'd look at the audits  
18 and surveillance by CECO. The audits of, in this case,  
19 Hatfield's own quality program, quality assurance program  
20 would help us identify them, as well as our own inspection  
21 reports.

22 Q Is it your testimony, Mr. Love, that in order to be

1 considered a programmatic weakness, it has to show up in  
2 more than one place?

3 A I would say more than one occurrence.

4 Q More than one occurrence. Okay. Any specific  
5 number?

6 A No. In some cases, two; in some cases, you may  
7 not pick it up until you identify 10.

8 Q Mr. Love, how many open items of noncompliance  
9 are there right now with respect to Hatfield Electric Company?

10 A I don't know without going back and checking the  
11 record.

12 Q Can you give me a range or a number or even a  
13 number that you're involved in personally?

14 A Number I'm involved in personally? I believe  
15 there are three items of noncompliance and one unresolved,  
16 I believe is what I have open right now.

17 Q Is it safe to assume there are other inspectors  
18 inspecting Hatfield Electric who may also have open items  
19 and unresolved items against Hatfield?

20 MR. MILLER: I object to the form of the  
21 question. Ask him what he knows.

22 MR. PATON: So do I.



1 BY MS. WHICHER:

2 Q Are there other inspectors who inspect Hatfield  
3 Electric, Mr. Love?

4 A Yes, ma'am.

5 Q Is it your testimony that you do not know  
6 whether any of those inspectors have open items or unresolved  
7 items against Hatfield Electric?

8 A No, ma'am, I couldn't tel you that without  
9 going back and looking at the reports.

10 Q Mr. Love, as to the open and unresolved items  
11 that you personally are involved in with respect to Hatfield  
12 Electric, are any of these items you consider items that  
13 must be resolved before fuel load?

14 A Yes, ma'am.

15 Q Which ones are they, please?

16 A For example, in the 84-27 report, both of those  
17 items need to be resolved prior to fuel load, and likewise,  
18 those two items, if you remember, also tied back into a  
19 -- I believe it was an item of noncompliance and an unresolved  
20 item.

21 Q Is that in 82 --

22 A That was in 82-17 items. The one item of

1 noncompliance was while attempting to close, I believe it  
2 was unresolved item 82-17-04, I believe, and the other one  
3 was while attempting to close an item of noncompliance,  
4 I think it was 82-17-05.

5 Q And these are both items of noncompliance that  
6 are covered in 84-27; right?

7 A Yes, ma'am.

8 Q Are there any other of the open and unresolved  
9 items that must be resolved prior to fuel load, or must be  
10 closed prior to fuel load?

11 A Again, I can't answer that without going back  
12 and checking my file.

13 Q How about the butt splices issue? Must that be  
14 resolved prior to fuel load?

15 A Butt splicing? I understand that we do not have ~~an~~  
16 an item of noncompliance, open or an unresolved item open on ~~an~~  
17 that. That item is being handled by 50.55(e), and yes,  
18 50.55(e)s, even potential, must be closed prior to fuel load.

19 Q Does that apply to all 50.55(e)s, Mr. Love?

20 A I can't make that blanket statement.

21 Q But you can make that statement with respect to  
22 the butt splice issue?

1 A Yes, ma'am.

2 Q Mr. Love, you stated this morning, I believe,  
3 that you had no role in the formulation <sup>or</sup> of approval of *RSR*  
4 the reinspection program; is that correct?

5 A That's a true statement.

6 Q Can you think of any way that program could have  
7 been improved?

8 A I guess the only improvement I could think of  
9 would be to require 100 percent <sup>of</sup> reinspection of all *RSR*  
10 inspectors from day one on up through whatever day it would be.  
11 I mean that would be an improvement. Or some point in  
12 between that.

13 Q I'd like to turn your attention, Mr. Love, to  
14 Exhibit -- I believe it's Exhibit 5, Report 84-27, and page 7  
15 of that report. The first paragraph at the top of that page,  
16 the third sentence starts with, "The CECo QA engineer informed  
17 the inspectors." Do you see that sentence?

18 A Yes, ma'am.

19 Q Who is that CECo QA engineer?

20 A If my memory serves me correctly, Mike Dellabetta  
21 was with me at that time.

22 Q And Mr. Dellabetta is the Commonwealth Edison

1 QA engineer; is that right?

2 A Yes, ma'am.

3 MR. PATON: While we have the spelling right in  
4 front of him, could he spell that? Because it sounds a  
5 little different than what I'm hearing.

6 THE WITNESS: D-e-l-l-a-b-e-t-t-a.

7 BY MS. WHICHER:

8 Q In the sentence immediately following that, Mr.  
9 Love, it refers to a May 10th telephone conversation. Do  
10 you see that sentence?

11 A Yes, ma'am.

12 Q Did that conversation take place on the same day  
13 as your conversation with Mr. Dellabetta?

14 A No, ma'am. The conversation with Mr. Dellabetta  
15 was during the on-site portion of the inspection program  
16 between April 24th and May 4th.

17 Q So this conversation with you and Mr. Williams  
18 here at Region III, and Mr. Hansing at the site was well  
19 after the site portion of your inspection; is that right?

20 A Yes, ma'am.

21 Q And who is Mr. Hansing?

22 A Mr. Hansing is the site QA superintendent for CECO.

1 Q Did he replace Mr. Stanish?

2 A Yes, ma'am.

3 Q And I take it from my reading of your report, Mr.  
4 Love, that Mr. Dellabetta did not know if there were any  
5 audits performed of the hanger reinspection program, or even  
6 if there was such a program; is that right?

7 A Yes, ma'am.

8 Q And during the later telephone conversation with  
9 Mr. Hansing, Mr. Hansing informed you that Commonwealth  
10 Edison's quality assurance program was aware of the hanger  
11 reinspection program; is that right?

12 A Yes, ma'am.

13 Q He also told you that they had not performed any  
14 audits or surveillances of the program; is that right?

15 A No, ma'am. At that -- I stand corrected. At  
16 that time, I believe he told us that, but later on it was  
17 found out, I believe the following day -- you go down to the  
18 next paragraph, sentence two, this discusses a May 11th,  
19 1984 telecon between myself and site personnel. The second  
20 sentence states that during this conversation it was learned  
21 that CECO QA had in fact performed an audit of the subject  
22 reinspection program in June 1983 and at that time had

1 expressed a concern in Memo 295.

2 Q But at the time of your conversation with Mr.  
3 Hansing, Mr. Hansing did not know of that audit; isn't that  
4 correct?

5 A That's a true statement.

6 Q And then you later found out, did you not, the  
7 subsequent day that in fact Commonwealth Edison had performed  
8 one audit of the hanger reinspection program; is that right?

9 A Yes, ma'am.

10 Q And Commonwealth Edison had told Hatfield to  
11 cancel Hatfield Memo 295; isn't that right?

12 A Yes, ma'am.

13 Q And had Hatfield cancelled that memo?

14 A I assume that they have. I haven't been back to  
15 the site since this inspection.

16 Q Well, at what point, Mr. Love, did Commonwealth  
17 Edison direct Hatfield to cancel the memo?

18 A In accordance with telephone conversations with  
19 Mr. Binder, that he informed me on May 11th, 1984 by telecon  
20 that he had directed the Hatfield QA/QC manager to prepare  
21 a letter to cancel Memo 295.

22 Q Okay, and that was during your inspection that

1 resulted in Love Exhibit No. 5; is that correct?

2 A No, ma'am. This was after the on-site portion  
3 of the inspection.

4 Q But it was in connection with --

5 A Yes.

6 MR. PATON: Wait a minute. "It was in connection  
7 with -- yes."

8 BY MS. WHICHER:

9 Q It was in connection with your inspection that  
10 resulted in 84-27; right, Mr. Love?

11 A Yes, ma'am.

12 Q Even though Commonwealth Edison's June '83 audit  
13 had expressed a concern with that memo; is that right?

14 A Yes, ma'am. This is what I was informed.

15 Q Do you know what the concern was that was  
16 expressed in the June '83 audit?

17 A No, ma'am.

18 Q Mr. Love, have you seen any direction to Hatfield  
19 to cancel Memo 295?

20 A No, ma'am. As I stated earlier, since this  
21 inspection when I departed the site May 4th, I have not been  
22 back to the site since then.

1 Q I take it Mr. Binder didn't send you one in the  
2 mail, or anything?

3 A No, ma'am.

4 Q You received no documents concerning the  
5 cancellation of that memo?

6 A No, ma'am.

7 Q Mr. Love, I'd like to ask you a few questions  
8 concerning your Reports 82-17 and 84-27, which I understand  
9 are connected.

10 In using those two reports as a group, if you  
11 can, and the noncompliances that you discovered in those two  
12 reports, and the 82-05 reinspection program, is my under-  
13 standing correct that the attributes covered in the  
14 reinspection program stemming from the noncompliance found  
15 in 82-17 are not covered in the 82-05-19 program?

16 MR. MILLER: Could I hear that question again,  
17 please?

18 BY MS. WHICHER:

19 Q Is my understanding correct that the attributes  
20 covered in the program arising from the noncompliance in  
21 82-17 were not covered in the 82-05-19 program?

22 A (Witness reading document.)



1           A       No, ma'am, that was not -- the items here, the  
2 two attributes there, i.e., the separation between safety-  
3 related nonsafety-related cable trays, as well as the  
4 separation between safety-related and nonsafety-related  
5 cables and wires inside of equipment was not part of the  
6 reinspection program.

7           MR. MILLER: I think there's some confusion on  
8 the record. Was that the portion of 82-17 that you intended  
9 to direct him to?

10          MS. WHICHER: I intended to direct him to --  
11 actually, no, it's not, but now that he mentions it -- and  
12 I'll clear it up, and if you think the record is unclear,  
13 you can go back to it later.

14          BY MS. WHICHER:

15          Q       Is it your testimony, Mr. Love, that cable tray  
16 separation is not covered in the 82-05-19 reinspection program?

17          A       No, ma'am, it is not.

18          Q       Why is it not covered?

19          A       At the time of the 82-05-19 program, there was  
20 no requirements by the specifications or drawings that  
21 Hatfield in fact inspect for cable tray separation. It was  
22 CECo's position at that time that as long as Hatfield

1 installed the cable trays per design that the -- any  
2 separation problems would be identified by Sargent & Lundy  
3 in their design documents.

4 Q And cable separation in equipment, I take it,  
5 was not covered in the 82-05-19 reinspection program, either;  
6 is that true?

7 A Yes, ma'am, that's true.

8 Q Was it not covered for the same reason that you  
9 just gave?

10 A Again, the same reason. It was to be picked up  
11 by Sargent & Lundy design, and Hatfield was not required to  
12 inspect for it.

13 Q Did there come a time when Hatfield was required  
14 to inspect for it?

15 A Yes, ma'am, as of the corrective action for this  
16 item of noncompliance -- as a result of item of noncompliance  
17 in the report 82-17, inspection for those two attributes  
18 is now required.

19 Q Mr. Love, do you believe that Commonwealth  
20 Edison's position that Sargent & Lundy would have the  
21 responsibility for the cable tray separation problem and  
22 cable separation and equipment problems to be adequate?

1 A No, ma'am. That's the reason we had an item of  
2 noncompliance.

3 Q Now I'd like to turn your attention, Mr. Love,  
4 to the other items of noncompliance in 82-17 concerning  
5 cable tray supports and hangers, and I believe you testified  
6 this morning about a reinspection program that covered those  
7 attributes.

8 A In 82-17?

9 Q Yes. Have I got the wrong report?

10 A The only item of noncompliance in 82-17 was the  
11 ones we just discussed as the separation of cable tray and  
12 the separation of cable inside of panels.

13 MR. MILLER: It was an open item.

14 MS. WHICHER: Ah. Okay. Mr. Miller has corrected  
15 me.

16 BY MS. WHICHER:

17 Q There is an open item in 82-17 concerning -- as  
18 soon as I find it -- cable tray connections. Is that the  
19 one we were talking about this morning, Mr. Love?

20 MR. MILLER: It was an allegation on page 16.

21 THE WITNESS: What page are you on, ma'am?  
22

1 BY MS. WHICHER:

2 Q I'm on page 16. There is an allegation concerning  
3 cable tray connections. This is 82-17.

4 A That was an unresolved item, not an open item.

5 Q All right, an unresolved item. And in order to  
6 resolve this item, there was a reinspection program; is that  
7 correct?

8 A Yes, ma'am.

9 Q And you testified about that program this morning;  
10 do you recall that?

11 A Yes, ma'am.

12 Q Is my understanding correct that the attributes  
13 covered in the cable tray connection reinspection program  
14 were not covered in the 82-05-19 reinspection program?

15 A No, ma'am, that's an incorrect statement. Some  
16 of the same attributes were covered, but not the individual  
17 hangers to the best of my knowledge, from the reports that  
18 I received yesterday by telecon.

19 Q So is my understanding correct, then, that none  
20 of the hangers that were reinspected pursuant to the item  
21 on page 16 of Exhibit 6 -- none of the hangers that were  
22 reinspected in that program were reinspected in the 82-05-19

1 program?

2 A At the present time I don't know. As I stated  
3 earlier this morning, that the attribute of configuration,  
4 the site was able to determine, from the configuration  
5 aspect only, that these hangers inspected under the NCR 407  
6 were not in fact inspected under the quality control  
7 inspector reinspection program.

8 Q Do you know why there was no overlap?

9 A Do I know why there was no overlap?

10 Q Yes.

11 A Because the inspectors that were selected under  
12 the 82-05 program did not inspect these hangers that happened  
13 to be being looked at under the 407 program.

14 Q Okay. So it was a matter of circumstance of  
15 the inspectors who happened to be selected under the 82-05-19  
16 program; is that correct?

17 A Yes, ma'am.

18 Q Okay.

19 A Now to clarify that, as the site does some more  
20 review they may in fact find that some of the welding was  
21 inspected under both programs.

22 Q Okay. Would you please explain to me what Hatfield

1 NCR 407 involves.

T.8 2 A 407, I don't remember all the details of it, but  
3 it basically required a reinspection of 4300 and some odd  
4 cable tray hangers.

5 Q Why?

6 A Again, I don't remember the details of the NCR.

7 Q Now it's my recollection from your testimony  
8 this morning, Mr. Love, that there were two parts to this  
9 inspection; that would be the weld portion of it and the  
10 connection detail of it. Is that correct?

11 A To better clarify that, the weld inspection  
12 portion of it and then the QC inspection portion of it, which  
13 takes into consideration the configuration, weld material  
14 type, et cetera.

15 Q What is involved in the QC configuration inspec-  
16 tion?

17 A The configuration there would be that the proper  
18 connection detail was utilized, that the hanger is properly  
19 located, that the proper material was utilized. If there  
20 happens to be bolt torquing or bolting involved, that the  
21 bolts were torqued to a given value, using a calibrated  
22 torque wrench.

MILLERS FALLS  
1 I may have missed a couple, but basically that's  
2 what the QC inspector does.

3 Q And I take it the welding inspector does something  
4 else; is that right?

5 A Yes, ma'am.

6 Q The welding inspector looks at the welding and  
7 not the items you have listed under the QC connection detail  
8 attributes; is that right?

9 A Under normal circumstances, yes. You find some  
10 welding inspectors again, though, that are a little more  
11 diligent and they will -- as we noted in review of the  
12 documentation, for example, the detail utilized, some of the  
13 welding inspectors did in fact note the type of detail on  
14 the weld inspection card, although it was not required <sup>on the ~~RF~~</sup>  
15 weld traveler.

16 Q Now is my understanding correct that in the  
17 82-17 reinspection program, we'll call it, if that's okay with  
18 you --

19 A All right.

20 Q -- in the 82-17 reinspection program, if you find  
21 that a welding inspector has noted the connection detail,  
22 that hanger, that support need not be reinspected; is that

1 correct?

2 A Not for weld detail. Now in fact it may be  
3 inspected twice. In other words, the QC inspector, not  
4 knowing that the welding inspector had in fact noted what  
5 detail it was, just in his reviewing program during a  
6 routine inspection, he would check all these various attributes.

7 Q If in fact the welding inspector checked the  
8 attributes that the QC detail inspector normally checks,  
9 then in that case that hanger would not have to be reinspected;  
10 is that right?

11 A Under the conditions of this reinspection program,  
12 where we were concerned with what type of detail, by detail  
13 number, was utilized, if the welding inspector had in fact  
14 noted the detail number on the weld traveler, we accepted  
15 that without a reinspection.

16 Q Okay. Is the same true for -- strike that.

17 Did the 82-17 reinspection program include the  
18 location and use of proper materials and proper torquing  
19 as well as connection detail?

20 A Yes, ma'am.

21 Q And is my understanding correct that those would  
22 also have to have been noted by the weld inspector in order



1 to relieve that support from being reinspected under the  
2 82-17 program?

3 A The welding inspector -- whenever you have certain  
4 weld detail -- I mean certain connection details that are  
5 all welded details -- okay, with that detail noted on the  
6 weld traveler, that detail could be accepted. But on other  
7 details where it specifies bolting, and the bolting had not  
8 been verified, then, no, just by marking the detail, we  
9 can accept that the proper detail was used, but we'd still  
10 need to know and have documented evidence that the proper  
11 torquing had been applied to the bolt.

12 Q So when you say you would have to have documented  
13 evidence, does that mean you'd have to reinspect, or you  
14 need some other type of evidence?

15 A If it hadn't been reinspected -- I assume you're  
16 talking or alluding to the fact that this hanger is now  
17 under fireproofing, and there was none there -- no, ma'am, if  
18 there was a bolting detail required, then they would still  
19 have to remove fireproofing to confirm the bolt torquing.

20 Q Mr. Love, welding inspectors are not necessarily  
21 certified to inspect connection detail and the other items  
22 that the QC inspector who inspects the connection detail

1 inspects; isn't that correct?

2 A Not all attributes, but the welding inspector  
3 must know what type detail and be able to identify detail.  
4 Otherwise, he doesn't know what welding attributes to look  
5 for. In other words, detail "X" may require welding on all  
6 four sides. Detail "Y" only requires welding on two sides.  
7 So the welding inspector then would have to know whether  
8 he's looking at detail "X" or detail "Y".

9 Q Okay. The welding inspector is not necessarily  
10 certified to do hanger connection detail inspections --  
11 hanger connection detail inspections. I got it right -- is  
12 that correct?

13 A Here again, he still has to know what detail he  
14 looks at. Now, as configuration, he may or may not be  
15 certified to look at configuration, but he still has to know  
16 -- both inspectors have to know what detail they're looking  
17 at and be able to identify the detail.

18 Q What I'm getting at, Mr. Love, is isn't it the  
19 case that the welding inspector may not be certified to  
20 inspect anything beyond welding, yet have noted that on the  
21 weld traveler, have notified --

22 MR. PATON: I'd say has noted that.

1 MS. WHICHER: Okay, you're right, that was  
2 confusing.

3 BY MS. WHICHER:

4 Q Isn't it the case that a welding inspector may  
5 have noted on the weld traveler connection detail, whether  
6 the hanger was in the proper location, whether the material  
7 used was proper, and whether the torquing was proper, yet  
8 not be certified in those areas, in areas other than welding?

9 MR. MILLER: I'm going to object to the form of  
10 the question. I don't think there's any foundation for that,  
11 but go ahead.

12 THE WITNESS: Basically you're asking an impossible  
13 question. The only thing that we were looking for on the  
14 weld traveler is the identification of the weld detail type.  
15 He was using type A, B, C. That's all we were looking for  
16 on the weld traveler. We were not looking for configuration,  
17 we were not looking for material traceability in that given  
18 area of concern. And as I stated earlier, yes, the welding  
19 inspector has to know what detail he is looking at to be  
20 able to perform his welding inspection.

21 BY MS. WHICHER:

22 Q Mr. Love, isn't it the case that a welding

1 inspector is not necessarily certified to inspect weld -- or  
2 to inspect connection detail?

3 A Again I would have to ask you now to define  
4 connection detail.

5 Q I'm using your terminology, Mr. Love.

6 A All right, as I --

7 MR. MILLER: The question has been asked and  
8 answered twice.

9 MS. WHICHER: Well, I don't think he's answered  
10 it. That's why I'm asking it again.

11 THE WITNESS: Again, the welding inspector has  
12 to be able to identify the connection detail before he can  
13 inspect that detail for proper welding. I'm sorry, ma'am, I  
14 don't know any other way to answer you.

15 BY MS. WHICHER:

16 Q Perhaps I'm laboring under a misconception, Mr.  
17 Love. My understanding was there were two types of inspec-  
18 tions.

19 MR. PATON: Wait a minute. Let's go off the  
20 record.

21 (Discussion off the record.)

22

1 BY MS. WHICHER:

2 Q I may be laboring under a misconception, and  
3 perhaps you can set me straight. My understanding was  
4 that there were two types of inspectors involved in  
5 inspecting a cable tray connection. One would be a welding  
6 inspector and the other would be an inspector who inspected  
7 for connection detail, whether the hanger was in the proper  
8 location, whether the materials used were proper, and whether  
9 any bolts had been torqued to the proper value. Is that  
10 correct?

11 A That there are two types of inspectors? Yes,  
12 ma'am, a welding inspector and a quality control inspector.

13 MR. PATON: Is all the rest that she said also  
14 correct?

15 THE WITNESS: The QC inspector does in fact  
16 check for proper material --

17 MR. PATON: Her question, is the rest of it  
18 correct?

19 THE WITNESS: Well, unless she slipped a word in  
20 there that I missed.

21 BY MS. WHICHER:

22 Q No, I don't think that I did.

1           A       But, yes, the welding inspector does inspect for  
2 the proper material.

3           Q       The welding inspector?

4           A       QC inspector. The QC inspector inspectors for  
5 proper material, proper configuration, and I forget what  
6 other attributes I'd mentioned earlier.

7           MR. GALLO: Bolt torquing.

8           THE WITNESS: Bolt torquing, and this type thing.  
9 And also he checks for the proper weld connection detail.

10           The welding inspector will check the welding  
11 of the detail to the auxiliary steel.

12           BY MS. WHICHER:

13           Q       Now, Mr. Love, it's a fact, is it not, that not  
14 all welding inspectors are certified as QC inspectors?

15           A       That's a true statement.

16           Q       Mr. Love, was the reinspection program that I've  
17 been referring to as 82-17 concerned with anything other  
18 than welding and connection detail?

19           A       That was the prime concern of the inspection  
20 program and, of course, of any inspection program, if you  
21 see something else that's wrong, you also identify that.

22           Q       Was it concerned with use of proper materials?

1           A       No, ma'am. Like I said, the basic program was  
2 the welding and the proper detail.

3           Q       Can you tell me, Mr. Love, why it was not concerned  
4 with -- within the universe of things that QC inspectors  
5 inspect for, why was it concerned only with weld connection  
6 detail and none of the other things that an inspector would  
7 inspect for?

8           A       For example, the proper material, that is picked  
9 up at receipt inspection. The hanger weld or the hanger  
10 detail would at some point in time, whenever it's withdrawn  
11 out of the store room, is pulled out for hanger X, Y, Z, at  
12 that time they know that they have good material that went  
13 into that hanger. They don't know if that given detail  
14 under the reinspection program -- they don't know if that  
15 detail that was checked out at the warehouse did in fact  
16 go into that given hanger because it was covered with fire-  
17 proofing.

18                       With respect to the bolt torquing, as I explained  
19 earlier, not all connection details are bolted. In fact,  
20 the biggest majority of them are welded. The hanger  
21 configuration and elevation can be determined even after  
22 the fireproofing has been put in place. We were only looking

1 for the attributes that could not be verified with the  
2 fireproofing in place.

3 Q One of those attributes is bolt torquing, is it not?

4 A It could be.

5 Q Assuming that the hanger in question requires  
6 bolts that are torqued to a specific value, one of the  
7 attributes is bolt torquing, is it not?

8 A Yes, ma'am.

9 Q And the 82-17 reinspection program was not  
10 concerned with bolt torquing; is that correct?

11 A The -- again, the connection detail utilized  
12 would tell us if it was a welded connection or if it was a  
13 bolted connection. So once we know the detail, then we  
14 know what else is involved in that reinspection.

15 Q So if the hanger, that is our hypothetical hanger  
16 that is covered with fireproofing, has bolts that need  
17 torquing to a certain value, that is in fact covered in the  
18 reinspection program; is that your testimony?

19 A Yes, ma'am, it would be, once we know the  
20 connection detail type.

21 Q Mr. Love, is my understanding correct that all  
22 hangers of a certain type or in a certain system are to be



1 reinspected under the 82-17 program?

2 A I can't make the statement "all." All I can  
3 make the statement right now is that the inspection  
4 involved a total of 4300 and some odd hangers.

5 Q And these are all cable tray hangers; is that  
6 right?

7 A Yes, ma'am.

8 Q And how many total cable tray hangers are there?

9 A Oh, lord, I wouldn't even venture to guess.

10 Q Is it the fact that this 82-17 reinspection  
11 program does not cover all cable tray hangers?

12 A I think that would be a safe assumption, although  
13 I can't swear to it.

14 Q Because you don't know how many cable tray hangers  
15 there are?

16 A Well, one, I don't remember the entire scope of  
17 NCR 407, in that that was like two years ago; I don't know,  
18 second, how many cable tray hangers are involved in the  
19 plant. There's too many unknowns. I can't answer it  
20 truthfully.

21 Q That would be the only way I'd want you to to  
22 answer it.

1           Is the reinspection program, the 82-17 reinspection  
2 program, completed?

3           A       No, ma'am.

4           Q       Do you know how far along it is, percentagewise?

5           A       As a result of this last item of noncompliance,  
6 it becomes obvious that it is still open and not complete.

7           Q       Do you know how many hangers remain to be inspected?

8           A       To the best of my knowledge right now, all the  
9 hangers have been reinspected and some of them, they're  
10 going back through and taking a second, and I understand,  
11 even a third look. But this is hearsay evidence, by the  
12 way, in telecons.

13          Q       This is from communications with Commonwealth  
14 Edison people at the plant; is that right?

15          A       Yes, ma'am.

16          Q       And why are they taking a second and third look  
17 at some of the hangers?

18          A       They went out and reinspected, they identified a  
19 problem. Now you have engineers that are going back out  
20 looking at it. The QC has identified a problem, now someone  
21 has to put a fix on that problem, so they go back out and  
22 look at it, and the engineer will make the decision then

1 maybe it needs more welding.

2 I'm using this now as an example. Maybe the  
3 hanger has to be completely removed, or maybe it's something  
4 that they figure that they want to accept as is, and then  
5 they will put it into their program where it goes through  
6 CECo on into Sargent & Lundy and back, and if everyone  
7 agrees, they can use that item as is. So there has to be  
8 an evaluation.

9 Q Who fabricated the cable tray connections? Were  
10 they fabricated on site?

11 MR. MILLER: Do you mean the cable hangers?

12 BY MS. WHICHER:

13 Q The hangers, right.

14 A Now the hangers come in multiple parts. I can't  
15 remember at Byron whether some of them were pre-fabbed,  
16 sections of them were pre-fabbed and shipped in, some of  
17 them, or they may have been fabricated at the site. I can't  
18 answer that.

19 Q If they had been fabricated off the site, would  
20 they have been fabricated by Hatfield Electric?

21 A Offsite?

22 Q Yes.

1           A       No, ma'am. They, in all probability, were not.  
2 I don't think there's any purchase orders that I remember  
3 looking at out to Hatfield Electric offsite to do fabrication.  
4 That would be to some vendor.

5           Q       Do you know whether any of these were fabricated  
6 by Systems Control Corporation?

7           A       No, ma'am, I don't.

8           Q       You don't know either way?

9           A       I don't know either way.

10          Q       Who would know that?

11          A       CECo personnel at the site would be able to tell  
12 you that. Mr. Binder could run it down for you, or any of  
13 the electrical QA engineers would be able to run it down for  
14 you. As far as that goes, the -- what's <sup>Gunner's</sup>~~Gunter's~~ proper RBF  
15 title?

16          Q       Mr. <sup>SORENSEN</sup>~~SORENSEN~~? RBF

17          A       Yes.

18          Q       Who at the NRC would know?

19          A       Who at the NRC?

20          Q       Who at the NRC.

21          A       Right off the top of my head, I don't know if  
22 anyone knows, without -- I'm saying now someone may have

1 looked at it as part of it, and could tell you who some of it,  
2 anyway, was supplied by. But I can't give you a name.

3 Q Do you know how many discrepancies were found  
4 on the hangers that were reinspected?

5 A Page 6 of Exhibit 5. At that point in time of  
6 the inspection, of the information provided to me by  
7 I think Mr. Binder on May 11th indicated there was a total of  
8 129 deficiencies, and I believe that was on 119 hangers.

9 Q And is that out of a total of 4300 hangers that  
10 were inspected?

11 A No, that's out of 295 that were reinspected. I  
12 can't tell you how many deficiencies that were identified  
13 on the original 4300 and some odd hangers.

14 Q Okay. I guess I'm a little confused, Mr. Love.  
15 I'm hoping you will help me out. Is my understanding correct  
16 that under the 82-17 reinspection program, about 4300 hangers  
17 were reinspected?

18 A Yes, ma'am.

19 Q And you do not know how many of those hangers  
20 had discrepancies or how many discrepancies were uncovered  
21 amongst those 4300 hangers?

22 A No, ma'am, I don't.

1 Q Who would know that?

2 A Again, site personnel.

3 Q Anyone at the NRC?

4 A I think I have thrown mine away, the tabulation  
5 or -- I don't remember. Or you may even have a copy of the  
6 breakdown, I don't know.

7 Q There was a document issued concerning that?

8 A There was a document that was provided to me at  
9 the site. Without doing a search of my records, I don't  
10 know whether I have since thrown it away or whether in fact  
11 it is in my records and you in fact have a copy of it.

12 MR. PATON: Jane, could I interrupt one second?

13 It is Kavin Ward's scheduled departure time.

14 (Discussion off the record.)

15 BY MS. WHICHER:

16 Q It's my understanding, Mr. Love, that at one  
17 time there was a document that gave the number of  
18 discrepant conditions found among those 4300 hangers that  
19 were reinspected; is that right?

20 A There was a listing of figures and it runs in my  
21 mind that the number of discrepancies identified was in fact  
22 on that.

1 Q You don't know where that document is; is that  
2 right?

3 A I would have to do a search of my records to see  
4 whether I have it here or not.

5 Q Who generated that document?

6 A Again this was an informal document. I think it  
7 was generated by Mr. Binder from information supplied by  
8 Hatfield.

9 Q Now turning our attention back to page 6 of  
10 Exhibit 5, the entry that says "Total Number of Hangers  
11 Requiring Reinspection" is stated at 314.

12 A Yes, ma'am.

13 Q Where does that number come from? How was that  
14 number arrived at?

15 A That number was arrived at by a review of  
16 approximately 6000 hanger packages by CECO QA and Hatfield  
17 personnel.

18 Q And is that connected at all with the 4300 hangers  
19 that were physically reinspected?

20 A Yes, ma'am. The 4300 was part of this 6000  
21 packages reviewed.

22 Q Do you know how the 4300 were selected out of the

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ERASE  
CONTENT

1 6000?

2 A No, ma'am. Again, we would have to go back  
3 to NCR 407.

4 MR. MILLER: In the interest of moving this  
5 along, would you accept a clarifying question from me?

6 MS. WHICHER: Sure.

7 MR. MILLER: Mr. Love, is it likely that the 4300  
8 hangers represent all the hangers that had been installed  
9 as of the date of the inception of the 82-17 reinspection  
10 program, and the 6000 hangers represents all the hangers  
11 that have been installed to date?

12 THE WITNESS: I don't know, sir.

13 (Laughter.)

14 MS. WHICHER: Nice try, Mike.

15 BY MS. WHICHER:

16 Q How were the 314 hangers selected? What was  
17 the basis used for selection of those hangers?

18 A The 314? Again, after reviewing 6000 --  
19 approximately 6000 hanger packages by CECO and Hatfield  
20 quality personnel, they identified these 314 documentation  
21 packages, if you will, that they couldn't determine from  
22 the documentation whether the hanger was in fact acceptable



1 or not. To verify that, then, they went out and reinspected  
2 314 less the 19 hangers that were inaccessible.

3 Q What would make a hanger inaccessible, as that  
4 term is used?

5 A This one here, as I understand it, they were, if  
6 you will -- portions of them were literally embedded into  
7 block walls, is what they considered inaccessible.

8 Q It didn't have anything to do with being covered  
9 with fireproofing?

10 A No, ma'am. Fireproofing was removed.

11 Q Mr. Love, of the 4300 hangers that have been  
12 reinspected, have you personally observed these hangers,  
13 any of them?

14 A Oh, I'm sure I have.

15 Q Have you inspected them?

16 A Again, I'm sure I've inspected some of those 4300  
17 hangers during normal routine inspection programs. But to  
18 pick one of those out under this given program, no, I have  
19 not.

20 Q Have you looked at documents generated by the  
21 82-17 reinspection program?

22 A Yes, ma'am.

1 Q What sorts of documents have you reviewed?

2 A Again, if we go back, it starts on page 3 of the  
3 84-27 report. It tells you what hangers I looked at, the  
4 documentation packages in detail. It goes on to pages 3,  
5 4, 5, and the top of page 6.

6 Q And these are the documents that you looked at;  
7 right?

8 A Yes, ma'am.

9 Q Mr. Love, were you involved in a meeting about  
10 August 4th or 5th in which Mr. Koca of Hatfield Electric  
11 was discussed?

12 A August 4th or 5th?

13 Q Yes.

14 MR. MILLER: 1983.

15 THE WITNESS: To the best of my knowledge, no.

16 BY MS. WHICHER:

17 Q I'd like to talk with you for a few minutes, if  
18 we can, about butt splices. Okay? Does Commonwealth  
19 Edison NCR 899 cover both the reject rate and the insulation  
20 size problems?

21 A I'd have to say yes on that, in that the reports,  
22 if my memory serves me correctly, there is the NCR, the

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1 text of it discusses the insulation problem with the ~~ecconite~~ <sup>OKonite R/S</sup>  
2 insulation not fitting into the barrel, and attachments to  
3 the NCR was also, I believe, the surveillance report that  
4 was discussed in the report here. I don't remember the  
5 number of it, or the dates where they identified the -- I  
6 think it was 17 or whatever the number was, defective splices.

7 Q Is that 27 defective -- or 27 rejects?

8 A No. The original figure, I believe, was 17  
9 rejects and as they were again making the 17 corrections,  
10 an additional 10 was identified. If you go to the bottom  
11 of page 12, the summary of the CECO surveillance report  
12 says that that 194 splices were originally inspected. One  
13 butt splice failed the tug test and 16 splices were  
14 identified as defective and replaced. In the process of  
15 replacing those 17, it appeared that they identified an  
16 additional 10 more from the inspection reports that I reviewed.

17 Q Mr. Love, whose idea was it that a 50.55(e)  
18 notification be prepared?

19 A Naturally, the Licensee.

20 Q Why do you say "naturally"?

21 A They are the ones that have to make the decision  
22 to prepare a 50.55(e).

Q Was it suggested to them by anyone at the NRC

1 that they prepare such a report?

2 A They were questioned as to had they considered a  
3 potential 50.55(e).

4 Q When was that?

5 A (Witness reading document.)

6 I believe -- I wouldn't swear to it, but I  
7 believe it was discussed during the May 10th telecon with  
8 the site.

9 Q How was the problem initially discovered at  
10 LaSalle, Mr. Love?

11 A That was through an allegation, as I indicated  
12 this morning.

13 Q By a worker at LaSalle?

14 A Yes, ma'am.

15 Q And when was the problem discovered at LaSalle?

16 A Again, I can't tell you. I'd have to go back  
17 and look at the inspection report dates.

18 Q There would be inspection reports on LaSalle  
19 concerning this problem; is that right?

20 A Yes, ma'am.

21 Q Did you do those inspections?

22 A No, ma'am, I was not out on those.

1 Q Do you know who did those inspections?

2 A Let's see. We had a large number of people out  
3 there involved in those. Mr. ~~Falevitz~~ <sup>Falevitz</sup>, Mr. ~~Godham~~ <sup>Gautam</sup>, Mr.  
4 Mendez, Mr. Christnot, and I think Mr. Naidu was out on that  
5 one. I can't remember whether he was out on the butt splice  
6 or not. I know he was out as part of the inspection report,  
7 but I'm not for sure about the butt splice portion of it.

8 Q Mr. Love, I'd like to turn your attention back  
9 for a few minutes to the 82-05-19 reinspection program, and  
10 assure you that if you'd like, you can refer to your copy of  
11 it, if you think you need to.

12 Do you recall whether any of the -- whether the  
13 sample size had to be increased with respect to any of the  
14 attributes with which you were concerned? I believe this  
15 morning you referred to them as Attributes 2 through 9.

16 A The only area that I'm not sure about -- I don't  
17 think there was any on 2 through 8. On 9, again, I don't  
18 think there were, but to the best of my recollection, I don't  
19 remember of any samples being increased on those.

20 Q Can you refresh my recollection and tell me what  
21 No. 9 was?

22 A 9 was the -- wait a minute. My 9, I think, is

1 different than their 9. My 9 was the as-built hanger.

2 Q And you don't believe that sample size was  
3 increased? If you can tell me where you're looking, I might  
4 be able to help you find it.

5 A What I'm looking at right now is in Table VII-E.5,  
6 is one area in the as-built program. For example, they had --

7 MR. MILLER: What page are you on? I'm sorry.

8 THE WITNESS: Page 3 of 5 of Exhibit 7.

9 MR. MILLER: Okay. Right.

10 MS. WHICHER: Okay.

11 THE WITNESS: They said that the reliability  
12 there was 99.9 percent, and with that figure it doesn't  
13 sound like there was any -- that an overinspection was  
14 required.

15 BY MS. WHICHER:

16 Q Reliability isn't the same as reject rate, though,  
17 is it, Mr. Love?

18 A No, ma'am. I was looking for a possibility of  
19 another --

20 MR. MILLER: May I again suggest it's broken down  
21 on Exhibit D-1, page 7 of 12, and then the table carries  
22 over to page 8 of 12, where the conduit as-built tabulation

1 is given. It's on the next page. But in terms of --

2 THE WITNESS: What I was looking for is -- it  
3 could have been in the January preliminary. I think in one  
4 report they had a breakdown by inspector, and that's what I  
5 was looking for. I don't see it in this -- this breakdown,  
6 but as I remember, no, there was no --

7 MR. MILLER: I think that's reflected with respect  
8 to Hatfield at page V-6.

9 MS. WHICHER: In which part of the report?

10 MR. MILLER: Chapter V, page 6.

11 MS. WHICHER: Oh, I see.

12 BY MS. WHICHER:

13 Q Looking at the reference from Mr. Miller, Mr.  
14 Love, page V-6, Table V-6, does that refresh your recollection  
15 as to whether any sample sizes had to be increased for  
16 those attributes for which you were responsible for Hatfield?

17 A According to this, they were all objective -- the  
18 attributes that I looked at were all objective, and this  
19 indicates that none of them had passed -- or failed the first  
20 three months.

21 Q Mr. Love, do you recall seeing an interim report  
22 in October on the reinspection report from Commonwealth

1 Edison?

2 A I may have. I can't answer that question one way  
3 or the other without having -- or without looking at it.

4 (Recess.)

T.10 5 BY MS. WHICHER:

6 Q Mr. Love, I'd like you to turn, please, to Exhibit  
7 12. Can you tell me what this is and why you had it in your  
8 files?

9 A What this is and why I had it in my file? This  
10 was some information that was preliminary at the time that,  
11 as I indicated earlier, that Mr. Klingler was working on,  
12 and I believe this eventually went into the preliminary  
13 report dated January. I would have to go back and verify it.  
14 This was some information, as I indicated, that he was  
15 working on to submit the report to us, and in a share of  
16 information these copies were provided.

17 Q So these were provided to you before the actual  
18 reinspection report was provided to you; is that correct?

19 A Yes, ma'am.

20 Q They were sort of an advance preview of some of  
21 the data that had been collected?

22 A Yes, ma'am.



1           Q       Mr. Love, is cable pulling an attribute that a QC  
2 inspector is required to observe?

3           A       Yes, ma'am. Safety-related.

4           Q       And is butt splicing an attribute that QC  
5 inspectors are required to inspect?

6           A       Under the program up until the time it was  
7 identified, the procedures did not address it. I don't  
8 remember whether we indicated that earlier, but I guess, to  
9 say we're human, that as many times as I looked at the  
10 procedures and other inspectors looked at the procedures,  
11 we missed it. But, normally, yes, it would be looked at.

12          Q       Is it your testimony, Mr. Love, that Hatfield  
13 just didn't have any procedures to inspect butt splicing,  
14 and so butt splicing was not inspected?

15          A       They had no procedure for it, as indicated in  
16 Report 84-27. I think, if my memory serves me correctly,  
17 without going back to look, there was 600 and some odd  
18 inspection reports that did in fact address butt splices.  
19 And I have done a detailed review on "X" number of those,  
20 which is also documented in the report, and the ones that  
21 had findings where butt splices had to be repaired or  
22 replaced is also documented in there on the ones I reviewed.

1 Q But Hatfield had no procedure; is that right?

2 A That's a true statement.

3 Q But in spite of the fact they didn't have a  
4 procedure, some of them apparently had been subject to QC  
5 review; is that right?

6 A Yes, ma'am.

7 Q Do you know how that occurred, why that happened?

8 A Again, as I indicated in Inspection Report 84-27,  
9 that an interview with the Licensee's -- the Licensee's  
10 interview of the termination inspectors presently onboard  
11 at Hatfield, of the ones interviewed, all of them stated  
12 that they did in fact look at butt splices, but only  
13 approximately 50 percent of them stated that they documented  
14 those butt splices, the inspection of the butt splices.

15 MS. WHICHER: I have no more questions for you,  
16 Mr. Love.

17 MR. MILLER: Bill?

18 MR. PATON: No, I don't have any questions. But  
19 what time is convenient for everybody else? I want to pass  
20 out some papers.

21

22

## RE - EX A M I N A T I O N

BY MR. MILLER:

1  
2  
3 Q Mr. Love, you were questioned by Ms. Whicher  
4 regarding the -- I think you differentiated between the  
5 weld inspectors and the QC inspectors with respect to types  
6 of inspections that were performed on connection details.  
7 Do you recall that line of examination?

8 A Yes, sir.

9 Q I think you said at least twice that the welding  
10 inspector has to know the type of connection detail that is  
11 supposed to be present so he can do his weld inspections; is  
12 that correct?

13 A Yes, sir.

14 Q It's a fact, is it not, that is a necessary part  
15 of the training of a weld inspector? He has to be able to  
16 recognize the different kinds of connection details, doesn't  
17 he?

18 A Yes, sir.

19 Q And so when he is certified as a weld inspector,  
20 that certification necessarily indicates that he can  
21 satisfactorily identify a particular type of connection  
22 detail; correct?

1 A Yes, sir.

2 Q So when a welding inspector is certified, he is  
3 certified as a certified observer of connection details of  
4 welds? That's kind of a facetious description of what his  
5 skills are, but that's accurate, isn't it?

6 A Yes, sir, I think that's fairly accurate.

7 Q I believe that Ms. Whicher also asked questions  
8 about programmatic weaknesses. Those were words that I used  
9 initially. Let me just go back to the item of noncompliance  
10 that we discussed, which was the improper dispositioning of  
11 one Hatfield DR in cable overtensioning. Do you recall  
12 that discussion this morning?

13 A Yes, sir.

14 Q And I believe you said you would categorize that  
15 as an isolated instance, rather than a programmatic weakness;  
16 is that right?

17 A Yes, sir.

18 Q Do you have to have a trend analysis to figure  
19 that out?

20 A No, sir. That's what I had indicated to Ms.  
21 Whicher. A trend analysis will help you identify a  
22 programmatic weakness, but it is not required.

1 Q And I think you said in response to a question  
2 from her that the Note 47 item of noncompliance, the  
3 Severity Level V in Inspection Report 84-27 --

4 A Yes, sir.

5 Q -- that this was a form of programmatic weakness,  
6 and I think you said also that there were gradations of  
7 programmatic weaknesses. Have I characterized your testimony  
8 accurately, first of all?

9 A Yes, sir, you did.

10 Q What did you mean by saying that there were  
11 gradations of programmatic weaknesses?

12 A For example, that was a programmatic weakness in  
13 one area. You can have a programmatic weakness throughout  
14 the program in that basically then if we found one through  
15 a program, you would end up with a citation under, say,  
16 Criterion 2, a breakdown in the quality program.

17 Now, there I would categorize that as a --  
18 forgetting NRC severity levels, now, but I would categorize  
19 that as say a Severity Level I.

20 Q That would be pretty serious, in other words?

21 A Pretty serious, yes, sir.

22 Q And I take it that the Note 47 issue in terms of a

1 programmatic weakness is not serious; is that a fair  
2 characterization of it?

3 A No, sir, I wouldn't consider that serious,  
4 primarily from the respect that it's -- there you are looking  
5 at going back and installing cable trays for the worst  
6 situations, assuming no cable tray fires and this type  
7 thing. If that would have been identified downstream, even  
8 after fuel loading, et cetera, it's something we can go back  
9 in and you can do a fix on it, without any major modifications,  
10 if you will. Or where you've endangered the plant to a great  
11 extent.

12 Q In terms of the programmatic significance, though,  
13 of the issue, you wouldn't refer to this as a widespread --  
14 well, you said forgetting NRC severity levels, you described  
15 one that would be a Severity Level I. Where would you put  
16 this one?

17 A On a one to 10 basis, probably about an 8 or a 9.

18 Q Now, Ms. Whicher also examined you about -- I  
19 think she characterized them as possible improvements in  
20 the quality control inspector reinspection program. Do you  
21 remember that line? And you said one way of improving it  
22 was to have, I think, 100 percent reinspection. Did I

1 accurately characterize your testimony?

2 A Yes, sir.

3 Q Okay. Quite apart from any knowledge of  
4 statistics, just as a matter of your judgment as an  
5 experienced inspector, do you believe that the number of  
6 inspectors that was looked at in the inspection program  
7 should have been more than it was?

8 A No, sir. And to clarify that a little bit, I  
9 would base that again on, if you will, my experience of  
10 the Byron site and on the reinspection of Hatfield, or the  
11 inspection of Hatfield.

12 Q In other words, as you sit here today, you have a  
13 pretty warm feeling about the way Hatfield has performed?

14 A Overall, yes, sir. Again, minor weaknesses.

15 MR. PATON: In some case that I read just --

16 MR. MILLER: what, the warm feeling test?

17 (Laughter.)

18 MR. PATON: Yes, the warm feeling test.

19 MR. MILLER: I just want to make sure the witness  
20 and I have a warm feeling. We'll worry about explaining it  
21 to the Licensing Board at some other point.

22 MR. PATON: All right.

1 (Laughter.)

2 BY MR. MILLER:

3 Q You were examined regarding Mr. Hansing and Mr.  
4 Dellabetta. Do you recall?

5 A Yes, sir.

6 Q Mr. Dellabetta is identified as Commonwealth  
7 Edison electrical quality assurance engineer. Do you know  
8 how long he's been on the Byron site?

9 A No, sir, I don't.

10 Q Now I'm not sure I caught the question and answer,  
11 so if I'm repeating some questions Ms. Whicher has asked,  
12 forgive me, but you were informed that on the May 11th, 1984  
13 telephone call that Commonwealth Edison Company had in fact  
14 performed an audit of the subject reinspection program in  
15 June 1983, and had a concern with Memo 295. That's in the  
16 inspection report.

17 Do you remember which individual from Commonwealth  
18 Edison Company made that representation to you?

19 A Do I mention the names of the personnel contacted  
20 there?

21 Q It just says Binder, Bergner and others of the  
22 CECO PCD and QA of the Byron site organization.



1           A       Reading this, I believe it was Mr. Bergner, in  
2       that I made the statement following that, that Mr. Bergner  
3       did not elaborate on this concern.

4           Q       Okay. Did Mr. Bergner or anyone else from  
5       Commonwealth Edison indicate to you that Commonwealth Edison  
6       quality assurance in June of 1983 had directed that Memo 295  
7       be cancelled?

8           A       To the best of my knowledge, I don't know that  
9       the direction was given by QA or by Construction to cancel it.

10          Q       Have you had an opportunity to look at the  
11       Commonwealth Edison Company audit that's referred to on page  
12       7 of Exhibit 5?

13          A       No, sir, I have not.

14                 Oh, wait a minute. Page 7?

15          Q       Yes. This audit that's referred to.

16          A       Of June '83? No, sir, as I indicated earlier, I  
17       have not been back on the site since May 4th.

18          Q       Mr. Love, is there a regulatory requirem t  
19       that Commonwealth Edison's quality assurance departm t  
20       should have conducted an audit or surveillance of this  
21       activity?

22          A       Here again, I think everyone has their

1 interpretation of the criterion, I believe it's 18, on audits.  
2 I don't recall seeing anything in writing, but in my opinion,  
3 an audit should have been performed in that area.

4 Q Okay. In any event, you didn't assess an item  
5 of noncompliance under Criterion 18 to Commonwealth Edison?

6 A No, sir.

7 Q And that's because it is subject to interpretation?

8 A Yes, sir.

9 Q Is it sometimes the case that a Licensee's  
10 quality assurance department will wait until a corrective  
11 action is completed before conducting an audit?

12 A Here again, on personal experience, I find that  
13 that happens, if you will, on a short-term item of non-  
14 compliance, something that's, say, going to be closed within  
15 a month, two months, something to this effect, where they  
16 audit the corrective action.

17 Q You had a long conversation or a long question  
18 and answer session with Ms. Whicher on the removal of fire-  
19 proofing. Are you aware, Mr. Love, that even though Memo 295  
20 authorized the acceptance of connection details based on a  
21 weld traveler, that there was at least one Hatfield  
22 inspector who directed that fireproofing be removed for all

1 hangers that he was reinspecting?

2 A Yes, sir. I believe that was in two different  
3 areas.

4 Q Do you know how many hangers he directed the  
5 fireproofing be removed from?

6 A No, sir, I do not.

7 Q Do you know the name of that Hatfield inspector?

8 A I think it was Steve Hubler, but I wouldn't swear  
9 to it.

10 Q What, if anything, does that indicate to you  
11 about the attitude towards quality of the Hatfield inspectors?

12 A Of that individual -- I guess I'd have to give  
13 him an "atta boy."

14 (Laughter.)

15 Q Care to draw any inferences about the total  
16 population of Hatfield inspectors from the sample of one?

17 (Laughter.)

18 When you say you'd give him an "atta boy," that's  
19 the way he should be conducting himself, right, as far as  
20 you are concerned?

21 A Yes, sir. But you have to understand the  
22 circumstances. As you probably know, those inspections that

1 were performed as a result of that fireproof removal at that  
2 Level II's direction was not formally documented, and in  
3 discussions with the individual inspector, that the reasoning  
4 that it was not documented is that he basically went against  
5 the direction of his QC manager when he performed that opera-  
6 tion.

7 Q And that was the direction of his manager as  
8 expressed in Memo 295; correct?

9 A The manager at that time, yes, sir.

10 Q Yes, Mr. Buchanan.

11 Finally, you were asked about the initiation of  
12 the 50.55(e) report on the butt splicing issue, and I think  
13 you said that Commonwealth Edison's response to NRC --  
14 was that you, sir, as to whether or not they were going to  
15 initiate a 50.55(e)?

16 A I believe that was Mr. Williams that brought up  
17 in that conversation, "Have you considered" -- you, CECO --  
18 "considered a 50.55(e) or potential 50.55(e) on this item?"

19 MR. MILLER: I have no further questions.

20 T.11 MR. PATON: I would like the record to show that  
21 I am now supplying to the parties the documents that I  
22 previously described. I am now providing to each party a

1 document that I previously described as 82-05, Book No. 1.

2 I am now handing to the Intervenors and to the  
3 Applicant a copy of the document that I previously described  
4 as 82-05, Book No. 2.

5 I am now supplying to Intervenors and the  
6 Applicant a copy of a file that I previously described as  
7 82-05-19 Reinspection Program Audits.

8 Now, in addition, I would like to discuss six or  
9 seven documents that the parties indicated they wanted copies  
10 of.

11 These documents were produced by Mr. Love out of  
12 his files, and they are documents on which he had written,  
13 and these have been provided to Intervenors and the Applicant.

14 Now, my recollection is that when Mr. Love  
15 described each of these documents previously, we were off  
16 the record. I don't care, it's up to you whether or not you  
17 want to go on the record and have him again describe these  
18 documents.

19 MS. WHICHER: I don't have any need to do that.

20 MR. MILLER: No. CONFIDENT

21 MR. WILCOVE: I have a list of documents from  
22 Mr. Little's file. I will ask the Intervenors and the

1 Applicant to go through and if there are any documents they  
2 see on this list that they either know or think that they  
3 might not have, then we can have copies made.

4 MS. WHICHER: You'll have those copies available  
5 for us tomorrow before Mr. Little's deposition?

6 MR. WILCOVE: I think we should be able to. If  
7 you can let me know first thing in the morning, we should  
8 be able to have copies made. I think Mr. Little did indicate  
9 that he had a few more things to check, so there might be a  
10 few more documents that will be added.

11 MR. MILLER: A Cunningham-to-Denton letter?

12 (Discussion off the record.)

13 MS. WHICHER: I'd like to have this marked Love  
14 Exhibit 13.

15 (The document referred to was  
16 marked Love Depo. Exhibit No. 13  
17 for identification.)

18 R E - E X A M I N A T I O N

19 BY MS. WHICHER:

20 Q Mr. Love, I'm handing you what the reporter is  
21 marking Love Exhibit 13, and asking you if you can tell me  
22 what this is, please. And if you have ever seen it before.

1           A       Yes, ma'am, I prepared the first portion of it,  
2 and here again, as was indicated, I have no background on  
3 statistical analysis, and my question was to my management,  
4 based on the number of defects out of the number of welds  
5 that was inspected. And my question to my management, if  
6 you will, was can we justify 100 percent reinspection of welds  
7 as not required?

8           Q       Did you receive an answer?

9           A       Yes, ma'am. Mr. Williams and I discussed it,  
10 and as indicated in the answer there, that to summarize it,  
11 if you will, that people knowledgeable in that area would  
12 look at it and evaluate it technically and statistically,  
13 and Mr. Ward, I believe, among others, was involved in the  
14 technical evaluation of it. Statisticalwise, I can't answer  
15 who evaluated it.

16          Q       This was signed also by Mr. Williams and Mr.  
17 Little; is that correct?

18          A       Yes, ma'am.

19          Q       Okay. Is it fair to characterize this as your  
20 raising a concern on your part, Mr. Love?

21          A       Would you rephrase that there again, now?

22          Q       Is it fair to characterize this as raising a

1 concern on your part, Mr. Love?

2 A Again it was an area that I have no knowledge in,  
3 and I was just asking a question of my management. It could  
4 be a concern, or it could not. That was, if you will, their  
5 decision.

6 Q Were you asked to fill this out?

7 A The inspector evaluation?

8 Q Yes.

9 A This is -- at this time I think it was a voluntary  
10 program. If you had some concerns, if the inspector had a  
11 concern that you wanted to pass up to management, this was a  
12 form that would get you there.

13 Q Mr. Love, looking at the Part 4 of this exhibit,  
14 where it says "Supervision," do you recognize the handwriting  
15 that appears in that box, and do you know whether that is  
16 the handwriting of two different people, or one person, and  
17 who wrote that?

18 A The first two lines appears to be Mr. Williams'  
19 handwriting, and from the initials at the bottom of the  
20 remainder, I would say that was Mr. Little's handwriting.

21 Q Okay. Thank you.

22 MS. WHICHER: I have no more questions.



## R E - E X A M I N A T I O N

BY MR. MILLER:

Q Just so the record is clear, could you read into the record what appears in Box 4?

A You're speaking to me?

Q Yes, sir. Please. The first two lines you said were Mr. Williams'.

MR. PATON: Could I ask, Mike, you want him to read all the writing in there?

MR. MILLER: Yes.

MS. WHICHER: It's an exhibit, Mike. I don't think it's necessary.

MR. PATON: I'm not going to object. I'm just not sure why you're doing that.

MS. WHICHER: I just think it's unnecessary.

BY MR. MILLER:

Q Would you agree that the last word on the first line is "pursue"?

A I would say right offhand it says, "I don't know, but we will pursue technically and statistically."

Q Okay. Who are -- the next line, NHPS, are those the four letters that are there?

1 MR. PATON: Mike, I don't have any trouble. If  
2 you have a purpose with him reading it, it's fine with me.  
3 You apparently have a purpose. That's fine with me.

4 MR. MILLER: I just want to know what it means.

5 BY MR. MILLER:

6 Q Do you know?

7 A Oh, that is the initials -- right off the top of  
8 my head I don't know what it stands for, but that is the  
9 group that Mr. Ward is in, for example, in the plant systems  
10 section, and that is the other group that Mr. Ward works  
11 for, who Mr. Danielson is the section chief.

12 Q I take it that this was sent back to you with  
13 Block 4 filled in by Mr. Williams and Mr. Little; is that  
14 right?

15 A As routine, yes, sir, I'd say it was.

16 Q Did they discuss it with you orally at all?

17 A Mr. Williams did, yes.

18 Q Did he say anything in substance that is in  
19 addition to what appears in the Box 4?

20 A I remember the discussion, but I can't tell you  
21 what all went on at that time.

22 MR. MILLER: Okay, no further questions.

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Mr. Love, you have been very patient with all of us. Thank you.

(Whereupon, at 4:58 p.m., the deposition was concluded.)

*Ray S. Love*  
RAY S. LOVE

STATE OF ILLINOIS :  
COUNTY OF DUPAGE :

Subscribed and sworn to before me by the said RAY S. LOVE on this the 14 day of July, 1984.

*Marcia J. Smith*  
Notary Public

My Commission Expires: February 8, 1986

MILLER PAPER  
E2222222

1 STATE OF MARYLAND :

2 COUNTY OF MONTGOMERY:

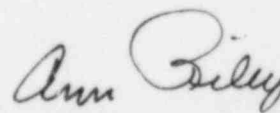
3 I, ANN RILEY, a Notary Public in and for the  
4 County of Montgomery, State of Maryland, do hereby certify  
5 that I reported the deposition of RAY S. LOVE.  
6

7 I further certify that the foregoing 196 pages  
8 contain a true and accurate transcription of the testimony  
9 given by said witness.

10 I further certify that the transcription was done  
11 either by me or under my personal supervision.  
12

13 I further certify that I have no interest,  
14 financial or otherwise, in the outcome of this litigation.

15 Given under my hand and seal of office this 24th  
16 day of June, 1984.

17 

18 Ann Riley

19 My Commission Expires:

20 July 1, 1986  
21  
22

RELATED CORRESPONDENCE

DOCKETED  
USMDC

'84 JUL 27 P3:57

OFFICE OF SECRETARY  
DEFENSE & ARMY  
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RAY S. LOVE DEPOSITION

EXHIBITS 1-13

June 20, 1984



83-16  
w/ CECO response attached

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

JUN 02 REC'D

MAY 31 1983

Docket No. 50-454

Commonwealth Edison Company  
ATTN: Mr. Cordell Reed  
Vice President  
Post Office Box 767  
Chicago, IL 60690

Gentlemen:

This refers to the routine safety inspection conducted by Mr. R. S. Love of this office on March 21-25, and April 4-8, 1983, of activities at Byron Station authorized by NRC Construction Permit No. CPPR-130 and to the discussion of our findings with Mr. G. Sorensen at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in non-compliance with NRC requirements, as specified in the enclosed Appendix. A written response is required. Information gathered in this inspection indicates that the use of interim lead auditors who are not certifiable per ANSI 45.2.23 may be common practice at CECO construction sites. Please include in your response to the item of noncompliance a discussion of the extent of this practice at all CECO sites, including steps being taken to remedy the problem. Also, include in your response the steps you plan to take to assure that audits conducted by non-certifiable lead auditors were properly conducted.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter, the enclosure(s), and your response to this letter will be placed in the Public Document Room.

Love Depo. #1  
6-20-84

MAY 31 1983

The responses directed by this letter (and the accompanying Notice) are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,



W. S. Little, Chief  
Engineering Branch II

Enclosures:

1. Appendix, Notice  
of Violation
2. Inspection Report  
No. 50-454/83-16(DE)

cc w/encls:

D. L. Farrar, Director  
of Nuclear Licensing  
V. I. Schlosser, Project Manager  
Gunner Sorensen, Site Project  
Superintendent  
R. E. Querio, Station  
Superintendent  
DMB/Document Control Desk (RIDS)  
Resident Inspector, RIII Byron  
Resident Inspector, RIII  
Braidwood  
Philip L. Willman, Esq.  
Assistant Attorney General  
Environmental Control Division  
Reed Neuman, Esq., Assistant  
Attorney General  
Ms. Jane M. Whicher  
Diane Chavez, DAARE/SAFE

Appendix

NOTICE OF VIOLATION

Commonwealth Edison Company

Docket No. 50-454

As a result of the inspection conducted on March 21-25, and April 4-8, 1983, and in accordance with the NRC Enforcement Policy, 47 FR 9987 (March 9, 1982), the following violation was identified:

10 CFR 50, Appendix B, Criterion II, states, in part, "The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained."

Commonwealth Edison Company (CECo) letter, L. O. DelGeorge to D. G. Eisenhut, U.S. NRC, Director, Division of Licensing, dated August 17, 1981, affirmed CECo commitment to Regulatory Guide 1.146, August 1980 and ANSI N45.2.23-1978 as required by Generic Letter 8'-01.

ANSI N45.2.23-1978, paragraph 2.3, states, "An individual shall meet the requirements of paragraphs 2.3.1 through 2.3.5 prior to being designated a lead auditor."

ANSI N45.2.23-1978, paragraph 2.3.1, states, in part, "Education and Experience. The prospective lead auditor shall have verifiable evidence that a minimum of ten (10) credits under the following scoring system have been accumulated. Education (4 credit maximum). Experience (9 points maximum). Other credentials of professional competence (2 credit maximum). Rights of Management (2 points maximum).

Contrary to the above, the Commonwealth Edison Company Quality Assurance Lead Auditor performing the Power-Azco-Pope audit was not adequately qualified and/or trained to perform lead auditor functions. Details of apparent non-compliance to the above requirements are delineated in paragraph 3.A.(1) of the attached report.

This is a Severity Level IV violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, you are required to submit to this office within thirty days of the date of this Notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown.

Dated

May 27, 1983

W. S. Little  
W. S. Little, Chief  
Engineering Branch II



U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-454/83-16(DE)

Docket No. 50-454

License No. CPPR-130

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, IL 60690

Facility Name: Byron Station, Unit 1

Inspection At: Byron Site, Byron, IL

Inspection Conducted: March 21-25 and April 4-8, 1983.

Inspector: *R. S. Love*  
R. S. Love

Approved By: *C. C. Williams*  
C. C. Williams, Chief  
Plant Systems Section

*5/27/83*  
*5/27/83*

Inspection Summary

Inspection on March 21-25 and April 4-8, 1983 (Report No. 50-454/83-16(DE))

Areas Inspected: Review of licensee action on previously identified items. Reviewed installation of instrument sensing lines, installation and termination of instrumentation cables, and the review of associated procedures and records. This inspection involved a total of 69 inspection-hours by one NRC inspector.

Results: In the areas inspected, one potential item of noncompliance was identified. The licensee failed to assure that CECO lead auditors were properly qualified and certified (Paragraph 3.A.(1)).

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

#\*G. Sorensen, PCD Construction Superintendent  
#\*R. Tuetkon, PCD Assistant Construction Superintendent  
\*J. T. Westermeier, PED Project Engineer  
\*M. A. Stanish, QA Superintendent  
#\*R. B. Klingler, Staff Assistant  
\*P. T. Myrda, QA Supervisor  
#\*R. A. Westberg, QA Engineer  
\*A. J. Rosenbach, QA Inspector  
\*F. A. Mazzini, QA Engineer  
\*M. E. Lohmann, PCD Mechanical Supervisor  
# K. J. Hansing, QA Supervisor  
# E. Sager, Field Engineer  
# J. Binder, Project Electrical Supervisor  
R. G. Gruber, QA Engineer

Power-Azco-Pope (PAP)

R. P. Larkin, QA Manager  
R. C. Schulz, Project Manager  
\*D. M. Nelson, QC Supervisor  
\*M. C. Donohoe, Engineering Manager

Hatfield Electric Company (HECo)

T. Hill, QA/QC Manager  
J. D. Spangler, Lead Welding Inspector (PTL)  
R. Quias, Welding Inspector (PTL)  
G. A. Cason, QC Lead Inspector (PTL)

Westinghouse

\*M. D. Pitlyuk, Manager  
\*G. L. Laughlin, Engineer

The inspector also contacted and interviewed other licensee and contractor personnel during this reporting period.

\*Denotes those present at the exit interview on March 25, 1983.

#Denotes those present at the exit interview on April 8, 1983.

2. Action on Previously Identified Items

(CLOSED) Noncompliance (50-454/80-25-13): This item pertained to the failure to apply hold tag on items identified on CECo Nonconformance Report (NCR) F-529. This NCR identified the fact that the cable tray

stiffener welds did not meet the requirements of AWS D1.1 and the purchase order specifications. Weld profile maps were prepared on cable tray stiffener welds that did not meet the acceptance criteria. The design engineer, Sargent and Lundy (S&L), performed an analysis on the identified weld and with a few exceptions, found that the welds met the design intent. The welds that did not meet the design intent were repaired by the electrical contractor. Paragraphs 3.10.3.2.2.a.1 of the FSAR was revised by Amendment 41, February 1983, to state, "Deviations from the AWS requirements for specific weldments are made on the basis of design calculations." This item is closed.

(CLOSED) Unresolved Item (50-454/81-16-03; 50-455/81-12-03): Hatfield procedures did not address methods to verify that maximum cable pulling tension had not been exceeded when small cables were pulled. S&L drawing 6E-0-3000B, Sheets 1 thru 5, and Hatfield Procedure No. 10 were revised to address the required precautions to be taken when small cables are pulled. This item is closed.

(CLOSED) Unresolved Item (50-454/81-16-04; 50-455/81-12-04): This item identified that the safety-related switches, instruments, recorders, etc., in the main control room were not distinctly identified as being in the protection system. Paragraph 8.3.1.3.3 of the FSAR identifies the fact that the switches, instruments, records, etc. in the main control room would not be color-coded to identify the items as being in the protective system. This item is closed.

(CLOSED) Noncompliance (50-454/82-05-09b; 50-455/82-04-09b): This item identified that HECO procedure number 6 did not address corrective action to prevent recurrence when a nonconformance or deviation was identified. Procedure 6, Revision 11, dated October 9, 1982, now addresses corrective action to prevent recurrence. A review of HECO NCRs indicates that the procedure is being implemented. This item is closed.

(CLOSED) Noncompliance (50-454/82-05-09c; 50-455/82-04-09c): This item identified that HECO procedures did not address the precautions to be taken to prevent exceeding maximum cable sidewall pressure during cable installation. Also, this procedure did not address cable rework. HECO Procedure 10, Revision 19, dated February 14, 1983, satisfactorily addresses cable rework and steps to be taken so as not to exceed cable sidewall pressure. This item is closed.

(CLOSED) Noncompliance (50-454/82-05-11d; 50-455/82-04-11d): This item identifies that PAP procedure QC-4 did not address corrective action to prevent recurrence when a nonconforming condition was identified. PAP Procedure QC-4, Revision 10, dated September 21, 1982, satisfactorily addresses corrective action to prevent recurrence. This item is closed.

(CLOSED) Open Item (50-454/82-05-12; 50-455/83-04-12): This item identified that CECO NCRs were remaining open for an extended period of time. A review of the identified NCRs indicates that a concerted effort has been made to implement the disposition and close these NCRs. The CECO PCD Staff Assistant is implementing a tracking system to expedite the closure of NCRs. This item is closed.

(CLOSED) Noncompliance (50/454/82-05-13; 50/455/82-04-13): This item identified that NCRs were being improperly closed/voided by CECo and HECo. Improperly closed/voided NCRs were reopened by preparing a new NCR. These NCRs were then properly closed and procedure were revised so as to mitigate the possibility of this situation re-occurring. This item is closed.

(CLOSED) Open Item (50-454/82-05-15; 50-455/82-04-15): This item identified that there was not a procedure in place that addressed the installation of covers on cable tray and risers. HECo Procedure 9C, Revision 1, was prepared to address the installation of cable tray and riser covers in accordance with S&L drawings. This item is closed.

(CLOSED) Unresolved Item (50-454/82-05-16; 50-455/82-04-16): This item identified that HECo procedure 9E did not meet the requirements of IEEE-384 as relating to marking of cable tray risers. Procedure 9E, Revision 10, Paragraph 5.3.1, now requires risers to be identified every 15'. This is in accordance with IEEE-384. Inspection Reports for the retro-fit of riser markers were reviewed by the inspector. This item is closed.

(CLOSED) Unresolved Item (50-454/82-17-01; 50-455/82-12-01): This item identified the possibility of QC inspectors inspecting items that they had installed or worked on. Hunter, HECo, and PAP are utilizing craft personnel as QC inspectors. These contractors reviewed their records and determined that no QC inspector had final inspected his own work. This item is closed.

### 3. Functional or Program Areas Inspected

#### A. Powers-Azco-Pope (PAP)

- (1) The Region III inspector reviewed the last three CECo audits of PAP, (PAP is the licensee's non-electrical instrumentation installation contractor). These audits were conducted on June 8 thru 10, 1982, December 15 thru 21, 1982, and February 1 thru 4, 1983. The findings and concerns identified during the audits were corrected by PAP.

During the review of CECo audit reports, the Region III inspector observed that the CECo lead auditor that performed the PAP audit was classified as an Interim Lead Auditor. The auditor's qualification and certification records contained a letter from the Byron Station Quality Assurance Superintendent to the CECo Manager, Quality Assurance. This letter (BY8067, August 24, 1982) was a request for Interim Lead Auditor Certification for the subject auditor. However, the letter indicated that the lead auditor candidate, based on education, experience, etc.,... had accumulated eight (8) points to date. This is less than the minimum of 10 credit points specified by ANSI N45.2.23-1978. Moreover, an approved procedure allowing the use of lead auditors who do not meet the minimum requirements of the referenced code

was not available. This letter received the concurrence of the CECo Manager, Quality Assurance on August 26, 1982.

Interim Lead Auditor Certification is not addressed in the CECo Quality Assurance Manual, CECo Topical Report (CE-1-A), nor in ANSI N45.2.23-1978. CECo letter, L. O. DelGeorge to D. G. Eisenhut, U.S. NRC, Director, Division of Licensing, dated August 17, 1981, affirmed CECo commitment to Regulatory Guide 1.146, August 1980 and ANSI N45.2.23-1978 as required by Generic Letter 81-01.

During interviews with Byron Station Quality Assurance personnel, including site Quality Assurance Superintendent, the Region III inspector was informed that it has been standard practice within CECo to certify an individual as an Interim Lead Auditor when he/she does not meet the qualifications of a Lead Auditor.

The licensee was informed that failure to assure that Lead Auditors were trained, qualified, and certified in accordance with the CECo Quality Program and ANSI N45.2.23-1978, was an item of noncompliance in accordance with Criterion II of 10 CFR 50, Appendix B (50-454/83-16-01).

- (2) During this reporting period, the Region III inspector reviewed three CECo Material Receiving Reports (MRR) for material to be installed in the safety-related instrumentation system by PAP. Following are the results of this review:
  - (a) MRR-50225 was for 3/8" x 1/2" U-bolts. The original purchase order stated that three U-bolts were to be manufactured to the ASME Code, Section III, Subsections NF-2130 and NF-2150, 1974 edition through summer 1975 Addenda. The Code edition and addenda was revised (CECo letter to Elcen Metal Products Company, December 12, 1979) to read, 1977 edition through summer 1977 addenda. Certificate of Conformance, September 2, 1980, stated that the 3/8" x 1/2", SA-36, Batch/Lot No. A000812A, U-bolts meet the requirements of Subsection NF of the 1977 ASME Code through 1977 addenda.
  - (b) MRR-50554 was for 81 safety-related pressure gauges per Purchase Order 247695. Certificate of Conformance, July 10, 1981, was in the documentation package. Engineering qualification tests (environmental, radiation, seismic, etc.) have been submitted to Sargent & Lundy for their evaluation and approval.
  - (c) MRR-52904 was for 3 safety-related Rosemount 1153 pressure transmitters per Purchase Order 261620. Certificate of Conformance, September 21, 1982, was in the documentation package. Preliminary qualification test data to the requirements of IEEE-323 and IEEE-344 has been submitted to

CECo. This data indicates that the pressure transmitter will qualify to the requirements of IEEE-323 and IEEE-344. Final test data is being prepared by Wyle Laboratories.

No items of noncompliance were identified in this area.

(3) During this reporting period, the Region III inspector reviewed the following PAP procedures:

- . FP-1, Document and Drawing Control, Revision 5
- . FP-2, Control of Procurement and Requisitioning of Material and Services, Revision 9
- . FP-4, Material Storage, Revision 6
- . FP-5, Weld Filler Material Control, Revision 10
- . FP-12, Cold Bending of Pipe and Tube, Revision 6
- . FP-13, Hanger Installation and Control, Revision 9
- . FP-16, Identification and Marking of Pipe and Components, Revision 8

The above listed procedures appeared to be adequate.

(4) During this reporting period, the Region III inspector reviewed the installation of the instrument sensing lines for the following instruments:

- (a) 1 FT-0434 - Loop "C" flow, instrument mounted on panel 1PL66J, located in the Containment Building at 377' elevation between Radius 1 and 2. The instrument sensing lines were installed in accordance with drawings T4-1FT-0434, Sheets 1, 2, and 3 and were identified in accordance with Field Change Request (FCR) 15437. This FCR modified specification F-2906. The installation and separation appeared to be adequate.
- (b) 1 LT-548 and 1 LT-549 - Redundant level transmitters for Steam Generator No. 4. During a walk down of the sensing lines for these instruments, the Region III inspector observed that there was only a 2" separation (18" required) between the sensing lines near hangers 1LT548H135-12 and 1LT549H136-7. The licensee's instrumentation installation contractor (PAP) prepared Fabrication/Installation Surveillance Report No. 992, March 24, 1983, to document the separation violation identified by the NRC.

In accordance with FCR-15437, the licensee has instituted a program to identify instrument sensing line separation violations for Containment Building safety-related RPS sensing lines:

1. PAP prepares as-built drawing of the installation and submits these drawings to Westinghouse Electric Corporation-Nuclear Technology Division (WNTD) for review.

2. Utilizing their computer system, WNTD reviews the as-built drawings for separation violations.

Violations are then analyzed on a case-by-case basis to determine acceptability and/or provide recommended resolutions.

To confirm that this method of analysis will in fact identify separation violations, the Region III inspector requested that a computer run be made on the sensing lines for instruments 1LT-548 and 1LT-549. Note the full computer run for instrument sensing lines for Unit #1 is scheduled for June 1983. The inspector also requested that WNTD be provided the information on the separation violation observed.

During the week of April 4-8, 1983, WNTD performed an analysis on the subject sensing lines. This analysis indicated a separation of 3", center to center, in the same area identified by the Region III inspector.

Pending a review of the Unit #1 final separation analysis by WNTD, this item is open (50-454/83-16-02).

- (5) During this reporting period, the Region III inspector reviewed the installation and inspection documentation and as-built drawings for the following instrument sensing lines:
  - (a) Pressurized level transmitter 1LT-0460  
Installation drawing T146-1LT-0460, Sheet 1 of 4, Revision 5; Sheet 2 of 4, Revision 6; Sheet 3 of 4, Revision 6; and Sheet 4 of 4, Revision 8.

As a result of a previously identified item of noncompliance (Reference 454/82-05-19; 455/83-04-19), PAP has instituted an extensive re-inspection program. During a review of the sensing line installation records for this instrument, it was observed that for Weld Numbers 1 thru 16, 8 of these welds were rejected during the re-inspection. The original weld inspection was performed on October 29, 1980 by Inspector "A". A review of Inspector A's qualification records indicated that he had been certified as a Level I weld inspector on November 1, 1980, and a Level II weld inspector on November 15, 1980. Inspector "A" was terminated on July 8, 1981. It is the Region III inspectors understanding, that, as a minimum, all accessible welds inspected by Inspector "A" through April 1981 will be re-inspected. This understanding is based on interviews with licensee and contractor personnel and a review of the re-inspection program. This re-inspection effort is being tracked by the item of noncompliance referenced above.

- (b) Loop C flow transmitter IFT-0434  
Installation drawing T4-IFT-0434, Sheet 1 of 3,  
Revision 4; Sheet 2 of 3, Revision 6; Sheet 3 of 3,  
Revision 3.

During a review of the sensing line installation records for this instrument, it was observed that Inspector "A" (Reference paragraph (S).a above) performed a visual inspection on 56 welds in this system in one day. Per the re-inspection program, these welds are scheduled for re-inspection. It was also observed that the Authorized Nuclear Inspector (ANI) performed/observed one visual weld inspection and 6 liquid penetrant examinations (PT) on the welds in this system. The re-inspection effort for this system is being tracked by previously identified item of noncompliance (Reference 454/82-05-19; 455/82-04-19).

- (6) Summary of PAP Re-Inspection Effort, as of April 3, 1983.

- (a) As a minimum, the first three months of each certified inspectors (21) work will be re-inspected. Depending upon the reject rate as defined in the procedure, the re-inspection for a given inspector's work may encompass an additional three months or longer.
- (b) The initial scope (three months per inspector) of the re-inspection effort has been defined.
- (c) Approximately 25% of the re-inspection effort has been completed. To date, April 3, 1983, 125 valid welding rejects have been identified.

B. Hatfield Electric Company (HECo)

- (1) During this reporting period, the Region III inspector verified the installation and termination of instrumentation cables for instrument IFT0434, 1LT0548, and 1LT0549. This verification consisted of a physical walkdown of the cables, inspection of the terminations, and a review of the associated records.
- (a) Loop C flow transmitter IFT-0434 is mounted on instrument rack, 1PL66J. Signal sent to Process I&C Protection Channel 1, Cabinet 1, Panel 1PA01J.
1. Cable IRC-723 - From transmitter IFT-0434 to junction box 1JB-428R. As of April 7, 1983, this cable has not been installed.
  2. Cable IRC-364 - From 1JB-428R to electrical penetration E24-1S105E-1K1R. Cable type - 1TW-PR #16 (shielded), 600 volt. Reel No. 02166-39. Installed December 4, 1980 to Revision A of the pull card. Cable routing



is as follows: 1JB-428R, C1R-1303-1K1R, 1JB-334R, C1R-2301-1K1R, 1JB-348R, C1R-2371-1K1R, 1JB-623R, C1R-4326-1K1R, 1377U-1K1R, 1359U-1K1R, terminating (inline splice) at electrical penetration, inside Containment Building.

3. Cable 1RC-363 - From electrical penetration E24-1S105-1K1R to Panel 1PA01J. Cable type 1TW-PR #16 (shielded), 600 volt. Reel No. 02166-41. Installed April 5, 1981 to Revision B of the pull card. Cable routing is as follows: inline splice at penetration, 1823D-1K1R, 1829D-1K1R, 1973D-1K1R, 1828D-1K1R, 1827D-1K1R, 1R319-1K1R, 11885F-1K1R, 11886F-1K1R, 11887F-1K1R, 11888F-1K1R, 11889F-1K1R, 11890F-1K1R, 11891F-1K1R, 1R401-1K1R, Panel 1PA01J.

This installation was in accordance with drawings, cable pull card and S&L Cable Tabulation printout.

- (b) Steam Generator No. 4 level transmitter 1LT-0548. Signal to Process I&C Protection Channel 3, Cabinet 3, Panel 1PA03J.

1. Cable 1FW-057 - From transmitter 1LT-0548 to electrical penetration E51-1S107E-1K3R. Cable type - 1TW-PR #16 (shielded), 600 volts. Reel No. 02166-69. Installed October 21, 1982 to Revision B of the pull card. Cable routing is as follows: 1LT-0548, C1R-4103-1K3R, 1JB074R, C1R-4104-1K3R, terminating at the penetration, inside containment.

2. Cable 1FW-056 - From electrical penetration E51-1S107E-1K3R to Panel 1PA03J. Cable Type 1TW-PR 316 (shielded), 600 volts. Reel No. 0216631. Installed April 2, 1980 to Revision B of the pull card. Cable routing is as follows: inline splice at penetration, 1798J-1K3R, 1797J-1K3R, 1972J-1K3R, \* 1C216D-1K3R, 11880A-1K3R, 11881A-1K3R, 11882A-1K3R, 11883A-1K3R, 1R400-1K3R, Panel 1PA03J, terminal block F, landing points 10, 11, and 12.

\*Where cable 1FW-056 enters conduit 1C216D-1K1R, it was observed that the cable jacket was damaged at cable footage marker 4684. The shield wire was exposed but did not appear to be damaged. The licensee's electrical contractor, HECO, prepared NCR 597, April 6, 1983, to document the damaged cable jacket. Also, during the labeling of conduits 1C216C and 1C216D, the markings were reversed on both ends of these embedded conduits. Field Change Request (FCR) 22863, April 7, 1983, was prepared to have this error corrected on the as-built drawing. This item is open

pending a review of NCR 597 for proper closure and review of FCR 22863 for approval and correction of as-built drawing (50-454/83-16-03).

Except as noted, this installation was in accordance with drawings, pull cards, and S&L Cable Tabulation printout.

(c) Steam Generator No. 4 level transmitter 1LT-0549. Signal to Process I&C Protection Channel 2, Cabinet 2, Panel 1PA02J.

1. Cable 1FW-049 - From transmitter 1LT-0549, Rack 1PL57J, to electrical penetration E35-1S106E-1K2R. Cable installed November 5, 1981, to Revision A of the pull card. Cable type - 1TW-PR #16 (shielded), 600 volts. Reel No. 02166-46. Cable routing is as follows: 1LT-0549, C1R4478-1K2R, 1JB088R, C1R5124-1K2R, terminating at penetration, inside containment.

2. Cable 1FW-049 - From electrical penetration E35-1S106E-1K2R to Panel 1PA02J. Cable installed April 8, 1981 to Revision A of the pull card. Cable type 1TW-PR #16, 600 volts. Reel No. 02166-41. Cable routing is as follows: inline splice at penetration, 11458H-1K2R, 1R364-1K2R, 11467H-1K2R, 11485H-1K2R, 11464H-1K2R, 11418H-1K2R, 11417H-1K2R, 11620H-1K2R, 11623H-1K2R, 11624H-1K2R, Panel 1PA02J, terminal block J, landing points 22, 23, and 24.

This installation was in accordance with drawings, pull cards, and S&L Cable Tabulation printout.

(2) Summary of HECo Re-Inspection Effort as of April 3, 1983.

(a) As a minimum, the first three months of 22 certified inspectors work will be re-inspected. The 22 inspector equals 1 in 5 of all inspectors employed by HECo since start of project. Depending upon the rejection rate as defined in the procedure, the re-inspection for a given inspector's work may encompass an additional three months or 100% of his/her work. In addition, the original sample size of inspectors may be increased 50%.

(b) The initial scope (three months per inspector) of the re-inspection effort has been defined.

(c) Approximately 5% of the inspection effort has been completed.

4. Status of Installation Effort

	<u>Unit 1</u>	<u>Unit 2</u>
Cable tray installation	100%	98%
Conduit installation	90%	54%

Cable installation	80%	34%
Cable terminations	80%	30%
Equipment installation	100%	90%
Instruments & sensing lines	98%	01%

5. Open Items

Open items are matters, not otherwise categorized in the report, that need to be followed up on in future inspections. Open items disclosed during this inspection are discussed in paragraphs 3.A.(4).b and 3.B.(1).b.2.

6. Exit Interview

The inspector met with licensee representatives (denoted under Persons Contacted) on March 25 and April 8, 1983. The inspector summarized the scope and findings of the inspection. The licensee representatives acknowledged this information.



Commonwealth Edison  
One First National Plaza, Chicago, Illinois  
Address Reply to: Post Office Box 767  
Chicago, Illinois 60690

June 27, 1983

Mr. James G. Keppler, Regional Administrator  
U.S. Nuclear Regulatory Commission - Region III  
799 Roosevelt Road  
Glen Ellyn, IL 60137

Subject: Byron Generating Station Unit 1  
Inspection Report No. 50-454/83-16  
NRC Docket No. 50-454

Reference (a): May 31, 1983 letter W. S. Little  
to Cordell Reed.

Dear Mr. Keppler:

This letter is in response to the inspection conducted by Mr. R. S. Love on March 21-25, and April 4-8, 1983, of activities at Byron Station. During that inspection certain activities were found to be in noncompliance with NRC requirements. Commonwealth Edison's response to the Notice of Violation attached to reference (a) is provided in Attachment A to this letter.

To the best of my knowledge and belief the statements contained herein and in the attachment are true and correct. In some respects these statements are not based upon my personal knowledge but upon information furnished by other Commonwealth Edison employees. Such information has been reviewed in accordance with Company practice and I believe it to be reliable.

If you have any further questions on this matter, please direct them to this office.

Very truly yours,

D. L. Farrar  
Director of Nuclear Licensing

TRT/lm

6766N

ATTACHMENT A

RESPONSE TO NOTICE OF VIOLATION

VIOLATION

10 CFR 50, Appendix B, Criterion II, states, in part, "The program shall provide for indoctrination and training of personnel performing activities affecting quality as necessary to assure that suitable proficiency is achieved and maintained."

Commonwealth Edison Company (CECo) letter, L. O. DelGeorge to D. G. Eisenhut, U.S. NRC, Director, Division of Licensing, dated August 17, 1981, affirmed CECo commitment to Regulatory Guide 1.146, August 1980 and ANSI N45.2.23-1978 as required by Generic Letter 81-01.

ANSI N45.2.23-1978, paragraph 2.3, states, "An individual shall meet the requirements of paragraphs 2.3.1 through 2.3.5 prior to being designated a lead auditor."

ANSI N45.2.23-1978, paragraph 2.3.1, states, in part, "Education and Experience. The prospective lead auditor shall have verifiable evidence that a minimum of ten (10) credits under the following scoring system have been accumulated. Education (4 credit maximum). Experience (9 points maximum). Other credentials of professional competence (2 credit maximum). Rights of Management (2 points maximum).

Contrary to the above, the Commonwealth Edison Company Quality Assurance Lead Auditor performing the Power-Azco-Pope audit was not adequately qualified and/or trained to perform lead auditor functions. Details of apparent noncompliance to the above requirements are delineated in paragraph 3.A.(1) of the attached report.

Response

The lead auditor's certification as an Interim Lead Auditor was carefully and selectively established on the basis of demonstrated capabilities in the performance of his work, technical competence and mature judgement, audits as an auditor, satisfactory completion of training in auditing and non-destructive testing involving MT/PT, RT, UT and Visual Inspection, satisfactory participation in an ASME Survey, serving as a knowledgeable instructor involving several welding and codes and standards training classes and proficient performance in eight audits including six as an auditor (ANSI N45.2.23 requires a minimum of five (5) for Lead Auditor.) This individual had eight points of the ten required for certification. The only area in which the individual did not specifically meet ANSI N45.2.23 was the two year experience in Quality

Assurance requirement. He had approximately eighteen months of Quality Assurance experience. This person is a graduate Welding Engineer and for this reason was recruited and hired to provide expertise in welding and in codes and standards. Because he performed exceptionally well in carrying out this type of assigned work, because he had expertise in welding plus codes and standards and was a graduate Welding Engineer, because he had more than adequately met all the technical requirements and because he was required to carry out his auditing activities directly under the supervision of a Quality Assurance Supervisor who was a Lead Auditor, it was deemed acceptable to establish him as an Interim Lead Auditor because it could be clearly demonstrated that the person had experience, could perform the audit acceptably and did perform the various interim lead auditor functions under the supervision of a qualified Quality Assurance Supervisor. Under the role of Interim Lead Auditor, audit checklists and reports are required to be formulated under the supervision of at least a supervisor as well as be reviewed and approved by a supervisor.

As a result of this required supervisory involvement in the formulation and approval of the audit checklist, the review and acceptance of the checklist objective evidence and the approval of the audit reports by Quality Assurance Supervision, we are confident that the audits were performed and reported acceptably and that proper corrective action was achieved. Also, subsequent and repeated coverage by surveillances and other audits by other people adds to our confidence that the audits performed under a designated Interim Lead Auditor are acceptable.

It has not been standard practice to establish Interim Lead Auditors. On the contrary, only on rare occasions, after careful evaluation and where there was dire need, and the person had more than a year of Quality Assurance experience, and had demonstrated technical competence, mature judgement, and lead auditor attributes, was an Interim Lead Auditor established. In all cases, such appointees worked directly under the supervision of at least a supervisory level person as described above.

ACTION TAKEN TO AVOID FURTHER NONCOMPLIANCE:

The Interim Lead Auditor concept has been discontinued and a request has been submitted to ASME/ANSI requesting that other provisions be provided in the Standard for giving points for experience.

DATE WHEN FULL COMPLIANCE SHALL BE ACHIEVED:

June 15, 1983



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

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TRT

JUL 6 1983

Docket No. 50-454

Commonwealth Edison Company  
ATTN: Mr. Cordell Reed  
Vice President  
Post Office Box 767  
Chicago, Illinois 60690

Gentlemen:

Thank you for your letter dated June 27, 1983, informing us of the steps you have taken to correct the items of noncompliance which we brought to your attention in Inspection Report No. 50-454/83-16 forwarded by our letter dated May 31, 1983. Based upon the telephone conversation between Messrs. D. Swartz and J. Bitel of your office and Mr. R. S. Love of the Region III office on June 30, 1983, it is our understanding that you have reviewed all audits conducted by non-certifiable lead auditors over the past six years for all CECO sites, including your home office, and determined that these audits were properly conducted. It is also our understanding that the Interim Lead Auditor concept has been discontinued throughout CECO. We will examine these matters during a subsequent inspection.

Your cooperation with us is appreciated.

Sincerely,

W. S. Little, Chief  
Engineering - Branch II

- cc w/ltr dtd 6/27/83:
- D. L. Farrar, Director  
of Nuclear Licensing
- V. I. Schlosser, Project Manager
- Gunner Sorensen, Site Project  
Superintendent
- R. E. Querio, Station  
Superintendent
- DMB/Document Control Desk (RIDS)
- Resident Inspector, RIII  
Byron/Braidwood
- Phyllis Dunton, Attorney  
General's Office,  
Environmental Control Division
- Ms. Jane M. Whicher
- Diane Chavez, DAARE/SAFE

83-37



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

*2-01 boxed*

SEP 29 1983

Docket No. 50-454

Commonwealth Edison Company  
ATTN: Mr. Cordell Reed  
Vice President  
Post Office Box 767  
Chicago, Illinois 60690

Gentlemen:

This refers to the routine safety inspection conducted by Mr. R. S. Love of this office on August 8-19 and September 7-9, 1983, of activities at Byron Station, Unit 1, authorized by NRC Construction Permit No. CPPR-130 and to the discussion of our findings with Mr. G. Sorensen and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter and the enclosed inspection report will be placed in the Public Document Room.

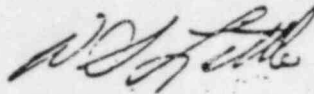
*Love Repo #2  
6-20-84*



SEP 29 1983

We will gladly discuss any questions you have concerning this inspection.

Sincerely,



W. S. Little, Chief  
Engineering - Branch II

Enclosures: Inspection Report  
No. 50-454/83-37

cc w/enclosure:

D. L. Farrar, Director  
of Nuclear Licensing  
V. I. Schlosser, Project Manager  
Gunner Sorensen, Site Project  
Superintendent  
R. E. Querio, Station  
Superintendent  
DMB/Document Control Desk (RIDS)  
Resident Inspector, RIII Byron  
Resident Inspector, RIII  
Braidwood  
Phyllis Dunton, Attorney  
General's Office, Environmental  
Control Division  
Ms. Jane M. Whicher  
Diane Chavez, DAARE/SAFE  
Steve Goldberg, ELD, MNBB

U. S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-454/83-37(DE)

Docket No. 50-454

License No. CPPR-130

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, Illinois 60690

Facility Name: Byron Station, Unit 1

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: August 8-12, and 16-19, and September 7-9, 1983

*C.C. Williams*  
Inspector: R. S. Love

9/28/83  
Date

*C.C. Williams*  
Approved By: C. C. Williams, Chief  
Plant Systems Section

9/28/83  
Date

Inspection Summary

Inspection on August 8-12, and 16-19, and September 7-9, 1983 (Report No. 50-454/83-37(DE))

Areas Inspected: Review of licensee action on previously identified items as pertaining to the re-inspection program for Powers-Azco-Pope and Hatfield Electric Company. Reviewed installation of instrument sensing lines and the review of associated procedures and records. This inspection involved a total of 129 inspector-hours by one NRC inspector.

Results: In the areas inspected, no items of noncompliance were identified.

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECO)

\*G. Sorensen, PCD Construction Superintendent  
\*R. Tuetken, PCD Assistant Construction Superintendent  
\*J. O. Binder, Project Electrical Supervisor  
\*R. L. Byers, PCD Engineer  
\*R. B. Klingler, PCD Quality Control Supervisor  
\*W. P. Dijstelbergen, PED Engineer  
\*K. J. Hansing, Quality Assurance Supervisor  
\*J. W. Rappeport, Quality Assurance Engineer  
\*P. T. Myrda, Quality Assurance Supervisor  
\*M. E. Lohmann, Project Mechanical Supervisor  
K. Weaver, Station Health Physicist  
F. A. Mazzini, Quality Assurance Engineer  
M.A. Stanish, Quality Assurance Superintendent

#### Powers-Azco-Pope (PAP)

R. P. Larkin, Quality Assurance Manager  
D. M. Nelson, Quality Control Supervisor  
M. C. Donohoe, Engineering Manager  
J. Swinbank, Pipe Fitter

#### Hatfield Electric Company (HECO)

J. T. Hill, QA/QC Manager  
S. Bindenagel, QC Electrical Group Leader  
G. Cason, QC Lead Inspector  
S. Hubler, QC Lead Inspector  
J. Merritt, QC Lead Inspector

The inspector also contacted and interviewed other licensee and contractor personnel during this reporting period.

\*Denotes those persons present at the exit interview on August 19, 1983.

### 2. Action on Previously Identified Items

(OPEN) Noncompliance (50-454/82-05-19; 50-455/82-04-19): This item identified the fact that certain contractor QA/QC supervisors and inspectors were not adequately qualified and/or trained to perform safety-related inspection functions. As a result of this finding, the licensee initiated a re-inspection program. The details of this program are delineated in Attachment A to W. L. Stiede letter to James G. Keppler, dated February 23, 1983. Following is a listing of the total attributes inspected and the number of rejects identified for each attribute by Power-Azco-Pope and Hatfield Electric Company as of August 15, 1983.

Powers-Azco-Pope

<u>Inspector</u>	<u>Att. #1</u>	<u>Att. #2</u>	<u>Att. #3</u>	<u>Att. #4</u>	<u>Att. #5</u>	<u>Att. #6</u>	<u>Att. #7</u>	<u>Att. #8</u>
A	692(42)	94(30)	44(1)	44(0)	3(0)	2(0)	-	-
B	345(66)	99(34)	62(3)	72(1)	-	-	-	-
C	11(0)	1(1)	6(0)	5(3)	-	-	-	-
D	495(99)	142(43)	47(1)	116(4)	-	1(0)	-	-
E	304(27)	81(41)	28(0)	119(5)	22(11)	1(0)	5(0)	-
F	211(17)	109(29)	32(0)	48(17)	-	-	-	-
G	395(24)	260(72)	210(10)	778(25)	33(13)	-	10(1)	-
H	35(1)	11(0)	7(0)	11(9)	-	-	-	-
I	85(18)	69(13)	17(0)	23(2)	-	-	-	-
J	12(1)	3(0)	7(0)	5(0)	-	-	-	-
K	113(0)	116(23)	93(1)	149(0)	141(14)	1(0)	8(0)	-
L	455(15)	228(46)	145(5)	319(4)	4(0)	-	2(0)	-
M	178(15)	112(15)	25(0)	106(1)	-	1(0)	-	-
N	90(0)	38(3)	65(2)	214(7)	18(10)	-	5(0)	-
O	18(2)	51(2)	1(0)	8(0)	-	-	-	-
P	370(14)	558(111)	190(0)	629(13)	6(0)	10(3)	1(0)	16(14)
Q	90(2)	117(49)	60(0)	119(0)	15(11)	-	2(0)	-
R	125(5)	111(26)	35(3)	161(6)	36(14)	-	1(0)	-
Total	4024 (348)	2201 (538)	981 (26)	2946 (97)	279 (73)	16 (3)	34 (1)	16 (14)

The numbers in parentheses are the number of rejects for that attribute.

Attribute #1 - Visual weld inspection of instrumentation piping welds.

Attribute #2 - Visual weld inspection of instrumentation piping hanger welds.

Attribute #3 - Piping material verification.

Attribute #4 - Hanger material verification.

Attribute #5 - Final hanger inspection.

Attribute #6 - Flexible hose inspection.

Attribute #7 - Pipe bend inspection.

Attribute #8 - Mechanical joint inspection.

a. Attributes #1 and #2 are discussed in NRC Inspection Report No. 50-454/83-39; 50-455/83-29.

b. Attribute #3 - A total of 26 rejects were identified in this area. Breakdown is as follows:

23 - Wrong material heat numbers were recorded on the drawings/reports, i.e. numbers transposed, etc. Installed material was good.

1 - Material heat number of material installed was not authorized for safety-related use. Fabrication/Inspection Surveillance (FIS) No. 1936 was prepared to document this fact (IFT-918 system).

2 - 1/4" x 0.049 tubing substituted for 1/4" x 0.065" tubing. This substitution is authorized by S&L drawing M819, Sheet 1, Revision M, Note 7.

c. Attribute #4 - A total of 97 rejects were identified in this area. Breakdown is as follows:

49-- Wrong material heat numbers were recorded on the drawings/reports, i.e. numbers transposed, etc. Installed material was good.

1 - Material heat number of material installed was not authorized for safety-related use. FIS-1810 was prepared to document this fact (System OTS-SX-093).

39 - Authorized material was substituted but inspector failed to document this fact on the drawings/reports.

8 - Unauthorized material was substituted. FIS-965 was prepared to document four items in the PIP-SX019 system. FIS-1464 was prepared to document two items in the ILSH-SI004 system. FIS-1430 was prepared to document two items in the IFT-444 system.

d. Attribute #5 - A total of 73 rejects were identified in this area. Breakdown is as follows:

36 - Weld bead length shorter than that specified on drawings. In most all cases, the weld length was out of specification by less than 1/4". FIS's have been prepared on all these welds.

19 - Hanger configuration dimensions did not meet drawing requirements. FIS's have been prepared on the applicable hangers.

12 - Torque of nuts on U-bolts had relaxed to the point that the torque requirements did not meet specification requirements. S & L study indicates that 70% of initial torque will meet the criteria for a seismic event. FIS's have been prepared on these items and they will be evaluated under the 70% criteria.

6 - Documentation sign-offs were not in accordance with approved procedure in that one or more signatures/initials and/or dates were missing. These items have been corrected.

e. Attribute #6 - A total of 3 rejects were identified in this area. Breakdown is as follows:

2 - An acceptable clearance between instrument flexible hose for transmitter FIS-428A and surrounding items (pipe, hangers, etc.) was not maintained. This is documented on an FIS Report.

1 - Flexible hose for instrument IFT-426 was not installed within the 1/2" installation tolerance. This is documented on an FIS report.

f. Attribute #7 - One rejectable pipe bend was identified in the OPI-W0008 system. NRC 178 was prepared to document this bend as having excessive flatness.

Hatfield Electric Company

<u>Inspector</u>	<u>Att. #1</u>	<u>Att. #2</u>	<u>Att. #3</u>	<u>Att. #4</u>	<u>Att. #5</u>	<u>Att. #6</u>	<u>Att. #7</u>	<u>Att. #8</u>	<u>Att</u>
A	625(166)								
B	51(0)								
C	4190(400)								
D	2841(109)								
E	572(41)								
F	10868(1383)	60(0)	41(4)						
G	933(166)	564(2)	304(14)	(0)					
H		770(0)	40(8)	1 report					
I		132(0)	137(1)	(0)	24(0)			8(0)	
J				2 reports					
K			1046(40)						
L			586(48)						
M		8208(7)				80(0)	1734(56)		
N					24(0)				
O							198(5)		
P									1509(
Q									4488(
R									2879(
S									2113(
T									88(
U									7020(
V									2542(
Totals	20,140 (2,265)	9,734(9)	2,154(115)	(0) 3 reports	48(0)	80(0)	1932(61)	8(0)	22,6 (1,2

The numbers in parentheses are the number of rejects for that attribute.

Attribute #1 - Visual weld inspection of raceway hangers and cable tray to hanger welds.

Attribute #2 - Inspection of cable terminations.

Attribute #3 - Inspection of conduit installation.

Attribute #4 - Inspection of equipment modifications.

Attribute #5 - Inspection of equipment installation.

Attribute #6 - Inspection of cable pan (tray) installation.

Attribute #7 - Inspection of cable pan hanger installation.

Attribute #8 - A-325 bolt inspection.

Attribute #9 - Preparation of as-built drawings.

- a. Attribute #1 is discussed in NRC inspection report 50-454/83-39; 50-455/83-29.
- b. Attribute #2. A total of 9 rejectable items were identified in this area. Breakdown is as follows:
- 1 - Copper exposed at terminal lug. DR 2380 prepared.
  - 2 - Cable jacket damaged. NCR/DR 771 prepared.
  - 1 - Conductor not terminated per drawing. DR 2380 prepared.
  - 1 - Cable separation was not to drawing/specification requirements.
  - 1 - Copper conductor was nicked when insulation was removed.
  - 3 - Conductor not terminated per drawing. Drawing as revised after termination was inspected.
- c. Attribute #3. A total of 115 rejectable items were identified in this area. Breakdown is as follows:
- 7 - Condulets installed without Engineering approval.
  - 2 - Exposed threads on conduit were not galvanized.
  - 4 - Conduit run contained more than 270° of bends.
  - 8 - Insulated bushings were not installed in conduit fittings.
  - 9 - Grounding was not installed per drawings.
  - 1 - 90° conduit fitting installed without Engineering approval.
  - 2 - Conduit bends were less than minimum radius specified.
  - 11 - Installed seal-tite flex conduit is greater than 6' in length.
    - 2 - Wrong type fasteners utilized on J-Boxes.
      - 1 - Improper size conduit installed.
      - 5 - Damaged seal-tite flex conduit.
    - 6 - Installed pull-sleeves are less than standard length.
  - 21 - Paper type gaskets installed.
    - 6 - J-Boxes did not have barriers installed per drawings.
    - 3 - Wrong type J-Box installed (bolted vs hinge cover).
      - 1 - Conduits not separated per drawing/specification.
      - 2 - Hanger strap missing or was not of proper length.
    - 3 - Conduits were not terminated per drawing.
      - 1 - J-Box cover was missing.
      - 2 - J-Box had been removed.
  - 10 - Conduit hanger location was not per drawings.
    - 8 - Hanger material was of improper size.
- d. Attribute #4, #5, #6 - No rejectable items were identified in these areas.
- e. Attribute #7 - A total of 61 rejectable items were identified in this area. Breakdown is as follows:
- 38 - Configuration, approved alternate connection details utilized but documentation indicated that scheduled connection detail had been installed.
  - 11 - Hanger member size was not per drawing (tube steel rotated 90° on its axis or oversized unistrut installed).
    - 1 - Auxiliary steel was oversized.

- 1 - Auxiliary steel plate was undersized.
- 2 - Fit-up gap larger than specified.
- 1 - Auxiliary steel elevation was out of specifications.
- 1 - Wrong hanger connection detail installed.
- 1 - Hanger brace location was out of specifications.

- f. Attribute #8 - No rejectable items were identified in this area.
- g. Attribute #9 - A total of 1200 rejectable items were identified in this area. A detailed breakdown of the rejectable items was not available as of August 19, 1983. A detailed breakdown was available for two of the eight as-built personnel. Location of items for as-built drawings are to be within  $\pm 1$ " of actual locations. Typical dimension discrepancies ranged between 1-3/8" and 6-7/8".

This item of noncompliance remains open. Region III will continue to monitor the re-inspection program at the Byron station.

(Closed) Unresolved item (50-454/82-17-07; 50-455/82-12-07): This item pertains to the effectiveness of the HECO training program in the area of welding. A review of the HECO reinspection program indicated a weld rejection rate of approximately 11%. Pittsburgh Testing Laboratory (PTL) is performing a 10% overinspection of welds accepted by HECO. Between January 1, 1983 and August 16, 1983, PTL inspected 889 welds accepted by HECO. Of the welds inspected, 865 were accepted and 21 were rejected. The rejection rate for the overinspection program is approximately 2.3%, indicating that the training program appears to be effective. This item also closes an allegation pertaining to the effectiveness of the HECO training program. The allegor stated that the HECO training program accomplishes nothing. Based on the results of the PTL over-inspect program, this allegation could not be substantiated.

(Open) Open item (50-454/83-16-02): This item pertains to the separation of instrument sensing lines installed by Powers-Azco-Pope (PAP). In accordance with FCR-15437, PAP prepares as-built drawings of the installed instrument sensing lines. These as-built drawings are submitted to Westinghouse Electric Corporation - Nuclear Technology Division (WNTD) for analysis. WNTD letter, No. CAE-2.1.205, to Ceco, dated July 22, 1983, indicates that there are 12 potential separation violations for the installed sensing lines. The licensee prepared NCR 187 to document the 12 separation violations. NCR 031 and FIS 992 also document sensing line separation violations. Pending review of actions taken to close NCR 031, NCR 187, and FIS-992, this item remains open.

### 3. Functional or Program Areas Inspected

#### A. Powers-Azco-Pope (PAP)

- (1) The Region III inspector reviewed the following-PAP procedures and found them to be adequate, except as noted:-

QC-2, Revision 7, "Welding Equipment Calibration". This proce-



cedure had been withdrawn by PAP but was still in the CECO QA active procedures file. When this fact was pointed out by the Region III inspector, the licensee took immediate action to remove procedure QC-2 from their active file.

QC-3, Revision 11, "Visual Weld Inspection".

QC-4, Revision 10, "Nonconformance Control". PAP is performing a trend analysis on Fabrication/Installation Surveillance (FIS) Reports. The requirement to trend FIS Reports is not addressed in procedure QC-4. The PAP QA Manager agreed to insert this requirement into the next revision to procedure QC-4.

QC-7, Revision 5, "Non-Destructive Examination".

FP-1, Revision 5, "Document and Drawing Control".

FP-3, Revision 11, "Material Receiving Inspection Control".

FP-4, Revision 6, "Material Storage".

FP-5, Revision 10, "Weld Filler Material Control".

FP-11, Revision 9, "Calibration and Control of Measuring and Test Equipment".

FP-16, Revision 9, "Identification and Marking of Pipe and Components".

- (2) During this reporting period, the Region III inspector reviewed the installation, inspection documentation, restraint calculation sheets, and as-built drawings for the following instrument sensing lines and found them to be adequate except as noted:

IPT-515, Pressure transmitter for Loop A feedwater pressure. Sensing line was installed per Isometric Drawing T322-IPT-515, Revision 5. Field weld FW-49 was welded by welder CO. Welder CO qualified on February 6, 1981 and his qualifications for GTAW and SMAW processes were current as of August 10, 1983. Condensate pot is at elevation 386'10". Sensing line leaves the condensate pot and goes up to elevation 395'8". This is poor practice. Condensate pot should be the high point in the system.

IPT-544, Pressure transmitter for Loop D. Sensing line was installed per Isometric Drawing T329-IPT-544, Revision 6. Sensing line leaves the condensate pot and goes up for approximately 10'. Again, this is poor practice.

IPT-533, Flow transmitter for feedwater flow to steam generator C. Sensing line installed per Isometric Drawings T319-IPT-0533, Sheet 1 - Revision 6 and Sheet 2 - Revision 5. Observed

a ventilation blower hanging from the sensing line approximately 2' from hanger 1FW95-091A. Immediate action was taken to remove the blower.

OPI-SX089, Flow indication for Chiller B, located in the Auxiliary Building at elevation 383'. Sensing line installed per Isometric Drawing T186-OPI-SX089, Revision 2. Selected heat numbers for piping and fittings and verified that documentation was available and traceable to the item.

OPI-W0025, Pressure indication for Chiller A, located in the Auxiliary Building at elevation 383'. Sensing lines installed per Isometric Drawing T193-OPI-W0025, Revision 2.

OLE-DO-024, Diesel Oil storage tank level, located in the Screen House. Installed per Isometric Drawing T157-OLE-DO-024, Revision 5. Torque wrench TW28, S/N 1425, was utilized to torque the flange bolts. Verified that the torque wrench was in current calibration on the date utilized, and no adjustments were necessary on the succeeding calibration.

OLE-DO-025, Diesel Oil storage tank level, located in the Screen House. Installed per Isometric Drawing T158-OLE-DO-025, Revision 5.

IPT-RY019, Pressure transmitter for primary system hydrogen tank. Installed per Isometric Drawing T397-IPT-RY019, Sheet 1 - Revision 3 and Sheet 2 - Revision 2.

IPT-RY021, Pressure transmitter for primary system hydrogen tank. Installed per Isometric Drawing T398-IPT-RY021, Sheet 1 - Revision 3 and Sheet 2 - Revision 2.

IPSL - SX024, Pressure switch for Essential Service Water. Installed per Isometric Drawing T118-IPSL-SX024, Revision 3. Drawing indicates a 8' 1-1/8" span between hangers IPI-SX020-H-78-4 and IPI-SX024-H-119-7. Maximum span between hangers is 6'6" per Specification F-2906. During walk down of the system, it was observed that an additional hanger (IPI-SX020\_H-119-15) had been installed per the drawing for the SX020 system. Verified heat numbers of the piping and fittings.

IPT-923, Pressure Transmitter for Safety Injection. Installed per Isometric Drawing T29-IPT-923, Sheets 1 thru 5, all Revision 1. Final review of this system was still in progress. During a review of the Weld and Inspection Record, it was observed that field welds 222 and 223 had not been visually inspected. These welds were inspected and accepted on August 11, 1983. During the walkdown of the system, it was observed that the piping was not supported for a span of approximately 14' between hangers H-2-6 and H-55-8. An instrument sensing line, ISI-C7BB, that runs parallel to line IPT-923 was in fact bent due to lack of

support and protection from other construction activities. PAP prepared Fabrication/Installation Surveillance (FIS) Report 2137 to document the damaged line. It was also observed that the instrument sensing line for the IPT-923 system was not identified in accordance with PAP procedure FP-16. PAP prepared FIS-2036 to document the lack of color code markings.

After observing the lack of support (hangers) for instrument sensing lines IPT-923 and ISI-C7BB, the Region III inspector met with PAP engineering to discuss their final review process. The inspector observed two systems where final review was in process and the engineer performing the review had noted that additional hangers were required to meet the specification requirements. It appears that PAP engineering would have identified the need for additional hangers in the IPT-923 and ISI-C7BB systems during the final review.

- (3) During this reporting period, the Region III inspector toured the PAP material storage areas. In the Level D storage areas, weed and grass cutting was in progress. During a tour of warehouse 4, Level B storage, a warehouseman (pipe fitter) informed the Region III inspector that there were numerous radioactive check sources in the warehouse. The following check sources were observed:

100 micro-curie, CS 137, source located in 1PR30J, Auxiliary Building Vent Stack WRGM.

100 micro-curie, CS 137, source located in 2PR30J, Auxiliary Building Vent Stack WRGM.

19.105 micro-curie (10.1 micro-curie CI-36, 9 micro-curie BA-133, .005 micro-curie AM-241) sources were located in 8 each, Radiation Monitors.

The inspector contacted Station Health Physics at approximately 11:35 a.m. on August 12, 1983, and informed them of the sources in warehouse 4. The Station Health Physics was also informed that the inspector would inform the Region III Facilities Radiation Protection Section for follow-up of this matter. The inspector contacted the Radiation Protection Section at approximately 1:15 p.m. on August 12, 1983.

The PAP material storage areas were generally acceptable.

B. Hatfield Electric Company (HECo)

- (1) During this reporting period, the Region III inspector reviewed the following HECo procedures and found them to be adequate, except as noted:

No. 4, Revision 11, dated April 11, 1983, "Drawing Control". In paragraph 5.13, it is not clear as to the action taken to remove superseded documents from the field.

No. 6, Revision 11, dated October 9, 1982, "Reporting of Damaged or Nonconforming Material or Equipment". It is not clear in this procedure how nonconforming items are controlled to prevent their inadvertent use or installation when documented on a Deficiency Report (DR).

No. 9C, Revision 1, dated November 22, 1982, "Class I Cable Pan Cover Installation". Cables are being inspected under the housekeeping procedure (No. 30) prior to cable pan cover installation. A step needs to be added in procedure 9C to verify that the cables are inspected per procedure 30 prior to installation of pan covers. This would apply to initial cover installation and to any rework evolutions.

No. 9E, Revision 10, dated September 30, 1982, "Class I Cable Pan Identification".

Procedure comments were discussed with the licensee and they agreed to consider the inspector's comments during the next procedure revision.

C. Commonwealth Edison Company (CECo)

- (1) During this reporting period, the Region III inspector reviewed the last 3 CECo. audits of HECO.

Audit 6-83-08 was conducted on February 22-25 and 28, 1983. This audit identified certification problems with two HECO. QC inspectors. The audit finding was closed on June 3, 1983 by CECo. Surveillance Report 4498. Actions taken appeared to be adequate.

Audit 6-83-16 was conducted on April 12 and 18, 1983. As of August 16, 1983, the three findings and two NRC observations were still open. The findings and observations are as follows:

- Finding a.1 QC accepted a pan to hanger attachment that was not in accordance with the installation drawing.
- a.2 Pan routing points were not inspected prior to pulling cable.
- a.3 Cables were temporarily supported in a cable pan riser and QC signed-off that inspection attribute as being acceptable.
- Finding b. Pan to hanger welds were not acceptable and QC failed to identify this fact.
- Finding c. HECO. NCR 511 was closed based on CECo. NCR 756 but NCR 756 did not have an approval for the proposed corrective action.

- Observation a. Splice plate bolts were not pulled flush with the splice plate.
- Observation b. Cables were pulled prior to CECO approval of an applicable FCR.
- Observation c. The Lead Inspector released cable pulls but in some cases, the inspection was performed by a different inspector. Training was conducted and this item was closed on July 27, 1983.
- Observation d. QC failed to document pull-back of cables. Training was conducted and this item was closed on July 28, 1983.

Audit 6-83-22 was conducted on June 21-24, 1983. As of August 10, 1983, the finding (HECo. had not documented secondary erection tolerances on FCRs in a timely manner) was still open.

The CECO audits of HECo. appeared to be adequate but closure of the findings and observations should be expedited by HECo and CECO.

- (2) During this reporting period, the Region III inspector reviewed the final documentation package for ESF Sequencing and Actuation Cabinets and Remote Shutdown Control Panels. These items were purchased from Harlo Corporation under Specification F/L 2802. A checklist for documentation requirements was utilized to verify documentation acceptability. When all documentation required by the subject specification has been received, reviewed, and accepted by Sargent and Lundy (S&L), S&L sends an acceptance letter to the Byron QA Superintendent. The Seismic Test Reports and Environmental Qualification Reports are on file at S&L and were not reviewed by the inspector during this reporting period. Documentation on-site appears to meet the specification requirements.
- (3) During a review of the final documentation review log maintained by Byron Station QA Department, it was observed that as of August 9, 1983, only 18 documentation packages had been final reviewed and accepted by S&L and CECO. CECO is planning to audit S&L during the week of September 12, 1983. Part of this audit will be devoted to S&L's progress in reviewing final documentation packages to support loading fuel in Unit 1. This item is open pending a review of final documentation acceptance by S&L and CECO. This item must be closed prior to fuel loading (50-454/83-37-01).

4. Open Items

Open items are matters, not otherwise categorized in the report, that need to be followed up on in future inspections. Open items disclosed during this inspection are discussed in Paragraph 3.c.(3).

5. Exit Interview

The inspector met with licensee representatives (denoted under Paragraph 1) on August 19, 1983. The inspector summarized the scope and findings of the inspection. The licensee representatives acknowledged this information.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELL ROAD  
GLEN ELLYN, ILLINOIS 60137

APR 16 1984

Docket No. 50-454  
Docket No. 50-455

Commonwealth Edison Company  
ATTN: Mr. Cordell Reed  
Vice President  
Post Office Box 767  
Chicago, IL 60690

Gentlemen:

This refers to the special safety inspection of portions of the Byron QC Inspector Reinspection Program and of other matters conducted by Messrs. K. D. Ward and J. W. Muffett of this office on January 24-26, March 8-9, 27 and April 12, 1984 at Sargent and Lundy Engineers in Chicago and on February 16-17, 22, March 12-16 and April 11-12, 1984, at the site of activities at Byron Station, Units 1 and 2, authorized by NRC Construction Permits No. CPPR-130 and No. CPPR-131 and to the discussion of our findings with Mr. G. Sorenson at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

Based on the results of all of the Region III activities and inspections referenced and documented in the attached report, we conclude that the actions proposed by Commonwealth Edison Company in response to the noncompliance identified as 454/82-05-19; 455/82-04-19 have been satisfactorily completed and this item is closed. As stated in the Summary and Conclusion of the attached report we believe that the Reinspection Program has demonstrated that the safety related components and systems at the Byron site are of acceptable quality.

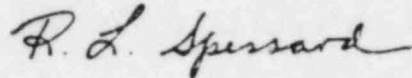
In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter and the enclosed inspection report will be placed in the Public Document Room.

*Leave Repo. #3*  
*6-20-84*

APR 16 1984

We will gladly discuss any questions you have concerning this inspection.

Sincerely,



R. I. Spessard, Director  
Division of Engineering

Enclosure: Inspection Reports  
No. 50-454/84-13 and  
No. 50-455/84-09

cc w/encl:

D. L. Farrar, Director  
of Nuclear Licensing  
V. I. Schlosser, Project Manager  
Gunner Sorensen, Site Project  
Superintendent  
R. E. Querio, Station  
Superintendent  
DMB/Document Control Desk (RIDS)  
Resident Inspector, Rill Byron  
Resident Inspector, Rill  
Braidwood  
Phyllis Dunton, Attorney  
General's Office, Environmental  
Control Division  
Ms. Jane M. Whicher  
Diane Chavez, DAARE/SAFE  
R. Rawson, NRR



U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/84-13(DE); 50-455/84-09(DE)

Docket Nos. 50-454; 50-455

Licenses No. CPPER-130; CPPER-131

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, IL 60690

Facility Name: Byron Station, Units 1 and 2

Inspection At. Byron Site, Byron, IL  
Sargent and Lundy Engineers, Chicago, IL

Inspection Conducted: January 24-26, February 16-17, 22, March 8-9, 12-16,  
27, and April 11-12, 1984

*K. D. Ward*  
Inspectors: K. D. Ward

4/16/84  
Date

J. W. Muffett

\_\_\_\_\_  
Date

*D. H. Danielson*  
Approved By: D. H. Danielson, Chief  
Materials and Processes Section

4/16/84  
Date

Inspection Summary

Inspection on January 24-26, February 16-17, 22, March 8-9, 12-16, 27, and April 11-12, 1984 (Reports No. 50-454/84-13(DE); 50-455/84-09(DE))

Areas Inspected: Review of licensee actions on QC Inspector Reinspection Program; review of licensee action on previous inspection findings, IE Bulletins, and 10 CFR 50.55(e) items; followup on allegations; review of reactor vessel internals welding. The inspection involved a total of 158 inspection hours by two NRC inspectors.

Results: No items of noncompliance or deviations were identified.

## SUMMARY AND CONCLUSIONS

### PURPOSE

The purpose of this report is to document the Region III actions taken to assure that the Byron Reinspection Program was properly carried out, and to document the Region III review, evaluation and follow up of the "Report on the Byron QC Inspector Reinspection Program," dated February, 1984 submitted by Commonwealth Edison Company (CECo).

### BACKGROUND

A special Region III team inspection conducted in March and April, 1982 revealed deficiencies which resulted in an item of noncompliance. Specifically, Byron site contractors had deviated from commitments to Regulatory Guide 1.58 stated in the FSAR, the Commonwealth Edison Company Quality Assurance Program and ANSI N45.2.6-1978. The notice of violation transmitted with Region III Inspection Report No. 50-454/82-05; 50-455/82-04 stated, "Certain contractor QA/QC supervisors and inspectors were not adequately qualified and/or trained to perform safety related inspection activities."

Section 2.h. of Region III Inspection Report No. 50-454/82-05; 50-455/82-04 describes the inspection and inspection findings related to QC inspector effectiveness. The stated inspection objectives were to determine if:

- a. any problems exist that inhibit an inspector from properly executing his assigned functions.
- b. the training, qualifications, and certification of QA/QC personnel working for contracting organizations to the licensee are in compliance with 10 CFR 50, Appendix B; ANSI N45.2.6-1978; ANST SNT-TC-1A; USNRC Regulatory Guide 1.58; USNRC Generic Letter 81-01; CECo Quality Assurance Program Manual; CECo Response to Generic Letter 81-01 (L. O. DelGeorge to D. G. Eisenhut-August 17, 1981); and Contractor Quality Assurance Manuals.

These objectives were accomplished by the Region III inspector randomly selecting thirty QC inspectors, at least one from each contractor working at Byron. The records for their training, qualification and certification were examined, and they were interviewed by asking each to answer a standard set of questions. One of the thirty inspectors stated that he did not feel his training was adequate for the work activity he was required to perform. A majority stated that although their training was not the best, if they needed additional guidance or clarification management would provide the information immediately. Other interview results did not reveal significant problems that would have an adverse impact on inspector effectiveness. Of the inspectors interviewed 54% had worked onsite for greater than one year and 30% for greater than two years. All of the interviewed inspectors expressed their opinion that the overall finished product of their contractor met or exceeded minimum acceptable standards.

The contractor QC inspector certification records were reviewed and many deficiencies were identified, including:

- a. Some records did not document verification of previous work history and employment, and/or education.
- b. Some records did not document training received prior to certification.
- c. Some evaluations and justifications for certification were incomplete.
- d. One certification record did not indicate the activities which the inspector was certified to perform.
- e. Some certification records included open book examinations that did not demonstrate or result in an adequate level of knowledge.
- f. Some certification records did not support adequate testing prior to certification.

Similar deficiencies were identified for some contractor QC supervisor records, and one contractor QA manual did not require training and certification to ANSI N45.2.6-1978. The Region III inspector concluded, "...an effective program does not exist to ensure that a suitable evaluation of initial capabilities is performed, that written certification is provided in an appropriate form, and that qualification criteria is established."

In response to the identified problems CECO took action to upgrade the contractors QA/QC programs and to assure that inspectors working at Byron after September, 1982 were properly certified. Existing contractor records were not sufficient to determine whether inspectors working prior to September 1982 were certifiable or not. As a result CECO proposed to conduct the Reinspection Program described in Mr. Stiede's letter to Mr. Keppler, Regional Administrator of Region III, dated February 23, 1983. The development of the Reinspection Program took into consideration that safety related hardware problems attributable to QC inspector ineffectiveness had not been identified in Region III inspections. The purpose of the Reinspection Program was to determine whether prior to September 1982, inspectors who may have not been properly certified overlooked significant safety related hardware problems in their inspections. The Reinspection Program consisted of randomly selecting one of every five QC inspectors from Byron contractors performing safety related work from 1976 to September 1982. The Region III Senior Resident inspector selected 2 to 4 additional inspectors for each contractor to be added to the random sample of inspectors. The accessible inspections conducted by these inspectors for their first 3 months of inspections were reinspected and if at least 90% of the subjective or 95% of the objective reinspections agreed with the original inspection the inspector was considered to have been qualified and no more of his work was reinspected. If the reinspection did not agree with the original inspections in greater than 90% or 95% of the cases, provisions were made to increase the sample size until the acceptance criteria were met, or all of the inspectors work was reinspected.

## SUMMARY OF REGION III INSPECTIONS TO MONITOR REINSPECTION ACTIVITIES

Region III expended a large amount of inspection resources to assure that the Reinspection Program was properly conducted, that identified deficiencies were properly evaluated and dispositioned, that potential adverse trends were detected, and that the results of the program were accurately documented and evaluated. Table 1 is a chronology of Region III inspection activities conducted throughout the Reinspection Program. The resident inspection staff and regional specialist inspectors in welding, NDE, piping and components, structural, electrical, and instrumentation and control took part in the inspection effort. Seven Region III inspectors spent greater than 100 man-days at the Byron site and at the Sargent and Lundy office monitoring the reinspection program and the evaluation and disposition of identified discrepancies. No further items of noncompliance related to contractor QC inspector effectiveness were identified during these inspections.

During the conduct of the Reinspection Program, it was necessary for CECO and the contractors to provide guidance for the implementation of the program. These guidance memoranda and instructions were documented, and the Region III inspectors reviewed all of these and found no significant problems (Details I and II of this report discuss this matter).

While the Reinspection Program was in progress, Region III conducted inspections into allegations which had the potential for providing insight into QC inspector certification. Most of these allegations were not substantiated. For those that were substantiated, nothing was brought to CECO's or Region III's attention that indicated that the Reinspection Program was not adequate. (Region III Inspection Report Nos. 50-454/83-09, 50-455/83-07; 50-454/83-13, 50-455/83-11; 50-454/83-21, 50-455/83-16; 50-454/83-29, 50-455/83-22; 50-454/83-41, 50-455/83-31; 50-454/84-05, 50-455/84-04 and Details Section I of this report discuss this matter.)

A major focus of the Region III inspections were the subjective weld inspections and the evaluation and disposition of deficiencies identified. The Region III inspector personally inspected over 800 welds, including those with and without identified discrepancies. He found no welds identified as free of discrepancies that should have been classified otherwise. He found the reinspection effort to be conservative in identifying weld discrepancies stating, "...in many cases the reinspections were overly conservative and inspectors were classifying weld attributes as unacceptable which, in fact, were acceptable under the AWS Code." (See Region III Inspection Report No. 50-454/83-39; 50-455/83-29.) The Region III inspectors reviewed in detail the weld discrepancies that were being dispositioned by judgement or calculations, and identified no significant problems or points of disagreement. The inspectors concluded from this review that there were no violations of FSAR commitments with respect to applicable Code adherence. To gain additional confidence in the quality of welds that were inspected by subjective methods Region III asked the licensee to do additional things outside of the Reinspection Program. For example: perform a detailed engineering evaluation of the fifty Hatfield welds with the lowest design margins to verify that they comply with the applicable codes and design requirements, and perform a detailed engineering evaluation of a representative sample of Hatfield welds not included in the Reinspection Program to verify that design requirements were met. The Region III inspectors have identified no significant areas of

disagreement with these evaluations (See Details Sections I and II of this report and Region III Inspection Report Nos. 50-454/84-05, 50-455/84-04; 50-454/83-39, 50-455/83-29.)

On January 12, 1984 CECo submitted a summary report of the reinspection which was reviewed by Region III and discussed with CECo in a public meeting on January 27, 1984. Region III comments and questions on the summary report were documented in a letter from Mr. Spessard to Mr. Reed on February 3, 1984.

CECo submitted the final "Report on the Byron QC Inspector Reinspection Program", dated February, 1984 to Region III on February 24, 1984. This report has been reviewed by Region III. As a result of this review, certain areas were selected for additional followup and inspection to provide additional confidence in the Reinspection Program. This additional followup and inspection is documented in Details Sections I and II of this report.

#### CONCLUSIONS

Based upon the Region III inspections and the review of "Report on the Byron QC Inspector Reinspection Program," dated February, 1984 it is concluded that:

- (1) The Byron Reinspection Program was conducted in accordance with the program described in Mr. Stiede's letter to Mr. Keppler dated February 23, 1983 as modified by the Region III letter to Commonwealth Edison dated March 22, 1983.
- (2) The final report accurately describes the reinspection results and the evaluation and disposition of identified discrepancies. Region III is in agreement with the disposition of these discrepancies.
- (3) The contractor QC inspectors who may not have been properly certified prior to September, 1982 did not overlook significant safety related hardware deficiencies.
- (4) The safety related work done by Byron contractors is of acceptable quality.

It is concluded that the licensee has taken adequate corrective action to resolve the noncompliance identified as 454/83-05-19, 455/82-05-19 and the matter is considered closed.

TABLE 1-

BYRON REINSPECTION PROGRAM

REGION III - CHRONOLOGY OF ACTIVITIES

February 23, 1983	CECo letter to Region III describing actions to be taken in response to site contractor QC inspector certification/training deficiencies.
March 22, 1983	Region III letter to CECo accepting proposed actions with stipulations that inspector sampling be conservatively biased by Region III additions to inspector sample.
March 10, 1983	Senior Resident Inspector selected a minimum of three QC inspectors to be added to the CECo random sample of inspectors for each contractor included in the Reinspection Program. (Region III Inspection Report Nos. 50-454/83-13; 50-455/83-11 and 50-454/83-26; 50-455/83-19)
March 15, 1983	CECo began Reinspection Program.
March 21, 28-31, 1983	Region III specialist inspector (welding, NDE) observes reinspection of instrumentation (PAP) contractor welding inspections (Region III Inspection Report No. 50-454/83-15; 50-455/83-13).
March 21-25 and April 4-8, 1983	Region III specialist inspector (electrical, I&C) inspects Reinspection Program results for instrumentation (PAP) and electrical (HECo) contractors (Region III Inspection Report No. 50-454/83-16).
June 7-10, 1983	Resident Inspector staff conducted an inspection and review of the Reinspection Program results for all site contractors (Region III Inspection Report No. 50-454/83-26; 50-455/83-19).
August 8-19 and September 7-9, 1983	Region III specialist inspector (electrical, I&C) conducted an inspection and review of Reinspection Program results for I&C (PAP) and electrical (HECo) contractors (Region III Inspection Report No. 50-454/83-37).
August 3, 4 and 8, 1983	Resident inspector staff reviewed electrical (HECo) Reinspection Program holding discussions with QC inspectors involved in the reinspection activities (Region I.I Inspection Report No. 50-454/83-38; 50-455/83-28).

<p>August 8-12, 15-19, 22, 23, and 29, 1983; September 2, 8-9, 12-15, 22, and 26-28, 1983; November 16, 17, and 22, 1983</p>	<p>Region III specialist inspectors (welding, structural, mechanical) conducted inspection and review of the Reinspection Program including evaluation and resolution of identified discrepancies. Region III welding inspector independently examined 500 welds that had been reinspected by several contractors including 53 worst case welds (Region III Inspection Report No. 50-454/83-39; 50-455/83-29).</p>
<p>September 22, 1983</p>	<p>Meeting at Byron between CECo and Region III staffs and management to review results of the program including analysis of discrepancies (Region III Inspection Report No. 50-454/83-39; 50-455/83-29).</p>
<p>October 28, 1983</p>	<p>CECo preliminary report issued (Region III Inspection Report No. 50-454/83-39; 50-454/83-29).</p>
<p>November 10, 1983</p>	<p>Telecon between Region III and CECo and letter giving Region III comments on preliminary report of October 28, 1983. (Region III Inspection Report Nos. 50-454/83-39; 50-455/83-29 and 50-454/84-05; 50-455/84-04).</p>
<p>January 12, 1984</p>	<p>CECo issues "Report on the Byron QC Inspector Reinspection Program."</p>
<p>January 17-20, 1984</p>	<p>Region III specialist inspector (welding) review and inspection of reinspection results and evaluation of discrepancies for all contractor weld reinspections (Region III Inspection Report No. 50-454/84-05; 50-455/84-04).</p>
<p>January 27, 1984</p>	<p>Public meeting between the CECo and Region III staffs and management to review summary reinspection report.</p>
<p>February 3, 1984</p>	<p>Letter from Region III to CECo providing comments and questions on summary reinspection report.</p>
<p>February 24, 1984</p>	<p>CECo reissues final report based on Region III comments and questions of February 3, 1984.</p>
<p>January 24-26, 1984 February 16, 17 and 22, 1984 March 8, 9, 12-16, and 27, 1984 and April 11-12, 1984</p>	<p>Region III specialist inspectors (welding and mechanical) followup on final reinspection report, including evaluation and disposition of discrepancies (Details Section I &amp; II of this inspection report).</p>

DETAILS--

1. Persons Contacted

Persons Contacted at Sargent and Lundy Engineers

Sargent and Lundy Engineers (S&L)

\*H. McCulloha, QAD  
\*D. Demoss, Mechanical Project Engineer  
\*C. Lim, PMD  
\*F. Bodhoth, EPED  
\*R. Hooks, Structural Engineer Division  
\*T. Ryan, Structural Project Engineer  
B. Treece, Electrical Project Engineer  
R. Netzel, Senior Structural Project Engineer  
T. Thorsell, Senior Electrical Project Engineer  
W. Cleff, Project Manager  
R. Johnson, QA Coordinator  
A. Morcos, Assistant Head QA Division  
R. MarShalla, Structural Engineer  
D. Patel, Supervisor Design Engineer  
W. Cleer, Project Manager  
D. Leone, Project Director  
R. Rosjal, Assistant Manager Structural Department  
E. Andruszkiewkz, Met. Welding Engineer  
F. Kosik, QC  
J. Kelnosky, Electrical  
F Gogliotti, EPEP

Commonwealth Edison Company (CECo)

B. Shelton, Project Engineer Manager  
D. Farrar, Director of Nuclear Licensing  
N. Kaushal, Projects

Personnel Contacted at Byron Site

Commonwealth Edison Company (CECo)

\*G. Sorenson, Construction Superintendent  
K. Hansing, QA Superintendent  
R. Tuetken, Startup Coordinator  
R. Klinger, QC Supervisor  
E. Martin, QA Supervisor  
J. Binder, Project Electrical Supervisor  
J. Woldridge, QA Supervisor  
P. Myrda, QA Supervisor

Hatfield Electric Company (HECo)

J. Spangler, Lead Welding Inspector (PTL)



The inspectors also contacted and interviewed other licensee and contractor employees.

\*Denotes those attending the final exit interview at S&L on April 12, 1984 and at the Byron site on April 12, 1984.

2. Exit Interview

The inspectors met with representatives (denoted in Persons Contacted paragraph) at the conclusion of the inspections. The inspectors summarized the scope and findings of the inspections noted in this report.

3. Functional or Program Areas Inspected

The details of this inspection are documented in Sections I and II.

## Section 1

Prepared by K. D. Ward

Reviewed by D. H. Danielson, Chief  
Materials and Processes Section

### 1. Licensee Action on Previous Inspection Findings

- a. (Closed) Noncompliance (454/82-05-19; 455/82-04-19): The Reinspection Program conducted as a result of concerns defined in Region III Inspection Report No. 50-454/82-05; 50-455/82-04 associated with the qualification and certification inspection personnel is completed.

An extensive program of reinspections was agreed upon and documented in a CECo letter to NRC Region III dated February 23, 1983. The deficiencies in the training and certification of QC inspectors called into question the initial capabilities of some inspectors. The program was initiated to determine whether these deficiencies resulted in the QC inspectors overlooking significant safety deficiencies in their inspection work.

The Reinspection Program began February 22, 1983, by meeting with contractors to identify purpose and content of the activities to be performed. The individual inspectors whose work was selected to be reinspected were established, and the process of record search to identify individual inspections to be reinspected was initiated.

A preliminary report dated October 28, 1983, was submitted to the NRC-Region III office. Comments on the preliminary report were identified in NRC-Region III letter dated November 18, 1983. One additional HECo, one Hunter and four PTL weld inspectors had to be selected and their first 90 days of work reinspected to complete the reinspection activities. The reinspection activities of these weld inspectors are now completed.

Based on the inspection of welds by the NRC inspector for Hunter and PTL activities (See Region III Inspection Report No. 50-454/83-39; 50-455/83-29) and the amount of welds that the additional inspectors had examined it was decided that the NRC inspector should visually examine only the HECo welds. The added HECo weld inspector had inspected 5,070 welds during his first 3 months. Hatfield reinspected the 5,070 welds and found 656 of the welds did not meet specification. The 3rd party Level III inspected the 656 welds and found 501 of those welds did not meet specification. The NRC inspector reviewed the inspection records and visually examined the following 240 welds and basically found the same results as the 3rd party.

Weld Inspection Abbreviations -

Acc.	Acceptable
U/L	Unacceptable length
U/S	Undersize
M/W	Miss weld
O/G	Over ground
NPD	Not per detail
I/L	Insufficient length
CV	Concavity
D	Damaged
Pro	Unacceptable profile
O/L	Over lap
I/T	Incomplete throat
Por	Porosity
W/T	Welds together
W/I	Welds intersect
U/C	Under cut
C	Crater
S	Slag
L/F	Lack of fusion
N, P, DWG	Not per drawing

<u>Weld No.</u>	<u>Material Welded</u>	<u>Reinspection Results</u>	<u>3rd Party Agreed</u>	<u>3rd Party Disagreed</u>
H 190	(4 welds)	Tube steel to plate	Acc	
H 190	(4 welds)	Gusset to embed	Acc	
H 190	(3 welds)	Gusset plate to embed	Acc	
H 190	(1 weld)	Gusset plate to embed	U/L	U/L
H 683	(6 welds)	Angle iron to gusset plate	Acc	
H 683	(1 weld)	Angle iron to gusset plate	U/L	U/L
H 683	(1 weld)	Angle iron to gusset plate	U/S	U/S
H 683	(2 welds)	Plate to plate	Acc	
H 182	(4 welds)	Tube steel to plate	Acc	
H 182	(4 welds)	Gusset to embed	Acc	
H 191	(12 welds)	Tube steel to angle clips	Acc	
H 191	(4 welds)	Angle clips to web of beam	Acc	
H 186	(3 welds)	Gusset to embed	Acc	
H 186	(1 weld)	Gusset to embed	U/L	U/L
H 186	(8 welds)	Angle to plate	Acc	
H 186	(2 welds)	Plate to plate	Acc	
H 186	(20 welds)	Plate to channel	Acc	
TS 182	(20 welds)	Tube steel to angle clip	Acc	
TS 182	(1 weld)	Tube steel to angle clip	Missing	Missing
H 122	(16 welds)	Tube steel to unistrut	Acc	
H 122	(3 welds)	Tube steel to unistrut	U/L	U/L
H 122	(1 weld)	Tube steel to unistrut	Overground	Overground
H 122	(4 welds)	Plate to I beam	Acc	
H 122	(3 welds)	Plate to embed	Acc	
H 122	(1 weld)	Plate to embed	O/L	O/L
H 079	(2 welds)	Pan to unistrut	Acc	
H 079	(4 welds)	Pan to unistrut	Not per detail	Not per detail
H 566	(5 welds)	Angle to plate	Acc	
H 566	(2 welds)	Angle to plate	I/L	I/L
H 566	(1 welds)	Angle to plate	CV	Damaged
H 566	(5 welds)	T beam to I beam	Acc	
H 566	(1 weld)	T beam to I beam	Unacc profile	Unacc profile
H 566	(1 weld)	T beam to I beam	U/S, O/L	U/S, O/L
H 566	(1 weld)	T beam to I beam	U/S	U/S
H 128	(11 welds)	Tube steel to tube steel	Acc	
H 128	(1 weld)	Tube steel to tube steel	U/S	U/S
H 128	(3 welds)	Gusset to tube steel	Acc	
H 128	(1 weld)	Gusset to tube steel	U/S	U/S
H 141	(8 welds)	Pan to unistrut	Acc	
H 141	(1 weld)	Pan to unistrut	I/T, I/L	I/T, I/L
H 141	(1 weld)	Pan to unistrut	U/L	U/L

<u>Weld No.</u>	<u>Material Welded</u>	<u>Reinspection Results</u>	<u>3rd Party Agreed</u>	<u>3rd Party Disagreed</u>
H 102	(1 weld)	Pan to unistrut		
H 102	(7 welds)	Pan to unistrut		POR
H 640	(2 welds)	Plate to I beam		
H 640	(2 welds)	T beam to tube steel		
H 640	(2 welds)	Angle to plate		
H 640	(1 weld)	Angle to plate		
H 640	(1 weld)	Angle to plate	Welds together	Weld intersect
H 640	(1 weld)	Angle to plate	O/L, U/S	O/L, U/S
H 640	(2 welds)	Angle to plate	U/S	U/S
H 640	(1 weld)	Angle to plate	U/L	U/L
H 640	(1 weld)	Angle to plate	U/C	U/C
H 106	(6 welds)	Unistrut to pan	Acc	
H 106	(1 weld)	Unistrut to pan	1/T	1/T
H 106	(1 weld)	Unistrut to pan	C	C
H 146	(5 welds)	Pan to unistrut	Acc	
H 146	(1 weld)	Pan to unistrut	U/S	U/S
H 100	(3 welds)	Unistrut to pan	Acc	
H 100	(1 weld)	Unistrut to pan	O/L PROF	O/L PROF
H 177	(1 weld)	Unistrut to channel	Acc	
H 177	(1 weld)	Unistrut to channel	S	S
H 177	(2 welds)	Gusset to I beam	Acc	
H 107	(4 welds)	Pan to unistrut	Acc	
H 107	(2 welds)	Pan to unistrut	O/L	O/L
H 88	(1 weld)	Tube steel to plate	U/L, CV	U/L, CV
H 88	(1 weld)	Tube steel to plate	U/L	U/L
H 88	(1 weld)	Tube steel to plate	U/L, L/F, S	U/L
H 88	(1 weld)	Tube steel to plate	U/L, Not per dwg	U/L, Not per dwg
H 88	(4 welds)	Gusset to embed	Acc	
H 88	(7 welds)	Unistrut to channel	Acc	L/F, S

The NRC inspector reviewed the results of the reinspection program as it progressed. Results are presented in Region III Inspection Report Nos. 50-454/84-05, 50-455/84-04; 50-454/83-39, 50-455/83-29.

The performance and results of visual weld reinspections were reviewed by the NRC inspector. The review consisted of discussions with supervisors/lead weld inspectors, examination of original inspection records and reinspection records, and visual examination of 500 welds which had been reinspected by several companies. (Region III Inspection Report No. 50-454/83-39; 50-455/83-29).

All discrepancies identified as a part of the reinspection were corrected either by physical rework to correct the condition or by detailing the condition on nonconformance reports to perform engineering analysis to determine acceptability of the condition without correction (Ref. CECo letter dated February 24, 1984 to NRC). All welds that were repaired were also evaluated and it was determined that they would have met specification even if they had not been repaired. The determination as to the course of action employed to disposition the condition was a function of the estimate of the more cost effective path to resolution. That is, when it appeared that the cost to physically correct condition was less than the costs associated with detailing data and performing an engineering analysis, then physical correction was chosen, and vice versa.

Based on discussions with cognizant personnel, review of records and engineering evaluations, and verification inspection, documented in this Section and Section II below, no further NRC review is considered necessary at this item. This item is closed.

- (1) The NRC inspector and the NRC staff of Region III reviewed the final report on the Byron QC Inspector Reinspection Program, dated February 24, 1984. The Staff requested the NRC inspector to review and verify the following items taken out of the final CECo report. The first paragraph is a paragraph out of the final CECo report and the second paragraph is the NRC Findings. This same method continues into the report. The attached pages are out of the CECo final report and are located at the end of this report.

CECo's Final Report, Section IV, D. Page IV-6 (See Attached Page 1)

Hatfield Electric has completed the reconciliation of hanger and weld inspections, which are documented on the weld travelers. For hangers that have weld traveler cards with incomplete data, new inspections are being performed. These new inspections are in addition to, and outside the scope of, the Reinspection Program. These inspections are expected to be completed in March 1984. Audit No. 6-83-124 remains open pending completion of these inspections.

### NRC Findings

The NRC inspector reviewed the completed program, that was outside the scope of the Reinspection Program, for hangers that had weld traveler cards with incomplete data, and Audit No. 6-83-124 which was completed. The inspector found the program and audit acceptable. No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-1, Page 1 (See Attached Page 2)

### Category Y

No. Acceptable

By Judgment

### NRC Findings

Category Y was an evaluation based on engineering judgment by comparison of the discrepancy with design margins. Category Y contained some of the following weld discrepancies: crater, incomplete fusion, overlap, porosity, undercut, or underrun. Portions of the weld with these discrepancies were considered ineffective, and weld capacity was based on a reduced weld length. Engineering judgement was used to evaluate the weld discrepancies based on the available design margin in the weld and the reduced weld length which accounted for the assumed ineffective portions. An engineering evaluation was also made by the NRC on the above discrepancies (Ref. Section II of this Report) and found to be acceptable. The inspector reviewed documentation relative to the engineering judgment used to evaluate the weld discrepancies based on the available design margin in the welds and found it to be acceptable. The NRC inspector visually examined approximately 150 welds with the above discrepancies (Region III Inspection Report No. 50-454/83-39; 50-455/83-29). No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C.D5, Page C-6 (See Attached Page 3)

### Pittsburgh Testing

The engineering evaluation has shown that the welding inspected by Pittsburgh Testing is of good quality. In order to expand the data base and respond to specific questions asked by the NRC staff (refer to question Q7 in Appendix F), the additional inspections and detailed evaluations described in Exhibit C-2 are proceeding.

### NRC Findings

An engineering evaluation of the welding inspected by Pittsburgh Testing was also made by the NRC and found to be acceptable (Ref. Section II of this Report). The additional inspections and detailed evaluations are completed and were reviewed by the NRC inspector and also found acceptable. No further review is needed by the NRC, this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-2, D.5, Page 12  
(See Attached Page 4)

A detailed review of the reinspection records for all 905 discrepancies was made. This review indicated that there were no cracked welds. In order to achieve 95% reliability with 95% confidence, a statistical sampling plan was chosen in accordance with Military Standard 105D. The resulting sample size for the engineering evaluation was 64 welds. The sample was conservatively biased by including the 50 welds that the 3rd party inspector identified as having the most weld quality discrepancies. The remaining 14 welds were randomly selected. The remaining 841 discrepancies were reviewed to assure that the numbers and types of discrepancies within the sample were representative of the entire group.

### NRC Findings

An engineering evaluation was also made by the NRC. (Ref. Section II of this report). The NRC inspector visually examined 35 of the 905 discrepant welds (Region III Inspection Report No. 50-454/83-39; 50-455/83-29) and reviewed the licensee evaluation of all the discrepancies. The licensee's review was found to be acceptable by the NRC inspector. No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-2, D.5, Page 13  
(See Attached Page 5)

Pittsburgh Testing showed an undesirable failure rate for inspection of welds with overlap and undercut. The presence of overlap makes visual weld quality inspection more difficult. In order to confirm that welds with overlap are not masking other discontinuities, the 3rd party inspectors will select a suitable number of welds which represent the most severe cases of overlap. The overlapped portion of these welds will be removed by grinding and the weld will be reinspected. The results of this reinspection will be reviewed and evaluated. For undercut, the reduction in capacity was approximately 5%, which is insignificant.



### NRC Findings

The results of this reinspection were reviewed and also evaluated by the NRC inspector and were found to be acceptable. Approximately 50 welds identified as having overlap were ground to remove the overlap condition. The inspection performed on the welds after "overlap" was removed, did not result in any welds being rejectable for other attributes (such as lack of fusion, weld size, etc.). The NRC inspector also inspected several of the 50 welds and found them to be acceptable. No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-3, C.1.a, Page 3  
(See Attached Page 6)

### ASME Large Bore Butt Welds - ND

One discrepancy involved a 1/4-inch diameter region of porosity on a 42-inch diameter circumferential pipe weld. The code considers surface indications up to 1/16-inch in diameter as not relevant. The subject indications were all 1/64-inch to 3/64-inch in diameter which fall within ASME Class ND liquid penetrant examination acceptance criteria. This discrepancy was therefore determined to be acceptable since the visual reinspection acceptance criteria exceeded code requirements.

The second discrepancy involved a convex bead on a 30-inch diameter circumferential pipe weld. After grinding to remove the convexity, the weld was then examined by visual and liquid penetrant examination and determined to be acceptable.

The final discrepancy involved a section of weld at a pipe-to-weld neck flange joint which was reported to be under the surface of the flange. The weld was reported to be 1/32 inch under the surface of the flange over approximately 25% of the weld length. This occurred only on the flange side of the weld (the pipe side of the weld was acceptable). Flange surfaces commonly are out of exact round due to manufacturing tolerances. This results in the type of discrepancy identified; this is not considered a valid discrepancy because it does not conflict with design requirements or intent. No sharp discontinuities were noted at the flange joint. The observed weld discrepancy was, therefore, determined to be acceptable.

### NRC Findings

The NRC inspector reviewed the documentation on the above discrepancies and also visually examined the welds and found the documentation and welds acceptable. This item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-3, C.1.b, Page 4  
(See Attached Page 7)

The surface porosity was evaluated as acceptable based on the approved magnetic particle test for the weld. The visual reinspection acceptance criteria again exceeded code requirements. The slag inclusion at the toe of the weld had a depth of 0.012 inches and was buffed out; no weld repair was required. The Code required that minimum weld size not be violated. For the slightly undersized radiographic plug seal weld, the piping has been qualified with the actual seal weld (NC) size and determined to be acceptable.

A total of 19 ASME Class 3 (ND) discrepancies were reported. These included 14 fillet welds identified as undersized, 3 welds with undercut, and 2 welds with surface porosity. The 14 fillet welds identified as undersized meet design requirements and therefore are acceptable per the ASME Code design criteria. The 3 welds with undercut were evaluated and found not to be significant. The remaining 2 welds identified as having surface porosity were evaluated and found to be acceptable.

NRC Findings

The NRC inspector reviewed documentation for the above welds and visually examined 2 (NC) Hunter welds and 9 (ND) Hunter welds in which the NRC inspector was in agreement with the Level III. (Region III Inspection Report No. 50-454/83-39; 50-455/83-29). All the documentation reviewed was found to be acceptable. The design requirements were reviewed by the NRC and found to be acceptable. (Ref. Section II of this report.) No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-3, C.1.c,  
Pages 4 and 5 (See Attached Pages 7 and 8)

ASME Support Welds - NF

A total of 14 discrepancies were reported for ASME Class NF welds. Eight of these involved fillet weld length, three involved fillet weld size reduction, and one involved undercut. These observed discrepancies were evaluated on the basis of the actual design capacity of the associated supports with the observed weld discrepancies taken into consideration. All welds were determined to be acceptable.

One discrepancy involved paint on a weld which resembled a crevice that was not actually a discrepancy (upon removal of the paint), and hence was acceptable.

The final discrepancy involved a fillet weld joining a strut bracket to a steel plate. A portion (1-1/2 inches) of the 5-inch weld was reported to have lack of fusion and undercut along the steel plate. The actual length of specified weld for the bracket exceeded design requirements. The weld was determined to meet ASME Code design criteria when compared to the actual design requirements. Since the region exhibiting the lack of fusion consisted of excess weld, the support weld was found to meet the ASME Code design criteria and to be acceptable. In addition, the weld with the discrepancy was evaluated with respect to the maximum design capacity of the support component and was determined to be acceptable with a design margin of 2.

#### NRC Findings

The NRC inspector reviewed the documentation on the above welds and the design capacity. (Ref. Section II of this report). The documentation and the design capacity were found to be acceptable. No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-3, C.1.d, Pages 5 and 6 (See Attached Pages 8 and 9)

#### ASME Pipe Penetration and Reinforcing Saddles - MC, ND

One discrepancy was reported involving an ASME Class MC penetration closure plate weld. This discrepancy involved the weld joining the penetration closure plate to the pipe wall. A full penetration weld with a 5/8-inch by 3/8-inch reinforcing fillet was specified. The 3/8-inch leg was joined to the pipe surface. The discrepancy involved a 1/8-inch reduction in reinforcing leg length of the larger leg. The observed reduction in weld leg was evaluated (compared with actual design requirements) and determined to be acceptable.

The second discrepancy involved an ASME Class 3, 16-inch diameter pipe, reinforcing pad, attachment weld. The specified attachment weld was a 3/8-inch fillet attaching a 3/4-inch thick reinforcing pad to the pipe wall. Several sections of the weld were reported to be undersized by 1/16- to 1/8-inch. The entire weld was conservatively reduced in size by 1/8-inch resulting in a 1/4-inch fillet weld for evaluation (compared with actual design requirements). It was determined that the weld was acceptable with a design margin in excess of 30.

### NRC Findings

The NRC inspector visually examined the above welds and design requirements were reviewed by the NRC and found to be acceptable (Ref. Section II of this report). This item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-3, C.2.a, Page 7  
(See Attached Page 10)

The 68 ASME socket weld discrepancies were evaluated for compliance with ASME Code design criteria. All discrepancies involved a slight reduction in fillet weld size. In all cases, an evaluation was made to determine the minimum fillet weld size required by design. All fillet weld sizes were found to meet ASME Code design criteria.

### NRC Findings

The design criteria was also reviewed by the NRC and found to be acceptable (Ref. Section II of this report). No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-3, C.2.b, Page 7  
(See Attached Page 10)

### ASME Support Welds - NF

A total of 34 support weld discrepancies were identified for ASME Class NF welds for small bore piping supports. All 34 discrepancies involved undersized tubing U type strap hold down fillet welds. A 1/4-inch fillet weld was specified; however, the installed welds were undersized by as much as 1/16-inch. The strap welds were evaluated for the maximum design load and were determined to be acceptable.

### NRC Findings

The NRC also evaluated the design load and found the discrepancies to be acceptable. (Ref. Section II of this report.) No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix C, Exhibit C-3, C.2.c, Page 7  
(See Attached Page 10)

The minor reductions in the PAP weld leg with a resulting 1/32-inch to 1/16-inch reduction in weld size were conservatively evaluated on the basis of 1/16-inch less weld over the entire weld circumference. All welds met design requirements and ANSI B31.1 Code design criteria.

### NRC Findings

The NRC inspector visually examined the above weld and reviewed the ANSI B31.1 Code design criteria and determined that the weld was acceptable. The NRC inspector also visually examined 20 other PAP welds (Region III Inspection Report No. 50-454/83-39; 50-455/83-29). No further review is needed by the NRC, and this item is considered closed.

CECo's Final Report, Appendix F, Q3, Page F-2 (See Attached Page 11)

"Provide results of the Hatfield computerized data base established to reconcile weld travelers to hangers. (Page 19 of 1-12-84 Interim Report)."

#### Response:

The computerized data base is complete and is available on site. After completion of the review, it was found that direct correlation of weld traveler inspection records to design drawing cable pan hanger and conduit hanger data could not be made for approximately 2% of the data. The augmented efforts to achieve complete correlation is expected to be complete in March 1984.

### NRC Findings

The NRC inspector reviewed the Hatfield computerized data base established to reconcile weld travelers to hangers and found that the data was acceptable and that the correlation is completed. No further review is needed by the NRC, and this item is considered closed.

- (2) During the reinspection program there were several inspection acceptance criteria submitted to CECo for interpretations. The NRC inspector reviewed the items submitted and agreed with the interpretations. CECo also conducted an audit (#6-83-93) and two surveillances (#5700 and #5885) of these interpretations.
- b. (Open) Infraction (454/80-04-01; 455/80-04-01): Investigation of allegations. Identified CECo has not taken timely and effective corrective action with regard to SCC deficiencies. Waiting NRC review of seismic qualification reports, main control boards and vertical control panels report and main control room weldment reconciliation report. Also resolution of NCR 850 (i.e., Engineering Evaluation based on a statistical sample to determine that cable tray hanger welds meet design requirements).
- c. (Open) Violation (454/82-01-01): Penetrameters placed on weld area to be viewed by radiography. Region III requested NRR to make a decision on this by January 1983, and to date, there is still no decision.

- d. (Closed) Violation (454/82-05-17; 455/82-04-17): Weld parameter sheets not located at the activity site. Region III requested ASME to make a further clarification on the response that CECO had received from ASME. The inspector reviewed all related documents, including the ASME interpretation and found CECO's practices to be acceptable.
- e. (Closed) Allegation; Open Item (454/83-39-01; 455/83-29-01): Some hangers do not have weld travelers for the auxiliary steel.

NRC Findings

The allegation was substantiated; however, the problem was independently identified by the Hatfield quality program and corrective action initiated. To date approximately 4836 hangers have been inspected and found to be acceptable for Unit 1 and 572 hangers unacceptable including weld travelers missing. There are 17 hangers that have not yet been inspected. There were approximately 1026 hangers inspected and found to be acceptable for Unit 2 and 138 hangers unacceptable (includes weld travelers missing). There are 528 hangers that have not yet been inspected. Where the travelers are missing, the list is sent to the production group to have the weld travelers generated in accordance with NCR #540.

The NRC inspector reviewed the Hatfield quality program and the corrective action initiated. The weld travelers are being generated in accordance with NCR #540. No further review is needed by the NRC. This item is closed.

2. Licensee Action on 10 CFR 50.55(e) Item

(Closed) 50.55(e) 83-05 (454/83-05-EE): Preservice Inspection weld indications. The NRC inspector reviewed the final response dated December 6, 1983, and the data on several weld indications that had been found during the preservice inspection program. CECO letter from E. Swartz to Region III dated May 26, 1983, reported that several weld indications had been found during the preservice inspection program and CECO indicated that additional NDE would be performed. CECO letter from T. Tramm to H. R. Denton documented the results of all of the examinations and CECO's plans to repair the indications in the steam generators. CECO also provided basis for not pursuing repair of the pressurizer indications and requested NRC concurrence. The NRC inspector reviewed all the above and considered this item closed.

(Open) 50.55(e) 82-09 (454/82-09-EE; 455/82-09-EE): A potential interference problem exists between the ends of ITT Grennell pipe clamps and cylinder ends of Pacific Scientific shock arrestors used with Fig. 306/307 snubbers shipped prior to 1980 caused by oversized welds. At present, 3% of the mechanical snubbers with potential interference problems have been inspected on Byron Unit 1. So far, none of the snubbers inspected require redesign or repair. All inspections and any necessary changes will be completed prior to fuel load on each unit.

(Closed) 50.55(e) 83-13 (454/83-13-EE; 455/83-13-EE): Pacific Scientific snubber capstan springs failed dynamic test. Representatives of the NRC visited Pacific Scientific manufacturing facilities and discussed the capstan spring problem. The vendor had completed various metallurgical analysis and determined the questioned snubbers do in fact meet the design requirements. Based on the analysis there are no reportable deficiencies. This item is considered closed.

3. Licensee Action on IE Bulletins

(Closed) IE Bulletin 83-06 (454/83-06-BB; 455/83-06-BB): Nonconforming materials supplied by Tube Line Corporation facilities. The inspector reviewed the final response dated November 17, 1983 indicating that CECO had reviewed the lists of purchasing records for materials which may have been supplied by Tube Line. All Tube Line materials which had been received were returned to the vendor. This item is considered closed.

(Closed) IE Bulletin 83-07 (454/83-07-BB; 455/83-07-BB): Apparently fraudulent products sold by Ray Miller, Inc. The inspector reviewed the final response dated March 20, 1984. Based on a review of station and corporate purchasing records CECO believes that no apparently fraudulent Ray Miller Inc. materials were received at Byron Station. This item is considered closed.

4. Allegation

On November 23, 1983, a Level II Quality Control Inspectors employed by Pittsburgh Testing Laboratory detailed to Hatfield Electric Company contacted the Resident Inspector's Office and stated several allegations. The inspector closed several allegations in Region III Inspection Report No. 50-454/83-29; 50-455/83-29 and Report No. 50-454/84-02; 50-455/84-04. The following is a follow-up of a previous allegation.

(Open) Allegation: Open Item (454/84-02-02; 455/84-02-02): "General surveillance of this project illustrates that approximately 90% of the "B" welds on DV-164's are 1/8" undersize where tube steel has been used. In most cases this represents a 40% decrease in size and 55% in strength."

NRC Findings

This allegation is addressed in Region III Inspection Reports No. 50-454/83-39, on page 50, Item 7.j; No. 50-454/84-02, on page 11, Item s; and No. 50-454/84-04, on page 13, Item 5.a. The allegation could not be substantiated, however, when the inspector viewed the drawing of the DV 164's he observed DV 162 "B" welds below the DV 164's. Therefore, further review indicated additional inspection was needed to resolve this item.

The NRC inspector was informed that Systems Control fabricated approximately 2600, DV-162 "B" welds. (80% of DV-162 "B" welds onsite).

On March 14, 1984, CECO issued NCR F-893 which identifies the allegation included in Region III Inspection Report No. 50-454/83-39; 50-455/83-29 on DV-162 "B" welds fabricated by Systems Control which are installed on site and that may be questionable. The corrective action was to punch list all DV-162 "B" weld connections in Units 1 and 2 and reinspect/analyze a MIL-STD-105D sample of 100 connections to achieve a 95/95 level of reliability and confidence.

Approximately 95 connections out of 100 were visually examined to date (April 12, 1984) and approximately 50% of the welds were found acceptable. Weld mapping and analyzing is being performed on the unacceptable welds and an engineering evaluation of the adequacy of the installed connections is also being performed. This effort may be completed May 1, 1984.

The NRC inspector inspected several "B" welds with the S&L Level III while he was performing the inspections in accordance with the MIL-STD-105D sampling plan. This is the same Level III that performed visual inspection on the Reinspection Program.

After 95 of the welds were reinspected, the NRC inspector visually examined the following welds in Table I and agreed with the Level III's interpretations.



TABLE 1

## DV 162 "B" Welds

Hanger No.	Item No.	Weld Traveler No.	Hatfields Inspection	S&L 3rd Party Review	
				Agree	Disagree
76	69	51181	Under Size	Under Size	
76	7	51180	Crater & Profile		Acceptable
61	23	51237	Under Size & Nonfusion	Under Size	Overlap
10	33	51194	Under Size	Under Size	
51	1	51144	Overlap		Acceptable
28	26	51179	Under Size & Slag	Under Size	Acceptable
32	18	51162	Nonfusion		Acceptable
127	2	51216	Under Size	Under Size	
8	14	51174	Crater & Porosity	Crater	Acceptable
13	82	51213	Under Size & Crater	Under Size	Acceptable
13	30	51213	Under Size, Overlap & Nonfusion	Overlap	Acceptable
13	55	51213	Crater		Acceptable
132	26	51224	Overlap	Overlap	
132	28	51359	Acceptable		
132	37	51359	Acceptable		
89	57	51147	Acceptable		
30	81	51151	Acceptable		
121	53	51146	Acceptable		
6	49	51160	Acceptable		
50	25	51208	Acceptable		
22	43	51175	Acceptable		
7	17	51161	Acceptable		
7	75	51161	Acceptable		
7	83	51161	Acceptable		
22HV9	103	51164	Acceptable		

In the visual examination, the NRC inspector found that in many cases the reinspections were overly conservative and the HEC0 inspectors were classifying weld attributes as unacceptable which, in fact, were acceptable under the AWS Code. The 3rd party inspection was correcting most of the over calls as seen in Table I. Most of the unacceptable welds were beaver line. As an example, six qualified weld inspectors may call the unacceptable welds acceptable and six other weld inspectors with the same qualifications may call the same welds unacceptable.

5. Reactor Vessel Internals Unit #1

Nuclear Installation Services Company (NISCo) performed most of the fabrication of the internals at their main office in Florida and the installation at the site. Hunter Corporation did the piping and HEC0 did the electrical. The vessel head is on and the work is completed.

The inspector reviewed various procedures and the following items related to control rod guide tubes and instrument tubes, repair work and miscellaneous tackwelds and plugwelds, and conduit runs:

- . Field changes
- . Receiving and inspection reports
- . Process control sheets
- . Weld material requisition slips
- . Data reports including NDE reports
- . Material review reports
- . Support pin modifications

No items of noncompliance or deviations were identified.

## Section II.

Prepared by J. W. Muffett

Reviewed by D. Danielson, Chief  
Materials and Processes Section

### 1. Review of Calculation and Engineering Judgements

Commonwealth Edison's reinspection program as delineated in the "Report on the Byron QC Inspector Reinspection Program" dated February 1984 found a number of instances where either ASME code, AWS code or general design intentions were violated. In a number of these instances "Engineering Judgement" was used to determine the adequacy of the installation. In the remainder of these cases calculations were performed to demonstrate the adequacy of the installation. The basic purpose of this section of the report is to document the NRC review of these calculations and engineering judgements.

#### a. Initial Review

On January 24, 1984 an initial review was performed on calculations supporting the L.O. Del George letter of January 12, 1984 (which is basically an initial summary of the Reinspection Program).

The calculations were reviewed for technical methodology, completeness, and proper references.

A summary of the discrepancies reviewed (divided by contractor follows):

PITTSBURGH TESTING LABORATORY

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT? YES OR NO	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
PTL-2	PTL 11847	One concrete expansion anchor violates requirement for embedded length.		Yes	Plate assembly works with three of four CEA's.	Concur
PTL-1	PTL 11725	Two concrete expansion anchors rejected due to no end code. One CEA violates plumbness and bevel washer requirement.		Yes	One anchor plate assembly out of two is sufficient.	Concur
PTL-8	PTL 4800	One concrete expansion anchor violates 1/4" projection beyond nut requirement.		Yes	Sufficient capacity is developed by nut.	Concur
PTL-17	PTL 5044	All four concrete expansion anchors in an anchor plate assembly have reduced embedded length.		Yes	Hanger loads small. Anchor capacity is sufficient.	Concur
PTL-21	PTL 6146	Concrete expansion anchor does not meet requirements for bolt projection beyond nut.		Yes	Anchor satisfies torquing requirement, therefore sufficient capacity is developed by nut.	Concur
PTL-28	PTL 7091	Two concrete expansion anchors have reduced length. One anchor rejected due to plumbness, bolt projection and torque requirements. One anchor rejected for torque requirements.		No	One plate assembly with two concrete expansion anchors unable to establish length.	Concur

BLOUNT BROTHERS CORPORATION

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT?	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
				YES OR NO		
BBC-6	Q3-704	El. 407', R3 secondary shield wall Pt. #2, Det. 981, (Dwg. AB E117). Not installed to detail. Missing 3/8" fillet welds top & bottom flange to 3/4" plate. Right and left vertical side plate should be on piece.	N/A	Yes	Connection works without missing weld.	Concur
BBC-6	Q3-704	Both plates are cut into two pieces in field. Horizontal 1/2" plate should be installed. A bent plate installed in field.			Cutting of plates not critical. 1/2" plate not required.	Concur
BBC-11	Q3-709	El. 382' 2-3/4", R10 at secondary shield wall, Pt. #16, Det. 979. Detail calls for 1" clearance from crown of wall embed to edge of W14 flange. In field, clearance is 3/4". Detail calls for 8" clearance from crown of wall embed to back of horizontal plate. In field, distance is 7". Not installed to detail.	F42406	Yes	Change in clearance does not significantly affect beam. Reduction in length is not a problem.	Concur
BBC-18	Q3-717	El. 425' 10-1/2", at secondary shield wall. Detail calls for 3/4" x 8" x 8" bottom plate. In field, top plate is 3/4" x 6-3/4" x 9-1/2". Not install per detail.	F42411	Yes	Top plate works despite being 1" short.	Concur
BBC-21	Q3-723	Not installed per detail. Installed similar to Det. A-464-1.	F41970	Yes	Block wall tee capacity acceptable.	Concur

## HUNTER CORPORATION

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT?	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
				YES OR NO		
HC-59		ISO. SCC-100-10-A excessive bend, pipe ovality (9.7%) 3/4" pipe.	PMD CALC PSAG-24	Yes	NR 604 accepted by calculation PSAG-22 dated 11-7-83.	Concur
HC-60		ISO. SCC-100-52 excessive bend, pipe ovality (11.2%) 1 1/2" pipe.	PMD CALC PSAG-24	Yes	NR 604 accepted by calculation PSAG-22 dated 11-7-83.	Concur
HC-79		Whip restraint 1FWR-17 grinding below minimum wall on rods.	SED CALC 19.1.3	Yes	Minor dimensional discrepancy.	Concur
HC-87		Whip restraint 1MSP-14 dimension off by 5 3/4".	SED CALC 19.1.3	Yes	Same as HC-79.	Concur
HC-107		ISO HFSK-137 dimension off by 1 1/2".	EMD CALC 0044953	Yes	Same as HC-79.	Concur

## JOHNSON CONTROLS

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT?	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
				YES OR NO		
JC-1		AA-6 fit up gap between L and CEA is 1/8" and weld is 1/4" fillet.	SED CALC 19.1.3	Yes	Reduced weld stress calculation performed and accepted.	Concur
JC-10		AB-7 Missing weld across unistrut.	SED CALC 9.1.3	Yes	ECN 5573 makes weld across unistrut optional.	Concur
JC-20		IAB-151 Hanger attached 2 1/4" off of beam.	SED CALC 9.1.3	Yes	FCR F17114 approved beam off center attachment.	Concur
JC-21		IAB-164 Gap between end of unistrut and end of connection plate (1/8" to 1/4").	SED CALC 9.1.3	Yes	FCR F16313 approved gap max. load 7 lbs.	Concur
JC-27		AZ-1 Lack of weld penetration.	SED CALC 9.1.3	No	Lack of penetration is normally limited to either first and last 1/4" (or both) of weld. Weld was checked for reduced length.	Concur*
JC-28		AZ-Z Lack of weld penetration.	SED CALC 9.1.3	No	Same as JC-27.	Same as JC-27.

\* See paragraph 1.c.(1) of this section of the report.

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT? YES OR NO	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
JC-39		AC-2 Base metal gouged.	SED CALC 9.1.3	Yes	Angle weld checked for reduced length due to base metal gouging. Load 12 lbs 75% of weld length considered.	Concur



POWERS - AZCO - POPE

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT? YES OR NO	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
PAP-54		Hanger 1PT-SI048-32 Incomplete weld.	SED CALC 9.1.3	Yes	Incomplete weld acceptable per ECN 4835.	Concur
PAP-64		Hanger 1PT-SI048-35 Incomplete weld.	SED CALC 9.1.3	Yes	Incomplete weld acceptable per ECN 4835.	Concur

HATFIELD ELECTRIC COMPANY

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT?	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
				YES OR NO		
HE-3	2295	(1) Conduit bends. (2) Ground jumper. (3) Missing WS hgr.		Yes	(1) Excess bends OK (because allowable cable pulling tension was not exceeded.) (2) #2 AWG jumper OK for 1/0 AWG power conductor per NEC. (3) Missing hangers OK because installed hangers temporarily removed due to anchor failure.	Concur  Concur  Concur
HE-29	2264	Hgr. type/configuration.		Yes	Installed plate size meets design require- ments.	Concur
HE-34	2274	Hgr. type/configuration.		Yes	Installed plate size meets design require- ments.	Concur
HE-594	3304	Incorrect plate size recorded.		Yes	FCR approved - resolution required no hardware change.	Concur
HE-622	2477	Incorrect dimension recorded	23421	Yes	FCR approved - resolution required no hardware change.	Concur
HE-863	3379	Incorrect conduit size recorded.	23811	Yes	FCR approved - resolution required no hardware change.	Concur

RANDOM POPULATION NUMBER	DISCREPANCY REPORT NUMBER	DISCREPANCY DESCRIPTION	FCR NUMBER	ACCEPT? YES OR NO	SARGENT & LUNDY RESOLUTION	NRC RESOLUTION
HE-1159	2485	Incorrect tube-steel dimensions recorded.	23407	Yes	FCR approved - resolution required no hardware change.	Concur

In addition to the discrepancies in the preceding list and analyses of the five welds with the lowest factor of safety were reviewed in detail. These welds were:

<u>Weld</u>	<u>Factor of Safety</u>
E-19	1.0
E-55	1.0
ES-1	1.0
S-5	1.0
S-21	1.0

The detailed review of the initial reinspection report prompted a number of questions. These questions basically involved the scope and method of selection of welds for engineering analysis and also the exact number and type of ASME, ANSI and AWS code discrepancies.

- b. In February 1984 the final report concerning the Byron Reinspection Program was issued. This report dealt with the questions raised by the initial report.
- (1) The number of discrepant welds which had engineering evaluation, was increased from 100 to include all discrepant welds.
  - (2) An exact listing of all code discrepancies was provided.

The large number of calculations performed to support the final report required an indepth review. The types of discrepancies reviewed are as follows:

- . Welds acceptable by judgement
- . ASME fillet welds
- . ASME NF welds
- . ASME MC, ND welds
- . ASME socket welds (on various classes of piping)
- . AWS welds of various types of components

The following is a detailed listing of calculations reviewed.

HATFIELD ELECTRIC (ELECTRICAL)

Discrepancy No.	FCR No.	Inspector's Report No.	Description	NRC Resolution
HE-159 HE-932	F-23577		Relocate Support	Reviewed Calculation
HE-186 HE-991		2799 (Dwg 0-3362)	Change radius of conduit bend	Concur
HE-239 HE-221		4109 (Dwg 1-3361)	Change radius of conduit bend	Concur
HE-212				
HE-262		4122 (Dwg 1-3361)	2 Plates stacked instead instead of 1 plate	Reviewed Calculation
HE-268i		4110 (Dwg 1-3361)	Change member size	Reviewed Calculation
HE-1545 HE-293		2065 (Dwg 6E-0-3322)	Incorrect as built	Concur
HE-306		4106 (Dwg 6E-0-3322A)	Added spacer plate	Reviewed Calculation
HE-326 HE-1578		(DWG 6E-0-3322AD03 6E-0-3322C03)	Relocate support	Reviewed Calculation
HE-344		2175 (Dwg 6E-1-3331)	Anchor bolts as built crew 4 5/8 long; reinspection actual 4 1/2	Reviewed Calculation
HE-358 HE-435		2183 (Dwg 6E-1-3331)	Incorrect as built data	Concur
HE-691		4116 (Dwg 6E-0-3385)	Incorrect as built data	Concur
HE-736	FCR 23808	3041 (Dwg 6E-0-3361)	Incorrect as built data	Concur
HE-771	FCR 23808	3040	Incorrect as built data	Concur

Discrepancy No.	FCR No.	Inspector's Report No.	Description	NRC Resolution
HE-790	F 23616	2976	Incorrect as built data	Concur
HE-829		3373 (Dwg 6E-0-3381A)	Incorrect as built location and thickness	Reviewed Calculation
HE-576		4124 (Dwg 6E-0-3361)	Member too long	Reviewed Calculation
HE-1235 HE-1234 HE-1257 HE-1262		2357 (Dwg 6E-0-3314)	Incorrect as built data	Concur
HE-1276		2363 (Dwg 6E-0-3314)	Incorrect as built data	Concur
HE-1445 HE-1463		3303 (Dwg 6E-0-3323)	Incorrect as built data	Concur
HE-1621 HE-1622	FCR F-23722	3092	Change conduit bend radius	Concur
HE-1625		2128 (Dwg 0-3386A)	Relocate conduit support	Reviewed Calculation
HE-36	F 23283	2276	Member larger than required	Reviewed Calculation
HE-120		2224	Change member	Reviewed Calculation
HE-121		2219	No Calculation present calculation prepared during inspection	Reviewed Calculation

POWERS - AZCO - POPE (Structural)

Discrepancy No.	FCR No.	Inspector's Report No.	Description	NRC Resolution
PAP-3		1262	Fillet weld too small	Reviewed Calculation
PAP-53		1640	Incomplete fusion	Reviewed Calculation
PAP-99 PAP-100		1230	Undersized weld	Reviewed Calculation
PAP-109 PAP-110		1193	Undersized weld	Reviewed Calculation
PAP-129		1179	Undersized weld	Reviewed Calculation
PAP-130		No Report	Undersized weld	Reviewed Calculation
PAP-183		1857	Ripples, ridges and slag in weld	Reviewed Calculation
PAP-195		1930	Undersized weld	Reviewed Calculation
PAP-217		1393	Undersized weld	Reviewed Calculation
PAP-219		1368	Undersized weld	Reviewed Calculation
PAP-236		1384	Lack of fusion	Reviewed Calculation
PAP-357		2160	Leg of fillet weld shot	Reviewed Calculation
PAP-395		No Report	Acceptable under current criteria	Concur
PAP-414		1786	Insufficient leg and throat	Reviewed Calculation
PAP-443		2070	Undersized weld	Reviewed Calculation
PAP-454		1943	Plate installed incorrectly causing undersized weld	Reviewed Calculation

Discrepancy No.	FCR No.	Inspector's Report No.	Description	NRC Resolution
PAP-522		No Report	Excessive undercut	Reviewed Calculation
PAP-555		1229	Lack of fusion	Reviewed Calculation
PAP-593		1481	Welds in wrong places	Reviewed Calculation
PAP-621		2142	Insufficient throat	Reviewed Calculation
PAP-658		1380	Undersized weld	Reviewed Calculation
PAP-711		2036	Gap between components reduces weld	Reviewed Calculation
PAP-733		1245	Coarse ripples, ridges, and slag.	S&L calculation reduced* throat dimension length should be reduced
PAP-762		1865	Weld not "all around" as per detail	Reviewed Calculation
PAP-778		2189	Weld not "all around" as per detail	Reviewed Calculation
PAP-850		964	Ripples, grooves, overlap scale and slag	S&L calculation reduced* throat dimension length should be reduced

\* See paragraph 1.c.(3) of this section of the report.



POWERS - AZCO - POPE (Mechanical)

Discrepancy No.	FCR No.	Inspector's Report No.	Description	NRC Resolution
PAP-849		1002	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-802		1097	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-266		1131	Undersized socket weld (Class B)	Reviewed Calculation
PAP-822		1131	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-25		1329	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-526		1387	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-164		1415	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-178		1422	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-472		1434	Undersized socket weld (Class B)	Reviewed Calculation
PAP-133		1463	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-678		2170	Undersized socket weld (Class 4)	Reviewed Calculation
PAP-775		1516	Undersized socket weld (Class 4)	Reviewed Calculation

All reviewed calculations were essentially correct except where noted. The review also included the following calculation "Hunter Subjective Welding Discrepancy Evaluation" BRP-1. This calculation included:

- 30 Small bore fillet welds
- 3 Large bore butt welds
- 14 ASME NF supports
- 4 ASME ND or MC penetrations
- 1 Calculation (EMD-044969) which develops stress intensification factor for discrepant weld

After completion of review of the calculations it was determined that in 50 instances the original inspector had missed an incomplete weld, a difference in configuration or both. Although this is a very small number on a percentage basis more inspection was performed to insure that the 50 errors had not all been of one type or the work of one inspector. The following table summarizes the types of discrepancies and the inspector responsible. After review it appears that no discernible pattern of inspector error had developed.

Description	Quantity
Length of weld short by 3/4" or less	23
Length of weld short by more than 3/4"	2
2 x 2 angle installed in lieu of 3 x 2	7
Fillet weld slightly undersized	5
Stiffeners omitted	6
Mislocated off Beam	2*
Fit-up gap	1
CEA relocation exceeds 2d	4
	50

\* Includes one item with mislocation and stiffener omitted.

Significant Discrepancies Per Original Inspector

Inspector	Item #	Attribute
A	22 1	5.1 Weld short in length by 1/4"
B	34 2	5.1 Requires stiffeners - not installed
B	35 3	5.3 Stiffener omitted
B	36 4	5.2 Requires stiffeners: not installed
B	41 5	5.3 Stiffeners omitted
B	42 6	5.1 Length of weld short by 1 1/2"
B	48 7	5.2 3 x 2 x 3/8 stiff. called out 2 x 2 x 1/4 installed
B	120 8	5.2 CEA relocation accep. per FCR 18163
A	121 9	5.2 Anchor location exceeds 2d requirement
A	122 10	5.2 Anchor location exceeds 2d requirement
A	124 11	5.2 Anchor location exceeds 2d requirement
C	125 12	5.1 Weld short in leg
D	126 13	5.1 Weld inside web does not have the req. 1/4" fillet
D	127 14	5.1 Weld 3/8" short in length
E	128 15	5.1 Weld 3/8" short in length
F	130 16	5.2 Hgr not inst. on center of beam emb - also stiffeners missing
F	131 17	5.2 Not centered on beam
F	132 18	5.2 Item #3 omitted (stiffener)
F	133 19	5.2 No stiffeners
D	175 20	5.1 Weld 1" short in length
D	179 21	5.2 2 x 2 x 3/8 angle iron installed in lieu of 3 x 2 x 3/8
D	180 22	5.2 2" x 2" x 3/8" L installed in lieu of 2" x 3" x 3/8"
D	181 23	5.2 2 x 2 x 3/8 angle iron installed in lieu of 3 x 2 x 3/8
D	182 24	5.2 2 x 2 x 3/8" L installed in lieu of 2 x 3 x 3/8
A	245 25	5.1 Weld short in length by 1/16"
B	247 26	5.1 Weld length short by 3/4"
G	248 27	5.1 Weld length short by 3/4"
H	249 28	5.1 Weld length short by 3/4"
H	250 29	5.1 Weld length short by 1/2"
B	251 30	5.1 Weld length short by 5/8"
E	252 31	5.1 Weld length short by 3/8"
I	253 32	5.1 Weld size 1/8" fillet used in lieu of 1/4"
I	254 33	5.1 Weld size 1/8" fillet used in lieu of 1/4"
C	260 34	5.1 Weld length short by 1/4"
F	264 35	5.1 Weld short in length by 1/8"
B	265 36	5.1 Weld short in length by 3/16"
D	266 37	5.1 Weld length short on stiffeners
D	267 38	5.1 Excess gap between angle and embed
D	268 39	5.1 Weld on tube steel to embed short by 3/8"
A	269 41	5.2 Weld undersized by 1/16" - hgr config weld size cannot be increased

Inspector	Item #	Attribute	
D	271 42	5.1	Weld short in length by 3/16"
D	272 43	5.1	Weld short in length by 1/2" and 3/16" (2 places)
D	273 44	5.1	Weld short in length by 1/8" (tube steel - embed)
F	278 45	5.1	Weld short in length by 1/8"
D	279 46	5.1	Welds short in length by 3/8" and 1/4" (2 places)
D	280 47	5.1	Weld short in length by 1/4" (channel and embed)
D	281 48	5.1	Weld short in length
E	284 49	5.1	Weld short in length
B	337 50	5.3	2 x 2 x 1/4" L used in lieu of 3 x 2 x 3/8 L causing weld to be short on leg by 1/16"
B	341 51	5.3	2 x 2 x 1/4" L used in lieu of 3 x 2 x 3/8" L - weld short in length by 1/8"

c. Observations

A number of observations were made during the inspection. They are as follows:

- (1) In the initial summary report discrepancies identified as JC-27 and JC-28 are resolved by S&L stating that lack of fusion exists only in the last or first 1/4 inch of the weld. Since the length of lack of fusion is indeterminate without grinding to check for reduced length, the generic application of this criteria is not acceptable. However, these welds were replaced so that at this time this issue has no safety significance.
- (2) Discrepancy HE-121 (inspector's report 2219) had no calculation at the time the review was performed. This appears to be an isolated incident.
- (3) Welds in which the reinspection found slag were treated by two different methods. In some instances the length of the weld was reduced while in others the throat dimension was reduced. The method of reducing the length is more conservative. In the cases reviewed the configuration appears satisfactory using either method.

d. Conclusion

In this inspection no items of noncompliance or deviations were identified. This inspection revealed no violation of FSAR commitments as they pertain to design and analysis. Also the procedures dealing with the dispositioning of the discrepancies were functioning properly.

2. Allegation

On May 27, 1983 and February 14, 1984 anonymous allegations concerning Sargent & Lundy design practices were received by the NRC. A detailed explanation of these allegations is contained in the February 17 memo from C. H. Weil to C. E. Norelius and R. L. Spessard (subject: Allegations Re: Sargent & Lundy and the Byron Station). This inspection dealt with one portion of the allegation:

"The allegor stated that 1000 Byron pipe hangers were undersized. The allegor further stated that S&L Engineers had begun to fix the problem but were stopped when it was estimated that the cost would be 5 - 7,000,000. Rather than fixing the problem, S&L simply said the design and loads were acceptable. The allegor attributed the problem to a flaw in a computer program. The allegor subsequently mailed a series of documents dealing with HVAC hangers."

These documents and allegations were the basis for two inspections. The first of these was conducted with R. W. Hooks, Assistant Division Head, Structural Engineering Division. The basic topic for this interview was items contained in the series of documents. These documents are a series of internal memos concerning HVAC supports. Topics of interest in these memos concern:

- . New Seismic loading requiring reanalysis 10/6/81.
- . Acceptability requirements for the reanalyzed hangers 4/12/82, 4/22/82 (Byron reanalysis acceptable at Braidwood and Marble Hill).
- . Error in computer program "SEISHANG" 5/3/82.
- . Reanalysis results from Byron should not be extrapolated to other sites (Braidwood & Marble Hill) or other floors at Byron.

Each of these items were discussed in detail with the following results:

- . A new reanalysis of HVAC hangers was performed in October 1982. Acceptability criteria were developed.
- . A memo of 4/22/82 states that reanalysis to requirements of Byron elevation 477' is acceptable at other elevations and other sites (Braidwood and Marble Hill).
- . The memo of 5/3/83 concerns an error in the "SEISHANG" program which was detected by S&L. This error appears to have been handled by proper S&L procedure and good engineering practice.
- . This memo of 6/14/82 negates the 4/22/82 memo and clearly states that Byron elevation 477' results should not be used at other elevations or other sites.

The important issue raised here is whether HVAC hangers at other sites or other elevations at Byron have been accepted based on the Byron elevation 477' reanalysis.

At the present time there are formal procedures in place and a major reassessment program underway. The purpose of this program is to make sure that every HVAC hanger is correctly analyzed.

The second part of this inspection which took place on April 12, 1984 consisted of private interviews with individuals named by the allegor. These four individuals will be called Mr. A, Mr. B, Mr. C, and Mr. D. The individuals were all asked the following questions.

1. Are you aware of any underdesigned pipe hangers at Byron or elsewhere?
2. Did S&L start a program to deal with this problem and abandon it due to excessive expense?
3. Are you aware of errors in computer programs which have compromised the design?
4. Are there procedures in place to deal with flaws in computer programs?
5. Are you aware of any underdesign or errors in the HVAC hangers or their design procedures?
6. Are you aware of any technical deficiencies in the design of Byron or any other plant?

Mr. A was not aware of any underdesign at Byron or in any other plant. He was aware that flaws had been detected in certain computer programs and HVAC hangers but was confident that both problems had been dealt with according to procedure.

Mr. B was not aware of any underdesign at Byron or in any other plant. He was aware of errors in some computer programs but felt that these errors had been handled by proper procedures. He had no technical concerns relative to design. Mr. C and Mr. D essentially reconfirmed the positions stated by Mr. A and Mr. B.

#### NRC Findings

The portion of this allegation dealing with HVAC hangers and pipe supports could not be substantiated based on both inspections. It appears that these allegations are based on an incomplete knowledge of more refined analysis techniques and supervisory attention to the stated problem.

applied to the Reinspection Program and it helped achieve accuracy because it eliminated using any original inspection data unless it was positively identified to a specific inspector.

To help improve the record selection and correlation process, a computerized data base management system, which was in the process of being finalized, was used to reconcile some weld travellers to hangers. This reconciliation between inspectors and hangers ensured that the initial hanger inspections assigned to each inspector were correct, and it provided an accurate means for identifying those hangers which did not have complete inspection records.

In two situations, it was found that it could not be determined which original inspection records were associated with a specific component in the field. The first situation involved the absence of information on weld traveler cards regarding the precise location of the hanger, and whether weld inspections had been performed originally. The second situation involved comparable documentation problems for Hatfield Electric and Reliable Sheet Metal hangers. Both of these situations were identified as an audit finding. New inspections were initiated for these hangers. Since these original inspections have no documentations which would tie those inspections to original inspectors, the results of the new inspections were not input to the Reinspection Program data.

Hatfield Electric has completed the reconciliation of hanger and weld inspections, which are documented on the weld travellers. For hangers that have weld traveler cards with incomplete data, new inspections are being performed. These new inspections are in addition to, and outside the scope of, the Reinspection Program. These inspections are expected to be complete in March 1984. Audit No. 6-83-124 remains open pending completion of these inspections.

E. THIRD AUDIT - IMPLEMENTATION OF REINSPECTION PROGRAM

Subsequent to the issuance of the "Preliminary Report on the Reinspection Program" (October 28, 1983), an additional audit was performed. Audit No.

EXHIBIT C-1

SUMMARY OF SUBJECTIVE DISCREPANCY EVALUATION  
BY CONTRACTOR

Table CE-1  
Summary of Subjective Discrepancy Evaluation  
Johnson Controls

<u>Type of Discrepancy by Attribute</u>	<u>Total Quantity</u>	<u>Category X No. Within Parameters</u>	<u>Category Y No. Acceptable by Judgment</u>	<u>Category Z No. Acceptable by Calculation</u>	<u>No. with Design Significance</u>
Visual weld					
1. Tube Track/ Instrument Supports	65	15	12	38	0

Note for Table CE-1:

1. Categories X, Y, and Z are defined in Section C of Appendix C.



5. Pittsburgh Testing

The engineering evaluation has shown that the welding inspected by Pittsburgh Testing is of good quality. In order to expand the data base and respond to specific questions asked by the NRC staff (refer to question Q7 in Appendix F), the additional inspections and detailed evaluations described in Exhibit C-2 are proceeding.

6. Peabody Testing

The welding inspected by Peabody is of good quality. The reinspected welds are representative of the welds inspected by Peabody.

E. CONCLUSION

None of the observed discrepancies had design significance and, in all cases, the design margin remains within specified design limits. The work by the contractors is of good quality.

5. Pittsburgh Testing Laboratory Evaluation Results - AWS Weld Discrepancies

The inspection work performed by Pittsburgh Testing covered structural steel work performed by Blount Brothers, American Bridge and Mid-City Architectural. A total of 6,137 welds were reinspected and 905 AWS weld discrepancies were identified.

A detailed review of the reinspection records for all 905 discrepancies was made. This review indicated that there were no cracked welds. In order to achieve 95% reliability with 95% confidence, a statistical sampling plan was chosen in accordance with Military Standard 105D. The resulting sample size for the engineering evaluation was 64 welds. The sample was conservatively biased by including the 50 welds that the third-party inspector identified as having the most weld quality discrepancies. The remaining 14 welds were randomly selected. The remaining 841 discrepancies were reviewed to assure that the numbers and types of discrepancies within the sample were representative of the entire group.

The results of the engineering evaluation for the sample of 64 Pittsburgh Testing welds are shown in Table CE-11.

Table CE-11  
Results of AWS Weld Discrepancy Evaluation  
Pittsburgh Testing

Weld Type	No. of Weld Discrepancies	Weld Discrepancy Category			
		A No Structural Impact	B1 Weld Strength Reduced by < 10%	B2 Weld Strength Reduced by ≥ 10%	C Weld Rejected (Cracks)
Structural steel work	64	10	37	17	0

The welds associated with the 905 observed AWS weld discrepancies involved 312 connections. Each was reviewed and those with the highest level of stress were identified. A representative number of connections, 6 of 44, with a design margin less than 1.3 were among those chosen for engineering evaluation, and they were found to have no design significance. Further detailed evaluation was not required because items with a design margin greater than 1.3 are capable of carrying the design loads even if the percentage reduction from the most discrepant of the 50 lowest quality welds is applied to those items.

For the 64 cases where a detailed engineering evaluation of the weld discrepancies was performed, the welds are adequate to carry the design loads. The average value of the weld strength reduction for Pittsburgh Testing welds is less than ten percent. This reduction is not significant to the overall behavior of the structures.

The engineering evaluation shows that Pittsburgh Testing welds are adequate to carry the design loads with the presence of weld discrepancies of the type observed.

However, to expand the data base and in order to answer a specific question asked by the NRC staff (see Q7, Appendix F), additional inspections and evaluations are being performed.

Pittsburgh Testing showed an undesirable failure rate for inspection of welds with overlap and undercut. The presence of overlap makes visual weld quality inspection more difficult. In order to confirm that welds with overlap are not masking other discontinuities, the third-party inspectors will select a suitable number of welds which represent the most severe cases of overlap. The overlapped portion of these welds will be removed by grinding and the weld will be reinspected. The results of this reinspection will be reviewed and evaluated. For undercut, the reduction in capacity was approximately 5%, which is insignificant.

a. ASME Large Bore Butt Welds - ND

One discrepancy involved a 1/4-inch diameter region of porosity on a 42-inch diameter circumferential pipe weld. The code considers surface indications up to 1/16-inch in diameter as not relevant. The subject indications were all 1/64-inch to 3/64-inch in diameter which fall within ASME Class ND liquid penetrant examination acceptance criteria. This discrepancy was therefore determined to be acceptable since the visual reinspection acceptance criteria exceeded code requirements.

The second discrepancy involved a convex bead on a 30-inch diameter circumferential pipe weld. After grinding to remove the convexity, the weld was then examined by visual and liquid penetrant examination and determined to be acceptable.

The final discrepancy involved a section of weld at a pipe-to-weld neck flange joint which was reported to be under the surface of the flange. The weld was reported to be 1/32 inch under the surface of the flange over approximately 25% of the weld length. This occurred only on the flange side of the weld (the pipe side of the weld was acceptable). Flange surfaces commonly are out of exact round due to manufacturing tolerances. This results in the type of discrepancy identified; this is not considered a valid discrepancy because it does not conflict with design requirements or intent. No sharp discontinuities were noted at the flange joint. The observed weld discrepancy was, therefore, determined to be acceptable.

b. ASME Socket and Fillet Welds - NB, NC, ND

A total of three ASME Class 1 (NB) observed discrepancies were reported. All three involved slightly undersized seal weld fillet welds for radiographic plugs. The piping has been qualified with the actual seal weld size and determined to be acceptable.

A total of eight ASME Class 2 (NC) discrepancies were reported. Five involved socket weld fillet sizes, one involved porosity in the socket weld,

one involved a slag inclusion at the toe of the fillet weld, and the remaining discrepancy involved a slightly undersized radiographic plug seal weld. For the five fillet weld discrepancies, it was determined that the fillet weld size indicated on the design documents was larger than required by design. All fillet sizes were found in compliance with ASME Code design criteria when compared to actual design requirements. The surface porosity was evaluated as acceptable based on the approved magnetic particle test for the weld. The visual reinspection acceptance criteria again exceeded code requirements. The slag inclusion at the toe of the weld had a depth of 0.012 inches and was buffed out; no weld repair was required. The code required that minimum weld size was not violated. For the slightly undersized radiographic plug seal weld, the piping has been qualified with the actual seal weld size and determined to be acceptable.

A total of 19 ASME Class 3 (ND) discrepancies were reported. These included 14 fillet welds identified as undersized, 3 welds with undercut, and 2 welds with surface porosity. The 14 fillet welds identified as undersized meet design requirements and therefore are acceptable per the ASME Code design criteria. The 3 welds with undercut were evaluated and found not to be significant. The remaining 2 welds identified as having surface porosity were evaluated and found to be acceptable. (Also, ASME porosity inspection requirements are nonexistent for Class 3 socket welds 2 inches or less in diameter.)

c. ASME Support Welds - NF

A total of 14 discrepancies were reported for ASME Class NF welds. Eight of these involved fillet weld length, three involved fillet weld size reduction, and one involved undercut. These observed discrepancies were evaluated on the basis of the actual design capacity of the associated supports with the observed weld discrepancies taken into consideration. All welds were determined to be acceptable.

One discrepancy involved paint on a weld which resembled a crevice that was not actually a discrepancy (upon removal of the paint), and hence was acceptable.

The final discrepancy involved a fillet weld joining a strut bracket to a steel plate. A portion (1-1/2 inches) of the 5-inch weld was reported to have lack of fusion and undercut along the steel plate. The actual length of specified weld for the bracket exceeded design requirements. The weld was determined to meet ASME Code design criteria when compared to the actual design requirements. Since the region exhibiting the lack of fusion consisted of excess weld, the support weld was found to meet the ASME Code design criteria and to be acceptable. In addition, the weld with the discrepancy was evaluated with respect to the maximum design capacity of the support component and was determined to be acceptable with a design margin of 2.

d. ASME Pipe Penetration and Reinforcing Saddles - MC, ND

One discrepancy was reported involving an ASME Class MC penetration closure plate weld. This discrepancy involved the weld joining the penetration closure plate to the pipe wall. A full penetration weld with a 5/8-inch by 3/8-inch reinforcing fillet was specified. The 3/8-inch leg was joined to the pipe surface. The discrepancy involved a 1/8-inch reduction in reinforcing leg length of the larger leg. The observed reduction in weld leg was evaluated (compared with actual design requirements) and determined to be acceptable.

The second discrepancy involved an ASME Class 3, 16-inch diameter pipe, reinforcing pad, attachment weld. The specified attachment weld was a 3/8-inch fillet attaching a 3/4-inch thick reinforcing pad to the pipe wall. Several sections of the weld were reported to be undersized by 1/16- to 1/8-inch. The entire weld was conservatively reduced in size by 1/8-inch resulting in a 1/4-inch fillet weld for evaluation (compared with actual design requirements). It was determined that the weld was acceptable with

a design margin in excess of 30. In addition, it should be noted that fillet welds on pipe surfaces are difficult to measure due to the curvature of the pipe surface; welding gages will typically indicate slightly undersized weld legs due to this pipe curvature.

e. Summary

In summary, all the ASME weld discrepancies were evaluated in detail and determined to be acceptable when compared with the design requirements and with ASME Code design criteria. Based on the small number of discrepancies and the evaluation which determined that no discrepancy had design significance, the ASME work performed by Hunter has been determined to be of good quality and no further inspections are warranted.

2. Powers-Azco-Pope Evaluation Results - Code Weld Discrepancy Evaluation

All the accessible, recreatable Powers-Azco-Pope work was reinspected, for those inspectors who did not meet the program acceptance criteria. A total of 306 weld discrepancies were identified involving ASME and ANSI B31.1 piping support welds as noted below in Table CE-14.

Table CE-14  
Code Weld Discrepancy Evaluation Results  
Powers-Azco-Pope

<u>Weld Type</u>	<u>No. of Weld Discrepancies</u>	<u>P</u> <u>Acceptable</u> <u>Weld Strength</u> <u>Reduction</u>	<u>Q</u> <u>Welds</u> <u>do not meet</u> <u>Code Design Criter</u>
a. Socket welds (NC)	44	44	0
b. Socket welds (ND)	24	24	0
c. Support welds (NF)	34	34	0
d. Socket welds (B31.1)	<u>204</u>	<u>204</u>	<u>0</u>
<b>TOTAL</b>	<b>306</b>	<b>306</b>	<b>0</b>

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

MAY 13 1984

Encl. No. 50-454

Encl. No. 50-455

Commonwealth Edison Company  
ATTN: Mr. Cordell Reed  
Vice President  
Post Office Box 767  
Chicago, IL 60690

Gentlemen:

This refers to the special safety inspection conducted by Mr. R. S. Love of this office on January 23-27, 1984, of activities at Byron Station authorized by NRC Construction Permit No. CPPR-130 and No. CPPR-131 and to the discussion of our findings with Mr. G. Sorensen and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in non-compliance with NRC requirements, as specified in the enclosed Appendix. A written response is required.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter, the enclosure(s), and your response to this letter will be placed in the Public Document Room.

The responses directed by this letter (and the accompanying Notice) are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

*Love Repo #4*

*6-20-84*



MAR 13 1984

Feel free to discuss any questions you have concerning this inspection.

Sincerely,



W. S. Little, Chief  
Engineering Branch 2

Enclosures:

1. Appendix, Notice of Violation
2. Inspection Reports  
No. 50-454/84-09(DE) and  
No. 50-455/84-07(DE)

cc w/encls:

D. L. Farrar, Director  
of Nuclear Licensing  
V. I. Schlosser, Project Manager  
Gunner Sorensen, Site Project  
Superintendent  
R. E. Querio, Station  
Superintendent  
DMB/Document Control Desk (RIDS)  
Resident Inspector, RIII Byron  
Resident Inspector, RIII  
Braidwood  
Phyllis Dunton, Attorney  
General's Office, Environmental  
Control Division  
Ms. Jane M. Whicher  
Diane Chavez, DAARE/SAFE

Appendix

NOTICE OF VIOLATION

Commonwealth Edison Company

Docket No. 50-454

As a result of the special safety inspection conducted on January 23-27, 1984, and in accordance with the NRC Enforcement Policy, 47 FR 9987 (March 9, 1982), the following violation was identified.

10 CFR 50, Appendix B, Criterion XVI, as implemented by CECO Topical Report CE-1-A, Section 16, requires that measures be established to assure that conditions adverse to quality are promptly identified and corrected.

Contrary to the above, the failure of Hatfield Electric Company to provide an adequate response on DR 3382 has resulted in 12 safety-related electrical cables being installed in Byron Station, Unit 1, whose quality is indeterminate in that one or more of these cables was overstressed during the attempted pull-back of cable 1VA7C9.

This is a Severity Level IV violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, you are required to submit to this office within thirty days of the date of this Notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown.

3/10/84  
Dated

W. S. Little  
W. S. Little, Chief  
Engineering Branch 2

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Reports No. 50-454/84-09(DE); 50-455/84-07(DE)

Docket Nos. 50-454; 50-455

Licenses No. CPPR-130; CPPR-131

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, Illinois 60690

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: January 23-27, 1984

Inspector: R. S. Love *RS Love*

3/15/84  
Date

Approved By: C. C. Williams, Chief *CC Williams*  
Plant Systems Section

3/15/84  
Date

Inspection Summary

Inspection on January 23-27, 1984 (Reports No. 50-454/84-09(DE);  
50-455/84-07(DE))

Areas Inspected: Review of licensee action on previously identified items. Followup on an allegation that safety-related electrical cables had been over-tensioned during installation. This allegation was substantiated by the review of records and personnel interviews. This inspection involved a total of 40 inspector-hours by one NRC inspector.

Results: In the areas inspected, one item of noncompliance (inadequate disposition on a Deviation Report - Paragraph 3.c) was identified.

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company

- \*G. Sorensen, Construction Superintendent
- \*K. J. Hansing, Quality Assurance Superintendent
- \*J. O. Binder, Project Electrical Supervisor
- \*E. L. Martin, Quality Assurance Supervisor
- \*M. Dellabetta, Quality Assurance Engineer
- \*E. Sager, PCD Electrical Engineer
- \*J. W. Rappeport, Quality Assurance Engineer
- R. B. Klingler, Project Quality Control Supervisor
- M. F. Lohmann, Assistant Construction Superintendent

#### Hatfield Electric Company (HECo)

D. L. Heider, QA/QC Manager

The inspector also contacted and interviewed other licensee and contractor personnel during this report period.

\*Denotes those present at the exit interview conducted on January 27, 1984.

### 2. Action on Previously Identified Items

- a. (Closed) Open Item (50-454/82-17-03; 50-455/82-12-03): This item pertained to the conflict between the SAR commitment to the 1972 edition of the AWS D1.1 Code and the implementation of the 1975 edition by the electrical contractor. SAR Amendment 44, dated December 1983, revised Table 3.8-2 to delete Code edition. Effective Code edition will be determined by the date of the applicable contracts.
- b. (Closed) Open Item (50-454/83-16-03): This item pertained to the damaged cable documented on NCR 597 and the misrouted cables caused by improper labeling of conduits. The damaged cable was replaced and FCR F-22863 was issued to show as-built conditions for conduit markings and cable routing.
- c. (Open) 10 CFR 50.55(e) Report (50-454/83-11-EE; 50-455/83-11-EE): After completion of the Hot Functional Testing at Byron Station Unit 1, the covering on the Anaconda Type NWC flexible conduit utilized inside the containment was observed to be split open on several installations. All liquid tight flexible conduits inside Unit 1 and Unit 2 containments are being covered with Okonite T-35 jacket tape. This tape is qualified for containment environment. As of the date of this inspection, Unit 1 is approximately 95% complete. This item must be closed for the applicable unit prior to loading fuel.

3. Follow-up on Allegations

The Region III office received an allegation that some safety-related electrical cables had been overstressed during installation at the Byron Station. As noted below, this allegation was substantiated. Reference: Open Item 454/84-02-03; 455/84-02-03.

Background - Electrical cables may be overstressed by exceeding the maximum pulling tension or sidewall pressure during installation or re-work activities. The information required to calculate these maximum values are normally provided by the cable manufacturer for the various types of cable provided.

a. A review of CECO nonconformance reports (NCRs) indicated that the following NCRs were prepared to document potential electrical cable overstressing:

• F539, dated April 2, 1981. During the installation of safety-related cables 1DC030 and 1DC089 (type 1/c-350 MCM) a pulling guide with a 9" radius was utilized. Installation tension was 2800#. Per project drawings, a pulling guide with a minimum of a 18" radius should have been used during the installation activities. Using a 9" radius pulling guide, the maximum pulling tension should have been limited to 375# so as not to exceed the maximum cable sidewall pressure. The subject cables were replaced and the NCR was closed on September 7, 1982.

• F679, dated October 30, 1981. During the installation of safety-related cable 2SX098 (type 3/c #4/0) a pulling guide with a 6" radius was utilized and cable installation tension was not measured. Per the approved disposition, a High Potential (Hi-Pot) Test at 17 kV for 5 minutes and an Insulation Resistance Test at 2.5 kV dc were satisfactorily performed on the subject cable. NCR was closed on March 9, 1982.

• F747, dated November 16, 1982. Was prepared to document that the cable pulling tension criteria delineated in ECN 2579, dated May 19, 1982 and ECN 3015, dated October 13, 1982, was not implemented by the electrical contractor, HECO, until October 27, 1982. Between May 19, 1982 and November 4, 1982, 133 cables were installed in conduit where the tension was measured. Utilizing the criteria contained in ECNs 2579 and 3015, these cable pulls were analyzed by Sargent and Lundy. Upon completion of the analysis, it appeared that 17 of these cables may have been overstressed. All of the applicable data, including sketches of the routing, for these 17 cables was forwarded to the cable manufacturer, Okonite Company, for their analysis. The Okonite analysis indicated that the 17 cables were acceptable as installed. The Region III inspector reviewed the Okonite analysis and found it acceptable. The NCR was closed on November 10, 1983. This item is also documented on HECO NCR 482.

F756, dated December 23, 1982. During the installation of safety-related cables 1FW217 (12/c #14), 1FW262 (2/c #14), 1FW346 (2/c #14), 1FW458 (2/c #14), 1FW510 (2/c #14), 1FW561 (2/c #14), 1MS282 (12/c #14), 1MS283 (12/c #14), 1MS325 (2/c #14), 1SD054 (7/c #14), 1SD058 (7/c #14), and 1SD062 (7/c #14) it appeared that the cables had been overstressed. The actual pulling tension was 610#. Utilizing the equation  $T_a = 0.6 \times n \times T_{cs}$ , the maximum allowable tension would be approximately 475#, where:  $T_a$  = allowable tension in pounds;  $n$  = number of cables in the pull;  $T_{cs}$  = maximum pulling tension of the smallest cable in the pull (2/c #14 = 66#); and 0.6 = additional safety factor. Utilizing equation  $T_a = 0.008 \times cm \times n \times 0.7$ , as provided by Okonite, the allowable tension would be approximately 1590#. Equation  $T_a = 0.008 \times cm \times n$  is found in IEEE Standard 422-1977 and the safety factor of 0.7 was provided by Okonite. Based on the above information, the subject cables were accepted as installed. Sidewall pressure was not a factor. NCR was closed on July 20, 1983. This item is also documented in HECo NCR 511.

F775, dated January 24, 1983. During the installation of safety-related cables: 1AP183 (HECo NCR 556); 1AP073, 1AP320, 1AP322 (HECo NCR 557); 1AP072, 1AP319, 1AP321 (HECo NCR 558); 2SX138, 2SX139, 2SX140, 2SX149, 2SX153 (HECo NCR 559); 2AP179, 2AP300, 2AP401, 2SX079, 2VX044, 2DC072 (HECo NCR 560); 1VC028 (HECo NCR 561); 1IP005, 1IP006 (HECo NCR 562); 1IP033, 1IP034 (HECo NCR 563); 1VA580, 1VA581 (HECo NCR 564); 1VA580, 1VA581 (HECo NCR 565); 1VA558, 1VA559, 1VA560 (HECo NCR 566) and 1VA374, 1VA375, 1VA548 (HECo NCR 567) it appeared that the cables had been overstressed. Based on the revised criteria for calculating maximum allowable pulling tension, all cables except 1AP183 were accepted as installed. Cable 1AP183 was Hi-Potted at 29.5 kV dc for 5 minutes and was found satisfactory for its intended use. NCR was closed on November 10, 1983.

F799, dated March 14, 1983. During installation of safety-related cable 2EF096 (4/c #14), the cable was overstressed. Actual pulling tension was 145# and the maximum allowable pulling tension was 132#. Okonite performed an evaluation of this cable and found it acceptable as installed. NCR was closed on December 18, 1983. This item is also documented on HECo NCR 579 and Discrepancy Report (DR) 1777.

F800, dated March 14, 1983. During installation of safety-related cable 2VA319 (4/c #14), the cable was overstressed. Actual pulling tension was 140# and the maximum allowable pulling tension was 132#. Okonite performed an evaluation of this cable and found it acceptable as installed. NCR was closed on December 13, 1983. This item is also documented on HECo NCR 580 and DR 1800.

F802, dated March 23, 1983. During pull back of safety-related cable 1AF279 (2/c #14), it appeared that the cable was overstressed. Actual pulling tension was 40# and utilizing the

revised criteria, the maximum allowable pulling tension is 66#. The cable was accepted as installed, (HECo NCR 586 and DR 1835). During installation of safety-related cables 10G189 (24/c #20) and 1DG187 (2/c #16), it appeared that these cables were overstressed. Actual pulling tension was 71# and utilizing the revised criteria, the maximum allowable pulling tension is approximately 250#. These cables were accepted as installed. This NCR was closed on June 28, 1983, (HECo NCR 588 and DR 1857).

F809, dated April 15, 1983. During rework (pullback) of safety-related cables 1VD119 (2/c #14), 1VD120 (2/c #14), and DG042 (2/c #10), the cables were overstressed. For cable 1DG042, the maximum allowable pulling tension is 166# and the actual tension was 195#. Cable 1DG042 was replaced. For cables 1VD119 and 1VD120, the maximum allowable pulling tension is 105.6# and the actual tension was 110#. These cables were accepted as installed based on an evaluation by Okonite. NCR was closed on January 9, 1983. (HECo NCR 599).

F821, dated May 20, 1983. During installation of safety-related cable 1VA709 (2/c #16), the cable was overstressed. The maximum allowable pulling tension is 58# and the actual tension was 120#. The cable was replaced and the NCR closed October 14, 1983, (HECo NCR 605 and DR 2075).

F827, dated July 8, 1983. During installation of safety-related cable 2VA707 (2/c #16), the cable was overstressed. The maximum allowable pulling tension is 58# and the actual tension was 180#. The cable was replaced and NCR closed on October 28, 1983. (HECo NCR 642 and DR 2458).

F837, dated August 5, 1983. During installation of safety-related cables 2VA786 (2 x 1/c #14), 1VA784 (2/c #14), and 1VA756 (2/c #14), the cables were overstressed. The maximum allowable pulling tension for each cable is 66#. The actual pulling tension for each cable was 115#, 92/120#, and 100# respectively. Cable 1VA784 was overstressed (92/120#) in two portions of the pull. As of January 26, 1984, this NCR was still open. These items are documented on HECo NCRs 658 (2VA786), 660 (1VA784), 662 (1VA784) and 666 (1VA756).

F838, dated August 5, 1983. During installation of safety-related cables 1RC650 (16/c #16), 1RC651, 1RC652, 1RC653, 1RC654, 1RC655, 1RC656, 1RC657, and 1RC658 (1RC651-1RC658 all 3/c #16), the cables were overstressed. The combined maximum pulling tension for these cables is 354# and the actual tension was 440#, (HECo NCRs 649 and 650). During installation of safety-related cables 1AR025 (2/c #16) and 1AR160 (2/c #16), the cables were overstressed. The combined maximum pulling tension for these cables is 116# and the actual tension was 260#. As of January 26, 1984, this NCR was still open.

- F839, dated August 8, 1983. During rework (pull back) of safety-related cable 1CV029 (4/c #14), the cable was overstressed. The maximum allowable pulling tension is 132# and the actual tension was 145#. Based on an evaluation by Okonite, the cable was acceptable for re-installation. NCR was closed on January 13, 1984. (HECo NCR 673 and DR 2787).
- F844, dated August 22, 1983. During rework (pull back) of safety-related cables 1FW020 (2/c #16), 1RC395 (2/c #16), and 1RC400 (2/c #16); the cables were apparently overstressed. The maximum allowable pulling tension was calculated to be 139# and the actual tension was 175#. Based on the criteria supplied by Eaton, cable manufacturer, the maximum allowable pulling tension for these cables is 176.4#. The cables were acceptable for re-installation. NCR was closed on November 17, 1983. (HECo NCR 681).
- F845, dated August 20, 1983. During installation of safety-related cables 1AP149 (3/c #500 MCM) and 1AP152 (3/c #500 MCM), the cables were overstressed. The maximum allowable pulling tension due to sidewall pressure limitations is 3000#. The actual pulling tension for cable 1AP149 was 5400# and 5754# for cable 1AP152. As of January 24, 1984, this NCR was still open, (HECo NCR 687).
- <sup>3</sup>F865, dated November 17, 1983. During installation of safety-related cable 2VA787 (2/c #14), the cable was overstressed. The maximum allowable pulling tension is 66# and the actual tension was 115#. As of January 24, 1984, this NCR was still open (HECo NCR 769 and DR 3596).
- F864, dated November 17, 1983. During installation of safety-related cable 2DG105 (4/c #14), the cable was overstressed. The maximum allowable pulling tension is 132# and the actual tension was 310#. As of January 24, 1984, this NCR was still open (HECo NCR 765 and DR 3523).
- F865, dated December 2, 1983. During installation of safety-related cables 1VA755 (2/c #14) and 1VA795 (2/c #14), the cables were apparently overstressed. The maximum allowable pulling tension is 132# and the actual pulling tension was 138#. As of January 24, 1984, this NCR was still open, (HECo NCR 733 and DR 3687).

Pending a review of CECo NCRs F837, F838, F839, F845, F863, F864, and F865 for proper closure, this item is unresolved (50-454/84-09-01; 50-455/84-07-01).

- b. A review of HECo NCRs 1-450 and the NCR log for NCRs 451-839 indicated that the following NCRs were prepared to document potential overstressing of electrical cables:



Note: Where the nonconformance is described on a CECo NCR, only the status of the HECo NCR and a reference to the CECo NCR will be provided.

- . 483, Opened October 27, 1982. Closed November 29, 1983.  
Reference: CECo NCR F747.
- . 511, Opened December 2, 1982. Closed January 13, 1983.  
Reference: CECo NCR F756.
- . 556, Opened January 24, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 557, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 558, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 559, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 560, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 561, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 562, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 563, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 564, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 565, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 566, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 567, Opened January 25, 1983. Closed January 21, 1984.  
Reference: CECo NCR F775.
- . 586, Opened March 17, 1983. Closed September 6, 1983.  
Reference: CECo NCR F802 and HECo DR 1835.
- . 588, Opened March 18, 1983. Closed September 6, 1983.  
Reference: CECo NCR F802 and HECo DR 1857.

- 579, Opened March 11, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F799 and HECo DR 1777.
- 580, Opened March 11, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F800 and HECo DR 1800.
- 642, Opened July 5, 1983. Closed January 25, 1984. Reference: CECo NCR F827 and HECo DR 2458.
- 605, Opened May 12, 1983. Closed October 17, 1983. Reference: CECo NCR F821 and HECo DR 2075.
- 599, Opened April 12, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F809.
- 687, Opened August 12, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F845.
- 681, Opened August 11, 1983. Closed January 25, 1984. Reference: CECo NCR F844.
- 668, Opened August 1, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F838.
- 666, Opened July 26, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F837.
- 662, Opened July 21, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F837.
- 660, Opened July 21, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F837.
- 658, Opened July 20, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F837 and HECo DR 2714.
- 673, Opened August 5, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F839 and HECo DR 2787.
- 650, Opened July 18, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F838.
- 649, Opened July 18, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F838.
- 773, Opened November 17, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F865 and HECo DR 3687.
- 769, Opened November 9, 1983. As of January 25, 1984, this NCR was still open. Reference: CECo NCR F863 and HECo DR 3596.
- 766, dated November 3, 1983. Cable 2DG070 (9/c #14) was pulled into a conduit without measuring the cable pull tension in

accordance with approved procedures. The cable was pulled back and re-pulled utilizing a dynamometer during the entire operation to measure cable pulling tension. The actual pulling tension was 40# and the allowable maximum pulling tension is 296#. Cable 2DG070 was accepted as installed. This NCR was closed on November 10, 1983. Reference: HEC0 DR 3518.

765, Opened November 3, 1983. As of January 25, 1984 this NCR was still open. Reference: CECO NCR F864 and HEC0 DR 3523.

113, dated June 16, 1980. During installation, cable 1SI523 (2/c #14) was hand pulled through conduit containing approximately 350° of bends. Conduit runs are normally limited to 270° of bends between pulling points. The maximum allowable pulling tension for 2/c #14 cable is 66#. The calculated pulling tension for this installation was 25.655#. The Region III inspector reviewed the calculations and they appeared to be adequate. This NCR was closed on May 21, 1981.

109, dated April 26, 1980. During installation, cables 1SX067 (3/c #10) and 1SX043 (12/c #14) were hand pulled through conduit containing more than 270° of bends. The maximum allowable pulling tension for these cables was 645#. The calculated pulling tension for this installation was 132#. Based on the calculations the cables were accepted as installed. This NCR was closed on May 21, 1981.

- c. The Region III inspector selected the HEC0 DRs prepared during the 3rd quarter of 1983 for review. DRs 2468 through 3362 were prepared during this time frame. Due to the method of filing, the inspector reviewed DRs 2400 through 3400. With respect to possible over-stressing of safety-related cables during installation or re-work, all DRs, except number 3382, were subsequently documented on NCRs and are discussed in paragraphs a and b above. Following are the Region III observations as relating to DR 3382.

During pull back of safety-related cable 1VA709 (2/c #16) from 2 1/2" conduit COA7464 (Reference: CECO NCR F821), the other 12 cables remaining in the conduit were overstressed. Based on interviews with HEC0 craft, engineering and QC personnel, CECO engineering personnel and the review of applicable documentation, following is a sequence of events as understood by the Region III inspector:

- (1) During the initial installation of cable 1VA709, the cable was overstressed. The maximum allowable pulling tension for this type of cable is 58.8# and the actual pulling tension was 120#. This fact was documented on HEC0 DR 2075, HEC0 NCR 605, and CECO NCR F821. The disposition on the CECO NCR was to replace the cable.
- (2) On or about October 4, 1983, while attempting to remove cable 1VA709 from conduit COA7464, pulling tensions of 250#, 450#, 140# and 500# were exerted on cable 1VA709. At that point in

time, the decision was made to abandon that portion of cable 1VA709 contained within the conduit. A new cable 1VA709 was installed and the applicable HEC~~o~~ and CEC~~o~~ NCRs were closed. HEC~~o~~ QC inspector prepared DR 3382, dated October 4, 1983, to document that the remaining cables (1VA182, 1VA185, 1VA707, 1VA712, 1VA714, 1VA716, 1VA720, 1VA721, 1VA722, 1VA723, 1VA818, and 1VA819) may have been overstressed during the attempted removal of cable 1VA709. All cables contained within conduit COA 7464 were 2/c #16 with an individual maximum pulling tension of 58.8#.

- (3) During the HEC~~o~~ engineer's evaluation of DR 3382, the engineer erroneously assumed that the cable pulling crew was attempting to remove all of the cables in conduit COA7464 when the pulling tensions of 250#, 450#, 140# and 500# were reached. Using the above assumption, the HEC~~o~~ engineer calculated the maximum allowable pulling tension for all the cables as 557#. Based on the engineer's calculations, the cables were accepted as installed and the DR was closed on October 10, 1983. In that the description of the discrepancy as noted on the subject DR did not contain all of the facts, the inspector can understand how the engineer made an incorrect assumption. It would appear that the engineer failed to gather all the facts prior to providing a resolution on the DR.
- (4) The failure to provide an adequate response on DR 3382 has resulted in 12 safety-related cables (1VA182, 1VA185, 1VA707, 1VA711, 1VA714, 1VA716, 1VA720, 1VA721, 1VA722, 1VA723, 1VA818, and 1VA819) whose quality is indeterminate in that one or more of these cables was overstressed during the attempted pull-back of cable 1VA709. The individual maximum cable pulling tension for these cables is 58.8# and the actual measured pulling tension was 500#. Subsequent to the inspectors findings, HEC~~o~~ prepared NCR 841, dated January 27, 1984, to document the overstressed cables.

The licensee was informed that failure to assure that conditions adverse to quality are promptly identified and corrected is an item of noncompliance in accordance with Criterion XVI of 10 CFR 50, Appendix B (454/84-09-02).

- d. During the Byron team inspection (IE Inspection Report No. 50-454/82-05 and 50-455/82-04) it was observed that the HEC~~o~~ procedures did not contain an electrical cable rework procedure nor the requirements to calculate electrical cable sidewall pressures prior to pulling cable. This information became part of the Byron, Unit 1, ASLB hearings conducted in Rockford, IL during August 1983. During these hearings, the licensee stated that cable-pull reports for cables already installed are being reviewed against the current criteria and any needed corrective action will be taken with the advice of the cable manufacturer and that all cables, regardless of when installed, will meet the current criteria.

In accordance with Sargent and Lundy (T. R. Eisenbart) letter to Commonwealth Edison Company (J. T. Westermeier) dated June 23, 1983, S&L performed an analysis of all safety-related cables pulled into conduit prior to December 1982. These cables pulled into approximately 2600 conduits and required analysis. Per the S&L letter, one of the following methods was utilized in performing the analysis:

- (1) Calculations for an assumed worst case conduit configuration containing a worst cable configuration.
- (2) Calculations for an assumed worst case conduit configuration containing the actual cable configuration.
- (3) Calculations for the actual conduit configuration containing the actual cable configuration.

S&L's review identified three conduits that required additional analysis by the cable manufacturer. Cable pulling information for these conduits was forwarded to Okonite Company, cable manufacturer, by S&L letter dated June 22, 1983, for their use in performing the detailed analysis.

In accordance with S&L (T. R. Eisenbart) letter to CECO (J. T. Westermeier) dated December 12, 1983, all safety-related cables pulled into conduit prior to December 1982 were acceptable. This acceptability is based on analysis performed by S&L and the Okonite Company's letter of October 11, 1983, and subsequent discussions with HECO to determine the actual direction of cable pulls into the three conduits analyzed by Okonite. Cable pulled into cable tray was not considered a potential problem by S&L since the cable information drawings addressed cable side-wall pressure by specifying minimum cable pulling guide radii, and in addition, the majority of cables pulled in tray were hand pulled.

The Region III inspector observed that the analytical method would not provide 100% assurance that all safety-related cables installed prior to December 1982 had not been overstressed. However, the analysis plus the various tests performed prior to reactor operations does provide a reasonable assurance that all the safety-related cables will perform their intended function. Pending a review of the analysis performed by S&L, this item remains open. Reference: Open Item 454/84-02-03; 455/84-02-03.

#### 4. Unresolved Items

Unresolved items are matters about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance, or deviation. An unresolved item disclosed during this inspection is discussed in Paragraph 3.2 of this report.

5. Exit Interview

The inspector met with licensee representatives (denoted in Paragraph 1) at the conclusion of the inspection on January 27, 1984. The inspector summarized the scope and findings of the inspection. The licensee acknowledged this information.

84-27,19

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137



JUN 6 1984

JUN - 7 RECD

Docket No. 50-454  
Docket No. 50-455

Commonwealth Edison Company  
ATTN: Mr. Corde!! Reed  
Vice President  
Post Office Box 767  
Chicago, IL 60690

Gentlemen:

This refers to the routine safety inspection conducted by Messrs. R. S. Love and E. Christnot of this office on April 24-27, April 30-May 4, and May 10-11, 1984, of activities at Byron Station authorized by NRC Construction Permits No. CPPR-130 and No. CPPR-131 and to the discussion of our findings with Messrs. R. Tuetken and R. B. Klingler and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in non-compliance with NRC requirements, as specified in the enclosed Appendix. A written response is required.

As a result of this inspection, it is our understanding that you will conduct a reinspection of all electrical conductor butt splices at Byron Station, Units 1 and 2, as outlined in your letter of May 17, 1984, D. Farrar to James G. Keppler.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter, the enclosure(s), and your response to this letter will be placed in the Public Document Room.

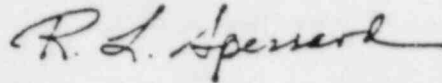
The responses directed by this letter (and the accompanying Notice) are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

*Love Repo #5*  
*6-20-84*

June 3 1984

We will gladly discuss any questions you have concerning this inspection.

Sincerely,



R. L. Spessard, Director  
Division of Engineering

Enclosures:

1. Appendix, Notice of Voilation
2. Inspection Reports  
No. 50-454/84-27 and  
No. 50-455/84-19

cc w/encls:

D. L. Farrar, Director  
of Nuclear Licensing  
V. I. Schlosser, Project Manager  
Gunner Sorensen, Site Project  
Superintendent  
R. E. Querio, Station  
Superintendent  
DMB/Document Control Desk (RIDS)  
Resident Inspector, RIII Byron  
Resident Inspector, RIII  
Braidwood  
Phyllis Dunton, Attorney  
General's Office, Environmental  
Control Division  
Ms. Jane M. Whicher  
Diane Chavez, DAARE/SAFE  
R. Rawson, ELD



Appendix

NOTICE OF VIOLATION

Commonwealth Edison Company

Docket No. 50-454

Docket No. 50-455

As a result of the inspection conducted on April 24-27, April 30-May 4, and May 10 and 11, 1984, and in accordance with the General Policy and Procedures for NRC Enforcement Actions, (10 CFR Part 2, Appendix C), the following violations were identified:

1. 10 CFR 50, Appendix B, Criterion V, as implemented by Commonwealth Edison Company Topical Report (CE 1-A), Section 5, requires that activities affecting quality be prescribed by documented instructions or procedures.

Contrary to the above, the licensee failed to assure that the requirements of S&L Drawing 6E-0-3237 B, February 1983 Revision, Note 47, were translated into instructions or procedures. Note 47 requires the electrical contractor to inspect for cable tray separation and add cable tray covers when the minimum separation requirements have been violated. This is exemplified by the fact that 124 units of safety-related cable tray has been installed since February 1983 and this tray has not been inspected for separation requirements. Additional details are discussed in Paragraph 2.d of Inspection Report 454/84-27; 455/84-19(DE).

This is a Severity Level V violation (Supplement II).

2. 10 CFR 50, Appendix B, Criterion XVI, as implemented by Commonwealth Edison Company Topical Report (CE 1-A), Section 16, requires that measures be established to assure that conditions adverse to quality such as nonconformances are promptly identified and corrected.

Contrary to the above, the licensee failed to assure that nonconforming cable tray hangers were identified and corrected. This is exemplified by the fact that as a result of this NRC inspection, 345 previously accepted cable tray hangers were reinspected and 119 were found defective and 19 were indeterminate because they were inaccessible for reinspection. A contributing factor to this item is that CECO Quality Assurance failed to determine the effectiveness of the electrical contractor's cable tray hanger reinspection program (Reference - HECO NCR 407R). Additional details are discussed in Paragraph 2.c of Inspection Report 454/84-27; 455/84-19(DE).

This is a Severity Level IV violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, you are required to submit to this office within thirty days of the date of this Notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown.

JUN 5 1984

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Dated

*R. L. Spessard*

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R. L. Spessard, Director  
Division of Engineering

U.S. NUCLEAR REGULATORY COMMISSION  
REGION III

Reports No. 50-454/84-27(DE); 50-455/84-19(DE)

Docket Nos. 50-454; 50-455

Licenses No. CPPR-130; CPPR-131

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, IL 60690

Facility Name: Byron Station, Units 1 & 2

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: April 24-27, April 30-May 4 and May 10-11, 1984

Inspectors: R. S. Love *R.S. Love*

*6/6/84*  
Date

*C.C. Williams*  
E. Christnot

*6/6/84*  
Date

Approved By: *C.C. Williams*  
C. C. Williams, Chief  
Plant Systems Section

*6/12/84*  
Date

Inspection Summary

Inspection on April 24-27, April 30, May 4, and May 10-11, 1984 (Report No. 50-454/84-27(DE); 50-455/84-19(DE))

Areas Inspected: Review of licensee action on previously identified items. This involved the review of applicable procedures, drawings, records and calculation on-site and at Sargent and Lundy (licensee's A/E). This inspection involved a total of 146 inspection hours by two NRC inspectors. Six of these inspector hours were expended in Nuclear-General Employee Training which will be required for unfettered access (Ref. 10 CFR 50.70).

Results: In the areas inspected, two items of noncompliance were identified (Paragraph 2.c, failure to identify and control nonconforming conditions-Criterion XVI, and Paragraph 2.d, failure to assure that activities affecting quality are prescribed in instructions or procedures-Criterion V).

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

G. Sorensen, Construction Superintendent  
K. J. Hansing, Quality Assurance Superintendent  
\*J. O. Binder, Project Electrical Supervisor  
\*R. B. Klingler, Project Quality Control Supervisor  
\*J. L. Bergner, Quality Assurance Supervisor  
\*M. V. Dellabetta, Electrical Quality Assurance Engineer  
\*E. T. Sager, Electrical Field Engineer  
\*J. W. Rapoport, Quality Assurance Engineer  
E. L. Martin, Quality Assurance Supervisor  
J. W. Zid, Quality Assurance Engineer  
P. T. Myrda, Quality Assurance Supervisor

#### Hatfield Electric Company (HECo)

D. L. Heider, QA/QC Manager  
S. Hubler, Lead Quality Control Inspector

#### Sargent and Lundy (S&L)

J. D. Regan, Electrical Engineer  
B. G. Treece, Senior Electrical Project Engineer  
J. F. Clancy, Quality Assurance  
T. R. Eisenbart, Electrical Engineer  
J. J. Kamba, Senior Structural Engineer  
T. J. Ryan, Structural Project Engineer

The inspectors also contacted and interviewed other licensee and contractor personnel during this reporting period.

\*Denotes those present at the exit interview conducted on May 4, 1984.

### 2. Action on Previously Identified Items

- a. (Closed) Noncompliance (50-454/80-09-01; 50-455/80-08-01): During a previous inspection it was identified that the requirements of the Byron SAR and Specification 2831 were not adequately translated into Specification 2815 in that corrosion protection (painting) was not specified for the exposed carbon steel material and exposed spot welds utilized in the installation of seismic Category I electrical raceway hanger supports. Engineering Change Notice (ECN) Number 4362 was issued to revise Specifications F/L 2815 and F/L 2831. The licensee's painting contractor (Midway Industrial Contractor, Inc.) has a program in place that will assure that the items have been painted. CECo Project Construction Department (PCD) is monitoring the progress of the painting contractor. This item is closed.

b. (Closed) Unresolved Item (50-454/82-17-02; 50-455/82-12-02): During a previous inspection it was identified that conduit and cable tray hanger bolts no longer met the bolt torque requirements as specified in the applicable procedures. The licensee was requested to evaluate these relaxed torque conditions and determine if they were acceptable. With respect to cable tray hangers, as part of the hanger reinspection program, the hanger bolt torque was verified and any bolts found not meeting the torque requirements were re-torqued to procedure requirements. With respect to conduit hangers, a reinspection of 300 conduit hangers was conducted. This reinspection identified 89 conduit hanger bolts with less than the specified torque. These hangers were then analyzed for worst case conditions. This analysis was reviewed by the inspectors and found to be adequate. The analysis identified that the conduit hanger would have performed their design function in the as-found condition. This item is closed.

c. (Open) Unresolved Item (50-454/82-17-04; 50-455/82-12-04): During a previous inspection it was identified that the hanger connection details under fireproofing were being accepted without QC inspection. The HECO QA Manager had instructed the QC inspectors to accept connection details covered by fireproofing based on the information on the weld traveler for the subject connection detail. These instructions were documented in QA/QC Memorandum Number 295. These instructions were provided in conjunction with the cable pan hanger reinspection required by HECO NCR 407. At that time, the Region III inspector informed the licensee that the weld traveler could be utilized for acceptance providing the hanger connection detail used was noted on the traveler. In accordance with a CECO letter, dated September 22, 1982, HECO was required to submit certain data pertaining to this reinspection program on a periodic basis. During this reporting period, the Region III inspector reviewed these data provided by HECO. These data indicated that of 4,308 hangers reinspected, fireproofing had to be removed from 131 hangers to determine acceptance. This report indicated that 3 of the hangers were rejected after the fireproofing was removed. To determine why these three hangers were rejected, the inspectors reviewed the applicable weld travelers, hanger de-hang/re-hang forms (HDRF), rework requested, field change request (FCR), deficiency reports (DR), nonconformance reports (NCR), and the hanger inspection checklists. Following are the results of this review:

(1) Hanger BHV11 on Drawing O-3097H, Revision T.

- . HDRF 1151 indicates hanger originally installed August 19, 1980. HECO could not locate a weld traveler for this installation.
- . FCR 1807, dated August 19, 1980, was issued to relocate the hanger.
- . DR 119, dated June 11, 1982, stated that the hanger could not be inspected due to installation of fireproofing. This DR was closed on December 21, 1982.
- . HDRF-1151, dated September 30, 1982, indicates that the hanger was not installed per the drawing and FCR 1807. Hanger was removed on October 12, 1982.

Weld Traveler 19038, dated October 12, 1982, states, "Welded plate to tube steel and structural steel (South side only)." Accepted by QC Welding Inspector.

Weld Traveler 19039, dated October 15, 1982, states, "Repaired weld on plate to structural and tube steel". Accepted by QC Welding Inspector.

HDRF 1151 indicates hanger was reinstalled on October 22, 1982.

Hanger installation was accepted by QC.

The following discrepancies were observed:

- Initial weld traveler missing,
- Weld traveler for North side of hanger missing,
- NCR, DR, or Inspection Report (as applicable) identifying that the hanger was not installed per drawing and FCR 1807 was missing.

(2) Hanger H005, Drawing 1-3051H, Revision H

Weld Traveler 24943, dated July 26, 1978, documents the installation of the hanger. Accepted by QC Welding Inspector.

Inspection checklist, dated September 27, 1982, rejected the hanger because the inspector could not verify the hanger type and configuration. Was later accepted by Memo #295.

HECo to CEC0 summary report, dated October 10, 1983, indicates this hanger was rejected during the reinspection.

The following discrepancies were observed:

- No documentation to show why the hanger was rejected,
- No documentation to indicate that the hanger was repaired or reworked, as applicable,
- No inspection checklist/weld traveler to indicate that the hanger is now acceptable.

(3) Hanger H 153, Drawing 1-3061H, Revision S,

Inspection checklist, dated February 22, 1984, was a final acceptance of this hanger. The checklist referenced: FCR 22920, Revision 1; FCR 21871; Rework Request 648; DR 1025; and HDRF 2197.

Work Request 648 involved the removal and replacement of the hanger horizontal members.

FCR 21871 involved the pan to hanger attachments. Work Request 648 and FCR 21871 were not in the area of concern and the inspector chose not to followup on these items during this inspection.

DR 1025, dated October 23, 1982, documents that Connection No. 1 was a DV5 detail instead of a DV4 as specified, and Connection No. 2 was a DV89C2 instead of a DV89E1 as specified.

FCR 22920, dated November 8, 1983, changed connection No. 1 to a DV3 detail and Connection No. 2 to a DV89G2.

The following discrepancies were observed:

The inspectors could not determine how FCR 22920 was implemented in that a HDRF/Work Request was not available for review. The inspection checklist, dated February 22, 1984, indicated that Details DV3 and DV89G2 were actually installed.

- (4) Based on the results of the records review of the three rejected hangers, the inspectors elected to review a random sample of the records for hangers that had been reinspected and accepted by H&Co QC. Following are the results of this review:
- (a) Hanger H043, Drawing O-3061H, Revision M, was accepted on Inspection Report 4270, dated October 5, 1982. Inspection appeared to be adequate.
  - (b) Hanger H143, Drawing O-3063H, Revision L, was accepted on Inspection Report 4172, dated October 21, 1982. Inspection appeared to be adequate.
  - (c) Hanger H001, Drawing 1-3051H, Revision H, was accepted on Inspection Report 3650, dated September 17, 1982. Connection details 1 and 2 were accepted on the Inspection Report based on Weld Traveler 24900, dated July 18, 1978. A review of the traveler indicated that a DV84 connection detail was utilized as specified on the drawing. This was found to be acceptable.
  - (d) Hanger H008, Drawing 1-3051H, Revision H, was accepted on Inspection Report 3657, dated October 7, 1982. Connection details 1 and 2 were accepted based on Weld Traveler 24943, dated July 26, 1978. During a review of the traveler, it was observed that the traveler did not indicate which connection details were used to attach the hanger to the structural steel, i.e., details 1 and 2. Based on the documentation presented, this hanger installation could not be accepted by the Region III inspectors.
  - (e) Hanger H080, Drawing O-3051H, Revision L, was accepted on Inspection Report 3484, dated October 16, 1982. Connection details 1 and 2 were accepted based on Weld Travelers 24801, 24804, and 24834. During a review of these travelers, it was observed that the travelers did not denote which connection details were used to attach the hanger to the structural steel. Based on the documentation presented, this hanger installation could not be accepted by the Region III inspectors.
  - (f) Hanger H028, Drawing O-3051H, Revision L, was inspected on Inspection Report 3433, dated October 5, 1982. This Inspection Report referenced DR542. During a review of this DR, it was observed that the auxiliary steel plate size was listed as being the wrong size. This item was not disposition nor corrected and the DR was improperly

closed. Based on the documentation presented, this hanger installation could not be accepted by the Region III inspectors.

(g) Hanger H085, Drawing 1-3051H, Revision H, was noted as being unacceptable on Inspection Report 3734, dated July 30, 1982. Reasons noted were: (1) unable to verify connection details 1 and 2 because they were covered with fireproofing, and (2) weld travelers did not specify the connection details installed. On September 27, 1982, this hanger was accepted per Memo 295. Based on the documentation presented, this hanger could not be accepted by the Region III inspectors.

(5) Based on the results of the documentation review for the ten above listed hangers, the Region III inspectors terminated their review of cable tray hanger documentation. On April 26, 1984, the inspectors conducted a mini-exit-interview with CECO and HECO QA and construction personnel. During this interview, the inspectors reviewed their concerns with the acceptability of the cable tray hanger documentation. The inspectors requested that the licensee review the hanger documentation and determine what hangers were unacceptable. On May 1, 1984, the inspectors were informed by the licensee that there were approximately 345 hanger that were accepted based on Memo 295.

The licensee stated that approximately 6000 hanger packages were reviewed by CECO QA and HECO QC personnel. The licensee continued to provide daily updates on the progress of the hanger reinspection effort and their findings. During a telephone conversation between Mr. J. Binder (CECO) and Mr. R. S. Love (RIII) on May 11, 1984, Mr. Binder provided the following results of the reinspection effort:

Total number of hangers requiring reinspection	314
Number of hangers inaccessible	19
These hangers were documented on HECO NCR 990	
Total number of hangers reinspected	295
Total number of deficiencies identified	129
Deficiencies by attribute:	
Welding fitup	91
Wrong connection detail	7
Wrong weld length, elevation, auxiliary steel plate size, and missing bolts	31

Fit up deficiencies are documented on HECO NCR 989. Connection detail and steel plate deficiencies, etc. are documented on HECO DRs 4921-4928, 4930, 4932, 4934-4937, 4943, 4945-4948, 5003, 5007, 5013-5017, 5019, and 5022-5032.



- (6) As a result of the inspector's observations noted above, the inspectors requested that the licensee provide the last three audit/surveillance reports performed by CECO in the area of hanger acceptance for the subject reinspection program. As stated earlier in this report, this initial reinspection effort involved 4308 hangers. The CECO QA Engineer informed the inspectors that to the best of his knowledge, no audits or surveillances were performed in this area and furthermore, he (CECO QA Engineer) was not aware of this hanger reinspection program. On May 10, 1984, Messrs. C. C. Williams and R. S. Love of the Region III staff contacted Mr. K. J. Hansing, CECO QA Superintendent, by telephone and discussed the reinspection program and lack of CECO QA audits and/or surveillances in this area. In summary, Mr. Hansing stated that: (1) CECO QA was aware of the hanger reinspection program; (2) CECO QA chose not to perform a special audit/surveillance of this hanger reinspection program; (3) CECO QA was not aware of Region III's interest in this program. It should be noted that Region III's involvement with this reinspection effort was documented in Inspection Reports 454/82-17; 455/82-12 and 454/83-48.

On May 11, 1984, Mr. R. S. Love, Region III, contacted Messrs. J. O. Binder, J. L. Bergner and others of the CECO PCD and QA Byron site organization by telephone. During this conversation it was learned that CECO QA had in fact performed an audit of the subject reinspection program in June 1983 and had a concern with HECO Memo 295. Mr. Bergner did not elaborate on this concern. Mr. Binder stated that during this inspection period, he (Mr. Binder) directed the HECO QA/QC Manager to prepare a letter to cancel Memo 295. Upon review of the sequence of events and the results of the hanger reinspection effort, it would appear that the 129 deficiencies observed on 119 safety-related cable tray hangers would have gone undetected if the Region III inspectors had not uncovered the problem areas and requested CECO to perform an indepth review of hanger documentation and the subsequent reinspection program. The licensee was informed that failure to establish a program to assure that conditions adverse to qualify are promptly identified and corrected is an item of noncompliance in accordance with Criterion XVI of 10 CFR 50, Appendix B (50-454/84-27-01; 50-455/84-19-01).

- d. (Open) Noncompliance (50-454/82-17-05; 50-455/82-17-05): During a previous inspection it was identified that the licensee was not identifying, controlling, and correcting cable tray separation violations. As part of the corrective action, during the latter part of 1982 and early 1983 a concerted effort was made by CECO, HECO and S&L to identify all cable tray separation violations. This information was compiled and analyzed by S&L. The corrective action were: (1) relocate one or more cable trays to correct the violations; or (2) install cable tray covers on one or more of the cable trays (by the installation of covers, the separation criteria is reduced

from 3" horizontal and 12" vertical to 1" horizontal and 1" vertical); or (3) based on the analysis, accept the installation as installed; and (4) place a distinctive mark (black octagon mark) on the applicable drawings to indicate that a separation violation had been identified in that area and that the violation had been analyzed by the engineer, S&L.

During this reporting period, the inspectors: (1) reviewed the engineer's analysis and found it to be adequate; (2) reviewed selected drawings and verified that they were marked to indicate that the engineer had analyzed the separation violations; (3) reviewed select drawing to verify that tray covers were specified as part of the corrective action; and (4) toured the power block and identified separation violations and verified that the violations had been addressed by the engineer and appropriate action taken. During interviews with S&L personnel identified in Paragraph 1 of this report, the inspectors were informed that several notes had been added or revised on Drawing 6E-0-3237B, February 1983 revision, to prevent recurrence of cable tray separation violations. During a review of Drawing 6E-0-3237B, Revision L, it was observed that Note 47 directed the electrical contractor, HECO, to install cable tray covers in accordance with the electrical specifications when the 3" horizontal and 12" vertical separation requirements were violated even though the applicable drawing does not show the subject tray to be covered. Note 48 directs the electrical contractor to notify S&L if the 1" metal to metal separation is violated after the installation of cable tray covers. During a review of HECO 9 Series procedures, it was observed that the requirements of Note 48 were adequately addressed but the requirements of Note 47 were not addressed. During interviews with the CECO Project Electrical Supervisor, CECO Electrical QA Engineer, CECO Electrical Field Engineer, HECO QA/QC Manager, and HECO Project Engineer, it appeared that these personnel were not aware of the requirement of Note 47 on Drawing 6E-0-3237B until it was brought to their attention by the Region III inspectors. It was also learned that HECO QC, engineering, and construction were not verifying cable tray separation.

During this reporting period, the licensee instituted a program to determine the amount of safety-related cable tray installed in Units 1 and 2 since February 1983 (effective date of Note 47). As a result of this review, it was determined that 83 cable tray inspection reports (Note: each report can address 1 or more sections of cable tray) had been prepared for Unit 1, and cable tray separation requirements were not verified (Reference: HECO NCR 975, dated May 4, 1984), and 41 reports were submitted for Unit 2 (Reference: HECO NCR 976, dated May 4, 1984). The licensee was informed that failure to assure that activities affecting quality are prescribed in documented instructions or procedures is an item of noncompliance in accordance with Criterion V of 10 CFR 50, Appendix B (50-454/84-27-02; 50-455/84-19-02).

- e. (Closed) Noncompliance (50-454/82-17-06; 50-455/82-12-06): During a previous inspection it was identified that the licensee was not identifying, controlling, and correcting cable separation violations inside of panels, cabinets, motor control centers, switchgear, etc. As part of the corrective action, during the latter part of 1982 and early 1983, a concerted effort was made by CECO, HECO and S&L to identify all cable separation violations inside of equipment. This information was compiled and analyzed by S&L. The corrective actions were: (1) relocate/reroute one or more of the cables to correct the violation; or (2) install fire barriers between the involved cables; or (3) route one of the involved cable inside a conduit that qualifies as a fire barrier; or (4) based on the analysis, accept the installation as installed; and (5) establish a program to inform S&L of future violations so that they could be analyzed and corrective action assigned.

During this reporting period, the inspectors: (1) reviewed the engineer's analysis and found it to be adequate; (2) reviewed the electrical contractor's (HECO) termination inspection procedure and identified that the QC inspector was required to inspect for and identify separation violations between safety-related and non-safety-related cables and between redundant cables; and (3) verified implementation of this program by reviewing cable separation problem reports that were being forwarded to the engineer for analysis. The corrective actions and the corrective actions to prevent recurrence appeared to be adequate. This item is closed.

- f. (Closed) Noncompliance (50-454/83-37-01): During a previous audit, it was identified that the CECO Manager of Quality Assurance had established an Interim Lead Auditor certification program that was not documented in the CECO Quality Assurance Manual, or in the CECO Topical Report nor is it permitted by ANSI N45.2.23-1978, "Qualification of Quality Assurance Program Audit Personnel for Nuclear Power Plants." This informal program had been established within CECO to certify an individual as an Interim Lead Auditor when he/she did not meet the qualification requirements of a lead auditor as specified in ANSI N45.2.23-1978.

As part of CECO's corrective action, the Interim Lead Auditor concept was discontinued, the personnel holding Interim Lead Auditor certifications were de-certified, and records were reviewed to determine the names of personnel that had been certified that did not meet the minimum qualification requirements. The records review indicated that between 1977 and 1983, eight (8) CECO personnel had been certified as Interim Lead Auditors by the CECO Manager of Quality Assurance. The audits performed by these 8 people were reviewed and evaluated by qualified CECO Lead Auditors. With a few exceptions, the audit reports and the objective evidence and the audit deficiency close outs were in compliance with the CECO audit program. During a review of these audit evaluations, the most significant audit deficiencies observed by the Region III inspectors were:

- (1) One item on the checklist had insufficient objective evidence for acceptance. This attribute was adequately covered on a subsequent audit by a different auditor and found acceptable.

- (2) One item as relating to records storage was marked acceptable and from the information documented in the report, it should have been listed as a deficiency. This item was subsequently identified and corrected.

The corrective action and corrective action to prevent recurrence appears to be adequate. This item is closed.

- g. (Open) Noncompliance (50-454/83-49-04): During a previous inspection, it was identified that Kelleem type cable grips (used to support electrical cables in cable pan risers and in vertical conduit runs) were not installed in accordance with the electrical specifications. This item is also identified in 10 CFR 50.55(e) reports 454/83-14-EE and 455/83-14-EE. During this reporting period, the Region III inspectors observed that the installation of cable grips in safety-related risers R277, R345, R368, and R369 were deficient in that they were not supporting the cables in accordance with the design specifications. Pending verification of the licensee's corrective action, this item remains open. This item has been assigned Category 1 and must be closed prior to fuel load.
- h. (Closed) Open Item (50-454/84-02-03; 50-455/84-02-03): During the ASLB hearing for Byron Station, Unit 1, the licensee stated that the cable pull reports for cables already installed are being reviewed to ensure that the maximum allowable cable pulling tension and maximum allowable cable sidewall pressure had not been exceeded. As documented in Inspection Report No. 50-454/84-09 and 50-455/84-07, the Region III inspector reviewed the on-site records and with one exception (Noncompliance 454/84-09-02; 455/84-07-02), these records were found to be adequate. During this reporting period, the Region III inspectors reviewed the engineering calculations at the engineer's facilities. The engineering analysis was performed utilizing one or more of the following methods:
- (1) Calculations for an assumed worst case conduit configuration containing a worst cable configuration, i.e. conduit run with four 90° bends with minimum bend radius (270° total bends allowed at Byron Station) and with the maximum cable density. Utilizing this methodology, a critical conduit length was calculated for each conduit size. Using this information, a review of the approximate 2500 conduit runs was made. If the actual length of the conduit run approached the calculated critical length, that run was flagged for further analysis per paragraph (2) below. Worst case accepted, as observed by the inspectors, during this first cut, had a safety factor of approximately four, i.e. allowable pulling tension 400# versus calculated of approximately 100#.
  - (2) Calculations for an assumed worst case conduit configuration (4-90° bends) containing the actual installed cable configuration. The worst case accepted, as observed by the inspectors, had a safety factor of approximately 3.3. Again, questionable conduit runs were flagged for analysis per paragraph (3) below.

- (3) Calculations for actual conduit configuration containing the actual cable configuration. Worst case accepted, as observed by the inspectors, had a safety factor of approximately 4.7. Upon completion of this three step analysis, three conduit runs were questionable. They were analyzed by Okonite Company, cable manufacturer, as described in paragraph (4) below.
- (4) The following information was forwarded to Okonite to assist in their evaluation of cables installed in conduits COA-6188, COA-6192 and COA-6193:

Conduit size - all 5"  
Conduit configuration from as-built drawings  
Cable configuration from cable pull cards  
Conduit COA-6188 - 2 - 1/C-750 MCM, 5KV, cables  
Conduit COA-6192 and 6193 - 3 - 1/C-750 MCM, 5KV, cables  
Cable pull direction

The maximum cable pulling tension for the subject cables was not in question for these three installations in that the maximum allowable tension for the 2-1/C-750 MCM cable pull is 120,000# and 180,000# for the 3-1/C-750 MCM cable pull. Due to conduit configuration, Okonite was requested to perform an analysis for possible cable sidewall pressure violations. Okonite's letter of October 11, 1983 indicates that they performed their analysis and found no sidewall pressure violations. It should be noted that each cable manufacturer establishes the maximum cable sidewall pressure that their cables are designed to withstand without causing damage to the conductor insulation. Based on the results of previous inspections and documentation reviewed during this inspection, the inspectors have a reasonable assurance that these safety-related cables will perform their intended function. This item is closed. *ndf*

- f. (Closed) Unresolved Item (50-454/84-09-01; 50-455/84-07-01): During a previous inspection, it was observed that there were several outstanding NCRs that were prepared to document possible over tensioning of safety-related cables during initial installation or during rework (pull back). During this reporting period, the inspectors reviewed the disposition and implementation of CECO. NCRs F838, F839, F845, F864, and F865. The inspectors also reviewed the back up data for these NCRs and found it to be adequate. This item is closed.
- j. (Closed) Noncompliance (50-454/84-09-02; 50-455/84-07-02): During a previous inspection it was identified that HECO DR 3382 was inadequately dispositioned, resulting in 12 cables being installed whose quality was indeterminate. Subsequent to the inspectors findings, HECO prepared NCR 841 to document the overstressed cables. During this inspection, the inspectors verified that the cables had been replaced, and action to prevent recurrence had been implemented. This item is closed.

3. Licensee Action on 10 CFR 50.55(e) Reports

(Closed) 10 CFR 50.55(e) Report (454/82-07-EE and 455/82-07-EE): Direct current (DC) control power cable failures. Several single conductor ASW #2 DC control power cables, which run from the auxiliary building to the essential service water cooling tower in an underground duct, have failed to ground. The failures occurred after the cables had been tested and placed in service. The inspectors reviewed the licensee's action on the failure of DC cables 1 DC 073 and 1 DC 075 in Unit 1 and DC cables 2 DC 073, 2 DC 074 and 2 DC 075 in Unit 2. Records indicated the following:

- a. Cables, 1 DC 073 and 1 DC 075 in Unit 1 were replaced by multi-conductor cables 1 DC 742 and 1 DC 243 respectively.
- b. Cables 2 DC 073, 2 DC 074 and 2 DC 075 in Unit 2 were replaced by multi-conductor cables 2 DC 244, 2 DC 245 and 2 DC 243 respectively.
- c. Two nonconformance reports (NCR) 666 and 732 were written documenting the failures and both NCR's were closed out on April 19, 1984.
- d. A sample of the cables was pulled and tested by the manufacturer. The sample failed a production test (e.g. a 13,500 volt spark test) which it had passed prior to shipment.
- e. The probable failure to pass the test was due to elongation of the cable insulation.

The inspectors determined from a review of installation records that the cables were replaced in accordance with approved procedures. This item is closed.

4. Conductor Butt Splices

Due to the problems encountered with conductor butt splices at other Nuclear Plants, the inspectors queried the licensee as to what actions had been taken or were planned to verify the acceptability of the butt splices at the Byron Station. The inspectors were informed that CECO QA initiated a review of approximately 11,000 cable termination reports and identified 646 of these reports that documented the installation of butt splices. Between March 13-16, 1984, CECO QA and HECO QC randomly checked 221 safety-related and 78 non-safety-related conductor butt splices. Following are the results of the checks made on the 221 safety-related butt splices as documented in CECO QA Surveillance Report 5944, dated March 27, 1984:

- . 27 splices were not inspected because they were covered with tape or heat shrink material.
- . 194 splices were visually inspected and 72 were "tug-tested".
- . 1 butt splice failed the tug-test and was replaced.
- . 16 splices were identified as defective and replaced. Failure attributes were not provided.
- . All 194 butt splices were installed with the proper crimping tool.

CECo NCR F899, dated April 5, 1984, was prepared to document that the conductor insulation on cables provided by Okonite Company would not fit inside the insulation barrel of Amp butt splice connectors. This NCR has been forwarded to CECO Project Engineering Department (off-site) for resolution. As of May 4, 1984, a resolution/disposition had not been received on-site.

To understand why the conductor butt splices were rejected, the inspectors requested the applicable inspection checklists/termination reports for review. The inspectors reviewed the following Cable Inspection Termination Reports (CITR) and Equipment Modification Inspection Requests (EMIR):

<u>Report No.</u>	<u>Cable No.</u>	<u>No. Rejects</u>	<u>Remarks</u>
CIRT 12318	2SX033	1	Butt Splice Replaced
CITR 12130	1RH058	2	Butt Splice Replaced
CITR 12119	1RH062	1	Butt Splice Replaced
CITR 12143	1RH053	3	Butt Splice Replaced
CITR 12145	1CSC01	2	Butt Splice Replaced
CITR 12144	1RH102	2	Butt Splice Replaced
CITR 12131	1RH059	3	Butt Splice Replaced
CITR 12150	1RH042	1	Butt Splice Replaced
CITR 12123	1RH043	1	Butt Splice Replaced
EMIR 5990	10G155	1	Cut insulation between Butt Splice and terminal lug-replaced.
EMIR 5988	1RC159	1	Cut insulation-repaired with shrink-fit material
	1RC137	1	Bad crimp on connector- replaced
	1RC147	3	Cut insulation-replaced
	1RC168	1	Exposed copper at splice replaced
	1RC170	1	Exposed copper at Splice- replaced
	10G157	1	Butt splice replaced
	10G158	1	Cut insulation-repaired with shrink-fit material
	10G163	<u>1</u>	Butt splice replaced

27 Total

From the above information, it would appear that an addition ten butt splices were rejected and repaired during the repair of the 17 rejected by CECO QA. Utilizing this latest information, it would appear that the reject rate 27/194 is 13.9%. During interviews with the CECO and HECO personnel involved in this reinspection effort, the inspectors were informed that the largest number of rejected butt splices were because the conductor (copper) was not visible at the connector crimp.

The inspectors also performed a general review of the 646 CITRs identified by the licensee that documented butt splices. It was observed that a large percentage of these splices were associated with the termination of

metal shielding braid or tape-shield on control or instrument cables as addressed in S&L Standard EA-215. The inspectors made a detailed review of 34 of these CITRs. Following are the results of this review:

<u>CITR No.</u>	<u>Cable No.</u>	<u>No. of Splices</u>	<u>Remarks</u>
119	1MS529	1	
11942	1AF181	1	
11941	1AF190	1	
11940	1AF179	1	
11939	1AF170	1	
11935	1VA053	1	Replaced-damaged conductor insulation
11933	1VA533	1	
11918	1DC245	1	
11906	1VC590	1	Replaced-damaged conductor insulation
11905	1CV543	2	Replaced-damaged conductor insulation
11904	1CV491	2	Replaced-damaged conductor insulation
11891	1CS116	2	
11860	1SI528	1	Replaced butt splice
11859	1SI523	1	Replaced butt splice
11858	1VA043	1	Replaced butt splice
11857	1VA102	1	Replaced butt splice
10898	1NR225	1	Shield braid splice
10897	1NR227	1	Shield wire splice
10896	1NR225	1	Shield wire splice
8037	1VA818	1	
8033	1VA707	1	
7985	1VA709	1	
7964	1VA705	1	
7963	1VA817	1	
5594	1NR014	1	In process inspection
5550	1CC010	1	
5549	1CC001	1	In process inspection
5534	1FW218	3	
5528	1RC439	1	In process inspection
5527	1NR102	1	In process inspection
5526	1RC436	1	In process inspection
5272	1FW221	5	
4561	1MS308	4	
4391	1FW055	1	Crimp tool not calibrated- replaced butt splice.

Dates of these inspections ranged from March 3, 1982 thru February 25, 1984. It was observed that all of the inspection reports randomly selected were for Byron Station Unit 1. In the 34 reports reviewed, it appeared that there were five defective butt splices and six examples of damaged/cut conductor insulation identified.



To determine if all QC termination inspectors were documenting butt splices on CIRTs, the CECo Electrical Field Engineer interviewed the HECO Electrical QC termination inspectors and determined that only approximately 50% of those interviewed documented their inspections of butt splices. In view of the information obtained by CECo during their review of potential butt splice problems at the Byron Station (i.e., 13.9% reject rate), the Region III inspector expressed his concern as to why CECo failed to implement a 100% reinspection/inspection of conductor butt splices. As a result of the inspector's concern, CECo, Byron Station, provided a verbal notification to Region III of a potential 10 CFR 50.55(e) report on May 10, 1984, relative to electrical conductor butt splices. As a result of telephone conversations between Mr. R. Tuetken (CECo Byron Staff) and Mr. C. C. Williams (Region III) on May 10 and 11, 1984, CECo developed an inspection plan for the reinspection of electrical conductor butt splices at the Byron Station, Units 1 and 2. This inspection plan is documented in Mr. D. Farrar (CECo Director of Nuclear Licensing) letter to Mr. James G. Keppler (NRC Regional Administrator), dated May 17, 1984.

Region III has assigned an inspector to monitor the conductor butt splice reinspection program. Upon completion of the reinspection program, separate inspection reports (50-454/84-29 and 50-455/84-21) will be issued to document the findings and corrective action taken.

5. Exit Interview

The inspectors met with the licensee representatives (denotes in paragraph 1) at the conclusion of the on-site portion of the inspection on May 4, 1984, and discussed the scope and concerns of this inspection. As stated in paragraph 4 of this report, Region III personnel discussed the concerns of this inspection with Mr. R. Tuetken on May 10 and 11, 1984 by telephone. On May 25, 1984, Mr. R. Love telephonically presented the findings of this inspection to Mr. R. B. Klingler (CECo Byron Station staff). The licensee acknowledged this information.



82-17,12

EDS -  
TRT

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION III  
799 ROOSEVELT ROAD  
GLEN ELLYN, ILLINOIS 60137

JAN 17 1983

JAN 11 1983

Docket No. 50-454  
Docket No. 50-455

Commonwealth Edison Company  
ATTN: Mr. Cordell Reed  
Vice President  
Post Office Box 767  
Chicago, IL 60690

Gentlemen:

This refers to a special inspection conducted by Mr. R. S. Love of this office on August 16-20, 23-27, and September 17, 1982, of activities at Byron Station authorized by NRC Construction Permits No. CPPR-130 and No. CPPR-131 and to the discussion of our findings with Mr. G. Sorensen at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

During this inspection, certain of your activities appeared to be in non-compliance with NRC requirements, as specified in the enclosed Appendix. A written response is required.

In addition to the items in the enclosed Appendix, a written response is also requested for the unresolved item identified in Paragraph 3.b.(2) of the Inspection Report.

In accordance with 10 CFR 2.790 of the Commission's regulations, a copy of this letter, the enclosures, and your response to this letter will be placed in the NRC's Public Document Room. If this report contains any information that you (or your contractors) believe to be exempt from disclosure under 10 CFR 9.5(a)(4), it is necessary that you (a) notify this office by telephone within ten (10) days from the date of this letter of your intention to file a request for withholding; and (b) submit within twenty-five (25) days from the date of this letter a written application to this office to withhold such information. If your receipt of this letter has been delayed such that less than seven (7) days are available for your review, please notify this office promptly so that a new due date may be established. Consistent with Section 2.790(b)(1), any such application must be accompanied by an affidavit executed by the owner of the information which identifies the document or part sought to be withheld, and which contains a full statement of the reasons which are the bases for the claim that the information should be withheld from public disclosure. This section further requires the statement to address with specificity

Love Depo #6  
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the considerations listed in 10 CFR 2.790(b)(4). The information sought to be withheld shall be incorporated as far as possible into a separate part of the affidavit. If we do not hear from you in this regard within the specified periods noted above, a copy of this letter, the enclosures, and your response to this letter will be placed in the Public Document Room.

The responses directed by this letter (and the accompanying Notice) are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, PL 96-511.

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

*C. E. Norelius*

C. E. Norelius, Director  
Division of Engineering and  
Technical Programs

Enclosures:

1. Appendix, Notice  
of Violation
2. Inspection Report  
No. 50-454/82-17(DETP)  
and No. 50-455/82-12(DETP)

cc w/encls:

Louis O. DelGeorge, Director  
of Nuclear Licensing  
V. I. Schlosser, Project Manager  
Gunner Sorensen, Site Project  
Superintendent  
R. E. Querio, Station  
Superintendent  
DMB/Document Control Desk (RIDS)  
Resident Inspector, RIII Byron  
Resident Inspector, RIII  
Braidwood  
Karen Borgstadt, Office of  
Assistant Attorney General  
Myron M. Cherry

;

Appendix

NOTICE OF VIOLATION

Commonwealth Edison Company

Docket No. 50-454

Docket No. 50-455

As a result of the special inspection conducted on August 16-20, 23-27 and September 17, 1982, and in accordance with the NRC Enforcement Policy, 47 FR 9987 (March 9, 1982), the following violation was identified:

10 CFR 50, Appendix B, Criterion XVI, states in part, "Measures shall be established to assure that conditions adverse to quality such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and noncompliances are promptly identified and corrected.

Commonwealth Edison Company Topical Report No. CE 1-A, Revision 21, Section 16, states in part, "A corrective action system will be used to assure that such items as failures, malfunctions, deficiencies, deviations, defective material and equipment and nonconformances which are adverse to quality and might affect the safe operation of a nuclear generating station are promptly identified and corrected."

Contrary to the above, the licensee had not taken the necessary actions to assure that an identified item of noncompliance, concerning (1) the separation criteria between safety-related and non-safety related cable trays and (2) the separation criteria between safety-related and non-safety related cables/wires inside Class 1B equipment, were promptly identified and corrected. This is exemplified by the fact that (1) cable tray separation violations and (2) electrical cable separation violations inside equipment are not being promptly identified and corrected or analyzed. See the body of the report for examples.

This is a Severity Level IV violation (Supplement II).

Pursuant to the provisions of 10 CFR 2.201, you are required to submit to this office within thirty days of the date of this Notice a written statement or explanation in reply, including for each item of noncompliance: (1) corrective action taken and the results achieved; (2) corrective action to be taken to avoid further noncompliance; and (3) the date when full compliance will be achieved. Consideration may be given to extending your response time for good cause shown.

JAN 11 1983

Dated

*C. E. Norelius*  
C. E. Norelius, Director  
Division of Engineering and  
Technical Programs

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-454/82-17(DETP); 50-455/82-12(DETP)

Docket No. 50-454; 50-455

License No. CPPR-130; CPPR-131

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, Illinois 60690

Facility Name: Byron Station, Units 1 and 2

Inspection At: Byron Site, Byron, Illinois

Inspection Conducted: August 16-20, 23-27, and September 17, 1982

Inspector: R. S. Love

*R. S. Love*

1/3/83

Approved By: C. C. Williams, Chief  
Plant Systems Section

*C. C. Williams*

1/3/83

Inspection Summary

Inspection on August 16-20, 23-27, and September 17, 1982 (Report No. 50-454/82-17(DETP); 50-455/82-12(DETP))

Areas Inspected: A special inspection was initiated following receipt of allegations and concerns, primarily relating to safety-related electrical work. The inspection consisted of an examination of pertinent procedures and records, observations, and interviews of personnel. The inspection involved 102 man-hours by one NRC inspector. The inspector also reviewed items identified on previous inspections and accompanied NRC staff personnel on a tour of the site.

Results: Of the areas inspected, one apparent item of noncompliance was identified (Criterion XVI - failure to identify and control nonconforming items - Paragraph 4).

:

DETAILS

1. Persons Contacted

Commonwealth Edison Company (CECo)

\*V. I. Schlosser, Project Manager  
\*G. Sorensen, Project Superintendent  
\*M. A. Stanish, Quality Assurance Superintendent  
\*R. Tuetken, Assistant Project Superintendent  
\*K. J. Hansing, Quality Assurance Supervisor  
\*J. T. Westermeier, Project Engineer  
\*R. B. Klingler, Quality Control Supervisor, PCD  
\*J. O. Bindor, Project Electrical Supervisor  
\*P. T. Myrda, Quality Assurance Supervisor  
\*A. A. Jaras, Project Operations Analysis Supervisor  
G. Adams, Field Supervisor  
H. J. Kaczmarek, Quality Assurance Engineer  
R. Gruber, Quality Assurance Engineer  
J. McLindsay, Work Analysis-Instrument Department

Sargent & Lundy (S&L)

\*T. B. Thorsell, Engineer  
\*R. Treece, Engineer

Westinghouse (W)

J. P. Strange, Construction  
R. W. Schulz, Site Manager

Hatfield Electric Company (HECo)

G. Vanderhei, Project Manager  
J. Buchanan, Quality Assurance Manager  
A. Koca, Quality Control Supervisor  
D. Stoner, Quality Control Foreman  
S. Bindenagel, Quality Control Lead Inspector  
R. Ewbank, Quality Control General Foreman  
R. Ruefer, Quality Control Inspector  
J. Hayes, Quality Control Inspector  
R. Riemer, Quality Control Inspector  
M. Momaly, Quality Control Inspector  
D. Hoffman, Quality Control Inspector  
E. Sarver, Quality Control Inspector  
S. Karr, Quality Control Inspector  
B. Peterson, Quality Control Inspector  
M. Andrews, Quality Control Inspector  
D. Nicholson, Quality Control Inspector  
P. McMenamin, Quality Control Inspector  
S. Webb, Quality Control Inspector

R. Friel, Quality Control Inspector  
J. Anderson, Quality Control Inspector  
B. Mandurano, Quality Control Inspector  
G. Ostrander, Quality Control Inspector  
J. Elgin, Quality Control Inspector  
B. Welden, Quality Control Inspector  
E. Lewis, Quality Control Inspector  
J. Eggum, Quality Control Inspector  
J. Wood, Quality Control Inspector  
D. Opatrny, Quality Control Inspector  
J. Like, Electrician  
S. Wagner, Quality Control Inspector  
M. Jonston, Quality Assurance Records Clerk

Hunter Corporation

M. Somsag, Quality Assurance Supervisor  
R. Cotton, Assistant Inspection Supervisor

Powers-Azco-Pope (PAP)

R. Larkin, Quality Assurance Manager

U.S. Nuclear Regulatory Commission (NRC)

S. Chesnut, Project Manager, Licensing Branch No. 1  
K. Kiper, Project Section Chief, (Braidwood) Licensing Branch No. 1  
S. Rhow, Electrical Engineer, Power Systems Branch, NRR

The inspector also contacted and interviewed other licensee' and contractor personnel during this reporting period.

\*Denotes those present at the exit interview.

2. Action on Previously Identified Items

(CLOSED) Unresolved Item (50-454/80-12-03; 50-455/80-11-03): This item pertains to the preservation of field welds where equipment is attached to embedded steel. Engineering Change Notices (ECN) 1843, 2041, 2164, and 2259 have been issued to revise specification F-2831. The subject ECNs address the preservation of field welds. This item is closed.

(CLOSED) Noncompliance (50-454/80-25-09; 50-455/80-23-05): This item pertains to the lack of separation, in free air, of safety related and non-safety related electrical cables. This item is now being tracked by noncompliance 50-454/81-16-01 and 50-455/81-12-01. This item is closed.

(CLOSED) Unresolved Item (50-454/81-08-01; 50-455/81-0701): This item pertains to the lack of separation between cable trays 1799-PIE and 1799V-PIB. Drawing 6E-1-3043B, Revision K now shows that a tray

cover will be installed on cable tray 1799V-PIB in the area where separation requirements are not maintained between the subject trays. This item is closed.

(CLOSED) Noncompliance (50-454/81-08-02): This item pertains to the acceptability of the data recorded on the Calibration Data Report Form Number 22. The subject form has been revised to provide for the evaluation of the data recorded. Signature and date are required to show acceptance. This item is closed.

(CLOSED) Unresolved Item (50-454/81-08-04; 50-455/81-07-03): This item pertains to the lack of QC verification of the torquing of bolts used in cable/wire terminations. The applicable procedure has been revised to incorporate the requirement for QC to witness/verify and document the torquing of the subject bolts. This item is closed.

(CLOSED) Unresolved Item (50-454/81-16-02; 50-455/81-12-02): This item addresses the failure of Hatfield Electric Company to implement approved procedures. A review of Hatfield's program indicates that all approved procedures are being implemented. This item is closed.

(CLOSED) Unresolved Item (50-454/81-08-05; 50-455/81-0704): This item addressed the separation of Class 1E and non-class 1E cables/wires inside of Class 1E equipment. This item has been upgraded to an item of noncompliance, see paragraph 4.b.

### 3. Investigation of Allegations

#### a. Introduction

On August 2, 1982, an alleged telephoned the Office of Investigations, Chicago Field Office, and expressed concerns about the qualifications of personnel, construction practices, and document control at the Byron Station as relating primarily to safety-related electrical work that is being performed by Hatfield Electric Company (licensee's electrical contractor). On August 16, 1982, the alleged was interviewed at his residence by four NRC representatives. At this time, the alleged provided copies of various documents and made specific allegations. The allegations and the inspector findings are addressed elsewhere in this report.

#### b. Personnel Qualification and Certification

- (1) It was alleged that numerous personnel, many by name, in the Hatfield Quality Control organization were not qualified by either experience or training.

This item was identified during the team inspection at the Byron Station and is being tracked as an item of noncompliance, numbers 454/82-05-19 and 455/82-04-19. During the followup on the aforementioned item of noncompliance, a more thorough review of the qualifications and certification



of Hatfield QC personnel will be made by the NRC Senior Resident Inspector. At the present, the licensee is taking a more active part in the review of the contractors training, qualification and certification programs.

- (2) It was alleged that approximately sixty-five journeymen electricians have transferred into the Hatfield Quality Department as Level I Quality Control Inspectors and most of their assignments have been to inspect work they had previously installed, thus removing any impartiality from the inspections.

During a review of this allegation, the Region III inspector interviewed approximately 26 journeyman electricians that were assigned to the Hatfield Quality Department and various supervisory personnel, see listing of Hatfield personnel contacted. The following determinations were made:

- (a) As of August 24, 1982, thirty-nine journeyman electricians and two 1st year apprentices were assigned to the QC Department. Following is a listing of the work assignments for the 39 journeymen:

Preparing as-built drawings	10
Inspection of terminations	4
Inspection of cable tray and hangers	11
Inspection of conduit and hangers	14

- (b) Of the journeymen interviewed, it appears that one man may have inspected some of his own work in the Auxiliary Building at the 330' elevation. While working as an electrician, Mr. M. Momaly was assigned to the installation of conduit and conduit hangers in both Auxiliary Buildings. On or about August 23, 1982, Mr. Momaly was assigned to the inspection of conduit and conduit hangers in the Auxiliary Building. When the Hatfield Quality Assurance Manager became aware of the aforementioned information on or about August 25, 1982, he immediately had Mr. Momaly reassigned to the inspection of cable tray and hangers. The NRC inspector requested that a 100% re-inspection be performed on the conduit and conduit hangers accepted by Mr. Momaly in the Auxiliary Building.
- (c) Hatfield Quality Management conducted a meeting with all journeymen electricians assigned to the QC Department in order to determine if any other journeymen had inspected items that they had worked on. Again, Mr. Momaly's inspections in the Auxiliary Building were the only inspections in question.

(d) In conjunction with this allegation, on August 25, 1982, the inspector reviewed the work assignments and inspection records of 6 craft personnel now working as inspectors in the Hunter Quality Control Department. The inspector could not identify any instances where a person inspected any item which he/she had worked on. Also on August 25, 1982, the inspector interviewed the PAP Quality Assurance Manager and was informed that upon learning of the NRC's investigation, the QA Manager initiated his own investigation to determine if a QC inspector had inspected his own work. The investigation was not complete but to date, PAP could not identify any inspector that had inspected his own work. The inspector requested that the licensee perform an indepth review of on-site contractors that utilize craft personnel as QC inspectors to determine if any "craft" QC inspectors have ever inspected any item he/she may have worked on. The licensee was requested to respond to this item as though it were an item of noncompliance. Pending a review of the licensee's indepth review of on-site contractors, this item is unresolved (50-454/82-17-01; 50-455/82-12-01).

NOTE

- (3) It was alleged that several journeyman electrician QC inspectors carry tools with them during their inspections and correct nonconforming conditions on the spot, without documenting that a problem existed or the corrective action taken. The allegor stated that this appears to happen most frequently during electrical termination inspections.

During several tours of the power block, the inspector did not observe QC inspectors making or correcting electrical terminations, nor did the inspector observe any QC inspectors carrying tools commonly used for making electrical terminations, i.e., wire strippers, terminal log crimpers, etc. During interviews with QC inspectors, none of the inspectors admitted to making or correcting electrical terminations. The inspector requested that the CECO QA personnel be made aware of this allegation so that they can check for this type of occurrence during their routine surveillance inspections and audits.

- (4) The allegor stated that Hatfield has an extensive training and retraining program which "Doesn't accomplish anything." The allegor also stated that in December 1981, Hatfield only had 4 inspectors, but now had 85 and the program has not been able to handle and adequately qualify the number of new inspectors.

Examination of records revealed that in December 1981, Hatfield had approximately 50 personnel (supervisor, inspectors, as-built, documentation) in quality and a total of 70 personnel on

August 24, 1982. These figures do not include secretaries/typist assigned to the QC department. In conjunction with the item of noncompliance identified in the team inspection on qualification of personnel (50-454/82-05-19 and 50-455/82-04-19), Hatfield is undergoing an extensive training program to upgrade the qualifications of inspectors. The training and requalification of Hatfield inspectors is being closely monitored by the licensee and the effectiveness of the training will be evaluated by the NRC during the review of noncompliance 50-454/82-05-19 and 50-455/82-04-19.

c. Voiding/Destroying Discrepancy Reports

The allegor advised the NRC that Discrepancy Reports (DR) had been prepared by inspectors to document findings in the power block but the DR's were being destroyed by Hatfield Supervision. The allegor stated that the reasons given for destroying the DR was that the inspector was not qualified to that procedure or in one case, Hatfield did not have a procedure that addressed the attribute stated on the DR. The allegor provided a copy of one DR to the NRC that was alleged to have been destroyed.

The inspector reviewed approximately 25 DR's, including the DR provided by the allegor, and the Hatfield DR books. It was observed that the text of the DR in Hatfield's DR log book did not match the text of the DR, of the same number, provided by the allegor. It was also observed that the Hatfield DR log was of the loose leaf type and the log did not provide a description of the discrepancy. With this type log, it is almost impossible to prove or disprove that the log had or had not been altered. The licensee was requested to consider the possibility of requiring a bound ledger type log for NCR's, DR's, etc., and also providing a descriptive statement of the discrepancy/nonconformance in the logs. During interviews with QC supervision and inspectors, they stated that they were not aware of any NCR's or DR's being destroyed. During a tour of the power block, the inspector observed that the area of concern addressed on the DR provided by the allegor appeared to have been corrected.

d. Design and Document Control

- (1) The allegor stated that Weld Record Cards, Field Change Requests (FCR), DR's, and NCR's are all filed separately and never consolidated into a single package. This adversely affects material traceability.

The inspector explained to the allegor that there were no requirements for the above mentioned documents to be consolidated into a single package. In discussions with the licensee, the inspector was informed that CECO would be indexing and cross-referencing the contractor furnished quality assurance records.

- (2) The allegor stated that Hatfield uses only five copies of drawings and contended this was an insufficient number, as QC was never furnished with a copy of a drawing nor was QC notified of the latest drawing revision.

During interviews and review of records, the inspector learned that as a general rule, drawings are issued to a foreman/engineer for incorporation into stick files located throughout the power block and in the office area. The number of copies issued of a given drawing varies with the need. Example - a drawing applicable to the Auxiliary Building may or may not be issued to the Control Building stick files, depending on interface requirements. The information as to current drawing revision is readily available. This inspector identified no problems in obtaining a drawing for review in the power block or in the office area at the Byron Station.

- (3) The allegor stated that Field Change Requests are only annotated on the Drawing Control Department's copy of a drawing and are not written on the other copies of the drawings.

In accordance with Hatfield Procedure Number 4, the FCR is issued to the holder of the document being revised by the FCR. The holder of the document may attach the FCR to the document or reference the FCR on the document. Hatfield QC performs a monthly surveillance to verify that the FCR is either attached or referenced on the parent document. During a tour of the power block, the inspector observed FCRs attached to the drawings and/or referenced on the drawing.

- (4) The allegor stated that in several instances, two and three revisions of the same drawing have been in the field at the same time and that outdated drawings were not collected and newer drawings did not have FCRs listed.

Per Hatfield Procedure Number 4, "Drawing Control", the drawing control clerk issues drawings to the foreman/engineer, using Form number 48. The drawing recipient is required to return the superseded document to drawing control. When the drawings are returned, the document control clerk signs and dates Form 48, indicating that the superseded document has been returned. Hatfield QC performs a monthly surveillance to verify that drawings in the field are of the most current revision. This verification is documented on Form 47. During a review of drawings and FCR's noted in items (2) and (3) above, no items of noncompliance were observed. It should be noted that the allegor did not provide specific drawings or areas where he observed the superseded drawings.

- (5) The allegor stated that numerous FCRs are written, but only one in five are ever approved, resulting in many instances of a DR being closed out by referencing a FCR, but the FCR cited on the DR had never been approved or the FCR may have been voided.

During a review of the licensee's FCR log (all FCR's are controlled by the licensee), the inspector observed that many FCR's were approved with comments, superseded by another FCR, disapproved, or voided. The inspector did not attempt to prove or disprove the statement that only one in five FCR's are approved. The inspector did review the closure of the FCR's. It was observed that if an FCR was disapproved, the item was re-inspected to verify that it was installed to the latest drawing instead of to the disapproved FCR, and this also applied to voided FCR's. In summary, CECO, QA has the final acceptance of all FCR's before closure.

During the last team inspection, the licensee was given an item of noncompliance (50-454/82-05-13b; 50-455/82-04-13b) for improperly closing/voiding NCR's. One example was that Hatfield Electric Company closed/voided a NCR based on an unapproved FCR. This item is still open as of the date of this report. Additional followup will be made prior to closure.

e. Bolt Torque

The allegor stated that Hatfield Electric Company does not have a written procedure to check bolt torque. The current practice is to use a preset 50 pound torque wrench, which then checks only the minimum torque rather than over torque. Hatfield does not own or use dial torque wrenches. The allegor stated that he borrowed a dial torque wrench and found numerous instances of over torque on Category I hangers which had previously been inspected using the preset 50 pound torque wrench. The torque values observed ranged between 90-125 pounds.

The inspector checked the torque of bolts on 6 cable tray hangers, 3 conduit hangers and 2 cable tray splice plates in the Auxiliary Building, 426' elevation, in the North and South 4KV switchgear rooms. By procedure, a 1/2" bolt shall be torqued to 50# minimum and a 5/8" bolt to 70# minimum. Following are the results observed: 1st conduit hanger from switchgear-conduit contains cables 1AP325, 1AP323, and 1AP077-1/2" bolt-25#; Hanger H034, Report HE3683, 1/2" bolts-70# and 10#; Hanger H033, Report HE3682, 1/2" bolts-60# and 50#; Hanger H045, Report HE3694, 1/2" bolts-52# and 56#; Hanger H046, Report HE3695, 5/8" bolts- 70# and 75#; Hanger H081, Report HE3730, 1/2" bolts-60# and 64#; Hanger TCC-5, Report HE 246, 1/2" bolts-60#, 35#, 20#, and 25#; Hanger TCC-4, Report HE 246, 1/2" bolts-20#, 60#, 30#, and 35#; cable tray 11378M-C2E, splice plates, 1/2" bolts-65# and 55#. It should be noted that the specifications do not require the torquing of splice plate bolts.

It is understood that over a period of time, bolt torque will relax. The inspector requested that the licensee evaluate the above observed torque values and determine if they are acceptable for the life of the plant. Pending a review of this evaluation, this item is unresolved, (50-454/82-17-02; 455/82-12-02).

f. Discrepancy Reports (DR)

- (1) The allegor stated that on May 4, 1982, the Nonconformance Report (NCR) procedure was rewritten to allow for the use of DR's for minor discrepancies. DR's have been used to the exclusion of NCR's with only two NCR's written since May 4th. The Project and Quality Managers have agreed to use the DR's in lieu of NCR's.

The inspector informed the allegor that the DR procedure was initiated as a result of the team inspection, Report Number 50-454/82-05; 50-455/82-04. The licensee identified the fact that the DR system was being misused and directed Hatfield Electric to revise their procedure to more clearly delineate when an NCR and DR would be used, (Ref. CECO to Hatfield letter number BY8014, dated August 3, 1982). Basically, a DR would be used for discrepant items that can be dispositioned by Hatfield, if CECO and/or S&L has to approve the disposition, then an NCR would be utilized. During this reporting period, the inspector reviewed the draft NCR/DR procedure and provided comments. The inspector informed the allegor that Hatfield could not implement a procedure without the approval of CECO.

- (2) The allegor stated that numerous DR's are being prepared on welding for lack of pre-heat in accordance with AWS D1.1-1975, and it appears that Hatfield Management is doing nothing about it.

The inspector reviewed the DR's provided by the allegor, as relating to welds being made with no pre-heat, as well as other DR's prepared on the same subject. Corrective action for the weld identified on the DR was adequate and the corrective action to prevent recurrence was to re-train the welders. A review of training records by the inspector indicates that a training class was held on August 5, 1982 for the Hatfield welders: 52 welders attended and 7 welders missed the class. Subjects addressed were: (1) pre-heat requirements, (2) filling out weld traveler cards, (3) proper methods of correcting undercut, (4) flagging welds, (5) using shim stock, and (6) over grinding of base metal. To determine that the training was effective, this area will be examined during subsequent inspections. This item is unresolved (50-454/82-17-07, 50-455/82-12-07).

8. QC Procedures

The allegor stated that most of the Hatfield Quality Control Procedures have not been approved by Commonwealth Edison. Many procedures have a temporary approval, but never receive a final approval, and it seemed that procedures were being revised daily without any type of approval.

Hatfield prepares new procedures or revises existing procedure in accordance with their Procedure Number 1, "Methods of Preparing Procedures". After the procedure is approved by the Hatfield Project and Quality Assurance Managers, it is submitted to CECO for their review and approval. The procedure is reviewed by CECO Engineering, Construction, and Quality Departments. If the procedure is disapproved, it is transmitted to Hatfield, via letter, with directions to revise and resubmit. If the procedure is approved or approved with comments, CECO submits the procedure to S&L for their review and approval and may grant Hatfield an interim approval to implement the procedure as written or to implement the procedure with the comments. S&L may disapprove the procedure, approve it, or approve it with comments. S&L then transmits the procedure back to CECO who then transmits the procedure to Hatfield indicating the final disposition (approved, approved with comments, or disapproved) to that revision of the procedure. Per Hatfield Procedure Number 1, disapproved procedures cannot be implemented and when a procedure is approved with comments, the procedure is issued and implemented with the comments attached to the procedure.

The inspector reviewed all Hatfield procedures, including CECO approval letters, and made the following observations:

- (1) All Hatfield procedures had either an interim approval, approved with comments, or an approval from CECO.
- (2) With the exception of Procedure Number 30, the latest approved revision of the procedures were being implemented by Hatfield. Procedure Number 30, Revision 4, was approved for use by CECO on February 11, 1982 but Hatfield was implementing Revision 3. During interviews with CECO and Hatfield personnel, a QC clerk for Hatfield stated that the approval letter for Revision 4 of the subject procedure had not been received. Mr. R. Gruber, CECO QA Engineer, provided Hatfield a copy of the February 11, 1982 approval letter on August 18, 1982. Procedure 30, Revision 4, was issued for use by Hatfield prior to the exit meeting on August 27, 1982.

h. AWS Code

The allegor stated that he was concerned that Hatfield Electric was still using the 1975 edition of the AWS Code. He thought that this edition was outdated and a commitment to a newer edition should be made.

The inspector explained to the allegor that the licensee committed to implement a given edition of the various codes and standards, as stated in their Safety Analysis Report, and that the NRC inspected to those commitments. In the case of AWS D1.1, the licensee committed to use the 1972 edition (Ref. FSAR-Table 3.8-2).

During a review of procedures and interviews with licensee and contractor personnel, the inspector was able to determine that Hatfield Electric Company is implementing the 1975 edition of AWS D1.1, Structural Welding Code. The inspector was informed that the contract between CECO and Hatfield was signed in 1976, thus making the 1975 edition the latest edition on the date the contract was signed. The licensee was requested to resolve the conflict between the SAR commitment to the 1972 edition of the AWS D1.1 code and the implementation of the 1975 edition. Pending a review of this resolution, this is an Open Item (50-454/82-17-03; 50-455/82-12-03).

i. Housekeeping

The allegor stated that even though inspections to the house-keeping procedure are done, none have any follow-up to remove the identified discrepancies. Wood, metal, and "other junk" can be found in previously inspected cable trays.

Housekeeping with respect to cable trays is and has been a never ending problem at sites under construction. Hatfield performed periodic housekeeping surveillance of all Category I areas in accordance with their Procedure Number 30, "Housekeeping and Protection of Class I Cable Exposed to Construction Activities". In addition, housekeeping of individual cable trays is verified prior to pulling electrical cable into the tray in accordance with Hatfield Procedure Number 10, "Class I Cable Installation". The licensee also performs periodic surveillances of housekeeping. During a tour of the power block, the inspector observed isolated instances where fire proofing material, magazines, and "pop" cans were in safety related cable trays. The licensee took immediate action to have the trash removed from the cable trays. With the exceptions noted, housekeeping was generally acceptable.

j. Cable Tray Fill and Cable Support

- (1) The allegor is concerned that cable trays are overfilled; that cables hang over the sides in cable switching rooms on the 414', 426', and 439' elevations of the Unit 1 Auxiliary Building; and that the crafts continue to pull cable through these trays even though the trays are filled to capacity.

During a tour of the power block, the inspector did not observe any instances where the installed safety related cables were higher than the top of the cable trays. It should be noted that this problem has been identified on



previous inspections by the NRC and was due primarily to lack of training of cables in the tray at time of installation. The inspector explained to the allegor that in those cases where retraining of the cables did not bring the cables below the top of the cable tray, the engineer was redesigning the cable tray to add side boards. It was further explained that this was a satisfactory fix as long as the cable tray was not thermally or physically overloaded, and that the NRC would continue monitoring the loading of cable trays.

- (2) The allegor stated that it is standard practice to tie cables with a single rope and in some instances to suspend one cable from another cable and this leads to kinking the conductors.

The current Hatfield procedures require a cable to be supported by a minimum of 2-1/2" nylon ropes and each supporting rope must be wrapped 3 times around the cable. During this reporting period, all safety related cables were observed to be in accordance with Hatfield procedures. The inspector did observe three instances where non-safety related cables were supported in the manner described by the allegor. The licensee took immediate action to have those three items corrected.

- (3) The allegor contends that cables in risers are not properly supported in that some cables will run through 3-4 floors without being supported. A cable at the 401' elevation, Auxiliary Building near columns P and 18 and Q and 22-23 is not supported for more than 60 feet. The requirement is to support the cables every 10 feet.

During a tour of the power block, the inspector did not observe any safety related cables that were improperly supported in the risers. In accordance with Sargent and Lundy Standard EB-146, cables in risers must be supported at least every 35' rather than every 10' as stated by the allegor.

k. QC Inspector Independence

- (1) The allegor stated that the Hatfield QA Manager had told all of the inspectors not to discuss Hatfield problems with Commonwealth Edison and had implied, but never specifically stated, the inspectors could not speak to the NRC. Whenever an issue is brought to the QA Manager's attention, he becomes visibly irritated that the inspector's have spoken to him.

The inspector discussed the above allegation with the Hatfield QA Manager. The QA Manager stated that he told the personnel under his supervision that if they had problems they were to first follow the Hatfield "chain-of-command" to resolve the problem, i.e., discuss problems with their

immediate supervisor first and if the problem is still unresolved, take the problem through the various levels of Hatfield supervision. If still unresolved, then present the problem to CECo and/or the NRC. The QA Manager stated that this was at the request of CECo because the inspectors were taking problems to the CECo Project Electrical Supervisor when the problem could have been resolved within the Hatfield organization. During this inspection and previous inspections at the Byron Station, this inspector observed Hatfield QC personnel in the CECo offices. This inspector also interviewed Hatfield QC and craft personnel in the power block and they appeared to be free and open in their discussions about construction and quality related problems.

The inspector also discussed the allegation with the CECo Project Superintendent. The Project Superintendent stated that CECo has an open door policy and wished that personnel, CECo and Contractor, would bring their allegations to CECo before going to the NRC. The inspector explained the "suggestion-box" method of handling allegations that has been successfully implemented at other Region III projects.

- (2) The allegor stated that Quality Supervision has set a minimum inspection quota for each inspector. The quota varies between inspectors, but 1 1/2 hours for all inspection effort (including preparation, field inspection, and documentation) has been the established rule.

The inspector informed the allegor that the NRC's concern with this allegation is that the assignment of a quota may impact the quality of the inspection effort. Although not stated directly, the allegor implied that to date, the assignment of a quota has not affected the quality of the inspections. In discussions with QC Supervision on this subject, the inspector learned that the 1 1/2 hour inspection time mentioned by the allegor was a suggested inspection time for hanger/tray location verification. The suggested time for inspections came about during a meeting that was called for "lack-of-production" by QC personnel in that QC was falling behind in their inspections, resulting in an increase in the inspection backlog. Records compiled by Hatfield for the inspection time per attribute indicates that the present inspection time for hanger/tray location verification is approximately 3 hours.

- (3) The allegor stated that Level II QC Inspectors are being used as production controllers and planners in that inspectors have been assigned to "drawing up travelers to work by" because Hatfield does not have a planning department.

During interviews with Hatfield QC Supervision, the inspector learned that Level II QC inspectors were in fact directed to

prepare hanger installation travelers for Area 7, elevations 414' and 426', in the Auxiliary Building. This action was the result of a verbal agreement between engineering and quality management. The reasoning behind this agreement was that quality had to review and verify the information on the traveler before it could be released to construction for installation and it required little or no additional work on the part of quality personnel to prepare the traveler vs reviewing and verifying the information on the traveler.

1. Pan Hanger Installation

- (1) The allegor stated that he was concerned about weld traveler number 38001, dated August 10, 1982, in that the welder (symbol A) whose name appeared on the subject traveler was not working for Hatfield on August 10, 1982.

During interviews with various Hatfield personnel, listed under persons contacted, it was learned that the subject welder had not been employed by Hatfield for approximately the last two years. While interviewing the QA Records Clerk it was learned that weld travelers were missing from the Records File for certain hangers. To correct the missing documentation problem, the QA Manager established the following procedure:

- (a) Advise the welding supervisor of the missing data and request that he assign a welder to examine the weld and prepare a new weld traveler.
- (b) The welder assigned in (a) above completes the traveler and places the original welder's stamp ID on the traveler and forwards the traveler to QC for inspection.
- (c) QC identifies the welder by name from the stamp ID on the traveler and performs the required inspections per approved procedures.

Weld traveler 38001 was prepared on August 10, 1982, because the traveler for hanger H068 was missing from the records file. The QA Records Clerk informed the inspector that traveler 38002 was also issued because of a missing traveler in the records file.

- (2) The allegor stated that the Pan Hanger Installation Checklist does not have space to record the NCR's/DR's written against the installation nor does the applicable procedure require the recording of the NCR's/DR's on the checklist.

The inspector reviewed the installation checklists in use by Hatfield and it was observed that the checklists had a space marked Corrective Action and/or Comments where an

NCR or DR number could be entered by the QC inspector. As a general rule, Hatfield procedures do not require NCR/DR numbers be annotated on inspection checklists. The inspector informed the allegor that although it was a good idea, there was no regulatory requirement that required the licensee or contractors to list the subject document numbers on the checklist. The NRC's basic requirement is that the applicable documents for a given item be retrievable. During a review of NCR's, DR's, FCR's, weld travelers, inspection checklist, etc., the inspector observed that the applicable item number (hanger, pan, conduit, equipment, etc.) was annotated on the various documents thereby making them retrievable if properly filed.

- (3) The allegor is concerned that when an inspection checklist is prepared by a Level I inspector, a Level II or Level III inspector has to review and accept/reject the item based on the information supplied by the Level I inspector and it can only be assumed that the Level I inspector actually went to the field and inspected the item.

The inspector informed the allegor that ANSI Standard N45.2.6, Qualification of Inspection, Examination, and Testing Personnel for Nuclear Power Plants, states that a Level I, Level II or Level III inspector may record inspection, examination, and testing data but only a Level II or Level III can evaluate the validity and acceptability of inspection, examination, and testing results.

With respect to the second area of concern, the NRC would expect the Level II inspector to periodically verify that the information being recorded by the Level I inspector is correct by performing an over-inspection on the item. These over-inspections should be on a more frequent basis for newly qualified inspectors and when the over-inspections identify problems with the recorded data.

m. Cable Tray Connections

The allegor stated that the Hatfield QA Manager has written an instruction to the inspectors for instances where cable tray connections cannot be inspected because they have been covered with fireproofing or buried in walls. The QA Manager instructed the inspectors to refer to the weld card, saying it has all the necessary information. The allegor contends that the weld card speaks only to the welding and not to the attachment detail; therefore, using the weld card information does not substitute for an inspection.

The inspector confirmed that for the cable pan hanger reinspection program (Ref. NCR-407), the Hatfield QA Manager had instructed the QC inspectors to accept connection details covered by fireproofing based on the information on the weld traveler card for the subject

connection detail. QA/QC Memorandum Number 295 states in part, "This acceptance is based on the fact that the weld inspector is required to identify the type connection detail for each weld. By virtue of this identification the welding inspector has confirmed the use of the correct detail by his acceptance of the weld."

The inspector informed the licensee that the utilization of the weld traveler card would be acceptable providing the weld inspector identified the hanger connection detail used on the weld traveler card. A review of weld traveler cards indicated that in most cases, the weld inspected did not specify the type of hanger connection detail used.

In a September 22, 1982 letter from CECO to Hatfield, the licensee requested the following information as pertaining to the reinspection program required by NCR 407.

- (1) The total quantity of hangers inspected.
- (2) The total quantity of hangers inspected for which the connection detail could not be visually verified due to fireproofing, but for which the weld traveler had been acceptable and therefore the connection detail accepted solely on this basis. 207
- (3) A log of the inspection report numbers based on the criteria of item (2) above.
- (4) The total quantity of hangers inspected where the connection details were not covered by fireproofing and which were rejected due to the connection detail being not of the type specified on installation design documents. 140
- (5) The total quantity of hangers inspected where the fireproofing had to be removed to perform weld inspections.
- (6) The total quantity of hangers where, as a result of item (5) above, it was discovered that the wrong connection 131 detail was installed.

The licensee stated that the above data would be evaluated upon completion of the reinspection program and one of the following actions taken:

- (1) Accept all of the connection details covered by fireproofing based on the weld traveler card, or
- (2) Direct the contractor to remove the fireproofing and inspect a sample, number to be determined by licensee. Re-evaluate, or

- (3) Direct the contractor to remove the fireproofing and reinspect all connection details previously accepted based on the weld traveler cards.

Pending a review of the data submitted to the licensee and the licensee's evaluation of this data, this item is unresolved (50-454/82-17-04; 50-455/82-12-04).

n. Improper Wire Lugs

During a tour of the power block, the NRC's Senior Resident Inspector picked up two pieces of internal panel wiring that appeared to have the wrong size terminal lug. The two pieces of wire were given to the inspector for followup during this investigation.

It was determined that the wire size was #18 and the terminal lug was designed for #14 or #16 wire. When this fact was brought to the attention of the licensee, the licensee instituted an investigation to determine the origin of the wire. It was determined that the wire with improper sized terminal lugs were installed in non-safety related Foxboro Panels 1PA20JC and 1PA50J by the panel manufacturer. The licensee informed the inspector that although the panels were non-safety related, action was being initiated to relace the incorrect terminal lugs.

o. Summary

As a result of this investigation, no items of noncompliance were identified. Three items are unresolved and one item is open. The unresolved items and the open item will be followed up during future inspections.

4. Observation of Electrical Work Activities

- a. During a tour of the power block with personnel from the Power Systems Branch of NRR, it was observed that non-class 1E cable tray 11445U-C2B passes under Class 1E ladder type cable tray 11441Q-C2E with a vertical separation of approximately 10", metal to metal. The subject trays are located in Area 5 of the Auxiliary Building at the 426' elevation. In reviewing the pertinent raceway installation drawing 1-3052A, Revision P, and in discussions with the licensee, it was determined that there are no requirements for the installation of raceway covers or barriers indicated on the subject drawing for tray 11445U-C2B. It was also observed in the upper cable spreading room that non-Class 1E cable tray 22080D-C1B passes under Class 1E ladder type cable tray 22129C-C1E with a vertical separation of approximately 10 3/4", metal to metal.

Paragraph 8.3.1.4.2.2 of the Byron/Braidwood FSAR states in part that the vertical separation between Non-Safety Related (non-class 1E) and Safety Related (Class 1E) cable trays is 12", metal to metal.

The Region III inspector informed the licensee that failure to promptly identify and control the above nonconforming conditions in accordance with QA program provisions is an item of noncompliance, contrary to the requirements of Criterion XVI of 10 CFR 50, Appendix B (50-454/82-17-05; 50-455/82-12-05).

- b. During a tour of the power block, the inspector observed that minimal progress is being made in the identification and resolution of the cable separation problems inside Class 1E panels, cabinets, and switchgears. Following is a brief history of the separation problems:

- (1) On December 18, 1980, CECo prepared NCR F-580 to document the fact that Class 1E and non-Class 1E cables were in direct contact with one another inside 480V Unit Substation 1AP98E, 4160V switchgear 1AP05E, 4160V switchgear 1AP06E, 4160V switchgear 2AP05E, and 4160V switchgear 2AP06E. IEEE standard 384-1974, as stipulated in the Byron/Braidwood Final Safety Analysis Report, requires that redundant Class 1E cables/wiring and Class 1E and non-Class 1E cables/wiring be separated by a minimum distance of 6 inches, or barriers be installed between the cables/wiring, or an analysis may be performed.
- (2) During the week of July 7-10, 1981, Region III inspectors met with the licensee and Sargent and Lundy (S&L) representatives to discuss the corrective action to be taken to correct the lack of separation identified by NCR F-580 and the corrective action to preclude repetition. During this meeting, the licensee stated that construction personnel would be instructed to rework the cables identified by NCR F-580 and if these efforts to achieve the separation criteria were unsuccessful, the licensee would document this condition to S&L, where an analysis would be performed to demonstrate that the lack of separation would not result in a degradation of the performance of the cables' safety related function. The licensee further stated that current procedures would be revised or a new procedure written to assure that each instance of inadequate cable separation would be identified and controlled. During this inspection, the inspector made this matter an unresolved item pending a review of the licensee's corrective action during a subsequent inspection. Tracking numbers 50-454/81-08-05 and 50-455/81-07-04 were assigned.
- (3) Hatfield Electric procedure number 11, Class I Cable Termination and Splicing, was revised to include the inspection attribute, cable separation inside electrical equipment. Paragraph 5.1.5.2 of the subject procedure states in part, "If any field conditions prevents compliance with the following separation criteria, HECo QA/QC should be notified per Procedure #6, and reported to CECo for disposition." Procedure Number 6 is titled, "Reporting of Damaged or Nonconforming Material or Equipment".

- (4) During this reporting period, the inspector made a spot check of panels and cabinets in the Unit 1 Auxiliary Electrical Equipment Room, Auxiliary Building, 451' elevation, and it was observed that there were numerous examples of Class 1E and non-Class 1E cables being ty-wrapped together. In panel 1PA20JA, it was observed that a Division 1 Engineered Safety Feature (ESF) cable was ty-wrapped to a Division 2 ESF associated cable. In the panels checked, the inspector did not observe any Hold Tags associated with cable separation problems in the panels. In discussions with the licensee, it was learned that the subject panels had as yet to be checked for cable separation compliance to the requirements of IEEE-384.

The inspector informed the licensee that failure to promptly identify and control the above nonconforming conditions in accordance with QA program provisions is another example of noncompliance to the requirements of Criterion XVI of 10 CFR 50, Appendix B (50-454/82-17-06; 50-455/82-12-06).

#### Unresolved Matters

Unresolved matters are items about which more information is required in order to ascertain whether they are acceptable items, items of noncompliance; or deviations. Unresolved items disclosed during this inspection are discussed in Paragraphs 3.b.(2), 3.e, 3.f.(2) and 3.m.

#### Open Items

Open items are matters not otherwise categorized in the report, that need to be followed up on in subsequent inspections. Open items disclosed during this inspection are discussed in Paragraph 3.h.

#### Exit Interview

The inspector met with licensee representatives (denoted under Persons Contacted) at the conclusion of the inspection on August 27, 1982 and September 17, 1982. The inspector summarized the scope and findings of the inspection. The licensee acknowledged the information.



The discrepancies in Table CE-14 are all minor and can be characterized as follows:

a. ASME Socket Welds - NC, ND

A total of 68 ASME socket weld discrepancies were reported. These were mainly leg and throat welding discrepancies. No incomplete fusion, overlap or undercut discrepancies were reported.

The 68 ASME socket weld discrepancies were evaluated for compliance with ASME Code design criteria. All discrepancies involved a slight reduction in fillet weld size. In all cases, an evaluation was made to determine the minimum fillet weld size required by design. All fillet weld sizes were found to meet ASME Code design criteria.

b. ASME Support Welds - NF

A total of 34 support weld discrepancies were identified for ASME Class NF welds for small bore piping supports. All 34 discrepancies involved undersized tubing U type strap hold down fillet welds. A 1/4-inch fillet weld was specified; however, the installed welds were undersized by as much as 1/16-inch. The strap welds were evaluated for the maximum design load and were determined to be acceptable.

c. Non-ASME

A total of 204 ANSI B31.1 weld discrepancies were reported. These included leg and throat discrepancies, minor reductions in weld legs (1/32-inch to 1/16-inch), items acceptable to current design/installation tolerances, surface ripples, overlap, slag and scale, and one undercut.

The minor reductions in weld leg with a resulting 1/32-inch to 1/16-inch reduction in weld size were conservatively evaluated on the basis of 1/16-inch less weld over the entire weld circumference. All welds met design requirements and ANSI B31.1 Code design criteria.

**Response:**

The data and tables have been reviewed and footnotes provided to clarify the information presented. The data in the January 12, 1984, Interim Report was provided to respond to Question Q14 (in response to Reference 2). Therefore, Table 3.1 (now Table III-1) and Table 4.7 (now Table Q14-7) were accurate and compatible except that a clarifying footnote has been added to the latter table to point out that the inspectors tabulated thereon included inspectors performing both subjective and objective inspections in the inspection area. Other clarifications (see Table III-4) have been provided where appropriate. Also, refer to the response to question Q14 below.

- Q3. "Provide results of the Hatfield computerized data base established to reconcile weld travelers to hangers. (Page 19 of 1-12-84 Interim Report)."

**Response:**

The computerized data base is complete and is available on site. After completion of the review, it was found that direct correlation of weld traveler inspection records to design drawing cable pan hanger and conduit hanger data could not be made for approximately 2% of the data. The augmented efforts to achieve complete correlation is expected to be complete in March 1984.

- Q4. "Elaborate on how Appendix C sample sizes were obtained for evaluating design limit compliance and how the sample selected bounds all of the remainder of the items in that category."

# REFERENCE ONLY

HATFIELD ELECTRIC COMPANY  
Byron Units 1 & 2

Class 1 Cable Pan Hanger  
Inspections Checklist

Dwg. Area: 0-3097 Rev. T Q.C. Inspector Scott Wagner  
Hanger: BWV11 Date: 12-17-82 Report 2925

ITEM	INSPECTION			COMMENTS	RE-INSPECTION			
	A	U	N/A		QA/ QC	Date	A	U
1. Hanger types/ configurations IP 5.1, 5.2, 5.4	✓							
2. Bracing IP 5.10			✓	no bracing is required				
3. Hanger locations IP 5.1, 5.4	✓							
4. Condition of metal surfaces IP 5.11	✓							
5. Bolt torque per 5.15 Wrench # _____ Calib. Date _____			✓	all connections are welded. Total Bolts Checked _____				
6. Other (specify)	✓			all members as specified				

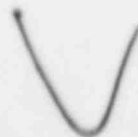
Comments: DE 119 ECR 1207 + 2921 HORE 1151

COMPUTER  
INPUT

Completed By: Scott Wagner Level: II Date: 12-21-82  
Reviewed by: Steve Hubler Date: 12/22/82  
Q.C. Level II or Higher

A - Acceptable  
U - Unacceptable  
N/A - Not Applicable

Row # 7  
6-20-84 Page 1 of 2

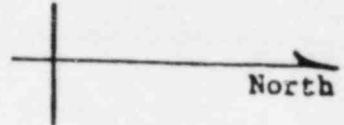


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0-3097

Rev. I

23



8HV11

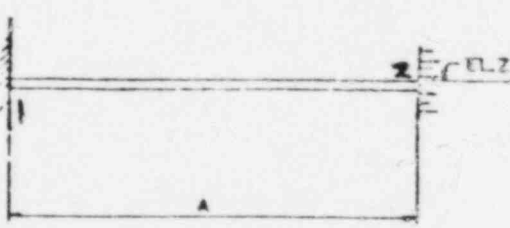
8HV11

REFERENCE ONLY

2925

Not to Scale

(Use symbols shown on drawing.)

Hanger Configuration			Hanger Data					
Standard <u>0-3260</u> Type <u>8HV</u>			HO/HL Drawing <u>0-3097 H01</u> Rev. <u>B</u>					
 <p>DETAIL 8HV</p>			CONNECTION		DIMENSION			
			ID	SPECIFIED	ACTUAL	ID	SPECIFIED	ACTUAL
			1	DV67	✓	A	18 1/4	✓
			2	DV67	✓	B		
			3			C		
			4			D		
			5			E	7	6
			6			F	12	12 1/2
			7			G	8	7 1/2
			8			H	12	12 1/2
			9			I	4 1/2	4
			10			J	24	24 1/2
						INSTRUCTION		
						1. Sketch Hanger, show connection detail, number and dimensional alpha locations.		
						2. Indicate acceptable data with a "✓" in actual columns. If Unacceptable enter data.		
			3. If location information unacceptable, show actual data in brackets adjacent to design data.					
			K	4 1/2	7			
			L	7	6 1/2			
			M	12	✓			
			N	17 3/4	16 1/4			
			O					
			P	24	25			
			Q	13	11 1/2			
			R	12	13			
			S	4 1/2	✓			
			T	18	18 1/2			
			U	4 1/2	5			
			V	18	18 1/2			
			W	14	14 1/2			
			X	443	3 1/2			
Member Size or Type								
Vertical		Specified	Actual					
Right								
Left		N/A						
Right		A						
Left								
Diagonal		Specified	Actual					
		N/A						
		A						
Horizontal		Specified	Actual					
ZTS		R 4 x 500	1/2 x 4 ZTS ✓					
Auxiliary Steel Hanger No. _____								
SIZE	LENGTH	CONNECTION	DISTANCE FROM LEFT EDGE TO C <sub>2</sub> OF ATTACHMENT PL. AND PL. TYPE.	T/S ELEV.	OTHER			
			N/A					
			A					
Miscellaneous/Comments								
FCR 1807								
N.S. ONLY SECTION CA-CA USE SECTIONS F 2921								
A-A DV111 (0-3283) + B2-B2 DV30 (0-3266)								

DETAIL 8HV

TORQUE - N/A

DR 119 FCR 1807 HDEF1151

fw  
12-17-82

HATFIELD ELECTRIC COMPANY

BYRON UNITS I & II

QA/QC MEMORANDUM #295

TO: A.W. Koca, QC Supervisor  
FROM: J. K. Buchanan, QA/QC Manager  
DATE: September 17, 1982  
SUBJECT: Pan Inspection

Since beginning the cable pan reinspection, we have had a policy for acceptance of hangers which have a connection assembly which is covered by fireproofing, making it impossible to verify the connection detail. I am reconfirming this policy.

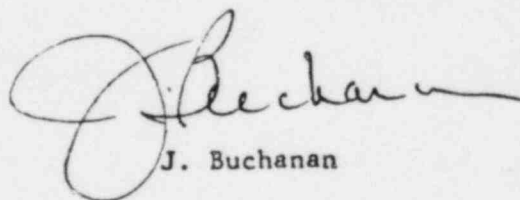
When inspectors are performing pan hanger or conduit hanger inspections they are required to verify the connection detail is as specified by the Architectural Engineer.

Should the hanger its connection detail rendered inaccessible by fireproofing, the inspector should research the weld inspection file for the related weld inspection for a given hanger. If the weld traveler has been accepted the inspector shall note the traveler on the hanger inspection report and shall accept the detail.

This acceptance is based on the fact that the weld inspector is required to identify the type connection detail for each weld. By virtue of this identification the welding inspector has confirmed the use of the correct detail by his acceptance of the weld.

If there is no weld inspection in the file for the specified hanger, the fireproofing shall be removed and the required inspection performed and documented. (See Memo 216)

Should you or your inspectors have any questions concerning this policy, please see me.

  
J. Buchanan

cc: J. O. Binder  
G. Vanderhei  
File 9.12

*Love Depo. #8*

*6-20-84*

September 22, 1982

Mr. J. Buchanan  
Q.A. Manager  
Hatfield Electric Co.  
Byron Station

Dear Jim:

This letter is in reference to the cable pan hanger reinspection program which is in progress as a result of your implementation of the corrective action stated on H.E.C.o. NCR No. 407.

Your memos No. 216 and No. 295 accurately describe the actions required to be taken when hanger connection details cannot be visually verified due to the installation of fire proofing.

In conjunction with this reinspection program, I am hereby requesting that you document the following information:

1. The total quantity of hangers inspected.
2. The total quantity of hangers inspected for which the connection detail could not be visually verified due to fire proofing, but for which the weld traveler had been acceptable and therefore the connection detail accepted solely on this basis.
3. A log of the inspection report numbers based on the criteria of item 2 above.
4. The total quantity of hangers inspected where the connection details were not covered by fire proofing and which were rejected due to the connection detail being not of the type specified on installation design documents.
5. The total quantity of hangers inspected where the fire proofing had to be removed to perform weld inspections.
6. The total quantity of hanger where, as a result of item 5 above, it was discovered that the wrong connection detail was installed.

Please implement the documentation associated with these items immediately.

*Low Repo #7*

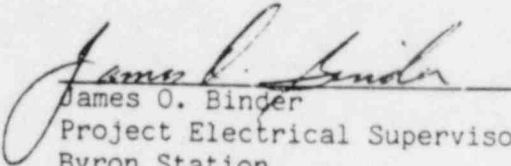
*6-20-84*

(2)

Also, please submit to me, on the first of each month (beginning 10-1-82), a status summary report of the data compiled to date in each of the six (6) categories listed.

If you have any questions, please contact me.

Very truly yours,

  
James O. Binder  
Project Electrical Supervisor  
Byron Station

JOB:bg

cc: G. VanLyssel  
G. Vanderhei  
R. Klingler  
M. Stanish

HATFIELD ELECTRIC COMPANY

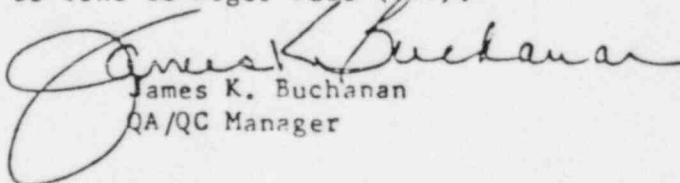
Byron Units 1 & 2

QA/QC Memorandum #216

TO: A. Koca, QC Supervisor  
FROM: J. K. Buchanan, QA/QC Manager  
DATE: August 16, 1982  
SUBJECT: Weld Inspection

As we are approaching completion of the logging of all weld traveler numbers and cross indexing same to the respective equipment status log, I have noted an absence of weld travelers for several hangers. It is imperative that our documentation correlates with the equipment listed on the relevant S & L Installation Drawings. In order to implement this correlation and provide the required documentation, we should initiate the following actions.

1. Ascertain if the required inspection will necessitate the removal of fire proofing. If it does, send a memorandum to R. Guse requesting the fire proofing be removed (include some mechanism to indicate when the removal is complete).
2. Advise the welding supervisor (GF) of the missing data.
3. The welding supervisor will assign a welder to examine the weld.
4. The welder will complete a new weld traveler and will place the original welder's stamp ID on the card (QA will provide the name). If there is not a stamp, the welder will assure himself that the weld is acceptable or will make the weld acceptable. For both circumstances, the welder will stamp the weld and have it inspected.
5. The QC Inspector will inspect the weld as in the standar practice. However, when the weld is accepted notification to replace the fire proofing must be sent to Roger Guse (PCD).

  
James K. Buchanan  
QA/QC Manager

cc: file 9.16 ✓

Low Depo. #10  
6-20-84



10

Byron  
83-48

1983

Ins &  
Close out

Docket No. 50-454

Commonwealth Edison Company  
ATTN: Mr. Cordell Reed  
Vice President  
Post Office Box 767  
Chicago, IL 60690

Gentlemen:

This refers to the routine safety inspection conducted by Messrs. R. S. Love, R. Mendez and A. S. Gautam of this office on October 18-21, 1983, of activities at Byron Station, Unit 1, authorized by NRC Construction Permit No. CPPR-130 and to the discussion of our findings with Mr. G. Sorensen and others of your staff at the conclusion of the inspection.

The enclosed copy of our inspection report identifies areas examined during the inspection. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations, and interviews with personnel.

No items of noncompliance with NRC requirements were identified during the course of this inspection.

In accordance with 10 CFR 2.790(a), a copy of this letter and the enclosure(s) will be placed in the NRC Public Document Room unless you notify this office, by telephone, within ten days of the date of this letter and submit written application to withhold information contained therein within thirty days of the date of this letter. Such application must be consistent with the requirements of 2.790(b)(1). If we do not hear from you in this regard within the specified periods noted above, a copy of this letter and the enclosed inspection report will be placed in the Public Document Room.

L0000312

Love Depo #11

6-20-84

We will gladly discuss any questions you have concerning this inspection.

Sincerely,

Original signed by W. S. Little

W. S. Little, Chief  
Engineering-Branch II

Enclosure: Inspection Report  
No. 50-454/83-48(DE)

cc w/encl:

- D. L. Farrar, Director  
of Nuclear Licensing
- V. I. Schlosser, Project Manager
- Gunner Sorensen, Site Project  
Superintendent
- R. E. Querio, Station  
Superintendent
- DMB/Document Control Desk (RIDS)
- Resident Inspector, RIII Byron
- Resident Inspector, RIII  
Braidwood
- Phyllis Dunton, Attorney  
General's Office, Environmental  
Control Division
- Ms. Jane M. Whicher
- Diane Chavez, DAARE/SAFE

0000313

RIII  
*Love/dh*  
Love/dh  
11/01/83

RIII  
*Mendez*  
Mendez

RIII  
*Gautpm*  
Gautpm

RIII  
*Williams*  
Williams

RIII  
*Hayes*  
Hayes

RIII  
*Little*  
Little  
11/3/83

U.S. NUCLEAR REGULATORY COMMISSION

REGION III

Report No. 50-454/83-48(DE)

Docket No. 50-454

License No. CPPR-130

Licensee: Commonwealth Edison Company  
Post Office Box 767  
Chicago, IL 60690

Facility Name: Byron Station, Unit 1

Inspection At: Byron Site, Byron, IL

Inspection Conducted: October 18-21, 1983

Inspectors: *C.C. Williams for:*  
R. S. Love

11/2/83

*R. Mendez for:*  
R. Mendez

11/2/83

*A. S. Gautam for:*  
A. S. Gautam

11/2/83

Approved By: *C.C. Williams*  
C. C. Williams, Chief  
Plant Systems Section

11/2/83

Inspection Summary

Inspection on October 18-21, 1983 (Report No. 50-454/83-48(DE))

Areas Inspected: Review of licensee action on previously identified items. Review of installation and termination of instrument cables and the review of associated procedures and records. This inspection involved a total of 69 inspection-hours by three NRC inspectors, this includes 6 inspector-hours during off shifts.

Results: In the areas inspected, no items of noncompliance were identified.

10000314

## DETAILS

### 1. Persons Contacted

#### Commonwealth Edison Company (CECo)

- \*G. Sorensen, PCD Construction Superintendent
- \*K. J. Hansing, Quality Assurance Superintendent
- \*R. Tuetken, PCD Assistant Construction Superintendent
- \*A. A. Jaras, Project Operational Analysis Department Supervisor
- \*J. J. Glowinski, POAD Assistant Supervisor
- \*J. W. Pappeport, Quality Assurance Engineer
- \*R. B. Klingler, Project Electrical Supervisor
- \*M. V. Dellabetta, Quality Assurance Engineer
- \*J. C. Woldridge, Quality Assurance Supervisor
- \*E. L. Martin, Quality Assurance Supervisor
- \*M. E. Lohmann, Project Mechanical Supervisor
- E. Sager, Electrical Field Engineer

#### Hatfield Electric Company (HECo)

- J. T. Hill, QA/QC Manager
- S. Bindenagel, QC Electrical Group Leader
- S. Hubler, QC Lead Inspector

The inspectors also contacted and interviewed other licensee and contractor personnel during this reporting period.

\*Denotes those persons present at the exit interview on October 21, 1983.

### 2. Action on Previously Identified Items

(Closed) Open Item (50-454/82-19-04; 50-455/82-19-04): This item concerned several instances where cable tray overflow was observed. This overflow condition was due to lack of training of the cables in the tray. A review of Deficiency Reports (DR) indicated that the licensee had adequate controls in place for identifying and correcting these deficiencies. The inspector observed the previous areas of concern and found them acceptable.

(Closed) Open Item (50-454/83-25-04): This item pertains to missing and incorrectly sized U-bolt type hangers. These hangers are utilized on the instrument sensing line for diesel generator level switch ILS-D0036. QC documented the missing hangers on Fabrication/Installation Surveillance Report (FIS) number 1910. The hangers were redesigned. This redesign has been incorporated into Nuclear Power Services (NPS) drawing M343-M-100036. Installation was completed on August 26, 1983 per Field Work Request 2468. The inspector reviewed the installation and it appeared to be adequate.

1.0000315

(Open) Unresolved Item (50-454/83-25-01): It had been previously identified that several thermal overload heaters were missing from Motor Control Center (MCC) cubicles. In each instance, the MCC had been turned over by the Project Operation Analysis Department (POAD). Procedures were not in place to assure that the proper size overload heater would be installed for the applicable load. Byron administrative procedures are being revised to address this concern. Pending a review of this revised procedure, this item remains open.

(Open) Unresolved Item (50-454/83-25-03): This item pertains to the conflict between S&L specification 2906 and S&L drawing M-819 as pertaining to the slope requirements for instrument sensing lines. The specification requires a minimum of 1/2" per foot slope and drawing M-819 states that a slope of less than 1/2" per foot is acceptable but does not provide a minimum slope. S&L is in the process of revising specification 2906 and drawing M-819 to require a minimum slope of greater than zero inches per foot. Pending a review of the revised minimum acceptance criteria, this item remains open.

(Closed) Noncompliance (50-454/81-16-01; 50-455/81-12-01): This item pertained to the failure to implement procedure No. 10, resulting in nonconforming condition (12" separation of cables in free air) not being identified and corrected. This procedure is now being implemented by the electrical contractor and during a tour of the plant during this reporting period, no violations of this type were identified. This item is closed.

(Closed) Unresolved Item (50-454/81-16-05; 50-455/81-12-05): This item pertained to the failure to address the separation requirements between safety related and non safety related cable trays in the FSAR, electrical specifications and drawings. Amendment 38 to the FSAR and the electrical drawings now incorporate minimum separation requirements between safety related and non safety related cable trays. This item is closed.

(Open) Unresolved Item (50-454/82-17-02; 50-455/82-17-02): This item pertains to the relaxation of bolt torque on electrical raceway hangers. During a previous inspection, it was observed that raceway hanger bolting torque had relaxed as much as 80%. The licensee was requested to evaluate the hanger bolt torquing requirements and provide a minimum acceptable torque value after the torque relaxation had occurred. This information was requested from the A/E in a CECO letter to S&L dated July 18, 1983. As of October 21, 1983, this data was not available at the Byron station. This item remains open until this data can be reviewed.

(Open) Open Item (50-454/82-17-03; 50-455/82-17-03): This item pertained to the conflict between the FSAR and Site Contractor's contracts as relating to the effective code edition of AWS D1.1, Structural Welding Code. The FSAR commits to the 1972 code edition while several site contractors are committed to the 1975 edition. No apparent action taken to date. This item remains open.

1.0000316

(Open) Unresolved Item (50-454/82-17-04; 50-455/82-17-04): This item pertains to the evaluation of data obtained during the re-inspection program in response to NCR 407. This reinspection program is still on going. Latest status report was dated October 10, 1983. This item remains open.

(Open) Noncompliance (50-454/82-17-04<sup>05</sup>; 50-455/82-17-04<sup>05</sup>): This item pertains to separation violations between safety-related and non safety related cable trays. As of May 13, 1983, site construction completed a walkdown of Units 1 and 2. Cable tray separation violations were documented on Cable Tray Walkdown Reports (CTWR) and submitted to S&L for evaluation. On August 23, 1983, S&L acknowledged receipt of the CTWRs. In interviews with CECO and S&L personnel, the inspector was informed that S&L has completed their review and evaluation of approximately 50% of the cable tray separation violations identified by CECO and the S&L design group for Unit 1. It is the inspectors understanding that the separation violations will be corrected by the installation of cable tray covers or relocating one or more of the trays, or an analysis will be performed to show that the separation violation does not compromise the safety of the plant. Pending a review of the S&L review and evaluation of these separation violations, this item remains open.

(Open) Noncompliance (50-454/82-17-06; 50-455/82-17-06): This item pertains to separation violations between safety related and non safety related cables inside panels, switchgears, etc. Cable separation violations are being reported to S&L by Cable Separation Conflict Reports. In interviews with CECO and S&L personnel, the inspector was informed that S&L has completed their review and evaluation of approximately 88% of the cable separation violations identified. Pending a review of the S&L review and evaluation of these separation violations, this item remains open.

### 3. Functional or Program Areas Inspected

#### A. Installation and Termination of Instrument Cables

During this reporting period, the Region III inspectors reviewed the installation and termination of the following instrumentation cables to the applicable procedures, instructions, cable pull cards, and drawings:

- (1) Cable 1SX144 - From 4160 volt switchgear 142, cubicle 2, to pressure switch 1PSL-SX024 - Cable type - 4/c - #14, 600V. Reel No. 04146-57. Cable routing - 11383M, 1R341, 11586J, 11676J, 1R294, and conduit 0986.
- (2) Cable 1SX283 - From Junction Box (J-Box) 1JB058A to Service Water Pump 1A heater, 1SX01PA. Cable type 1/c-#14, 600V. Reel No. 01146-81-2B. Cable routed thru conduit COA0922.
- (3) Cable 1NR032 - From electrical penetration 1NR01E to neutron detector 1NR07E. Cable type - RG-11/U triaxial. Reel No. 01113-6. Cable routing - conduit C7804, J-Box 1JB214R and conduit C7608.

1.0020317

- (4) Cable IMS120 - From electrical penetration IS106E to local instrument panel 1PL72J. Cable type 1TW-PR #16 (shld), 600V. Reel No. 02166-64, Cable routing - CIR5123, 1JB484R, 5402, 1JB485R, and 5406.
- (5) Cable IMS119 - From I&C equipment panel 1PA02J, cabinet 2, to electrical penetration IS106E. Cable type 1TW-PR #16 (shld), 600V. Reel No. 02166-43, cable routing - 11624H, 11623H, 11620H, 11417H, 11418H, 11464H, 11485H, 11467H, 1R264, and 11468H.
- (6) Cable IMS97 - From electrical penetration IS105E to instrument panel 1PL56J. Cable type - 1TW-PR #16 (shld), 600V. Reel No. 02166-47. Due to time limitations, only terminations, at panel 1PL56J, were verified.
- (7) Cable 1FW700 - From electrical penetration IS105E to instrument panel 1PL56J. Cable type 1TW-PR #16 (shld), 600V. Reel No. 02166-47. Due to time limitation, only terminations, at panel 1PL56J, were verified.

The installation and termination of the above listed cables appears to meet the project requirements. No items of noncompliance were identified.

B. Installation and Termination Records for Instrument Cables

During this reporting period, the Region III inspectors reviewed the installation and termination record for the cables listed in paragraph 2.A above and for cables 1RY199 and 1RY201. These records include, but are not limited to, cable pull cards, cable pan verification checklists (Form HP-102), cable installation inspection checklists (Form HP-105), cable termination cards, and cable termination inspection reports. A review of these records indicates that the electrical contractor's (HECo) QC inspector verified:

- (1) The size and type of cable specified was installed in the proper raceway and in accordance with procedures,
- (2) the cables were properly identified with the circuit number,
- (3) the cables were properly terminated,
- (4) when required, continuity and insulation resistance tests were performed and found acceptable,
- (5) when required, cable separation conflict reports (Form CSCR) are prepared. When cables are installed in accordance with design requirement and a cable separation violation is observed, a CSCR is prepared. These records are forwarded to S&L for review and evaluation. See the item of noncompliance addressing this subject in paragraph 2 of this report as an example of implementation.

Inspection reports are reviewed, signed, and dated by a Level II or Level III QC inspector. The installation and termination records reviewed appears to be adequate. No items of noncompliance were identified.

1.0000318

C. Receipt Inspection and Material Certification for Instrument Cables

During this reporting period, the Region III inspector reviewed the Material and Equipment Receiving and Inspection Reports (MRR), Material Certification, and verified that the safety-related instrument cables were traceable to a given cable reel. The above listed data was reviewed for the following cables:

-- (1) 1RY199 and 1RY201

- . Procured from Samuel Moore and Company under S&L Specifications F2852 and CECO Purchase Order (P.O.) No. 207293, dated December 21, 1976.
- . Received on MRR 3128, dated March 31, 1978.
- . Cable type-1TW-PR #16 (shld), 600V, traceable to Reel No. 02166-47.
- . Certificate of Conformance (C of C) to specification requirements.
- . Certified Material Test Report (CMTR) for insulation resistance tests, voltage tests, and cable insulation thickness tests.

(2) IMS119

- . Procured from Samuel Moore and Company under S&L Specifications F2852 and CECO P.O. No. 207293, dated December 21, 1976.
- . Received on MRR 3128, dated March 31, 1978. Cable type 1TW-PR #16 (shld), 600V, traceable to Reel No. 02166-43.
- . C of C to specification requirements.
- . CMTR for insulation resistance tests, voltage tests, and cable insulation thickness tests.

(3) IMS120

- . Procured from Samuel Moore and Company under S&L Specifications F2852 and CECO P.O. No. 207293, dated December 21, 1976.
- . Received on MRR 6652, dated May 2, 1979.
- . Cable type - 1TW-PR #16, 600V, traceable to Reel No. 02166-64.
- . C of C to specification requirements.
- . CMTR for cable jacket and insulation tensile tests, elongation and moisture tests to Form Eh-29135.

(4) 1VA163

- . Procured from Okonite Company under S&L Specifications F2823 and CECO P.O. No. 207113, dated November 29, 1976.
- . Cable type -1/C #14, 600V, traceable to Reel No. 01146-108-3
- . Received on MRR 7715, dated October 2, 1979.
- . C of C to specification requirements.
- . CMTR for voltage tests, insulation resistance tests, and cable insulation thickness tests.

(5) 1SX283

- . Procured from Okonite Company under S&L Specification F2823 and CECO P.O. No. 207113, dated November 29, 1976.
- . Cable type - 1/c #14, 600V, traceable to Reel No. 01146-81-2B.

L0000319



- . Received on MRR 7715, dated October 2, 1979.
- . C of C to specification requirements.
- . CMTR for voltage test, insulation resistance tests, and cable insulation thickness tests.

(6) 1SX144

- . Procured from Okonite Company under S&L Specification F2823 and CECO P O. No. 207113, dated November 29, 1976.
- . Cable type 4/c #14, 600V, traceable to Reel No. 04146-57.
- . Received on MRR 6039, dated March 3, 1982.
- . CMTR for jacket and insulation tensile strength and stress tests and met the physical requirements after aging.

(7) 1NR022 and 1NR032

- . Procured from Rockbestos under S&L Specifications F2919 and CECO P.O. No. 258936, dated November 16, 1981.
- . Cable type RG-11/U (76 ohm) triaxial, traceable to Reel No. 01113-6.
- . Received on MRR 51919, dated May 14, 1982.
- . Certified test reports indicate all tests were acceptable. A copy of S&L specifications F2919 was not available so a comparison between requirements and results was not made.

A review of final documentation packages will be made during a subsequent inspection. Final documentation packages are undergoing a final review by S&L and CECO. Documentation package review is being tracked by Open Item 50-454/83-37-01.

4. Open Items

Open items are matters, not otherwise categorized in the report, that need to be followed up on in future inspections. Open items are discussed in Paragraphs 2 and 3.C. of this report.

5. Exit Interview

The inspectors met with licensee representatives (denotes under paragraph 1) on October 21, 1983. The inspectors summarized the scope and findings of the inspection. The licensee representatives acknowledged this information.

L0000320

Table A.5 - Hatfield Electric

I. Results By Inspection Type



Type	Reinspection Results (Acceptable)		
	Level II Reinspection	Independent Third Party Review	Level III Reinspection
Subjective	87.4 % (20419/23350) 87.4% (20419/23350)	91.3 % (21315/23350) 91.3% (21315/23350)	92.8 % (21662/23350) 92.8% (21662/23350)
Objective	96.7%		

II. Results By Inspection Attribute

Attribute	Initial Sample Period		Expansion Sample Period	
	No. Of People Reinspected	Final % Acceptable	No. Of People Reinspected	Final % Acceptable
1. Visual Weld	7	92.8%		
2. Conduit	6	96.9%		
3. Terminations	5	99.9%		
4. Equip. Setting	2	100.0%		
5. A325 Bolting	1	100.0%		
6. Equip. Modification	2	100.0%		
7. Conduit As-built	8	95.9%		
8. Pan Hangers	2	96.9%		
9. Pan	1	100.0%		

Table B.5 - Hatfield Electric

Detailed Inspector Results

Insp.	Attr. #1	Attr. #2	Attr. #3	Attr. #4	Attr. #5	Attr. #6	Attr. #7	Attr. #8	At
41 572	A 73-1194/1267	E - 6%	7.2%						
	B								
166 625	C (40) 684/724	A - 6%	24.3%					4795/4974	
	D								
1383 10908	E 1029-10773/11802	F 37/38	32/32	770/770	24/24	8/8			
	F								
166 933	G (50) 1180/1230	H 289/304	137/137	132/132	562/564	4%	2/2 1/1		
	H								
400 4190	I 359-4280/4639	J - 4%	3.9%	539/561	48/586	8.2%		3985/4112	
	J								
	K								
	L								
	M								193/198
109 2841	N 136-3501/3637	O (47) 51/51	4%					10952/11457	
	P								
	Q								
	R							2001/2081	
	S							4818/5055	
	T							11734/12205	
	U							2753/2879	
	V			8201/8208	24/24			1917/2014	
									1696/1752

Totals	21662/23350	2053/2118	65				1822	61	
2205	21662	115					42955/44777	61	
20,140	1688	2154 - 30					1200	61	
NOTE:							22660	1932	

No expanded sampling was required.

- Attribute 1 - Visual Weld
- Attribute 2 - Conduit
- Attribute 3 - Terminations
- Attribute 4 - Equipment Setting
- Attribute 5 - A325 Bolting
- Attribute 6 - Equipment Modification
- Attribute 7 - Conduit Asbuilt
- Attribute 8 - Pan Hangers
- Attribute 9 - Pan

(4)

L0000481

Table B.6 - Powers-Azco-Pope

Detailed Inspector Results

Insp.	Attr. #1	Attr. #2	Attr. #3	Attr. #4	Attr. #5	Attr. #6	Attr. #7							
A	23/23	11/11	6/10	5/8	-	-	-							
B	54/54	34/35	24/34	11/11	-	-	-							
C	52/52	108/117	37/48	47/74	-	-	-							
C(exp)	-	85/93	-	33/35	-	-	-							
D	1/1	16/18	193/195	50/52	-	-	-							
E	47/48	275/328	111/114	87/127	-	2/2	-							
E(exp)	-	19/21	-	11/12	-	-	-							
F	152/155	218/272	95/97	36/61	-	-	-							
F(exp)	-	60/72	-	23/29	-	-	-							
G	67/68	330/351	62/62	39/54	3/3	2/2	-							
H	10/10	24/24	68/68	43/55	-	-	-							
I	40/41	259/286	240/242	38/72	11/22	1/1	5/5							
I(exp)	-	9/9	-	3/10	-	-	-							
J	47/59	163/178	139/142	97/112	-	1/1	-							
K	108/108	99/101	262/262	68/115	7/16	-	2/2							
K(exp)	-	-	-	3/5	-	-	-							
L	137/139	83/83	213/221	36/40	8/18	-	5/5							
M	295/302	536/546	858/946	82/181	16/41	2/2	12/12							
M(exp)	-	-	555/561	208/246	18/22	-	-							
N	231/237	468/484	503/508	172/218	-	-	2/2							
O	359/370	379/404	793/823	197/272	2/2	-	8/10							
O(exp)	-	-	-	5/7	-	-	-							
P	11/11	11/12	8/8	4/4	-	-	-							
Q	41/46	97/102	178/184	80/101	27/35	-	1/1							
Q(exp)	-	-	3/4	-	-	-	-							
RS	176/177	113/113	175/177	90/113	139/154	1/1	8/8							
Totals														
Initial-	2493	2543	3986	4256	5305	5599	238	2852	225	303	25	25	45	47
Expanded-	2172/2222	3605/3860	4675/4370	1660/2261	219/297	17/17	44/40							
	-	173/195	558/565	286/344	18/22	-	-							

NOTE:

The "exp" designation represents the expansion of an inspectors sample period when the acceptable threshold was not met.

- Attribute 1 - Pipe Material Verification
- Attribute 2 - Pipe Weld Visual
- Attribute 3 - Hanger/Mount Material Verification
- Attribute 4 - Hanger Weld Visual
- Attribute 5 - Final Hanger
- Attribute 6 - Flex Hose
- Attribute 7 - Pipe Bend

	✓	✓	✓	✓	✓	✓	✓
Q	321/321	381/395	710/729	478/591	6/6	8/8	1/1
Q(exp)	-	-	-	-	-	-	-

1.0000482

HATFIELD ELECTRIC COMPANY  
FAILURE MODE ANALYSIS

82-05-19

DATE: 9/108

INSP. NAME	ATTRIBUTE	QTY. INSP.	QTY REJECTED	REASON	SAFETY IMPACT
E. DUMAS  10000483	PROC. 20	304	2 ✓	HANGERS MISSING (WIS-TYPE)	DR2295 SEL ANALYSIS
			2 ✓	CONDUIT BENDS EXCEED 270°	DR2295, 2292 SEL ANALYSIS No Imp
			2 ✓	NO INSUL'D THROATS IN LX FITTINGS	DR2293 NONE DR2294 No Imp
			1 ✓	GROUNDING UNACCEPTABLE	YES No Imp
			1 ✓	INCORRECT TYPE LX FITTINGS	90° Frc. Installed SEL ANALYSIS
			1 ✓	CONDUIT BEND RADIUS PROBLEM	SEL ANALYSIS No Imp
			4	LX LESS THAN LENGTH PER EB-146	DR2337 SEL ANALYSIS - NONE
			2	CAPTIVE NUTS NOT USED ON J-BOX	NONE No Imp
			N/A	BOLT COUNT ON RPT INCORRECT	NONE Not Part of Reins.
			N/A	(N/A - NOTE REMOVED FROM DWG. 2-3361)	SPLIT COUPLERS NOT GROUNDED PROPERLY YES No Imp
BUCHANAN	PROC. 20	45 32-0	2	N/A - INTERPRETATION #17	NONE No Imp
			4	PULL SLEEVES LESS THAN SPEC'D LENGTH	NONE No Imp
GETZELMAN	PROC. 20	41 38-1	2	ELONGATIONS NOT BEING CHECKED AT THAT TIME	NONE No Imp
			1	CONDUITS OUT OF ELEV. TOL. ON HGR	NONE No Imp
K. CRIPPS	PROC. 20	137	3	FIELD-CUT THREADS NOT COATED	NONE No Imp
			0	CONDULET BODY NOT SPEC'D @ EQUIP	SEL ANALYSIS No Imp
H. HOLZE	PROC. 20	561-22 RET. 586	10	CONDUITS HAVE BEEN INSTALLED AGAINST CABINET IN THESE COMPARTS. GASKETS NOT BEEN ALIGNED	SEL ANALYSIS No Imp
			8	NO DEFECTS	r/a
		1.9%	10	NOT PART OF CRITERIA AT THAT TIME	SEL ANALYSIS No Imp
			8	HGR OUT OF LOCATION TOLERANCE	SEL ANALYSIS No Imp
			2	N/A - INTERPRETATION #17	DR2422, 2423 SEL ANALYSIS NCR 645, 61
			2	INCORRECT HGR TYPE INSTALLED	F.P.S. NONE No Imp
			5	END OF HGR NOT GALVANIZED	F.P.S. CORRECTED SEL ANALYSIS No Imp
			1	"O" RING INSTALLED INCORRECTLY	F.P.S. - CORRECTED SEL ANALYSIS No Imp
			1	GROUNDING UNACCEPTABLE	YES F.P.S. - CORRECTED
			2	N/A - NOT PART OF CRITERIA AT THAT TIME	F.P.S. CORRECTED
			2	PAPER GASKET IN CONDULET BODY	SEL ANALYSIS
			2	INCOMPLETE JUNCTION BOX (COVER, SCREWS)	DR 2341 NONE

HATFIELD ELECTRIC COMPANY  
FAILURE MODE ANALYSIS

DATE: 9/1/03

82-05-19

P. 2

INSP. NAME	ATTRIBUTE	QTY.	INSP.	QTY REJECTED	REASON	SAFETY IMPACT
H. HOLZE (cont'd)	Proc 20	561	560	1	J-Box Barrier Incorrectly Installed	F.P.S. To Rear (out) Barrier S&L ANALYSIS DR 2323
				1	Wrong J-Box Type Installed N/A - Not Part of Circuit at That Time	S&L ANALYSIS DR 2344 DR 2340
				2	No Insulated Thread in LX Fitting	NONE
				6	LX Greater Than Spec'd Per EB-146	S&L ANALYSIS
				1	Conduit Bends Exceed 370° 2 permitted per Des. Rev. - Not Reconnectable	S&L ANALYSIS (HP-201 #214) DR 2338
				18	Conduit Body Not Shown on E.I. Drawg	S&L ANALYSIS DR 2340
				1	Field-Cut Threads Not Coated	NONE F.P.S. To NIKELSON
				1	N/A - After The Fact - Not Reconnectable. DAMAGED LX	YES DR 2308
				1	(Loss of Shielding Passes, Pinnos, ETC) POOR WORKMANSHIP ON CONDUIT	YES
F. KEEP	Proc. 20	1046	1046	1	No Det. For Non-Std J-Box Barrier	S&L ANALYSIS
				3	No Insulated Thread in LX	NONE
				5	Incorrect Grounding	YES
				1	Insufficient Clearance Between Panel C in Conduit	1 1/2" - No Panel S&L ANALYSIS
				6	Incorrect or Missing Gasket on Body	DR 2347 DR 2309
				2	J-Box Wrong Size Installed	FCR 8638 S&L ANALYSIS DR 2119
				1	HGR. Distance Tol. Prod.	S&L ANALYSIS
				1	No Barrier in J-Box Where Required	YES DR 2219
				1	Conduit Exceeds 170° of Bends	NCE 382 S&L ANALYSIS DR 2119 DR 181
				1	No Gasket Under J-Box Cover	DR 2193 - INFRABUS S&L ANALYSIS
				1	Conduit Strap Extends Past End of HGR	NONE DR 3198
				2	LX Length Greater Than Spec'd on EB-146 AFTER	S&L ANALYSIS
				2	DAMAGED LX	YES

INSPECTION EVALUATION

Distribution

1 Facility: Byron Nuclear Power Station

IERP Members.  
Director, DPRP (For  
Rx Inspections)  
Inspector's Division  
Director

Dates of Inspection: 8/8-19/83 & 9/7-9/83

Inspector(s).  
Docket File.

Type (Circle one): Routine Reactive Special

Report No.:  
454/83-37

Inspectors: R. S. Love

2. Inspectors:  The report clearly addresses all safety concerns.

The report does not clearly address the following safety concerns:

In Reinspection program for H.E.C. identified 2,265 defective welds out of 20,140 welds inspected (? inspectors) Can we justify why 100% re-inspection of welds is not required??

3. Inspectors:  I believe RIII is effectively dealing with all safety concerns.

I do not believe RIII is effectively dealing with all safety concerns. I suggest RIII take the following actions to assure effective RII action:

See attached pages

R. S. Love

Inspectors' Signatures

See attached pages

Supervision:

9/13/83  
Date

If the inspector does not believe that all safety concerns are addressed in the report or that RIII is not effectively dealing with all safety concerns provide your position on these matters including date by which actions will be taken.

I don't know. But we will pursue technically & statistically

NAPS welding inspectors are inspecting this area at Byron and their inspection reports will address this area. Our welding specialist believes the licensee is being very cautious in identifying deficiencies and those found to date do not indicate serious problems. We will continue to inspect this area until the reinspection program is complete & then make a final evaluation. W&T

Supervisor's Signature

9/14/83  
Date

urrence (Only when Section 4.1s required to be completed.)

[Signature]

Branch Chief

10/4/83  
Date

Love Repo. #13  
6-20-84

\* Received by Branch Chief on 10/3