

ORIGINAL

UNITED STATES
NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

DOCKET NO:

METROPOLITAN EDISON COMPANY

50-289-SP

(THREE MILE ISLAND NUCLEAR STATION, UNIT No. 1)

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UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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In the Matter of: :

: Docket No. 50-289-SP

METROPOLITAN EDISON COMPANY : (Restart Remand on

: Management)

(Three Mile Island Nuclear :

Station, Unit No. 1) :

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The Library, Richards Hall
University Center
2986 North Second Street
Harrisburg, Pennsylvania 17110
Friday, December 14, 1984

The hearing in the above-entitled matter resumed,
pursuant to recess, at 9:33 a.m.

BEFORE:

JUDGE IVAN W. SMITH, Chairman
Atomic Safety and Licensing Board
Nuclear Regulatory Commission
Washington, D. C. 20555

JUDGE WHELDON J. WOLFE, Member
Atomic Safety and Licensing Board
Nuclear Regulatory Commission
Washington, D. C. 20555

JUDGE GUSTAVE A. LINENBERGER, JR., Member
Atomic Safety and Licensing Board
Nuclear Regulatory Commission
Washington, D. C. 20555

Sim 2

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25

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I N D E XWITNESSESDirect Cross Redirect Recross Board

Richard A. Brill

By Mr. Blake	31,593			
By Ms. Bernabei		31,605		
By Mr. Au		31,651		
By Mr. Goldberg		31,652		
By Judge Smith				31,657
By Judge Linenberger				31,657
By Judge Wolfe				31,659
By Mr. Blake			31,660	
By Ms. Bernabei				31,663

E X H I B I T S

	<u>Identified</u>	<u>Received</u>	<u>Rejected</u>
TMIA Exhibit Number 41	31,606		
TMIA Exhibit Number 42	31,612		
Licensee Exhibit Number 2	31,666		
Licensee Exhibit Number 3	31,666		
Licensee Exhibit Number 4	31,670		31,686
TMIA Exhibit Number 38		31,695	
TMIA Exhibit Number 39		31,695	
TMIA Exhibit Number 32-A through 32-K	31,697	31,697	

L A Y - I N

Prefiled Testimony of Richard A. Brill Following Page
31,610

P R O C E E D I N G S

2

(9:33 a.m.)

3

JUDGE SMITH: Is there any preliminary business before we hear from Mr. Brill?

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MR. BLAKE: One matter, to respond to Judge Linenberger's request with regard to TMIA Exhibit 32-C and what that document is.

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I'm going to let Mr. Lewis describe it.

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MR. LEWIS: These were the three pages that Ivan Porter was questioned about yesterday. They are not printed off the computer of the alarm printer. They are pages out of a book that sits next to the alarm printer. There are a number of books that sit next to the printer. The books are instruction booklets and other information.

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This particular book is called the point book. What a point is, is the analog inputs to the computer. The analog inputs come into the computer through an analog input cabinet which is located in the cable spreading room.

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In order to determine what point represents what input, you have to be able to match the numbers of the point to some particular instrument measuring a parameter. This point book allows you to do that by giving a point number and then an indication of what that point number indicates. That is why this was used when they went down to -- when they were recording millivolts off

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1 the points. It was a convenient way to take a point and
2 know what number it is and then be able to write it next
3 to the point number and also correlate that with an actual
4 input, in this case a particular thermocouple.

5 There is data at the bottom, 01/03/78, Revision
6 1, that is just the date of the book, not a date when any
7 measurements that are handwritten in here were made. It
8 was a revision of the particular point book in question
9 that was sitting next to the computer console.

10 JUDGE LINENBERGER: All right, sir. I don't
11 want to belabor this. But I'm interested also in the fact
12 that on the left-hand side of these pages there appear to
13 be reproductions of what look like sprocket holes in the
14 side of the paper as though at some point in the history
15 of the original of this thing it run through some kind of
16 a device that had a sprocket drive on the paper.

17 Now, how does that square with your information
18 about the date and the point book discussion?

19 MR. LEWIS: It may well have come off a comput-
20 er at one point, but it was not off the alarm printer. It
21 was not a printout off the alarm printer. I don't know
22 when it was original printed, what device printed it.
23 But it was not something that was printed on the 28th at
24 the request of an operator. It was an informational book
25 that was sitting next to the console along with a large

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1 number of other books.

2 JUDGE LINENBERGER: Okay. Thank you very much.

3 (The Board members are conferring.)

4 JUDGE SMITH: Anything else?

5 MS. BERNABEI: I have two exhibits that I
6 have distributed to the parties and move to be accepted
7 if they have not been already.

8 One is the portions of the Broughton deposi-
9 tion, which is TMIA Exhibit 31. That was accepted yester-
10 day. We did not have sufficient copies yesterday.

11 (Ms. Bernabei is distributing copies to
12 the Board members and the parties.)

13 And the second would be portions of the Porter
14 deposition to which the Licensee and TMIA have agreed,
15 and I believe that is TMIA Exhibit 50 -- excuse me, 40.

16 (Ms. Bernabei is distributing copies to
17 the Board members and the parties.)

18 I think there is still one outstanding matter,
19 the OIA Report which I believe has been identified as
20 TMIA Exhibit 25.

21 JUDGE SMITH: That's right. What's the status
22 of that?

23 MS. BERNABEI: We move to introduce it. We
24 think that it is relevant to Mr. Gamble's testimony and
25 what would appear to be the Staff's criticisms of Mr.

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1 Gamble's performance in that investigation. We would
2 move to introduce it.

3 JUDGE SMITH: Are there any objections?

4 MR. GOLDBERG: I guess with the same limitation
5 that a number of other documents have come into evidence,
6 namely in the context of what the witness had to say
7 about it, and to the extent that it was used, I don't
8 have an objection but certainly not admitted for all
9 purposes or for the truths of the matters asserted therein.

10 So, with the limitation I don't have any
11 objection.

12 JUDGE SMITH: Mr. Blake?

13 MR. BLAKE: Same position, to the extent it
14 was used and discussed.

15 JUDGE SMITH: The Board has an additional
16 reason for wanting to have that document a part of the
17 record. It should not be cited for the truth of the
18 contents. It has some value I guess for the purposes
19 alluded to by Mr. Goldberg. It also has a value of
20 demonstrating the Board's -- that the Board has reviewed
21 that report and has decided that it does not contain any
22 information which would cause us to pursue the subject
23 matter of that report; that is, whether we are correct
24 or not correct in allowing the recrd to be closed at
25 that point should be subject to review and there it is,

#1-5-SueT

1 they can see what it is we didn't pursue.

2 And so for that purpose we will have it marked
3 as a document but not a part of the evidentiary record
4 for that purpose.

5 Anything further?

6 MS. BERNABEI: Yes. The Keaten notes, which
7 is TMIA Exhibit 10, GPU counsel and we have decided on
8 what perhaps could be called the official stipulated copy.
9 I believe there are only changes to two pages; that is,
10 essentially an attempt to make the official stipulated
11 copy conform, at least to our minds, to the original.

12 What I would propose, the TMIA-10 that I
13 distributed during Mr. Broughton's examination, I would
14 propose for us to simply reproduce the two pages and pro-
15 vide them to the parties to substitute for those two pages
16 in the so-called clean copy.

17 END #1

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1 JUDGE SMITH: That is fine. Sure

2 MS. BERNABEI: Okay. We will have that done later
3 this morning.

4 MR. GOLDBERG: Just a couple of minor things. I
5 have been informed that the Commission meeting, which was
6 scheduled for 2 o'clock on Tuesday has been cancelled. There
7 is not a different meeting scheduled for that time. I don't
8 know whether the meeting that was scheduled for 2 o'clock on
9 Tuesday concerning the TMI restart proceeding has been
10 rescheduled or just cancelled. But apparently it is not
11 longer going to take place at 2 o'clock on Tuesday.

12 Also I have been informed by my office that TMIA
13 has moved to reopen the steam generator proceeding and maybe
14 they wish to say something more about that, but I thought
15 maybe Judge Wolfe might be interested in that.

16 MS. BERNABEI: We filed, as I understand it, a
17 motion to reopen on the grounds of newly discovered evidence.

18 JUDGE WOLFE: That is before the Appeal Board?

19 MS. BERNABEI: Yes.

20 JUDGE SMITH: Anything further?

21 JUDGE WOLFE: Yes. One other thing.

22 Ms. Bernabei, I have a note on your proposed
23 Exhibit 38, or 38 which has been admitted, I am not certain.
24 You had something to add to that?

25 In any event, I don't have a copy of 38. Would

Sim 2-2

1 you check on that?

2 JUDGE SMITH: That is the Abramovici notes.

3 MS. BERNABEI: Those we are getting copies of
4 as well as Exhibit 39, which is a portion of Mr. Broughton's
5 notes. We should have copies in a short time.

6 JUDGE WOLFE: All right.

7 MS. BERNABEI: And I would just propose to deal
8 with it at that time.

9 JUDGE SMITH: Are you ready for Mr. Brill?

10 Mr. Brill, would you come forward, please.

11 I suspect we are going to need some table space
12 there.

13 Whereupon,

14 RICHARD A. BRILL

15 was called as a witness on behalf of the applicant and, having
16 been first duly sworn by Judge Smith, was examined and
17 testified as follows:

18 JUDGE SMITH: State your name.

19 THE WITNESS: Richard A. Brill.

20 DIRECT EXAMINATION

21 BY MR. BLAKE:

22 Q Mr. Brill, do you have before you a document
23 entitled "Testimony of Richard A. Brill" dated December 10,
24 1984?

25 A Yes, I do.

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Sim 2-3

1 Q Mr. Brill, do you adopt this as your testimony
2 in this proceeding?

3 A Yes, I do.

4 MR. BLAKE: Mr. Smith, I ask that the document
5 entitled "Testimony of Richard A. Brill" be physically incor-
6 porated into the record as though read. The document consists
7 of three pages, three and a half pages and an attachment which
8 is a Taylor Instructions Instalations Installation Operation
9 Maintenance Manual by Taylor Instrument Companies.

10 MR. AU: Excuse me. I don't think I have a copy
11 of that.

12 MS. BERNABEI: I have two objections, the first
13 being I object to the testimony as a whole because I don't
14 believe that TMIA was given an adequate opportunity to present
15 evidence on this same point, that is the physical evidence
16 that the pressure chart recorder was cut and perhaps Xeroxed
17 on the evening of March 28th, as some site personnel have
18 testified.

19 My second objection is as to the latter two
20 paragraphs which appear on page 4. These two paragraphs are
21 testimony by Mr. Brill as to apparently when the two cuts were
22 made in the chart and whether or not they had been taped
23 together at a previous time.

24 It is apparent from the testimony that he is not
25 a competent witness to give that testimony. In other words,

Sim 2-4

1 any information he has is from the chart custodian, Karen
2 Imhoff, and it seems to me that this witness is not competent,
3 that is his particular expertise and familiarity with strip
4 charts wouldn't make him a competent witness to testify as
5 to when the or when the chart was not taped together.

6 I would not have the same objection to Karen
7 Imhoff, but she is not here to testify or cross-examine.

8 So, therefore, my second objection is to strike --
9 or my second proposal would be to strike the last two
10 paragraphs since this witness does not have competence to
11 testify to this.

12 JUDGE SMITH: It seems to me that you have a big
13 problem. If we sustain your objection, we just adjourn the
14 hearing and go on home and that is the end of it. I don't
15 know if that is what you want, but the Board will consult
16 and see if that is what we want.

17 MS. BERNABEI: I have two objections, and let me
18 state it very clearly.

19 I have an objection to the licensee presenting
20 testimony on this point, the testimony in the entirety, without
21 we be allowed to do so.

22 I think it is a relevant point and I think it is
23 one the Board should consider.

24 JUDGE WOLFE: What do you mean ---

25 JUDGE SMITH: All right. We will take it under

Sim 2-5

1 advisement.

2 JUDGE WOLFE: What do you mean you being allowed
3 to. I don't understand your point.

4 MS. BERNABEI: If you remember, at a prehearing
5 conference -- well let me start back in August. In August
6 we make a document request of the licensee for copies of
7 relevant document, including the original and copies of the
8 strip recorder.

9 We were not permitted to view the strip recorder
10 until the last day of discovery, October 15th. At that time
11 after we reviewed it, we asked the Board for access to the
12 strip recorder such that we could hire an expert to take a
13 look at it. We were denied that at the prehearing conference.

14 At this time during the hearing we made a second
15 request to the Board that the staff provide someone to talk
16 about it, someone with operating experience that would be
17 familiar with charts of this nature.

18 We were not granted that request. We were told
19 the resident inspector, who we didn't think had the kind of
20 expertise and the kind of objectivity to look at it, would
21 be provided and we rejected that offer.

22 We were provided an opportunity within the last
23 two days to hire our own expert and we did make attempts and
24 we couldn't do that.

25 My objection is to having Mr. Brill testify, or

Sim 2-6

1 having the licensee be able to produce testimony from their
2 expert as to physically what the chart shows without TMIA
3 being accorded what I think was a similar opportunity, and
4 I don't think granting us the chance to find someone within
5 the last two days is a similiar opportunity.

6 So that is my objection overall to the testimony.

7 My specific objection is to the last two
8 paragraphs in that I don't think Mr. Bill has the competence
9 to testify as to that. It is clear that the chart custodian
10 may have information on when the chart was cut and the status
11 of the chart as to taping prior to the microfilming on
12 May 2nd, but Mr. Brill doesn't.

13 So my proposal is to let the testimony remain
14 except for the last two paragraphs.

15 JUDGE SMITH: Oh, I thought you objected to it.

16 MS. BERNABEI: We would be prejudiced if this
17 were admitted in its entirety.

18 JUDGE SMITH: Well, we don't want to prejudice
19 you. So we are inclined to grant your objection to go home
20 or back to the office.

21 MS. BERNABEI: We are moving to strike the last
22 two paragraphs. That is our proposal.

23 JUDGE SMITH: So you have no objections to the
24 receipt into evidence of his testimony except for the last
25 two paragraphs.

Sim 2-7

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MS. BERNABEI: That is correct.

JUDGE SMITH: Okay.

MR. GOLDBERG: I just have one thing to say in response to Ms. Bernabei's argument, and that is that there is no basis at all for the suggestion that the staff's resident inspector is not objective and would not be objective in testifying about strip chart records and we have made the offer to have him testify. It was rejected by TMIA, but I resent the suggestion that he would not be objective. There is no foundation for such a suggestion.

(Board conferring.)

JUDGE SMITH: Mr. Blake.

MR. BLAKE: I will not go back over the discovery disputes. I think there is a sufficient record to cope with those. Let me just address the last two paragraphs.

end Sim
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1 The next to the last paragraph purports Mr.
2 Brill's review of records of micro filming. It certainly
3 seems to me he ought to be able to do that.

4 The second sentence in that paragraph says that
5 he spoke with Karen Imhoff. He certainly ought to be able to
6 say that. It certainly strikes me that anyone can be competent
7 to say I spoke with "X". We have heard testimony during this
8 hearing about who they spoke with, and who they didn't.

9 The last paragraph is that he looked at the chart.
10 He looked at the chart and seen whether or not there is evidence.
11 The chart is here for each of us to inspect. It strikes me
12 simply as a matter of confidence and what weight in the end
13 the parties might argue based on the examination of Mr. Brill,
14 but I see no basis on which to strike the last two paragraphs.

15 MS. BERNABEI: Let me just address these two
16 points. One, we are talking about having people up here who
17 are involved in the central events of the accident. We are not
18 talking about -- and they zre talking about what other people
19 told them, who are also involved in central events.

20 Here, we are talking about someone third hand
21 talking about what a chart custodian told him, and I don't
22 think that is reliable evidence. I think we should have the
23 chart custodian.

24 I would also mention the chart custodian was the
25 person we asked for when we originally asked for witnesses.

1 Someone that could identify, and was in part
2 because we wanted to know about it has been maintained, and
3 when it was cut and taped back together again. We asked for
4 that person.

5 JUDGE SMITH: Did you request a subpoena?

6 MS. BERNABEI: We asked the Board, and if you
7 remember in the original letter when we announced our
8 witnesses, we said the custodian of the chart. And there
9 was a big controversy over whether anybody would be able to
10 talk about the chart, and that was sort of laid on the back
11 burner, but we asked for the custodian precisely for this
12 reason.

13 Secondly, Mr. Blake I don't think has quite
14 represented correctly this man's testimony. He said he looked
15 at the chart after it has been taped together after micro-
16 filming, and he is going to tell us whether it was taped
17 together before microfilming.

18 Now, I think that is a very tenuous conclusion.
19 It seems to me the person who saw it before it was microfilmed
20 should be making that determination and brought in here to
21 testify. I don't see any way this man has the basis to state
22 it is taped together now, and I have an opinion as to whether
23 it was taped together before it was taped together now.

24 I mean, that seems to me a very tenuous argument
25 to be making. And if there is someone who saw it before it was

1 microfilmed, that person should be brought in.

2 JUDGE SMITH: My inclination is to just close the
3 record and forget the whole thing, and let you argue whatever
4 you want to argue.

5 MS. BERNABEI: We would be doubly prejudiced
6 then.

7 JUDGE SMITH: I think the Board has gone to
8 extraordinary lengths to provide an opportunity for you to
9 get this document into the hearing room, to let us look at it,
10 to hear what Mr. Brill's observations might be about it, and
11 now you seem to be quarreling with whether it is acceptable to
12 accept Mr. Brill's testimony that he learned, which I infer
13 that he learned from Karen Imhoff about the pieces being
14 subsequently taped together. That, there is no question about
15 it, that is traditional hearsay problem, and it is a traditional
16 hearsay objection that you are making.

17 I am inclined to say that we ought to grant it
18 and go home, and not listen to evidence on it. But this is
19 evidence at your request, and you just accept the record the
20 way it is. I am willing to go home right now and forget this
21 whole issue.

22 MS. BERNABEI: What I am saying is it is accepted
23 except for the last two paragraphs. That is what I am saying.

24 JUDGE SMITH: That is why he is here, and that
25 is one of the reasons we are here is to look at that and see

1 if his observations make sense.

2 If you don't want us to, I don't want to, believe
3 me.

4 MS. HERNABEI: Well, my proposal is to admit the
5 testimony except for the last two paragraphs.

6 JUDGE SMITH: The last two paragraphs are important.
7 I think there is other relief that you could probably have.
8 You question whether the hearsay communication between this
9 witness and Karen Imhoff is reliable. I think maybe we could
10 proceed today. I think it is the type of hearsay that is in
11 violation of the hearsay rule, which given the context of this
12 hearing, this person and everything else, is probably reliable.

13 But nevertheless, you have established a
14 traditional hearsay objection. I think we can probably proceed
15 with this guy. You can go out and interview Karen Imhoff if
16 you want to after the hearing. If you have doubts about it,
17 you move to reopen the record or something.

18 We probably won't grant it, you know, because I
19 think you are making a quibble. A quibble -- it is a trivial
20 matter that you are raising, and I think that you are entitled
21 to it, and go ahead, raise it.

22 To tell you the truth, I would just as soon go
23 home. You know, I think you are putting obstacles in the way
24 of your own effort to establish the record on the tape.

25 I would just as soon grant your objection and

1 go home myself.

2 MS. BERNABEI: Judge Smith, our objection is to
3 only the last two paragraphs.

4 JUDGE SMITH: Well, without the last two paragraphs,
5 I don't think there is any point in being here.

6 MS. BERNABEI: Yes. There is quite a lot in the
7 rest of the testimony.

8 MR. GOLDBERG: This transcript is going to show
9 the objection originally was a general objection on how TMIA's
10 case would be prejudiced if the testimony as a whole came in,
11 and then they went on and backed off that, and now it is the
12 last two paragraphs.

13 MS. BERNABEI: Let me --

14 MR. GOLDBERG: I would appreciate it if you would
15 not interrupt me. I have showed you that courtesy.

16 The transcript of this morning's proceeding will
17 show exactly what Ms. Bernabei said about this testimony.

18 MS. BERNABEI: Just so there isn't a problem
19 on the record, let me state our position. We wanted to hire
20 our own expert to come in here to talk about it. We were
21 not allowed access to the chart, so we could not. Given that
22 fact, we are prejudiced by having only available to us a
23 Licensee witness.

24 What we have said is that --

25 JUDGE SMITH: This is the third time you have

1 said that.

2 MS. BERNABEI: Mr. Goldberg just misunderstood.

3 That is why I stated it correctly.

4 JUDGE SMITH: I believe we can probably strike
5 the sentence: The pieces were subsequently taped together by
6 Karen Imhoff, the chart custodian with whom I spoke, for
7 easier reference.

8 And leaving: The chart was later microfilmed
9 in one piece, having been taped together).

10 Does that satisfy your hearsay objection?

11 MS. BERNABEI: Yes, for that paragraph.

12 JUDGE SMITH: And the rest of it I don't believe
13 you have any valid objection.

14 He is making more or less a layman's observation,
15 a layman's opinion, that we can judge the adequacy of ourselves
16 right here in the hearing room. Never mind. You obviously
17 were not listening to what I had to say.

18 It is not possible for you to engage in an active
19 conversation with you doing the speaking with Ms. Doroshow
20 and listen to what I am saying.

21 You have the -- unless you have the unique
22 capability of doing that, at the very least, the Board is
23 entitled to the courtesy of a perception that you are listening
24 to what we are saying.

25 MS. BERNABEI: Judge Smith, I heard what you

1 were saying --

2 JUDGE SMITH: Your objection is overruled.

3 MS. BERNABEI: Let me just state I did hear what
4 you said. You said for the other matters, the Board has the
5 capability, normal human judgment to determine the validity
6 and weight to be given. That was what I understood you to
7 say.

8 JUDGE SMITH: You got part of it. Let's forget
9 it. Your objection is overruled, except as stated. We will
10 strike the line which reads: The pieces were subsequently
11 taped together by Karen Imhoff, the chart custodian with whom
12 I spoke, for easier reference.

13 Remaining is a new sentence: The chart was
14 later microfilmed.

15 You may cross examine.

16 CROSS EXAMINATION

17 BY MS. BERNABEI

18 Q Mr. Brill, there are two strip charts for reactor
19 building pressure, is that correct?

20 A That is correct.

21 Q And in your testimony you speak about both of them,
22 is that correct?

23 A That is correct.

24 Q And each has, if I am correct, both an A and a B
25 channel?

XXX INDEX

1 A That is correct.

2 Q And I think we were speaking earlier this morning,
3 there is an independent pressure sensor for each channel. That
4 is, the A and B channel on the first strip chart; and an A and
5 B channel on the second?

6 A There are two sensors for each strip chart
7 recorder.

8 Q And does that correspond with the channels on
9 each one?

10 A Yes.

11 Q Now, referring you to page 3 of your testimony,
12 you identify a dip in the narrow range trace of one strip
13 chart, is that correct?

14 A That is correct.

15 Q I would like to have marked as TMIA Exhibit 41
16 a copy of one of the reactor building strip charts -- pressure
17 strip charts.

18 XXX INDEX

(Above mentioned document is
19 marked TMIA Exhibit 41 for
20 identification.)

21 JUDGE SMITH: This is so scarcely legible that
22 I don't know what I would be asked to do with it.

23 MS. BERNABEI: We do have the original here. This
24 is one of our problems, that without access to the originals
25 it is very difficult on the copies. What I would like to do

1 is have Mr. Brill explain his testimony with regard to the
2 strip chart, so that way the Board could see what he is talking
3 about.

4 End 3.
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BY MS. BERNABEI: (Continuing)

2 Q Mr. Brill, it might assist you if you use the
3 original.

4 A Okay. The dip in question is indicated on
5 Strip Chart B, which was the chart that was cut, occurred
6 at between 12:45 and 1 a.m. on March 29th. It is barely
7 visible, even on the original chart.

8 And it was a dip that was apparently due to
9 a pressure fluctuation in Channel A.

10 Q Okay. The --

11 A The dip on Strip Chart B occurs at approxi-
12 mately the same time, and it is such a minute variation
13 that it is barely even distinguishable on the strip charts.

14 MS. BERNABEI: Okay. I've just learned that
15 the chart the Board was distributed, in fact, does not
16 have the dips that Mr. Brill is speaking about.

17 JUDGE LINENBERGER: It doesn't span the time
18 that Mr. Brill is speaking about.

19 MS. BERNABEI: That's correct. I thought
20 it did, since I do have a copy.

21 BY MS. BERNABEI: (Continuing)

22 Q Mr. Brill, you are speaking -- starting with
23 the first strip chart which you call Strip Chart A, on
24 Strip Chart A you are talking about a time between 12:45
25 and 1 a.m. on the narrow range; is that correct?

#4-2-SueT

1 A 12:45 and 1 a.m.

2 Q And that would be on the narrow range re-
3 corder?

4 A No. That's on Strip Chart B.

5 Q So, it's Strip Chart B you have labeled --

6 A Strip Chart B is right here, and it is the
7 strip chart that was cut and taped back together.8 Q Okay. Fine. You say -- Strip Chart B, as
9 you are talking about it, you are identifying a dip between
10 12:45 and 1 a.m.; is that correct?

11 A That is correct.

12 Q Okay. I would like to refer you to another
13 dip, which is the one that TMIA identified. Okay. It's
14 slightly before midnight, and that would be on Strip Chart
15 B. That would be on the wide range recorder on that chart.

16 A Slightly before midnight?

17 Q That's correct. And it would be on the wide
18 range at the bottom.19 (Ms. Doroshaw is pointing on the document
20 for the witness.)21 JUDGE SMITH: While he is looking, let me
22 interrupt here and state that with the deletion and
23 response to your objection, Mr. Brill's testimony is
24 received into evidence. And I would ask that you conform
25 the copy that is bound into the transcript to our ruling.

#4-3-SueT 1

(The prefiled testimony of Richard A.

2

Brill follows.)

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)	
)	
METROPOLITAN EDISON COMPANY)	
)	
(Three Mile Island Nuclear)	Docket No. 50-289 SP
Station, Unit No. 1))	(Restart-Management Remand)

TESTIMONY OF RICHARD A. BRILL

My name is Richard A. Brill. I am a Lead Instrument and Control Engineer for GPU Nuclear Corporation and am responsible for engineering support on Instrumentation and Control Systems, including chart recorders, at TMI-2. I work with and am very familiar with recorders of the kind which recorded the pressure spike in the TMI-2 containment building on March 28, 1979. My total experience with chart recorders spans 10 years and includes assignments as Lead Start-up Engineer for NUS Corporation and Senior Control and Instrumentation Engineer for Bechtel Corporation. I have worked for GPU Nuclear Corporation since November 1982.

In connection with this proceeding regarding the Dieckamp mailgram I was asked to examine the reactor building pressure chart recorders which recorded the pressure spike on March 28, 1979 and the actual charts showing the spike. I have done so. Based on those examinations, discussions with a custodian of the charts and my experience with chart recorders, I have made the following observations.

The recorders in question record pressure inside the Unit-2 containment building. There are two recorders in the control room designated channel A and channel B. Each recorder is designed to trace two lines on the paper

chart that passes through it. One line records the pressure on a scale of -5 to +10 lbs./sq.in. (narrow range) and the other records the pressure on a scale of 0 to 100 lbs./sq.in. (wide range).

The paper chart which passes through the recorder is about 4 1/2 inches wide. It rolls off a supply roll, across a toothed wheel which engages holes in the bottom of the chart, under the recording pens, across the face of the recorder and back to a take-up roll. The toothed wheel is the primary motivation for the paper although the take-up roll does exert some tension after the paper passes across the face of the recorder. Attached hereto is an instruction manual for the recorder, and the path the paper takes is shown in figure 5 on page 4 of the Installation section of the General Components for Taylor Recorders 830J, 930J Model D.

The paper moves at a rate of 1 inch per hour. The paper can be moved ahead manually and the pens can be moved off the paper. The take-up roll moves independently of the toothed wheel, although they are connected by a friction mechanism, such that the take-up roll can be turned without affecting the motion of the toothed wheel.

The general questions I have been asked to address are whether a portion of the paper chart which has passed under the pens could be cut out while the rest of the chart remained on the machine; whether so removing a portion of the chart would result in marks being made by the pens and if there are any such marks on the original chart from the channel B recorder. The channel B chart has been cut in two places corresponding to 2 a.m. and 10 p.m. on 3/28/79.

Answering the last question first, there are no pen marks on the original channel B chart which indicate it was cut before the entire chart was removed from the machine. There is a slight dip in the narrow range line (the line

toward the center of the chart) at about the place corresponding to the pre-printed chart time between 12:45 and 1:00 a.m. on March 29, 1979. It is my understanding that this dip was an area of concern expressed by Three Mile Island Alert. However, there is a corresponding dip in the narrow range trace on the channel A chart at the pre-printed chart time between 12:30 and 12:45 a.m. Although the chart times of the dips are different, they actually occurred at the same time. The existence of a corresponding dip on both traces indicates it was caused by an event sensed by both recorders rather than the movement of the paper in the channel B recorder. Further, there's no dip on the channel B (or, for that matter, the channel A) chart in the wide range trace (the line toward the bottom of the chart) corresponding to the dip in the narrow range trace. Such a corresponding dip would be expected if paper disturbance had caused the dip in the narrow range trace.

I have concluded, however, that a portion of the chart could be cut out after having passed under the pens without causing any mark to be made on the paper. After the paper passes under the pens, it passes under a clear plastic bar on which a scale is etched. This bar would keep the chart engaged with the toothed wheel even if it were cut between there and the take-up roll. Therefore, even if the chart were cut, it would continue to move unimpeded under the tracing pens. The closest place to the pens that the chart could be cut corresponds to a time between one hour and one hour and forty-five minutes after the place where the pens touch the paper.

Access to the paper is easy after it has passed under the plastic bar so it could be cut without touching anything else. If the chart were cut, the take-up roll could be removed and any portion of the chart on the take-up roll could be cut or copied as needed.

If the chart were cut, but the operator wanted the remaining chart to continue to pass through the recorder, it would be necessary to tape the chart back together in order that the chart would move onto the take-up roll. Otherwise, the unguided paper would accumulate and eventually, over a period of time, jam the machine if left unattended.

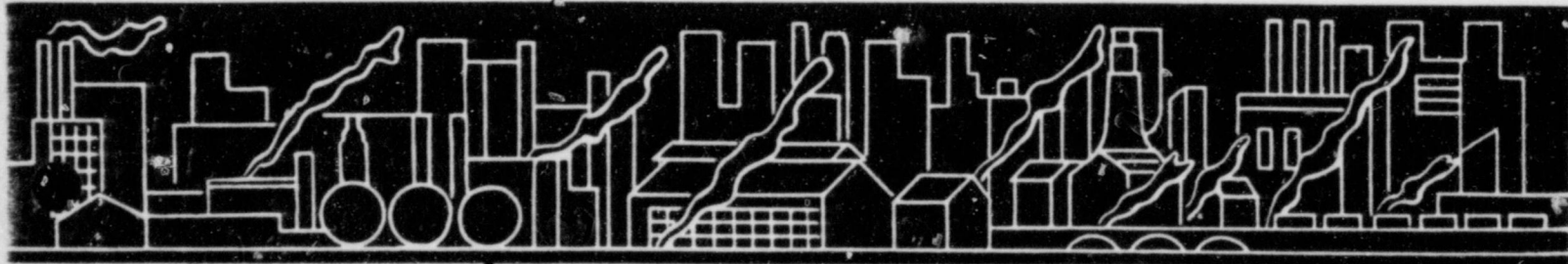
GPUNC records indicate that a portion of the channel B chart was micro-filmed on 5/2/79 and that at that time the chart was in three separate pieces. ~~The pieces were subsequently taped together by Karen Imhoff, the chart custodian with whom I spoke, for easier reference and~~ the chart was later microfilmed in one piece (having been taped together) on 12/27/83.

I have examined the chart to see if it shows any evidence of having been temporarily taped together at some time before Ms. Imhoff taped it together. Such evidence might be torn edges at the places where the chart is taped together or the presence of pieces of extra tape. There is no evidence that the three pieces were temporarily taped together as would be necessary to keep the chart flowing freely in the recorder if it had been cut before being removed.

Taylor

INSTRUCTIONS

installation
operation
maintenance



Taylor Instrument Companies

ROCHESTER, N. Y. 14601, U.S.A.

These instructions will aid in correct installation, satisfactory performance, and ease of maintenance of your Taylor instruments. They should be filed where readily available to the instrument men servicing the equipment. If additional information is required, be sure to include the Instrument Serial Number with your request.

protective service

A periodic inspection and service program will insure the most satisfactory instrument performance, efficient process operation and uniform high quality product. Under this plan a factory trained Service Technician will call at regularly stated intervals to check the condition and operation of your Taylor instruments. Let this Protective Service Plan help keep your Taylor instruments in first-class operating condition.

training school

Regularly scheduled training courses for instrument engineers and service men are given by Taylor. Classes are conducted by experienced instructors in demonstration and lecture rooms designed for this purpose. Sufficient equipment is provided to insure individual instruction. A list of course schedules is available upon request.

parts service

When making repairs to Taylor instruments, use only genuine Taylor parts to insure ease of replacement and the best operating performance. Parts Lists may be obtained from your nearest Taylor representative. Always give the complete serial number stamped on the instrument data plate when requesting information or Parts Lists or when ordering parts.

repair service

For instrument repair, replacement or conversion, Taylor maintains well equipped Factory Repair Service Shops throughout the world. Here factory trained men with access to all parts can completely recondition your Taylor instruments. A listing of these Factory Repair Service locations is given on the back cover.

contract and construction

The Taylor Contract and Construction Division offers a single-source responsibility for instrumentation specialty contracting. A coordinated service to supplement your own capabilities for feasibility studies, system design, preparation of specifications, procurement, installation, system calibration and checkout, system startup, and maintenance.

**TAYLOR
RECORDER**
Quick-Scan® Design
830J, 930J Model D

Instructions

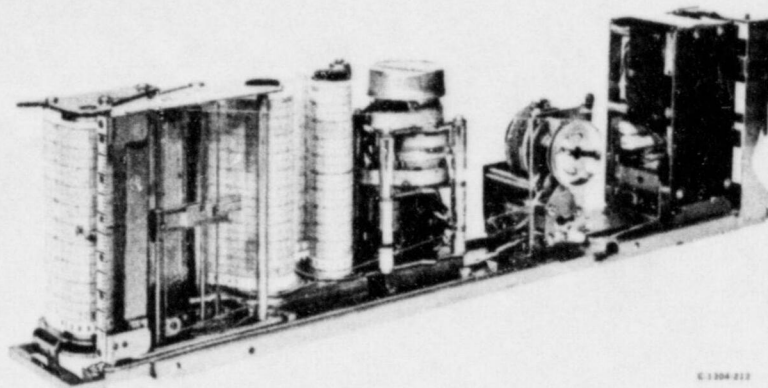


Fig. 1 - One-Pen Recorder, 830J, 930J Model D

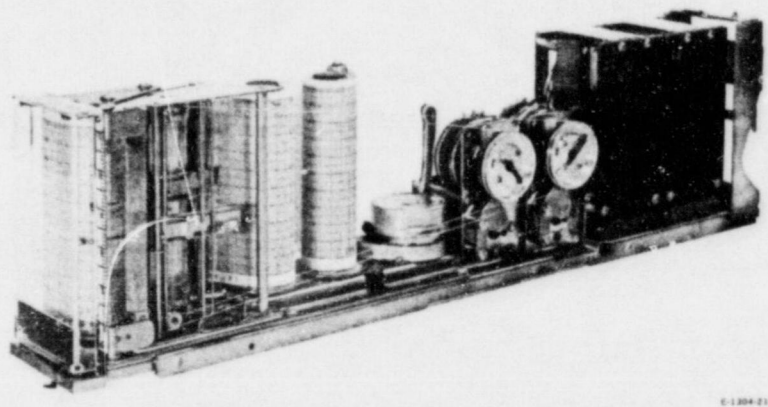


Fig. 2 - Two-Pen Recorder, 830J, 930J Model D

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INTRODUCTION		Installing Terminal Block and Cable	C
Description	2	Electrical Connections	C
Serial and Catalog Numbers	2	Power Connections	C
Specifications	3	Input Connections	C
INSTALLATION		Installing Instrument Slide	B
Mounting Instrument Housing	A	Chart Loading	B
Mounting on Inclined Surface	B	Installing Ink Capsule	B

A—Refer to *Housing* section

B—Refer to *General Components* section

C—Refer to *Electrical Connections* section

Introduction

OPERATION

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Description of Operation	B

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Periodic Servicing	D
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Rewind Spindle	D

WIRING DIAGRAMS

Connection and Schematic Diagrams	Back of Manual
--	----------------

C—Refer to *Electrical Connections* section
D—Refer to *Servicing and Trouble Shooting* section

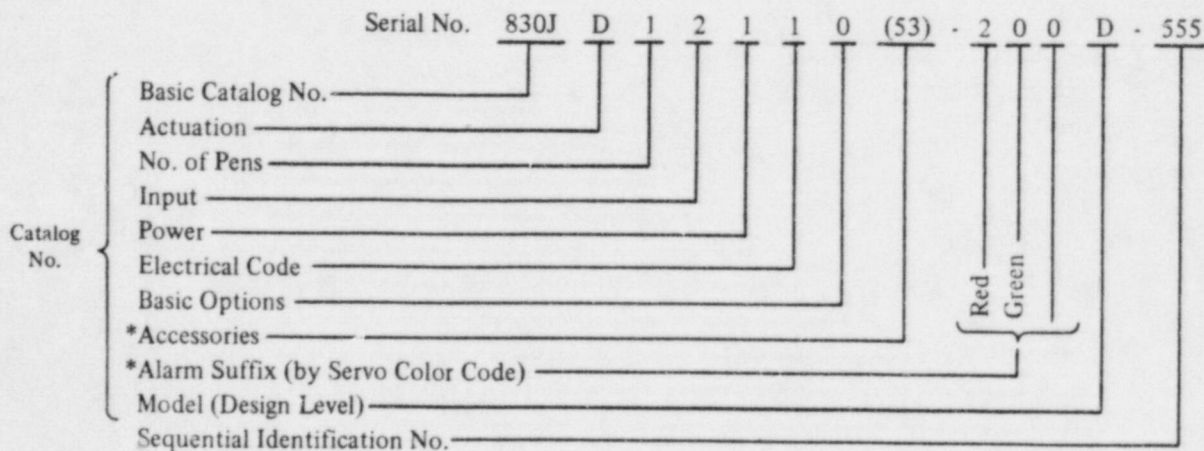
DESCRIPTION

The Taylor Transcope Electronic Recorders, 830J, 930J, Fig. 1 and 2, are electrically operated instruments for receiving and recording electrical signals on a 4" strip chart. Each recorder is a self-balancing system employing a solid state amplifier, balancing motor, recording pen and feedback element.

SERIAL and CATALOG NUMBERS

The serial number stamped on the data plate consists of the catalog number and a sequential identification number. The catalog number describes the construction of the recorder.

An 'X' before the serial number indicates that the instrument has been built to meet a customer's special requirements.



<i>Basic Catalog No.</i>	<i>Actuation</i>
830J – Recorder	D – D-C
Single unit housing for panel mounting	
930J – Same as 830J but without housing	

Introduction

No. of Pens

- 1 – One pen (red)
- 2 – Two pens (red, green)
- 9 – Special

Input

- 1 – 1 to 5 mA d-c
- 2 – 4 to 20 mA d-c
- 3 – 10 to 50 mA d-c
- 4 – 0.25 to 1.25V d-c
- 9 – Special

Power

- 1 – 117V, 60 Hz
- 2 – 117V, 50 Hz
- 3 – 234V, 50 Hz
- 5 – 110V, 50 Hz
- 6 – 220V, 50 Hz
- 9 – Special

Electrical Code

- 1 – General Purpose
- 2 – Class I, Group D, Div 2
- 9 – Special

Basic Options

- 0 – None
- 1 – Two-Speed Chart Drive with on-off switch
- 2 – On-Off switch

Example:

Serial No. 830JD12110(53)-200D-555 identifies a Recorder (830J) that is actuated by d-c (D) and has one red pen (1). The recorder accepts an input of 4 to 20 mA d-c (2), is powered by 117V, 60 Hz (1) and is designed to operate in areas designated as general purpose by the electrical code (1). It has no basic options (0) but has one accessory: a retransmitting potentiometer on the red servo (53). There is one alarm which is wired for NO (2). The sequential identification number is 555 and the des. gn level is Model D.

**Accessories*

- (53) – Retransmitting potentiometer on red servo
- (114) – Connections for extended cable system
- (149) – Same as (114) but with fuse

**Alarm Suffix*

- 0 – No alarms
- 1 – One electric, NC
- 2 – One electric, NO
- 3 – Two electric, (1) NC, (2) NC**
- 4 – Two electric, (1) NO, (2) NO**
- 5 – Two electric, (1) NC, (2) NO**
- 6 – Two electric, (1) NO, (2) NC**
- 8 – One, NC and NO
- 9 – Two, NC and NO

*Omitted if not required

**Servos with two alarms:

- (1) Alarm nearer to servo
- (2) Alarm farther from servo

SPECIFICATIONS

Input No.	Input Signal	Span	Input Impedance
1	1 to 5 mA	Adj 3.6 to 5 mA	250 ohms
2	4 to 20 mA	Adj 14.5 to 20 mA	62.5 ohms
3	10 to 50 mA	Adj 36 to 50 mA	25 ohms
4	0.25 to 1.25V	Adj 0.9 to 1.25V	100K at max unbalance*

*30 nA max input current at null

Operation

Zero Limits

Adjustable -1 to +0.25V

Calibration Accuracy

±0.25% typical

Power Supply

117V ±10%, 50 Hz

117V ±10%, 60 Hz

234V ±10%, 50 Hz

110V ±10%, 50 Hz

220V ±10%, 50 Hz

Power Consumption

50 Hz: 22 VA (12W) per servo at balance

60 Hz: 17 VA (15W) per servo at balance

Ambient Temperature Limits

40°F minimum, 120°F maximum

OPERATION

PRE-START-UP CHECK

Before putting the recorder into operation, make sure that it is properly installed and operating. Check the following:

1. See that electrical voltage and frequency agree with those on recorder data plate and that hot wire is connected to terminal 1, common wire to terminal 3, and ground wire to terminal 2.
2. Make certain that transmitter connections are correct.
3. See that an ink cartridge has been installed, the pen is inking properly and is tracking vertical lines on chart. If not, refer to General Components section.
4. Apply power to recorder and make following checks:
 - a. That chart drives smoothly.
 - b. That each pen assumes and holds a position on chart. If input condition is known, check to see that pen reading agrees with this condition.
 - c. If input conditions can be varied, check 0, 100% and several other points across range.
5. Advance chart by turning chart advance wheel until pen is at desired time line. Recorder is now ready to be put into operation.

Instructions

To the Customer:

This manual is for use with the instruments identified below by Instrument Catalog Number.

Customer Mercury Co. of Norwood, Inc.

Customer Order No. 52278-PC7604-1 Taylor Order No. 0814-024/72

Instrument Catalog No. X830JD13110D

Tagging:

- HD-TR-1633
- WDG-FR-1484-1
- WDL-FR-3117
- WDL-FR-1636
- WDL-FR-1637
- SR-FR-1638
- BS-PR-1412
- HD-PR-330

* Refer to both the *Manual No.* and the *Instrument Catalog No.* when corresponding about this manual.

Single-Unit Housing

3 x 6 and 6 x 6 Panel Mounted Type
for Electronic and Pneumatic Instruments

Installation

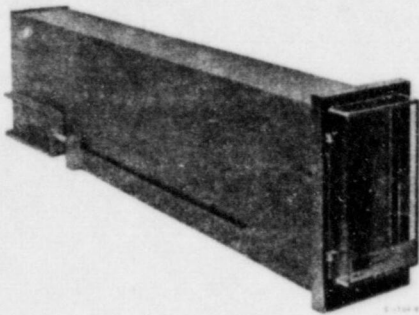


Figure 1
3 x 6 Single-Unit Housing
with Door

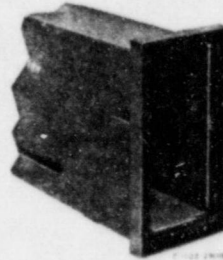


Figure 2
3 x 6 Single-Unit
Housing without
Door

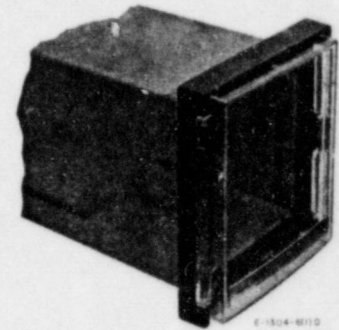


Figure 3
6 x 6 Single-Unit Housing
with Door

PART NUMBERS

The part number is stamped inside, on the bottom surface, near the front of the housing.

- 35S457K – 6 x 6 x 24 in. Single-Unit Housing with door
for Electronic Instruments
- 35S458K – 3 x 6 x 24 in. Single-Unit Housing with door
for Electronic Instruments
- 35S490 – 3 x 6 x 24 in. Single-Unit Housing without door
for Pneumatic Instruments
- 35S505 – 3 x 6 x 24 in. Single-Unit Housing with door
for Pneumatic Instruments
- 35S610K – 3 x 6 x 24 in. Single-Unit Housing without door
for Electronic Instruments
- 35S637 – 3 x 6 x 18 in. Single-Unit Housing without door
for Pneumatic Instruments

Installation

Single-Unit Housing

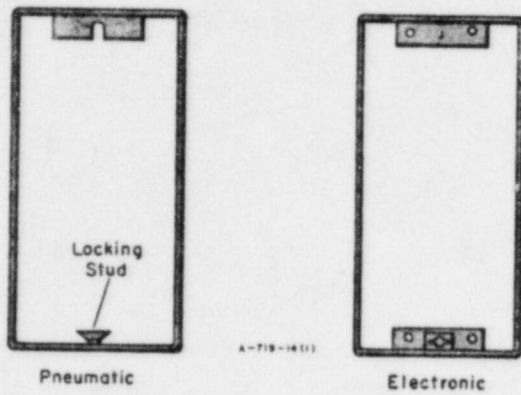


Figure 4—3 x 6 Single-Unit Housings, Back View

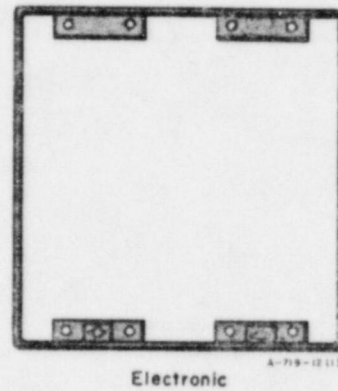


Figure 5—6 x 6 Single Unit Housing, Back View

MOUNTING

Mount the housing in a location that is free from vibration, dirt and corrosive atmosphere. The ambient temperature should be within the limits specified for the instrument.

For identification purposes, back views of the housings are shown in Figures 4 and 5. Housings can be mounted, and conduit can be connected before installing the instrument.

Mounting and panel cut-out dimensions are shown in Figures 7 and 8. Minimum center-to-center distance between cut-outs allows for use of plastic or rubber grommets in the knockouts. If cable connectors or rigid conduit is used, more space should be allowed for ease in wiring.

The housing can be mounted on an inclined surface. Maximum angles are shown in Figure 6. If the mounting angle exceeds $\pm 5^\circ$ from horizontal, the instrument will require moderate rezeroing after installation. Refer to the instrument instructions.

Note

If the housing is to be used for an instrument which has mercury switches, refer to the instrument instructions for allowable mounting angles.

Mount the housing as follows:

1. Remove mounting bracket and clamps, Figure 7.
2. Insert housing into cut-out from front of panel.

3. Reattach clamps to sides of housing.
4. Hold housing perpendicular to panel surface and put bracket in place under housing. Tighten screws to push bracket against back of panel and draw bezel tight against front surface; tighten locknuts.

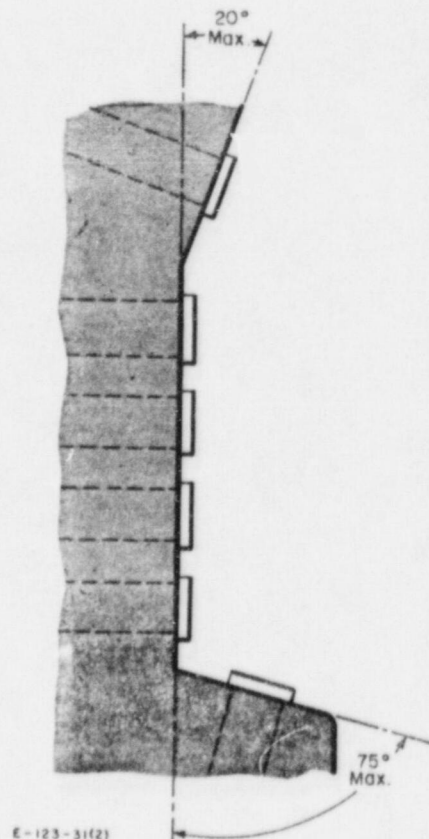


Figure 6—Housings Mounted on an Inclined Surface

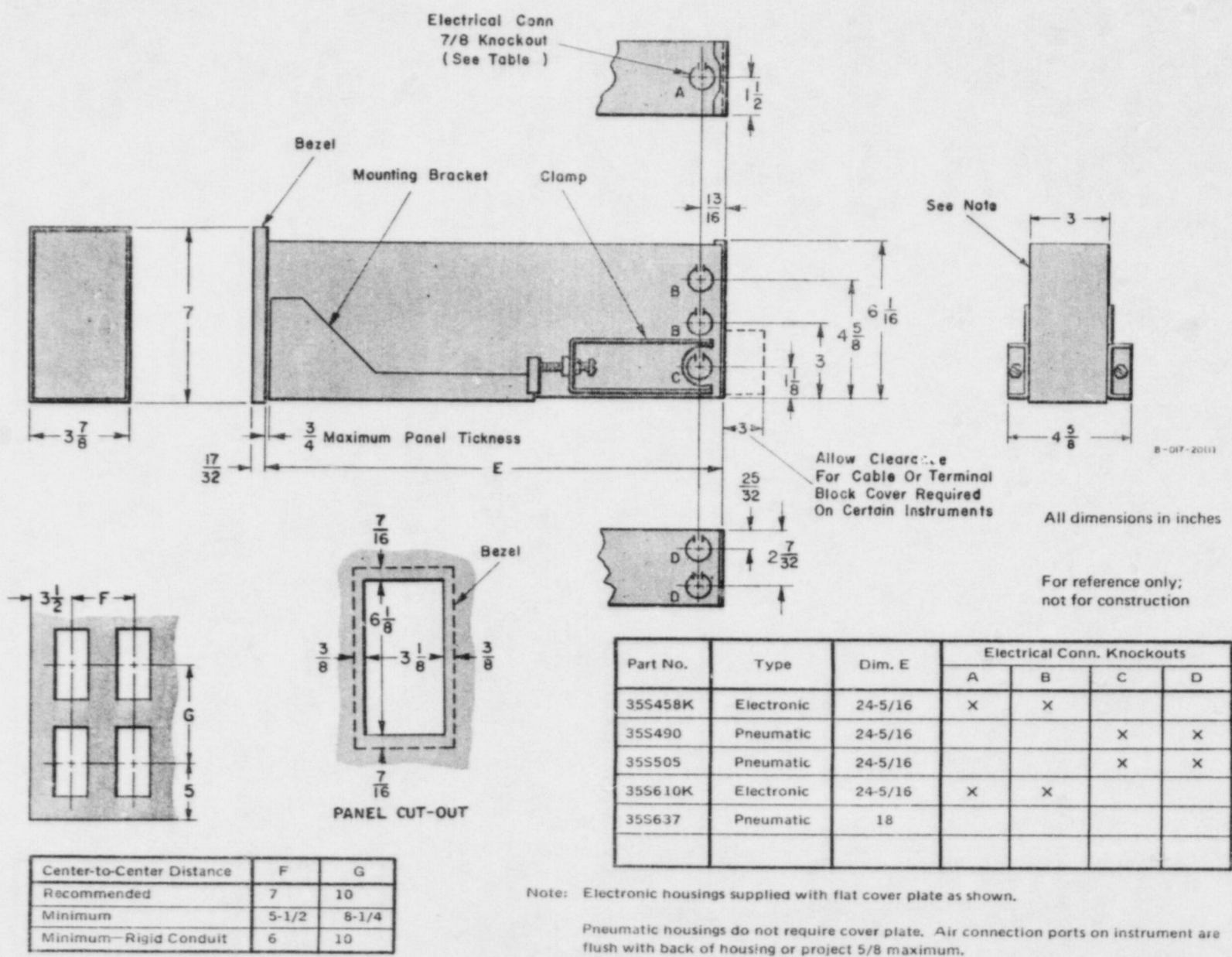
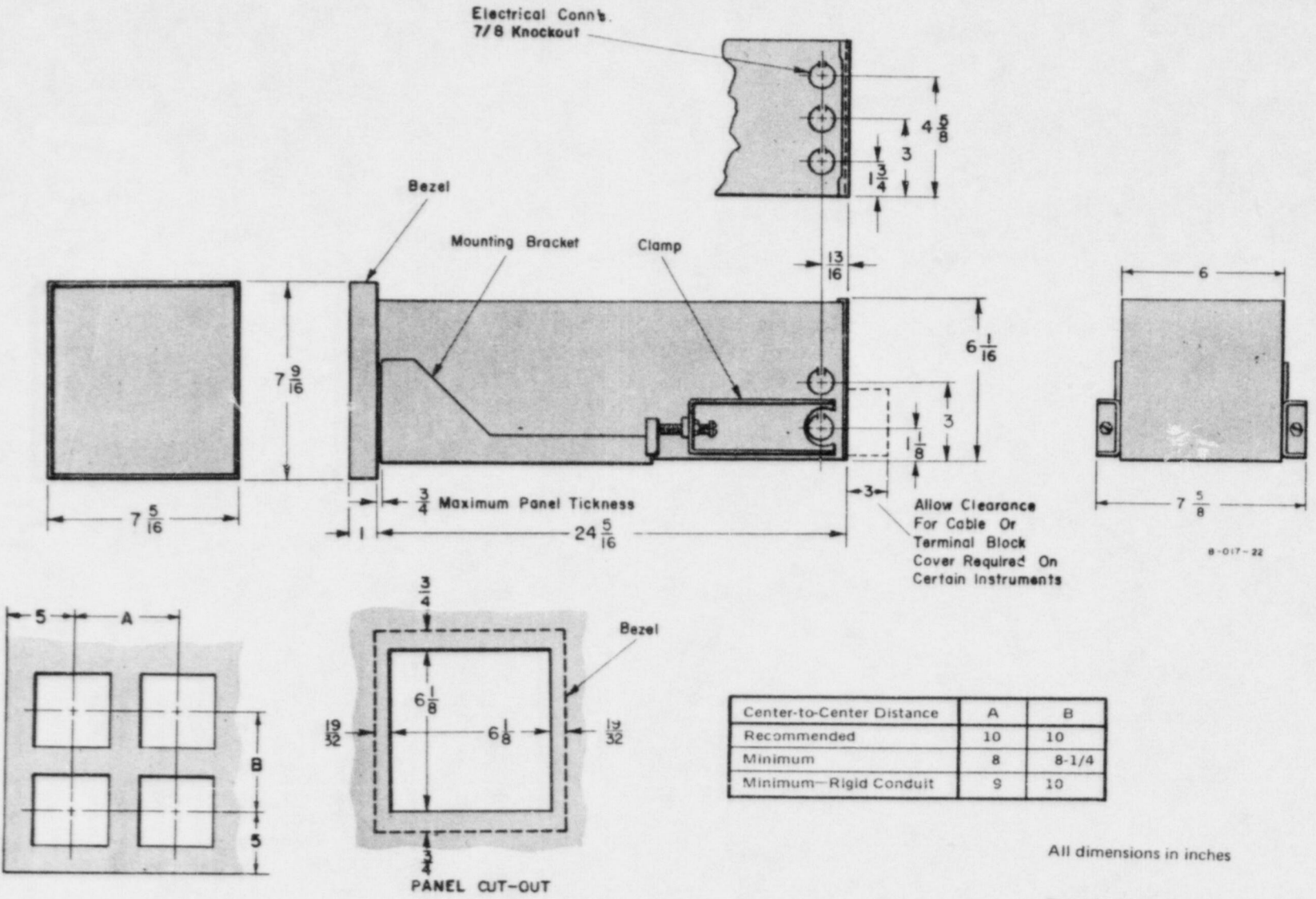


Figure 7—Mounting Dimensions for 3 x 6 Single-Unit Housings



All dimensions in inches

For reference only;
not for construction

Figure 8—Mounting Dimensions for 6 x 6 Single-Unit Housing

Electrical Connections

For Taylor Transcope® Recorders
830J, 930J Models A, B, C and D
870J, 970J

Installation

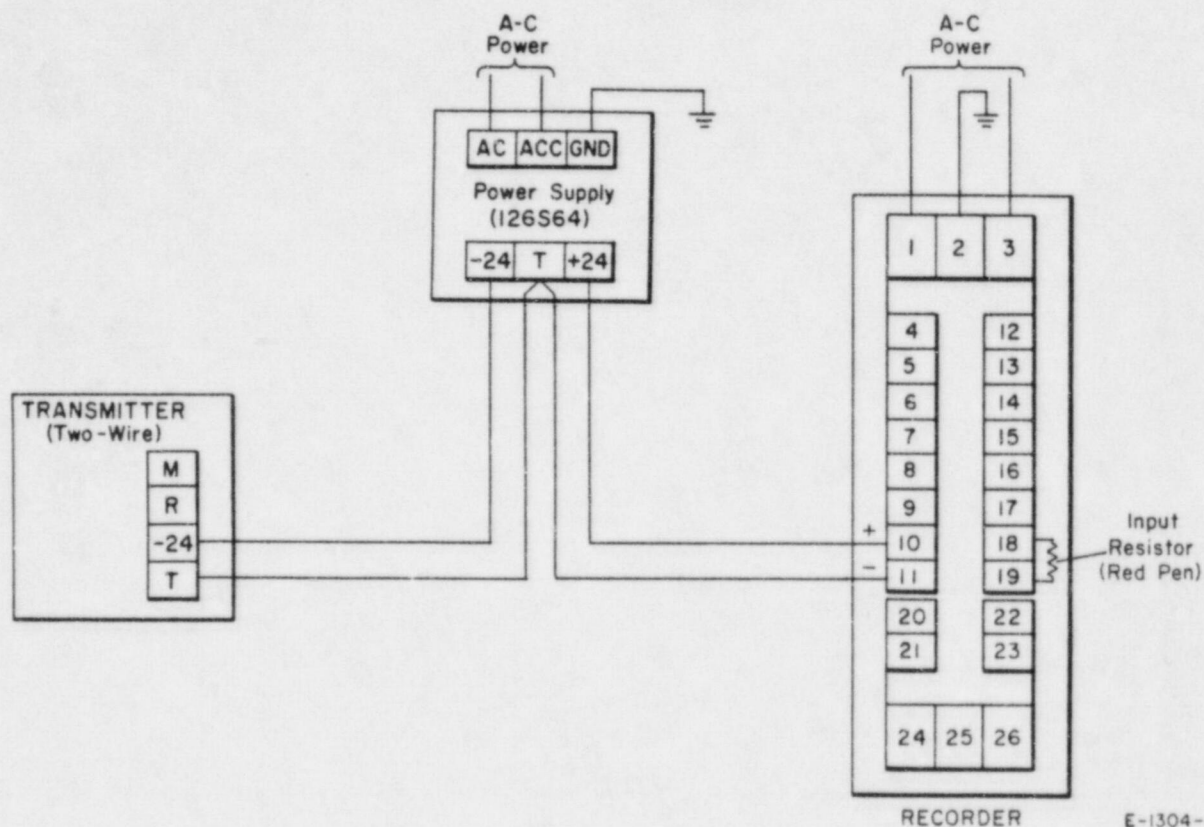


Fig. 1 - Taylor Two-Wire Transmitter and a Power Supply Connected to Recorder

Table of Contents

Installing Terminal Block and Cable	1
Electrical Connections	2
Power Connections	6
Transmitter Connections	6

INSTALLING TERMINAL BLOCK and CABLE

If the recorder is an 830J, 870J or a 930J, 970J instrument which is part of a 916Q or 956Q instrument, the terminal block and accordion cable has been installed in the housing at the factory. The following method is used when a 930J or 970J Recorder is installed in a housing by the customer.

1. Unpack recorder-slide.

Installation

Electrical Connections
830J, 930J Models A, B, C and D
870J, 970J

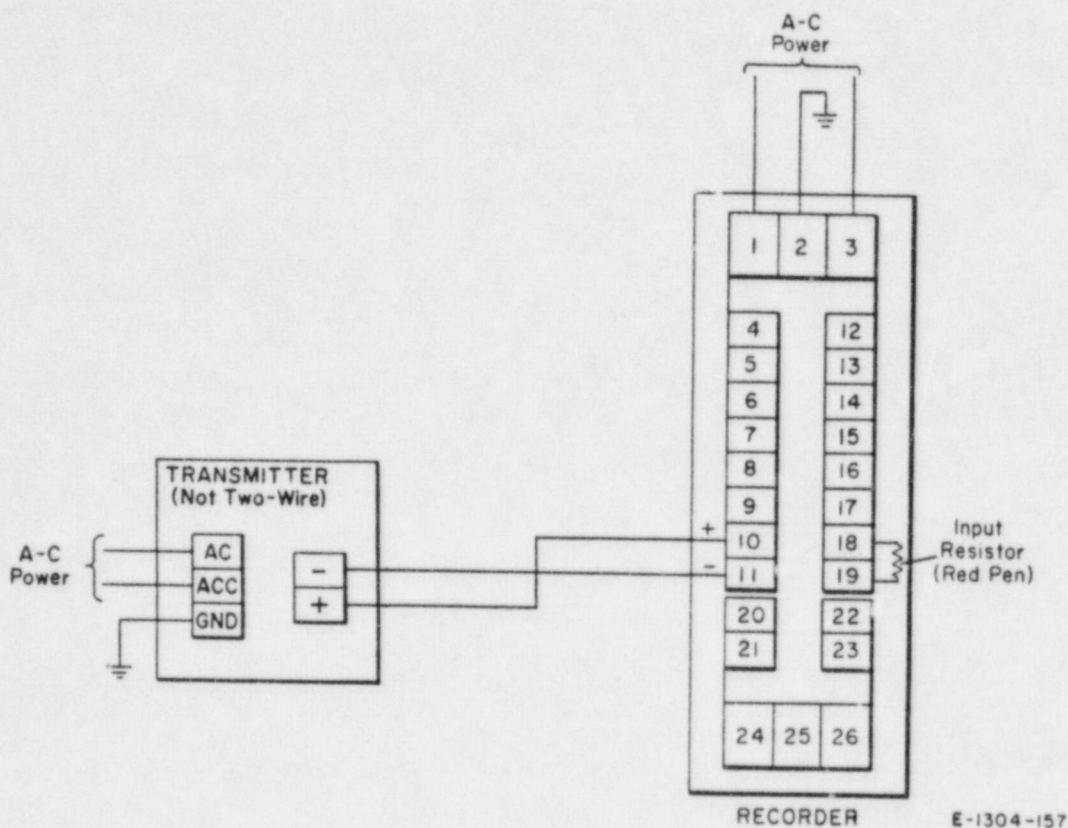


Fig. 2 - Non Two-Wire Transmitter Connected to Recorder

2. Push accordion cable into housing from rear.
3. Mount terminal block on rear face of top and bottom brackets with terminals 1, 2 and 3 at top. Retain terminal block with four #6-32 x 3/8" screws.
4. Install recorder-slide in housing as indicated under Installing Instrument Slide in General Components section.

ELECTRICAL CONNECTIONS

Before making any electrical connections check the voltage and frequency stamped on the data plate.

The electrical connections are made to the terminal section in the rear of the housing as indicated in the connection diagram.

Conduit may be connected to the knockouts in the rear of the housing.

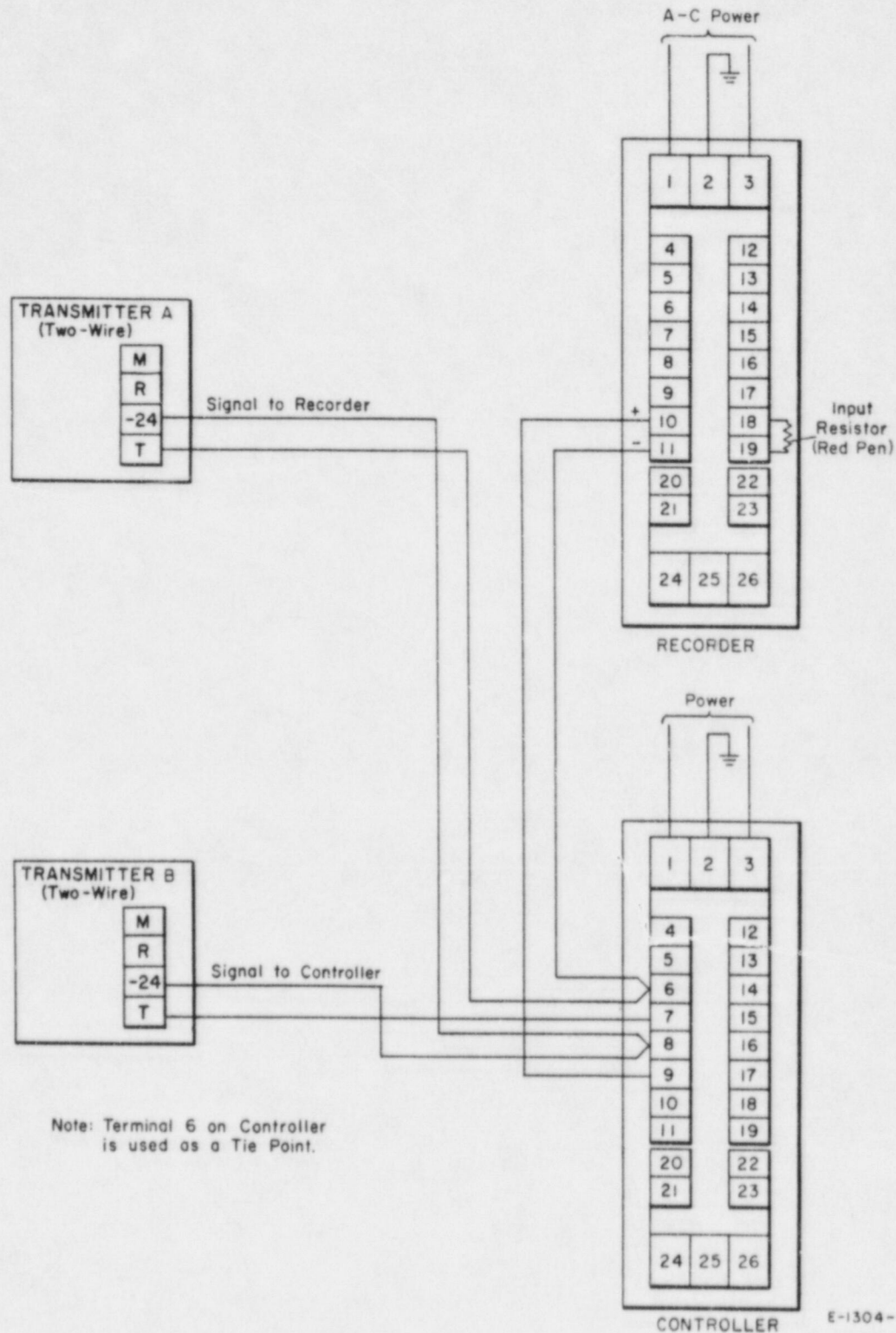


Fig. 3 - Taylor Two-Wire Transmitter Connected to Recorder Utilizing the 24v D-C Power Supply in an 840R or 860R Series Controller, When Transmitter Supplying Signal to Controller is also Two-Wire

Installation

Electrical Connections 830J, 93J Models A, B, C and D 870J, 970J

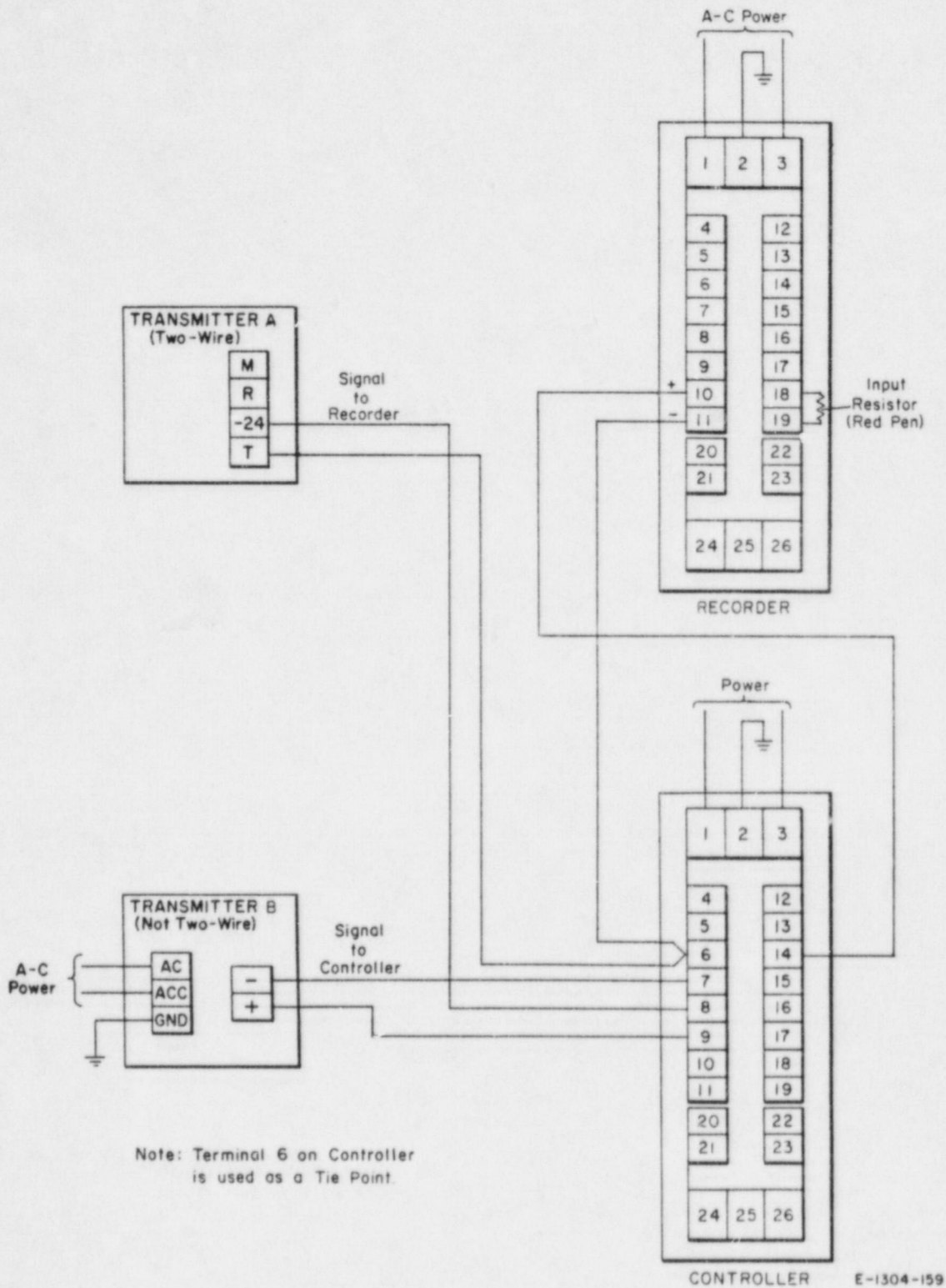
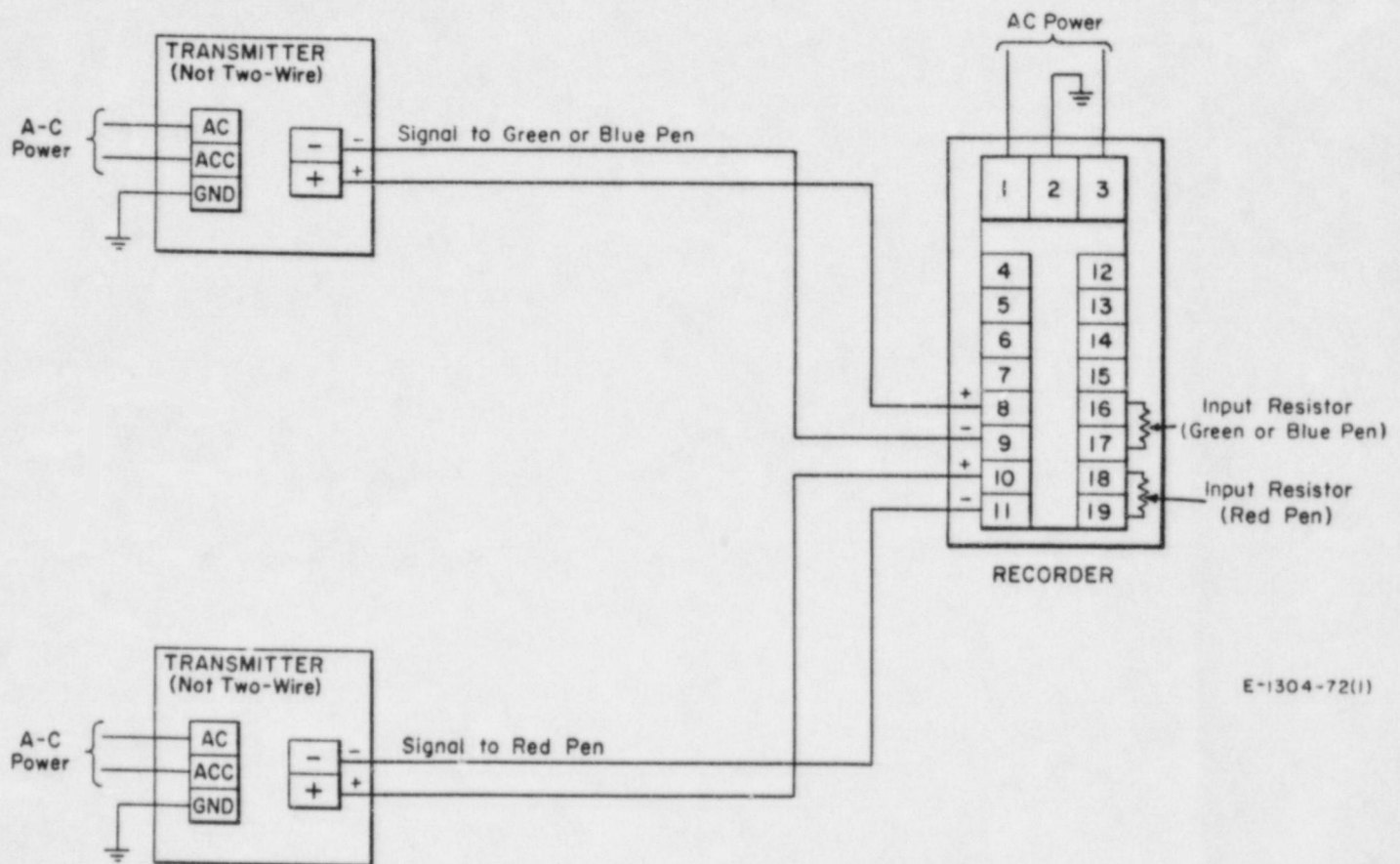


Fig. 4 - Taylor Two-Wire Transmitter Connected to Recorder Utilizing the 24v D-C Power Supply in an 840R or 860R Series Controller, When Transmitter Supplying Signal to Controller is Non Two-Wire



E-1304-72(1)

Fig. 5 - Two Non Two-Wire Transmitters Connected to 830JD2 or 870JD2 Recorder

When making the input connections keep the input cable as far away from the a-c power wires as possible. Run the input cable in a separate conduit from the power wiring.

The wire used to connect the instrument to the control system is not critical. Terminals 1, 2 and 3 will accept wire as large as #12 and the other terminals will accept wire as large as #14. The power and alarm wiring can be #18. Other wiring can be twisted pairs of #20 or #22. Normally it is not necessary to use shielded wire.

Installation

Electrical Connections
830J, 930J Models A, B, C and D
870J, 970J

Power Connections

The power connections to the recorder are made as shown in the connection diagram.

CAUTION: If recorder is an 830JD2, 930JD2 Models A, B or C or an 870JD2, 970JD2, do not turn on power to recorder unless cable from remote amplifier is connected to recorder. If power is applied first and then the cable is connected to the recorder, the transistors within the remote amplifier will be damaged.

Note: All housings are wired alike. Do not try to use a recorder-slide designed for use on 117v a-c in a housing which is connected to 234v a-c.

Transmitter Connections

These recorders do not have a built-in transmitter power supply. Thus, they cannot supply power to a Taylor two-wire transmitter such as a 740T__1___, 750T, 800T_4___, 811T_4___, 860T_4___ or any 1300T series. A two-wire transmitter has only two wires connected to it. Transmitters with two or three wires for power and two wires for the transmitted signal are not considered two-wire transmitters. A Taylor two-wire transmitter requires a separate external 24v d-c power supply, such as Taylor Part No. 124S64, to operate with the recorder. The transmitter and power supply are connected to the recorder as indicated in the connection diagrams and Fig. 1.

A Taylor transmitter powered by 117 or 234v a-c, such as a 718T, 740T__2___, 752T, 760T, 800T_1___, 811T_1___ or 860T_1___ has a built-in power supply. This is not a two-wire transmitter. This type transmitter is connected to the recorder as shown in the connection diagrams and Fig. 2.

A Taylor two-wire transmitter can be connected to the recorder and utilize the transmitter power supply located in an 840R or 860R series controller. This is shown in Figs. 3 and 4.

If transmitter B, which supplies a signal to the controller, is also a Taylor two-wire transmitter, transmitter A and the recorder are connected as shown in Fig. 3. The power supply in the controller is capable of supplying power to two transmitters. Here, both transmitters A and B are powered by the power supply in the controller. Both transmitters are turned ON or OFF by the transmitter power switch in the controller.

If transmitter B, which supplies a signal to the controller, is not a Taylor two-wire transmitter, transmitter A and the recorder are connected as shown

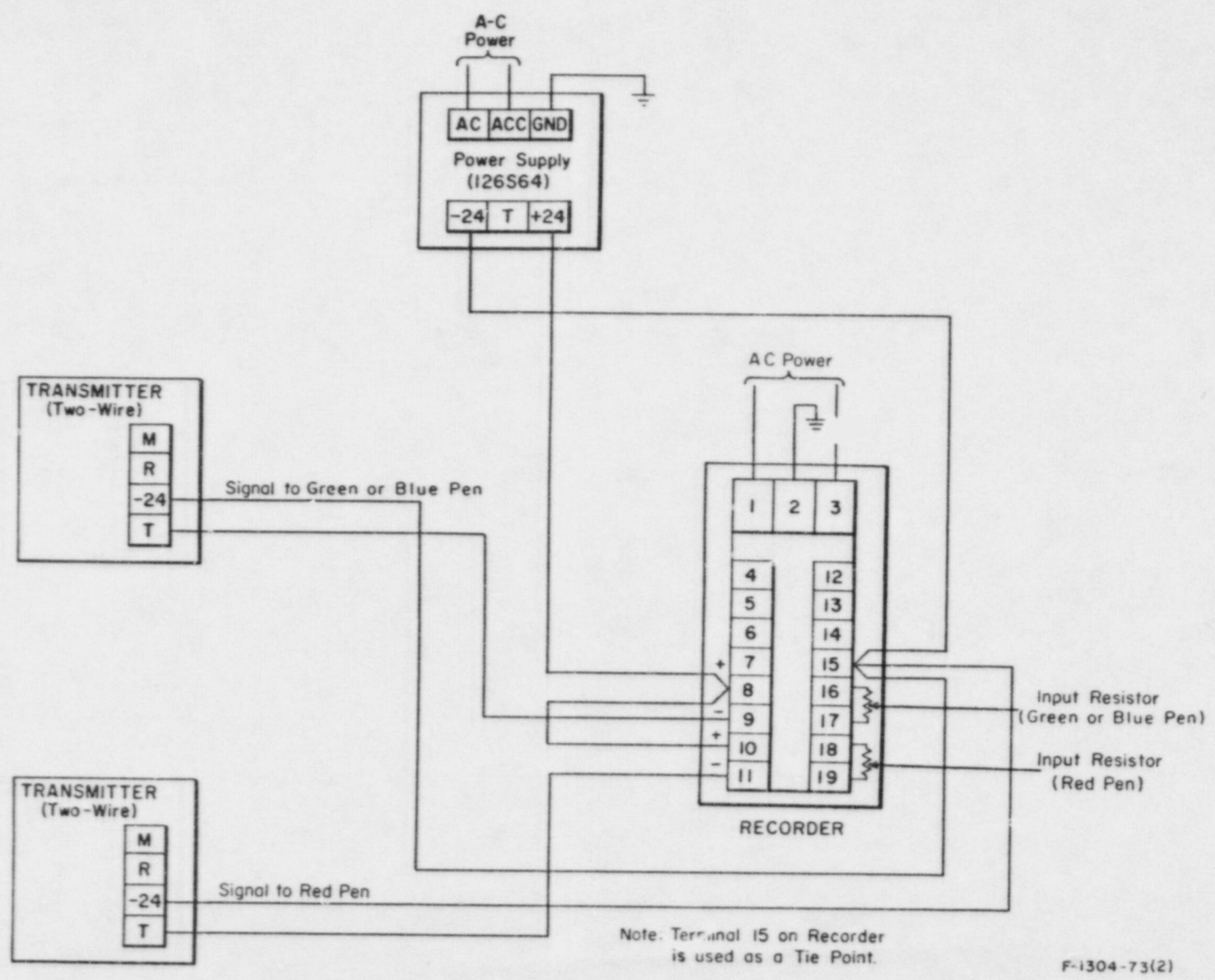


Fig. 6 - Two Taylor Two-Wire Transmitters and a Power Supply Connected to an 830JD2 or 870JD2 Recorder

Installation

Electrical Connections 830J, 930J Models A, B, C and D 870J, 970J

in Fig. 4. The transmitter power switch in the controller will control the power to transmitter A only.

If two "non two-wire" transmitters are connected to an 830JD2 or 870JD2 recorder, each transmitter is connected as shown in the connection diagrams and Fig. 5.

If two two-wire transmitters and a 24v d-c power supply are connected to an 830JD2, 870JD2, 930JD2 or 970JD2 recorder, the connections are made as shown in Fig. 6. In this circuit there is no transmitter power switch to control power to the transmitters.

Note: If the 830JD2, 870JD2, 930JD2 or 970JD2 recorder has alarms or a retransmitting potentiometer, Accessory No. 53, it may not be possible to use terminal 15 as a tie point. Refer to the Connection Diagram.

General Components

for Taylor Recorders
830J, 930J Model D

Instructions

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Installing Instrument Slide	1	Chart Read-Back	6
Chart Loading	2	Two-Speed Chart Drive	6
Installing Ink Capsule	4	Description of Operation	6

MOUNTING ON INCLINED SURFACE

If the recorder is designed to operate in areas designated as Class 1, Group D, Div. 2 by the electrical code (Electrical Code No. 2), mercury switches are required for switching. On 830J, 930J recorders with Basic Option No. 2, the one speed chart drive has one mercury on-off switch. On 830J, 930J recorders with Basic Option No. 1, the two speed chart drive has three mercury switches. One switch is an on-off switch and the other two control the fast and slow speed chart drive motors.

When the recorder is mounted in a panel that is other than vertical, adjust the switch plate so that the mercury switches will operate. Loosen clamp screw, Fig. 1, and rotate switch plate until mounting angle is opposite index mark; tighten clamp screw.

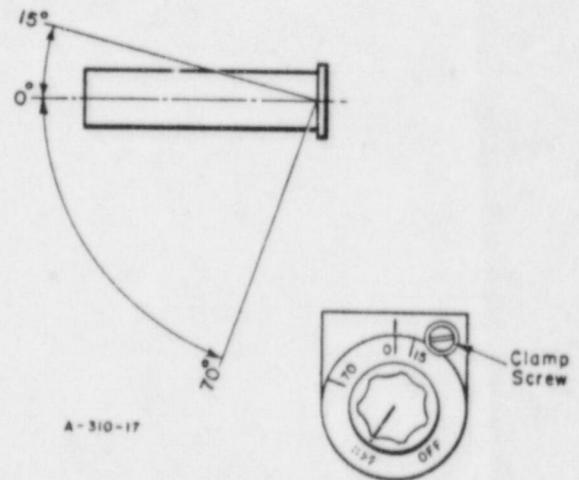


Fig. 1 - Mounting Angles and Switch Adjustment

INSTALLING INSTRUMENT SLIDE

1. Pull up on cable lock, Fig. 2.
2. Reach inside housing, pull accordion cable out and plug end of cable into connector at rear of instrument slide.
3. Push down on cable lock.
4. Insert instrument slide into housing, push down on slide stop, Figs. 3 and 4, and push rest of way into housing until front latch catches.

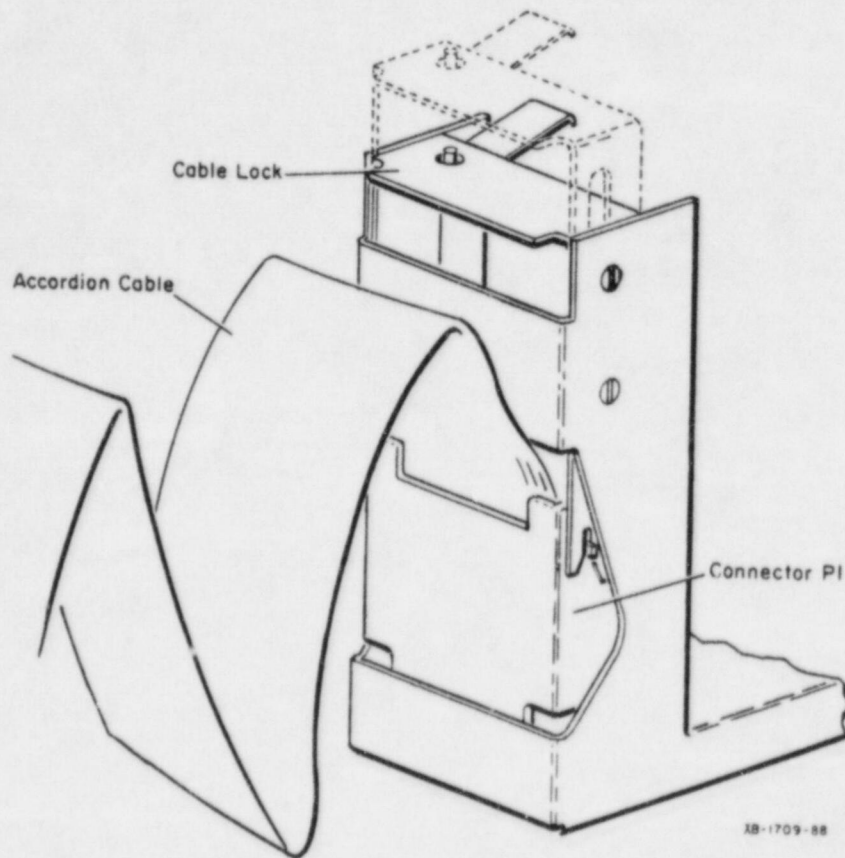


Fig. 2 - Connecting Accordion Cable to Recorder Slide

CHART LOADING

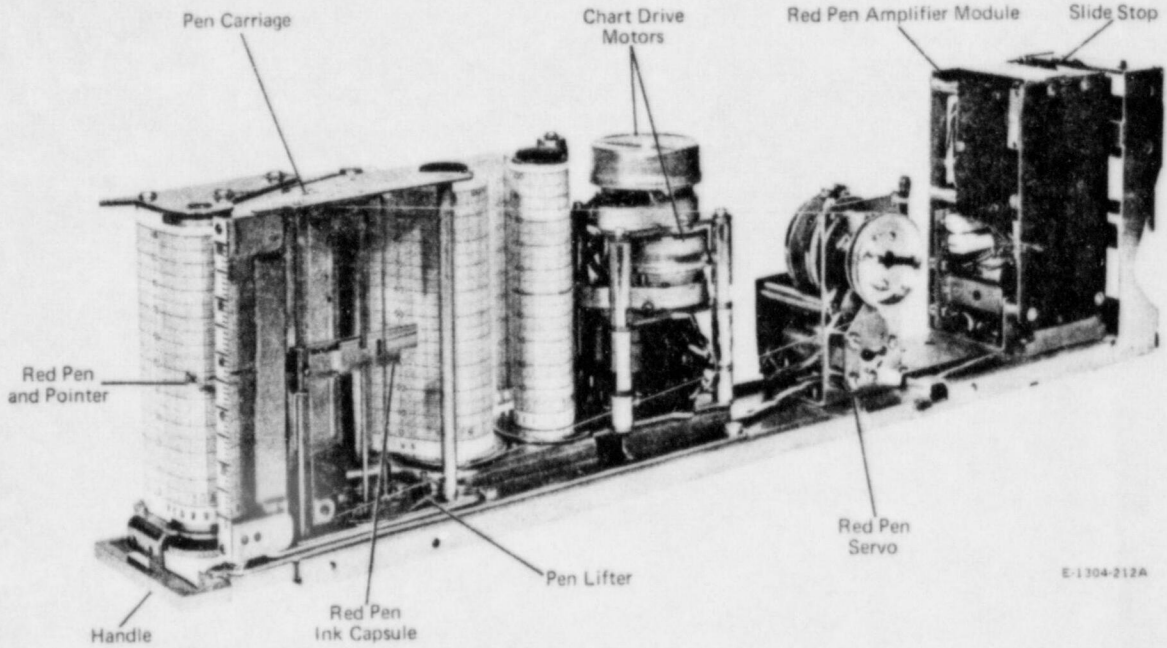
1. Lift handle, Figs. 3 and 4, and pull slide forward until chart unit is accessible.
2. Pull out pen lifter to lift pens off chart.
3. Remove full chart roll from rewind spindle and transfer empty chart core from supply spindle to rewind spindle, Fig. 5.

Note: When loading chart drive, make certain that notch in chart core engages pin on spindle, Fig. 6. Chart core must rest on base of spindle.

4. Place new chart roll, with perforations at bottom and pin engaged, on supply spindle, unroll chart about 20".

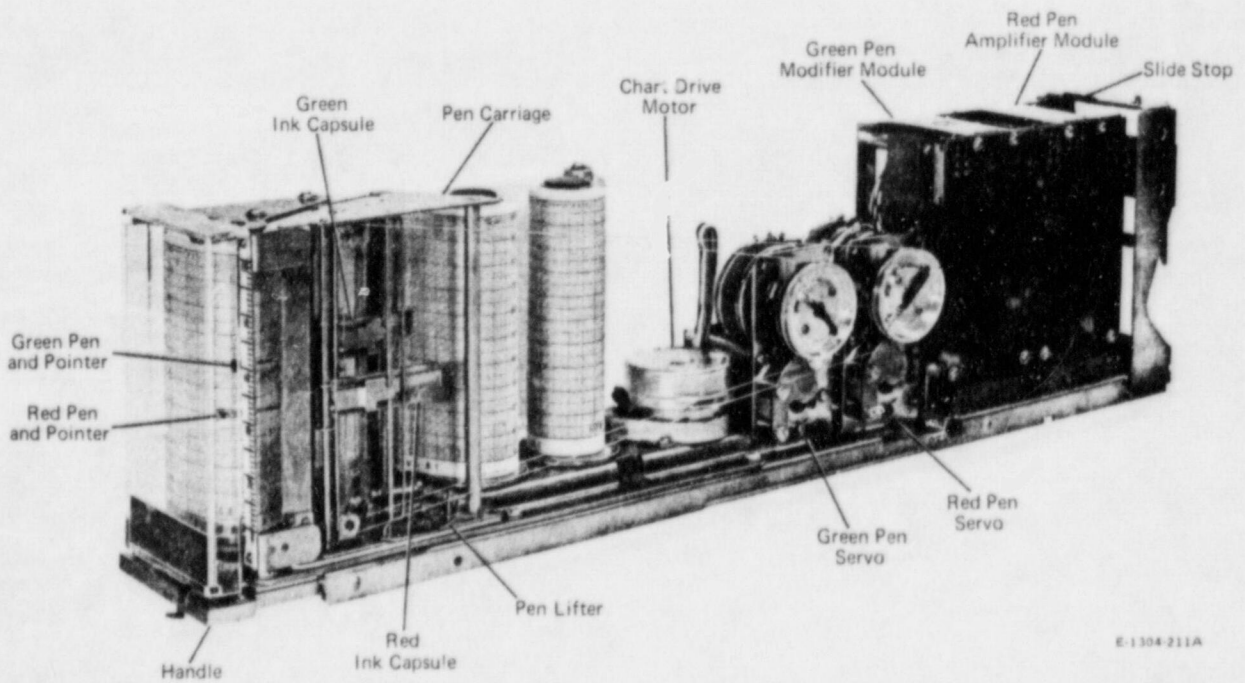
General Components
830J, 930J Model D

Installation



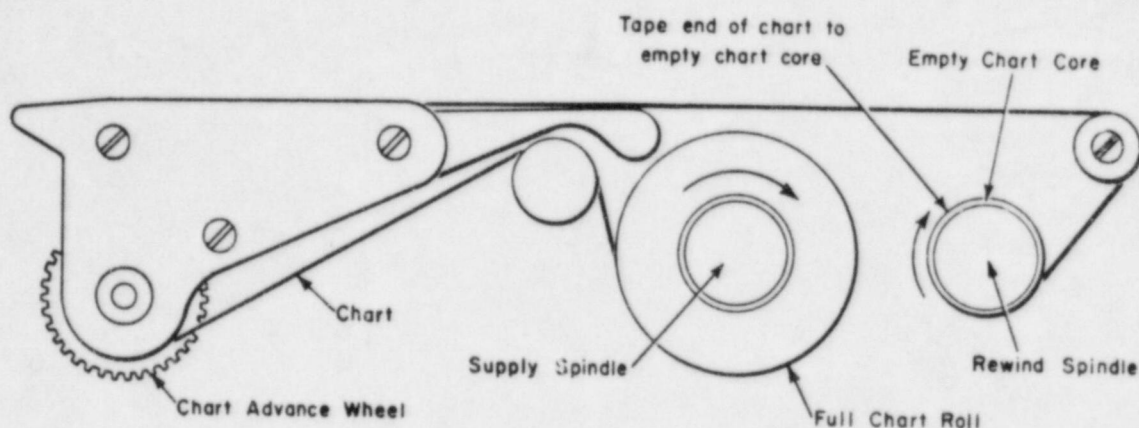
E-1304-212A

Fig. 3 - One-Pen Recorder Slide



E-1304-211A

Fig. 4 - Two-Pen Recorder Slide



B-310-15

Fig. 5 - Diagram for Chart Loading

5. Fit chart perforations over drive pins and tape chart to empty core on rewind spindle, Fig. 5.
6. Turn rewind spindle to wrap chart around empty core.
7. Push slide into housing and turn chart advance wheel until pen is at correct time line.

INSTALLING INK CAPSULE

A box of three ink capsules is supplied for each pen color. These will provide a fifteen months supply of ink at normal chart speeds.

Install ink capsule as shown in Fig. 7.

1. Pull bottom of indicating scale forward, swing up and pull pen clip from pointer arm.
2. Place capsule on flat surface and support by ends (not sides). Open vent hole by pushing in with end of pen arm, Fig. 7a.

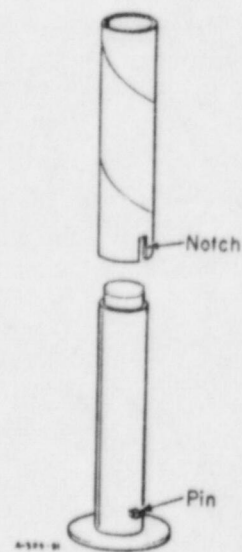


Fig. 6 - Core and Spindle

General Components

830J, 930J Model D

Operation

Fig. 7 - Installing Ink Capsule

Note: If recorder is mounted so rear of recorder is inclined downward, do not push out vent hole. Instead, push out ball at end opposite vent hole.

3. Cover vent hole with thumb; with bubble under vent hole, pierce pen hole with pen point, Fig. 7b.
4. Fully insert pen arm into capsule, Fig. 7c.
5. Cover vent hole with thumb; with bubble under vent hole, charge pen by squeezing sides of capsule, Fig. 7d.

Note: a. Uncover vent before releasing sides of capsule to prevent ink from drawing back out of pen.

b. To refill capsule, push in ball and refill thru hole (pen can remain in capsule).

6. Slide pen clip over pointer arm and push unit into place; return scale to vertical position. Make sure pen does not rub on scale bracket.

OPERATIONINPUT FILTER

The recorder amplifier has a built-in filter for reducing interference and smoothing signals from noisy processes.

The filter resistor has a fixed value of 27k for 200 milliseconds filtering. To change the value of the input filter, resistor R1 on the amplifier module is replaced by another resistor of the required value. For 20 milliseconds filtering, change R1 to a 2.7k resistor. For large increases in filtering, add capacitance (use a non-polarized electrolytic capacitor) in parallel with filter capacitor C12.

Operation

General Components 830J, 930J Model D

CHART READ-BACK

1. Lift handle and pull slide forward until chart unit is accessible.
2. Insert pencil behind chart; pull paper to left.
3. Rewind chart by turning top of rewind spindle clockwise.

TWO-SPEED CHART DRIVE (Basic Option No. 1)

A two-speed chart drive, Fig. 8, is an option on the 830J and 930J recorders.

The chart drive switch mounted under the chart drive motors has three positions "OFF", "SLOW" and "FAST". The OFF position turns off the recorder. The SLOW position turns on the slow speed motor. The fast speed motor runs when the switch lever is in the FAST position. The standard chart speeds are 1" per hour on SLOW and 1" per minute on FAST.

DESCRIPTION OF OPERATION

A block diagram of the recorder is shown in Fig. 9 and a simplified schematic diagram in Fig. 10.

The recorder is actuated by a 0.25 to 1.25V d-c signal. Any other signal

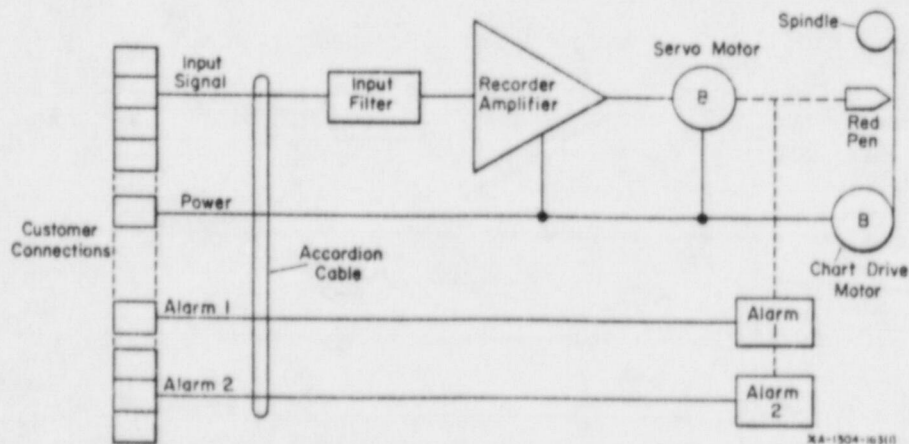
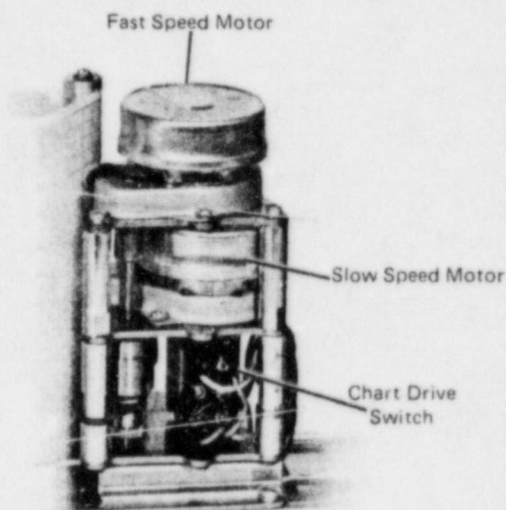


Fig. 9 - Block Diagram of Recorder



E-1304-213B

Fig. 8 - Two-Speed Chart Drive

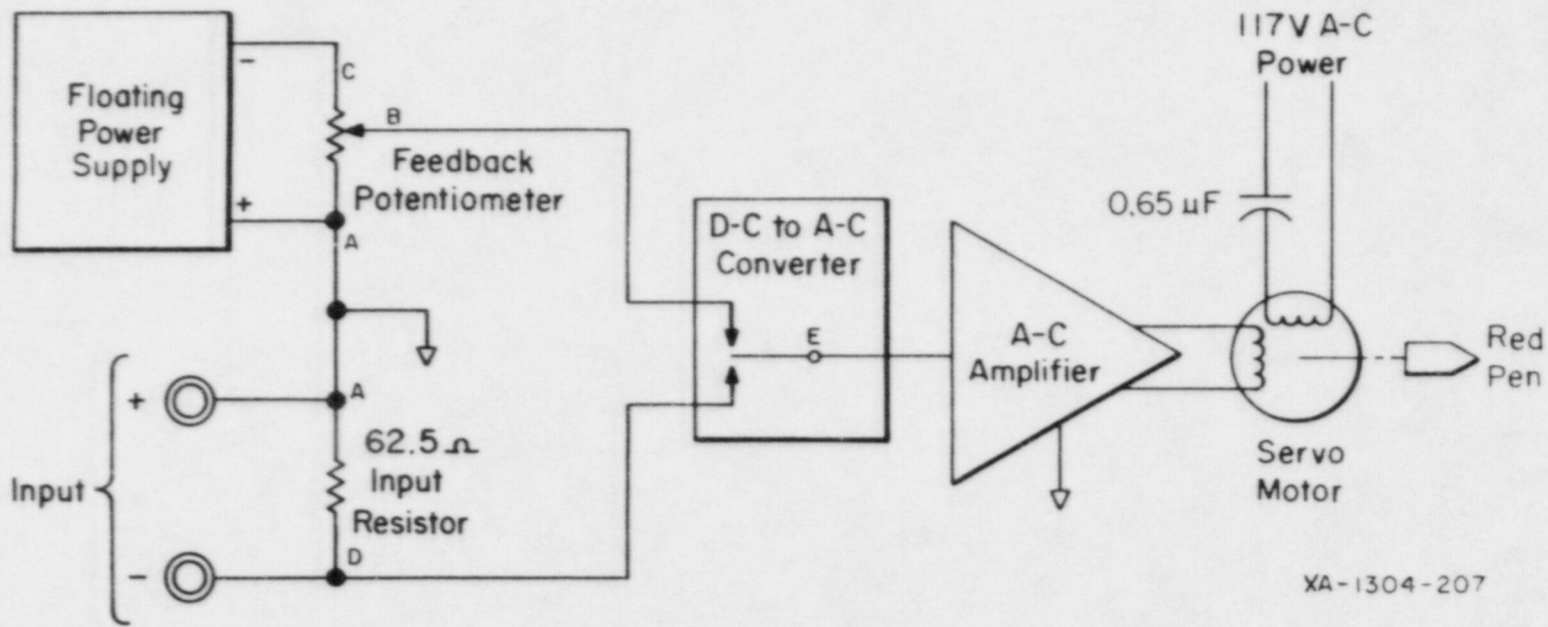


Fig. 10 - Simplified Schematic of Recorder

Operation

General Components

830J, 930J Model D

passes through a precision (0.1%) resistor to provide the necessary 0.25 to 1.25V d-c.

The input signal appears as a one volt signal between A and D in Fig. 10. A floating power supply provides a voltage of one volt between A and C. Point B is a sliding contact to pick off a fraction of the voltage between A and C. The voltage between A and D is compared to the voltage between A and B by the d-c to a-c converter. If the voltage between A and B does not equal the voltage between A and D, point E will be either positive or negative with respect to point A by the amount of the difference. This difference voltage or error signal is amplified by the a-c amplifier and applied to the control winding of the two-phase servo motor. The reference winding of the servo motor is excited by a 60 Hz sine wave that is shifted in phase 90° from that of the control winding by the $0.65 \mu\text{F}$ capacitor. The amplified error signal applied to the control winding causes the servo motor to drive the sliding contact B so as to reduce the error signal to zero and position the pen at the correct point on the recorder chart. The amplifier is actuated by a positive signal if the pen position is too high and negative if too low. The direction that the servo motor must turn to obtain balance is determined by the polarity of the signal at point E.

The feedback potentiometer is geared to the servo motor through approximately a 20:1 gear reduction. The pulley for driving the pen is mounted on the shaft of the feedback potentiometer. The shaft extends through the feedback potentiometer and carries the cams for actuating the alarm switches.

Servicing and Trouble Shooting

for Taylor Recorders
830J, 930J Model D

Maintenance

Table of Contents

Removing Instrument Slide	1	Aligning Pen Carriage	5
Calibration	1	Replacing Amplifier Module	5
Periodic Servicing	3	Replacing Servo Drive Cable	6
Adjusting Chart Drive Clutch	4	Checking Amplifier Module	7
Supply Spindle	4	Trouble Shooting	9
Rewind Spindle	4		

REMOVING INSTRUMENT SLIDE

1. Lift up on slide handle, Fig. 1 and pull instrument slide out to slide stop.
2. Push down on slide stop and remove instrument slide from housing.
3. Pull up on cable lock, Fig. 2.
4. Unplug accordion cable from connector at rear end of instrument slide.

CALIBRATION

The recorder was calibrated at the factory and should not require further adjustment. If recalibration is necessary, use the following procedure:

Note: The amplifier is actuated by a 0.25 to 1.25V d-c signal. Any other signal passes through appropriate precision (0.1%) resistors in the terminal section to provide the necessary 0.25 to 1.25V d-c.

1. Pull instrument out of housing to slide stop.
2. Rotate servo pulley, Fig. 3. The pen should travel approximately 1% below 0% and above 100% on chart.

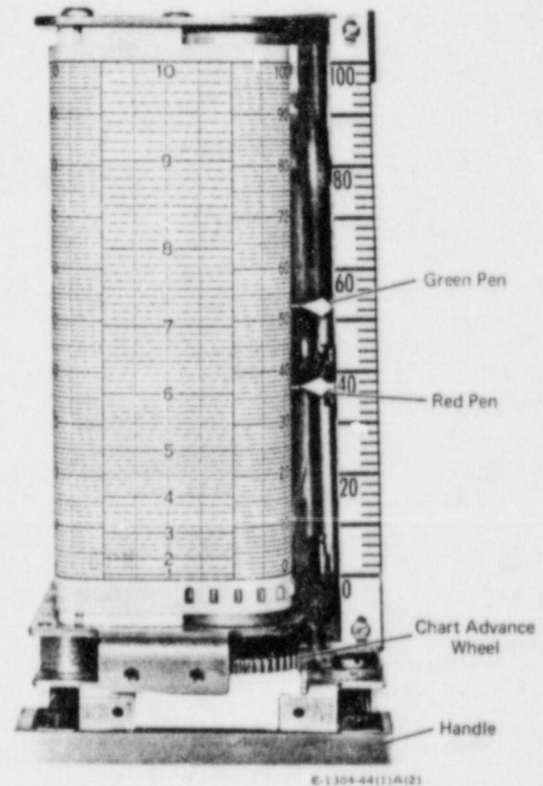


Fig. 1 - Front of Recorder Slide

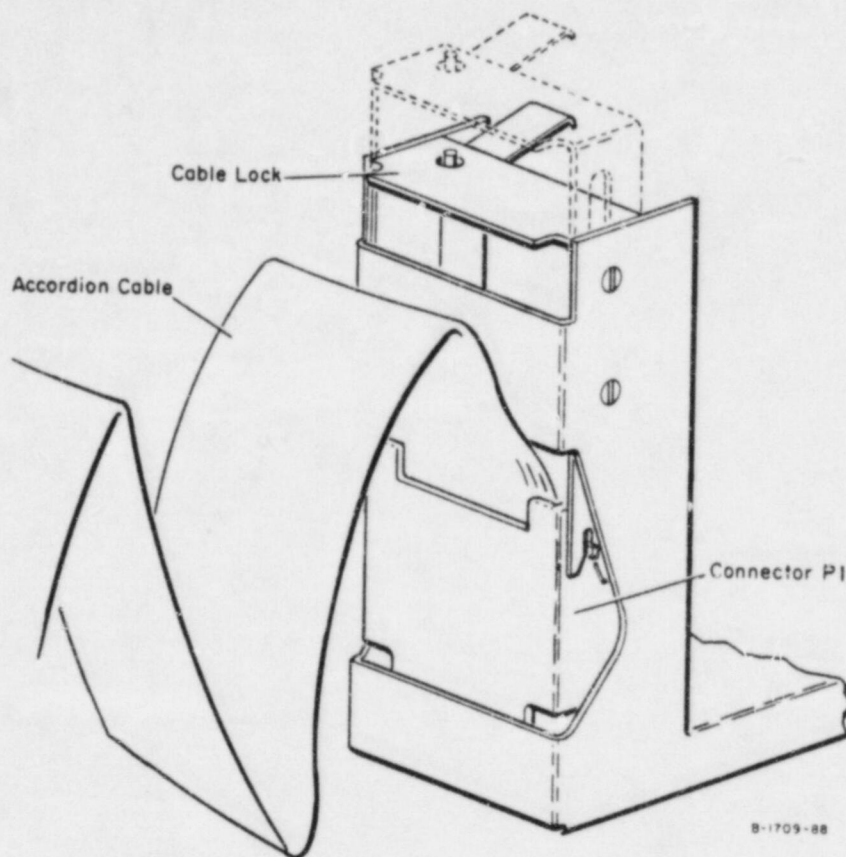


Fig. 2 - Connecting Accordion Cable to Recorder Slide

If it does not, rotate servo pulley counterclockwise to its stop. Loosen two pulley retaining screws. Hold pulley shaft against stop with large gear behind pulley and rotate servo pulley until pen reads approximately 1% below 0% point on scale. Tighten two pulley retaining screws.

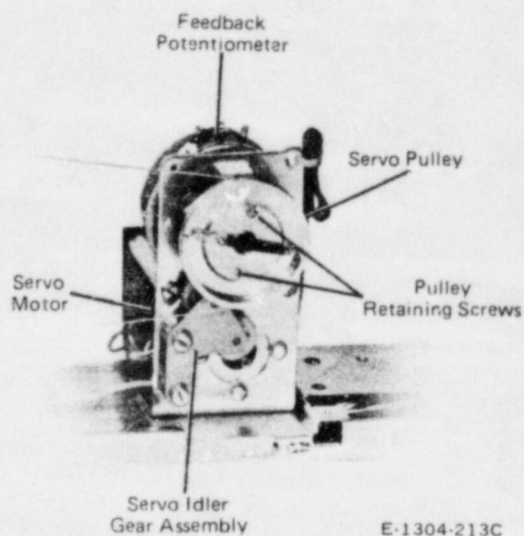


Fig. 3 - Servo Motor Assembly

Servicing and Trouble Shooting**830J, 930J Model D****Maintenance**

Note: If excessive resistance is felt in rotating servo pulley to move pen too much friction exists in system. This may be corrected by cleaning slide rod if it appears dirty or adjusting idler gears on servo assembly to eliminate binding. The idler gear adjustment must be precise to avoid excessive backlash of servo gear train.

3. Connect power to instrument terminal section. Refer to the connection diagram.
4. Connect the appropriate input signal (refer to instrument catalog no.) to input terminals in terminal section. Refer to the connection diagram.
5. Adjust input signal to 0% of range. The recorder pen should be at 0 on chart.

If it is not, turn zero adjustment, Fig. 4 until pen is at 0 on chart. Clockwise adjustment raises zero.

6. Adjust input signal to 100% of range. The recorder pen should be at 100 on chart.

If it is not, turn span adjustment until pen is at 100 on chart. Counterclockwise adjustment increases span.

7. Repeat Steps 5 and 6 for required accuracy.

PERIODIC SERVICING

The instrument requires little maintenance. Under normal operating conditions, it is recommended that the following items be checked once a year. If plant conditions dictate, checks should be made more often.

1. Clean pen slide rods on pen carriage with solvent such as trichloroethylene. Do not lubricate pen holder or guide rods.
2. Replace any servo drive cable which may have become frayed or worn.

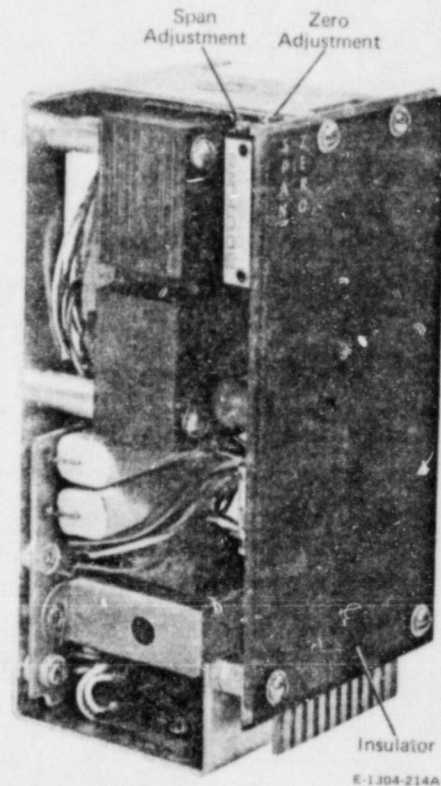


Fig. 4 - Amplifier Module

ADJUSTING CHART DRIVE CLUTCH

Adjustment of the clutches in the chart drive supply and rewind spindles is made at the factory. If further adjustment is necessary, use the following procedure:

Supply Spindle

1. Place empty chart core on supply spindle and remove black snap-in plug from top of spindle.
2. Suspend 60 grams from supply spindle, Fig. 5, in a direction which tends to turn spindle clockwise.
3. Use a 5/16" spin wrench and rotate adjusting nut counterclockwise until spindle rotates slowly; then, rotate nut clockwise until spindle just stops rotating.
4. Replace snap-in plug.

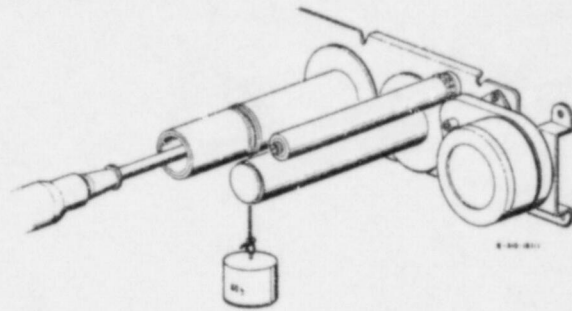


Fig. 5 - Supply Spindle Adjustment

Rewind Spindle

Follow same procedure as for supply spindle adjustment except in Step 2. Suspend 60 grams from rewind spindle in a direction which tends to turn spindle counterclockwise.

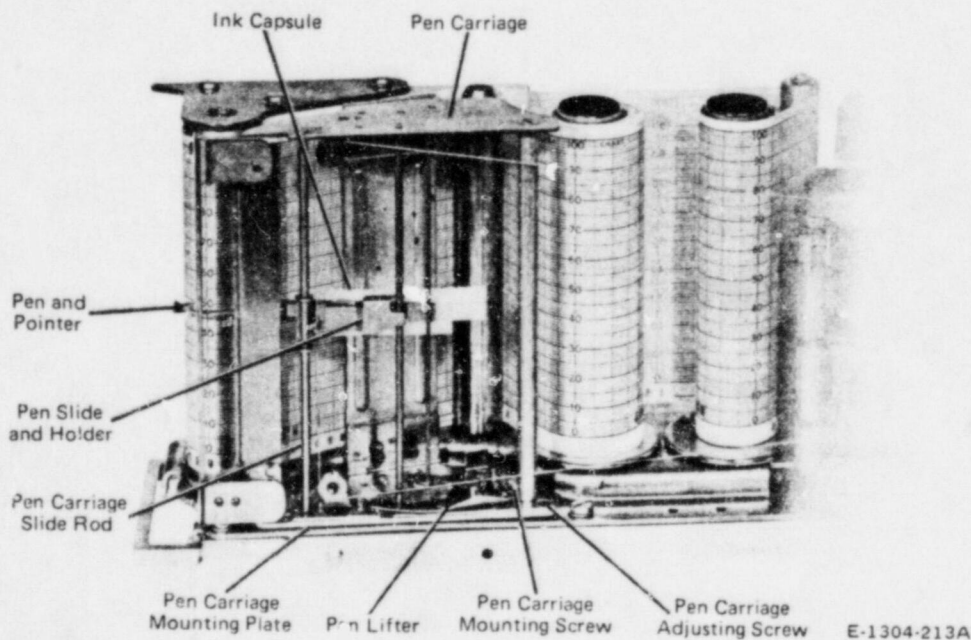


Fig. 6 - Adjustments on Pen Carriage

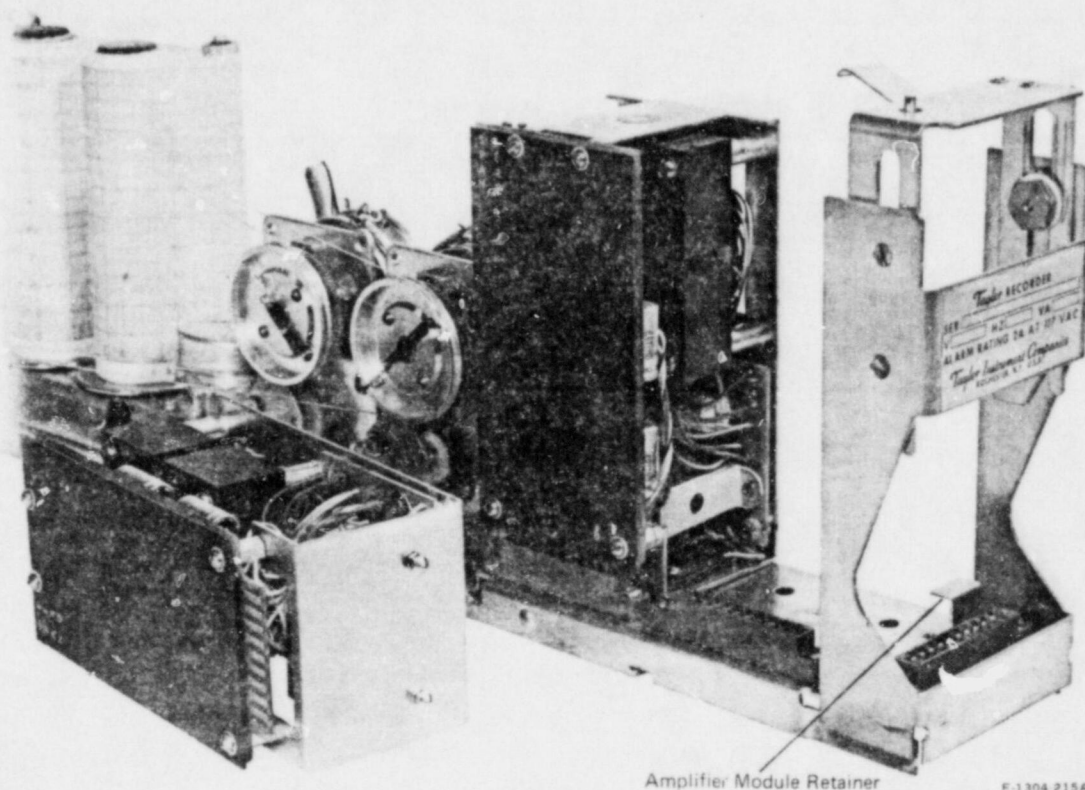


Fig. 7 - Replacing Amplifier Module

ALIGNING PEN CARRIAGE

The pen carriage should be aligned so that the pen will track a chart time line. This is accomplished by raising or lowering the rear of the mounting plate, Fig. 6.

1. Pull slide forward so that pen carriage is accessible.
2. Rotate chart advance wheel until pen is on fine time line.
3. Loosen mounting screw and turn adjusting screws until pen tracks time line when servo pulley is rotated.
4. Refer to Calibration, page 1. Zero instrument as described under this procedure.

REPLACING AMPLIFIER MODULE

1. Remove instrument slide from housing.
2. Amplifier module is held onto instrument slide by module retainer, Fig. 7.

Instrument	Length of Cable (inches)
830JD1, 930JD1 with 1 or 2-speed chart drive	19-1/8"
830JD2, 930JD2 with 1-speed chart drive	19-1/8" (Red)
	16-9/16" (Green)
with 2-speed chart drive	19-1/8" (Red)
	16-15/16" (Green)

Fig. 8 - Length of Servo Drive Cables

Pull module retainer toward rear of instrument slide and unplug amplifier module from instrument slide.

3. Plug new amplifier module into connector on instrument slide. Push module retainer toward front of instrument slide to retain amplifier module in place.

REPLACING SERVO DRIVE CABLE

The correct cable for each servo can be identified by its length. Refer to Fig. 8.

1. Remove old cable and spring from servo pulley and pen holder.

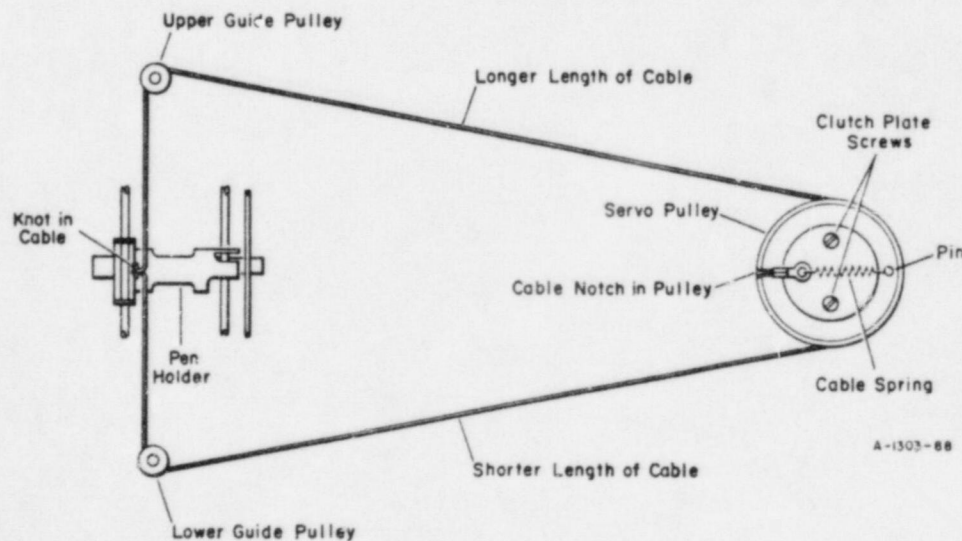


Fig. 9 - Diagram of Servo Drive Cable

Servicing and Trouble Shooting**830J, 930J Model D****Maintenance**

2. Rotate servo pulley until its cable notch is at 9 o'clock position, Fig. 4.

3. Feed spring loop through lug in end of new cable.

4. Extend cable and note that one length, measured from knot to spring, is longer.

5. Attach cable spring to pin on pulley and extend cable through notch, Fig. 5.

6. Wind longer length of cable once around pulley in counterclockwise direction; position cable on upper guide pulleys at servo and pen slide rod; manually raise pen holder and slip knot into notch on holder, Fig. 4.

7. Wind shorter length of cable once around pulley in clockwise direction; pass cable back through same notch and hold in place while cable is positioned around lower guide pulley at servo.

8. Carefully pull this length of cable so cable spring is extended and position cable under lower guide pulley at pen slide rod.

9. Refer to Calibration, page 1.

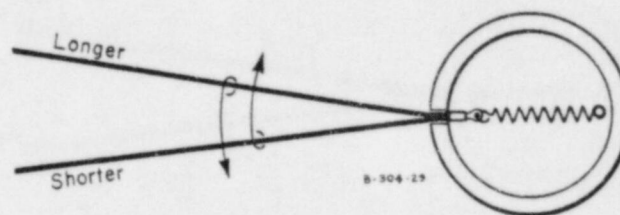


Fig. 10 - Cable Spring Attached to Pulley

CHECKING AMPLIFIER MODULE

There are test points on the back of the amplifier circuit board. For access to these test points, remove four screws holding insulator, Fig. 4, to amplifier module.

Check the waveforms with an oscilloscope connected between the test point and circuit common (use terminal 4 on the servo motor) as indicated below.

Test Point TP5

This is the output signal from the operational amplifier. The normal waveform consists of a small amount of noise (approx 2V p-p) at balance and a square wave going plus (+) and minus (-) approx 12 to 15V when the recorder is forced off balance by manually turning the servo pulley.

If the waveform at TP5 is correct, check the waveform at TP11. If the waveform at TP5 is not correct, proceed as follows:

1. Check +15V and -15V power supplies. Voltage should be 15V \pm 5%.

Maintenance

2. If voltage at TP5 is saturated at +15V or -15V, check C2 and R11. If C2 and R11 are ok, replace operational amplifier A1. This type of failure may cause output transistor Q3 or Q4 to burn out.
3. If waveform is a constant square wave or does not change as indicated above when recorder is unbalanced, check waveform at gate of Q1 and Q2. If Q1 or Q2 is shorted, its gate waveform will be affected. Replace Q1 or Q2.
4. If waveform shows a high frequency oscillation, check C2, C3, C4, C9, C11, C17, C18, R9, R10, R11 and R16. Replace defective component.

Note: A quick check for an open capacitor is to short it with a good capacitor and check if symptoms disappear.

5. If waveform is smaller than normal, amplifier gain may be too low due to defective A1, Q3, Q4, R10, R11 and R16. Replace defective component.

Test Point TP11

The normal waveform at TP11 should be nearly sinusoidal with a peak to peak value of approximately 300V when the recorder is forced off balance by manually turning the pulley.

If the waveform at TP11 is correct, but servo motor does not run, is sluggish or has low torque, check for a bad connection at the servo motor, a defective servo motor or a defective capacitor C10. Replace defective component.

If the waveform at TP11 is not correct, check D17 thru D20, Q3, Q4 and T2. Replace defective component.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	ACTION TO BE TAKEN
Pen does not move when input signal changes	<ul style="list-style-type: none"> a. No power to instrument b. Switch S1 on accordion cable is open or defective c. Electrical connections are incorrect d. Pen holder loose on servo cable e. Defective amplifier f. Defective servo motor g. No input signal 	<ul style="list-style-type: none"> a. Turn on power. Check fuses in power panel. b. Check switch S1. Replace if necessary. c. Refer to <u>Electrical Connections Section and Connection Diagram</u> d. Check for correct installation. Refer to <u>Replacing Servo Drive Cable</u>. e. Refer to <u>Checking Amplifier Module</u> f. Replace servo motor g. Check transmitter and transmission line
Pen will not travel over 100% of chart	<ul style="list-style-type: none"> a. Incorrect input signal b. Instrument out of calibration c. Servo cable incorrectly installed d. Pen holder stuck on slide rod e. Servo pulley positioned incorrectly f. Servo pulley retaining screws loose g. Servo idler gear assembly binding 	<ul style="list-style-type: none"> a. Check input signal b. Recalibrate. Refer to <u>Calibration</u>. c. Check for correct installation. Refer to <u>Replacing Servo Drive Cable</u>. d. Clean rod if dirty; replace if bent e. Correct positioning. Refer to <u>Calibration</u>. f. Tighten screws. Refer to <u>Calibration</u>. g. Adjust idler gears
When input signal changes, pen moves in one direction only	<ul style="list-style-type: none"> a. One-half of secondary winding of transformer T1 is open. (winding connected to D17 thru 20) 	<ul style="list-style-type: none"> a. Replace transformer T1
Pen motion not smooth	<ul style="list-style-type: none"> a. Pen holder or slide rod dirty or bent 	<ul style="list-style-type: none"> a. Clean rod if dirty; replace if bent
Pen motion is sluggish	<ul style="list-style-type: none"> a. Defective amplifier 	<ul style="list-style-type: none"> a. Refer to <u>Checking Amplifier Module</u>
Insufficient calibration adjustment	<ul style="list-style-type: none"> a. Defective component in reference voltage power supply 	<ul style="list-style-type: none"> a. Replace defective component
Pen chatters or oscillates	<ul style="list-style-type: none"> a. Noise in input signal b. Defective feedback potentiometer c. Excessive backlash in servo gear train d. Amplifier gain too high e. Defective output transformer T2 f. Defective input filter capacitor C12 g. Defective component in d-c to a-c converter h. Defective amplifier 	<ul style="list-style-type: none"> a. Increase input filtering b. Replace feedback potentiometer c. Adjust servo idler gears d. Check R10, 11, 16 or C2 on amplifier module. Replace if necessary. e. Replace output transformer f. Replace capacitor g. Replace defective component h. Refer to <u>Checking Amplifier Module</u>
Pen position drifts	<ul style="list-style-type: none"> a. Defective transistor Q1 or Q2 in d-c to a-c converter 	<ul style="list-style-type: none"> a. Replace defective component

Maintenance

Servicing and Trouble Shooting 830J, 930J Model D

Pen does not write	<ul style="list-style-type: none"> a. Ink capsule empty or no capsule on pen b. Pen clogged or installed incorrectly c. Pen not contacting chart 	<ul style="list-style-type: none"> a. Install new ink capsule b. Clean pen or install correctly c. Check for correct installation. Replace contact spring or guide rod if required.
Pen does not follow time line	<ul style="list-style-type: none"> a. Pen carriage out of alignment 	<ul style="list-style-type: none"> a. Align pen carriage. Refer to <u>Aligning Pen Carriage.</u>
Chart does not advance	<ul style="list-style-type: none"> a. Power off, no power supply or voltage incorrect b. Chart drive belt is off pulley c. Chart drive motor defective 	<ul style="list-style-type: none"> a. Check power supply and voltage b. Replace belt c. Replace motor
Chart advances too fast	<ul style="list-style-type: none"> a. Rewind clutch too tight 	<ul style="list-style-type: none"> a. Adjust clutch. Refer to <u>Adjusting Chart Drive Clutch.</u>
Chart bulges on roll or slips off drive pins	<ul style="list-style-type: none"> a. Rewind and/or supply roll installed incorrectly b. Rewind and/or supply clutch too loose 	<ul style="list-style-type: none"> a. Check installation of chart roll. Refer to <u>Chart Loading in General Components</u> section. b. Adjust rewind and/or supply clutch. Refer to <u>Adjusting Chart Drive Clutch.</u>
Chart perforations tear	<ul style="list-style-type: none"> a. Supply clutch too tight 	<ul style="list-style-type: none"> a. Adjust clutch. Refer to <u>Adjusting Chart Drive Clutch.</u>
Chart does not wind tight on rewind roll	<ul style="list-style-type: none"> a. Rewind clutch too loose 	<ul style="list-style-type: none"> a. Adjust clutch. Refer to <u>Adjusting Chart Drive Clutch.</u>
Rewind spindle wobbles	<ul style="list-style-type: none"> a. Normal condition. This provides self-alignment of chart. 	

Servicing and Trouble Shooting
830J, 930J Model D

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Notes

Servicing and Trouble Shooting
830J, 930J Model D

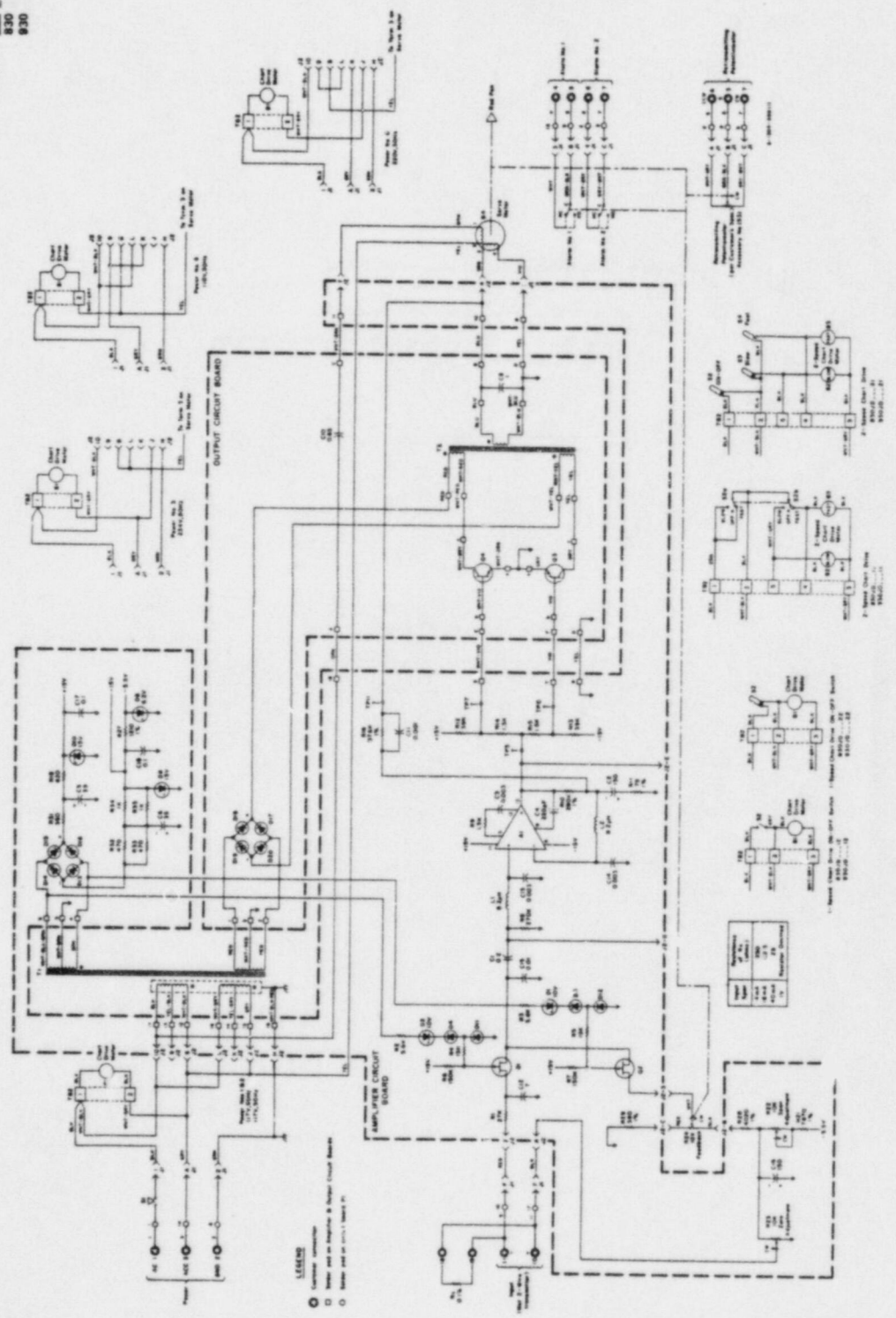
Notes

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Schematic: J () D
 830 0 1 1 1 1 0 100
 2 2 2 1 2
 3 3 2
 4 5
 5 6
 6

DIODES	
D1,2	1N758A
D3,4,11,12	1N914
D8	1N823
D9,10	*12B5019
D13 thru 20	1N4002
TRANSISTORS	
Q1,2	2N5462
Q3	MJE371
Q4	MJE531
INTEGRATED CIRCUIT	
A1	SN72708N

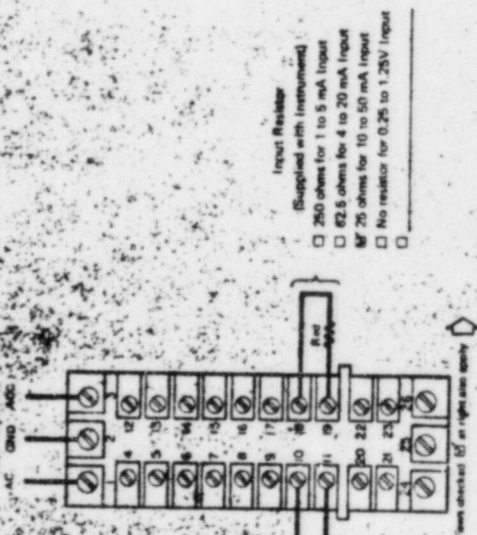
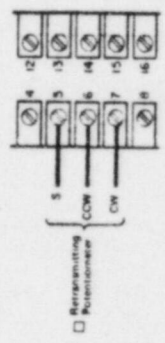
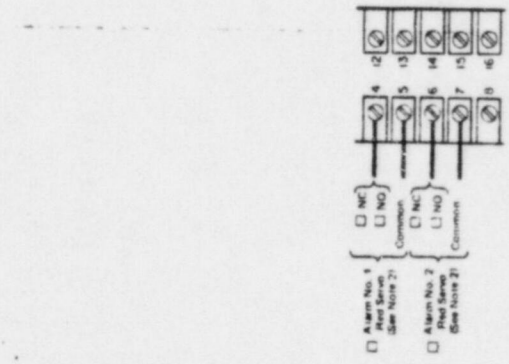
*Special Component. Order from Taylor Instrument Co.



REVISIONS
 73826
 73826
 DATE 2-10-71
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Notes: 1. Unless otherwise specified, resistance values are given in ohms and capacitance values are given in microfarads.

Connection Diagram: **830** D11110 1600
930 2221 2
 332 3
 45 4
 6 5
 6



- Input: (Hot 2-wire transmitter)
 0.25 to 1.25V d.c.
 1 to 5 mA d.c.
 4 to 20 mA d.c.
 10 to 50 mA d.c.
- Retransmitting Potentiometer
 1K
 10K
 U
 K
- Power:
 117V, 60 Hz
 117V, 50 Hz
 230V, 50 Hz
 110V, 50 Hz
 220V, 50 Hz
- Alarm:
 2A
- Note:
 1. All signal wires should be twisted pairs
 2. Alarm No. 1 is switch nearer to servo
 Alarm No. 2 is switch farther from servo
 3. AC - Hot (L) wire
 GND - Ground (Earth) wire
 ACC - Common (Neutral) wire

Not for construction unless certified
 CERTIFIED
 ID: 11-1632
 MIA-R-117
 BU-F-112
 HU-P-330
 MIA-R-165
 MIA-R-117
 CR-75-1638
 MIA-R-1637

ORDER NO. 5079-PC7604-1
 TAYLOR ORDER NO. 0214-024/72
 CALLER NO. 162011-1107
 MIA-830-1
 ALSO REFER TO DRAWING NO. 162011-1107

Only items checked apply
 Taylor Instrument Companies
 162011-1107
 W.D. J.F. 30-4
 DWG. NO.

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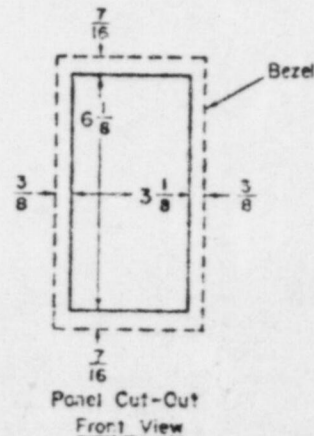
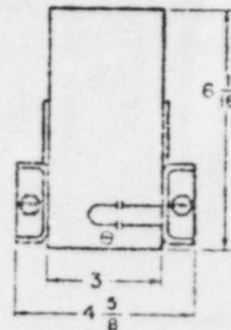
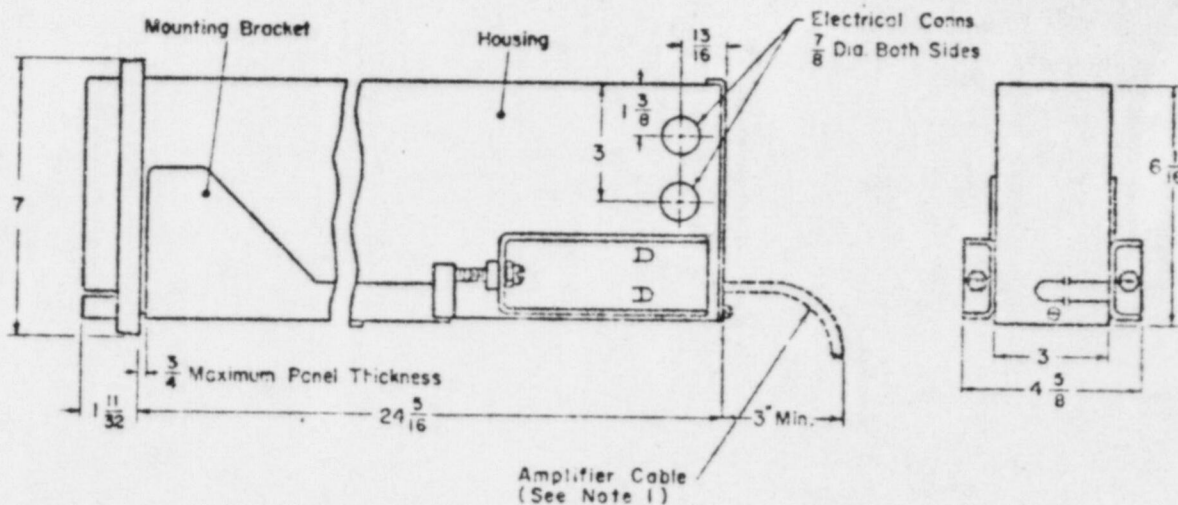
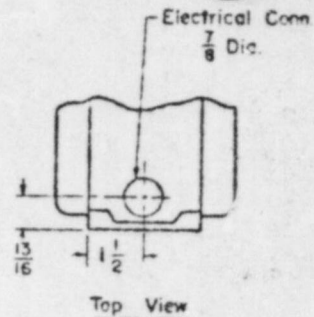
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BUENOS AIRES, ARGENTINA

Taylor  **COMPETENCE IN CONTROL**

TAYLOR ELECTRONIC
RECORDER - 830J; TREND RECORDER - 831J; SQUARE ROOT RECORDER - 870J

INCHES	MM	INCHES	MM
3/8	9.53	3-7/8	98.43
7/16	11.11	4-5/8	117.48
3/4	19.05	5	127.00
13/16	20.64	6	152.40
7/8	22.23	6-1/16	153.99
1-11/32	34.13	6-1/8	155.58
1-3/8	34.93	7	177.80
1-1/2	38.10	8-1/4	209.55
3	76.20	10	254.00
3-1/8	76.38	24-5/16	617.54
3-1/2	88.90		



Center to Center Distances	A	B
Recommended	7	10
Minimum	5	8 1/2
Minimum - Rigid Conduit	6	10

All dimensions in inches

Notes: 1. Amplifier cable supplied on 830JD2 and 870JD2 only. For cable length and Amplifier dimensions refer to drawing MD-5-124-3.

Not for construction unless certified

CUSTOMER
ALOG NO. X830JD13110D
WDL-TR-1632
WLG-FR-1484-1
WDL-FR-3117
WDL-PR-1636

WDL-PR-1637
SR-FR-1638
BS-PR-1412
HD-PR-330

ORDER NO. 50078-87604-1
TAYLOR ORDER NO. 0811-024/72

CERTIFIED BY: [Signature]

Taylor Instrument Company ROCHESTER, N.Y., U.S.A.

DWG. NO. MD-J-830-1

DATE 10-7-63
DRAWN R. Zurl
CHECKED W. K. 10-7
DRAFTING
APP. ENG. N. S. [Signature]

REVISIONS
TP-1928-28
D&N 53570

4-SueT

1 BY MS. BERNABEI: (Continuing)

2 Q Okay. Did you find that, sir?

3 A Yes.

4 Q Okay. Now, there is -- is there a correspond-
5 ing dip on the narrow range recorder on Strip Chart B,
6 the one you have before you?

7 And I would refer you slightly after, closer
8 to midnight.

9 A It's not noticeable if there is a dip
10 there.

11 Q Okay. Let me back up for a minute. On Strip
12 Chart B, the upper pin, the narrow range recorder appears
13 to be running somewhat behind the lower range one; is
14 that correct?

15 If you look at the pressure spike, perhaps
16 it would be easier to determine that.

17 A Yes, that is correct.

18 Q Okay. So I would presume that something which
19 appears shortly before midnight may be somewhat delayed
20 on the narrow range and be approximately midnight on the
21 narrow range; is that correct?

22 A Well, it could be approximately midnight.

23 Q Okay. And did you note, or can you see, on
24 the narrow range on Strip Chart B a slight dip at or
25 around midnight?

5-SueT

1 A Yes.

2 Q Now, I would like to refer you to the Strip
3 Chart A; that is, the other reactor building pressure strip
4 chart you have before you.

5 JUDGE SMITH: Which one is -- we have been
6 discussing now -- Exhibit 41 is Strip Chart A?

7 MS. BERNABEI: That's correct. However, the
8 portion that we are referring to is not before you. We
9 are obtaining copies for the Board. I apologize.

10 JUDGE SMITH: I'm sorry.

11 MS. BERNABEI: The portion of the strip chart
12 that Mr. Briii has been testifying about is not before
13 you.

14 JUDGE SMITH: I know.

15 MS. BERNABEI: Okay. That is -- though he
16 has been calling that Strip Chart B.

17 Okay. We do have copies of this. I would
18 propose this be TMIA Exhibit 42.

19 (Ms. Doroshaw is distributing copies to
20 the Board members and the parties.)

21 JUDGE SMITH: All right.

22 (The document referred to is
23 marked as TMIA Exhibit Number
24 42 for Identification.)

25 BY MS. BERNABEI: (Continuing)

EXXXXXX

6-SueT

1 Q Mr. Brill, if you can, can you refer to
2 the approximate time on Strip Chart A and determine if
3 there is a corresponding dip at that time; that is, at
4 or near midnight for the narrow range and wide range
5 recorders on Strip Chart A?

6 (The witness is looking at the document.)

7 A Looking at Strip Chart A, there doesn't appear
8 to be.

9 Q There does not?

10 A No.

11 Q Okay. Now, your testimony on Page 3, and I
12 will try to summarize it if I can, is that one would
13 expect a corresponding dip in both recorders on Strip
14 Chart A and recorders on Strip Chart B if that dip were
15 caused by a pressure event; is that correct?

16 A That is correct.

17 Q Now, if the -- if it were caused by something
18 other than a pressure event, such as the disturbance of
19 the paper one would not see the dip in both Strip Chart A
20 and Strip Chart B; is that correct?

21 Because it wouldn't be caused by a pressure
22 sensor, it would be caused by a disturbance of the paper.

23 A That's possible.

24 Q It's possible.

25 JUDGE SMITH: Possible what, that you would not

7-SueT

1 or would?

2

WITNESS BRILL: Would you repeat the question?

3

BY MS. BERNABEI: (Continuing)

4

Q Sure. Your testimony is that if a pressure

5

event or a pressure excursion caused a dip in Strip Chart A,

6

it would cause a similar dip in Strip Chart B; is that

7

correct?

8

A That's right.

9

Q Okay. So, following from that reasoning, if

10

there were a dip in one chart but not in the other the

11

conclusion would be that it was not caused by a pressure

12

excursion.

13

A It's possible that it was not caused by a

14

pressure excursion; that's correct.

15

Q Okay. And --

16

JUDGE SMITH: What does that tell us?

17

MS. BERNABEI: At a minimum -- well -- okay.

18

BY MS. BERNABEI: (Continuing)

19

Q At a minimum, you would know that two pressure

20

sensors; that is, the two pressure sensors for Strip Chart

21

A, in this case, were not picking up the pressure excursion;

22

is that correct?

23

A I don't think I follow that question.

24

Q Okay. You have told us that there are two

25

pressure sensors for each --

B-SueT

1

A Right.

2

Q -- chart?

3

A Right.

4

Q Okay. And each pressure sensor corresponds to a recorder, either the narrow range or the wide range recorder on each chart.

6

7

A That is correct.

8

Q So there is four independent pressure sensors; is that correct?

9

10

A That is correct.

11

Q Now, what I'm talking about is a hypothetical to you based on facts we have. If you were to find one strip chart, Strip Chart B, had certain dips on both the narrow range and the wide range, and the other one did not, one would assume that in fact the dips -- one would have to conclude that the dips were not caused by a real pressure excursion?

17

18

A That's not necessarily true, because there is four transmitters in the -- that go along with these strip charts, okay. Two transmitters per each strip chart.

20

21

If there is a slight variation in pressure that one transmitter would pick up and these dips, as you note, are very slight, and the other transmitter might not quite see that it is possible that you could have a pressure change due to the accuracy of the loop at that

24

25

9-SueT

1 time or whatever, and a slight dip in one tape and not the
2 other tape, and not see that.

3 Q Okay. But the most -- if I can term it
4 this way, the most probable explanation is that it was
5 not caused by a pressure excursion, the dips in one chart?

6 A I can't really say that.

7 Q Okay. Let me ask you this.

8 JUDGE LINENBERGER: Excuse me. I apologize
9 for the interruption, but one thing that is left dangling
10 here is, your mention of transmitters I understand but
11 it is also my understanding that these transmitters are
12 reacting to something they receive from a transducer placed
13 somewhere in the containment building.

14 WITNESS BRILL: Yes, sir.

15 JUDGE LINENBERGER: Each transmitter reacting
16 to a transducer. Now, without pinning down whether the
17 transducers are located close together, far apart, or
18 whatever, I have difficulty with the previous line of
19 questioning.

20 Are you in a position to explain to us how
21 the pressure pick up transducers, or where they were
22 located relative to each other so that this last discussion
23 about one chart showing a pulse and another chart not
24 showing a pulse can be put into some kind of perspective?

25 WITNESS BRILL: No, I do not know at this time

10-SueT 1

where those --

2 JUDGE LINENBERGER: Where the transducers were
3 located? Okay.

4 Let me ask you the following question. If I
5 propose to you that the two transducers were located, let's
6 say, on opposite sides of the reactor building, would you
7 in all cases expect a trace from one transducer to identi-
8 cally mimic the trace from the other one?

9 WITNESS BRILL: Normally very close to that
10 trace, possibly slight differences, very slight, if any.

11 JUDGE LINENBERGER: Thank you.

12 BY MS. BERNABEI: (Continuing)

13 Q Okay. Mr. Brill, it is true, is it not,
14 that four strip chart -- now I'm talking about gross
15 pressure excursions, the pressure spike was recorded on
16 the -- on both the narrow range and wide range on Strip
17 Chart B, which is TMIA Exhibit 40 and on the wide range
18 for TMIA Exhibit 40, which is Strip Chart A.

19 41, which is -- excuse me, 42, which is
20 Strip Chart A.

21 JUDGE SMITH: No. 41 was Strip Chart A.

22 MR. GOLDBERG: I think we ought to have the
23 witness identify which one is which, because it's certainly
24 not clear.

25 MS. BERNABEI: 41 is Strip Chart B.

11-SueT 1

MR. GOLDBERG: Well, let's ask the witness which one is 41 and which one is 42.

MS. BERNABEI: Okay. I can do that, Mr. Goldberg. Thank you.

BY MS. BERNABEI: (Continuing)

Q Mr. Brill, the reactor building pressure strip chart that you referred to as Strip Chart B has both the wide range and the narrow range recording of the pressure spike; is that correct?

A That is correct.

Q And that is what was the first chart distributed, that was TMIA Exhibit 41; is that correct?

A When you say TMIA Exhibit 41, I don't know --

Q Okay.

A Okay. That is correct.

Q Okay. And what you have been referring to as Strip Chart A is the one with only the wide range recording of the pressure spike; is that correct?

A Strip Chart A has a wide range recording and a narrow range recording.

Q Of the pressure spike itself?

A Which pressure spike are you referring to?

Q The one that occurred at 1:50 p.m. on March 28th.

A 1:50 p.m. Yes, it has a wide range variation,

12-SueT 1

2 but the narrow range variation is for some reason not all
3 there.

4 Q Okay. And I can represent that is TMIA Exhibit
5 42, the second chart that was distributed.

6 A I don't --

7 JUDGE SMITH: And that being which channel?

8 MS. BERNABEI: There are two channels on both,
9 Channel A and Channel B.

10 JUDGE SMITH: Yes.

11 MS. BERNABEI: It's called Strip Chart A in
12 his testimony.

13 JUDGE SMITH: Well I think I'm going to have
14 to back up and get my terms right, because I understood
15 that there is a Channel A and a Channel B.

16 MS. BERNABEI: Correct.

17 JUDGE SMITH: And you started talking about
18 Strip Charts A and B, and I thought you were talking about
19 the strip chart which was produced respectively by Channel
20 A and Channel B.

21 MS. BERNABEI: No.

22 JUDGE SMITH: But now you seem to be talking
23 about something else.

24 MS. BERNABEI: I'm trying to follow the
25 witness' terminology. And he --

BY MS. BERNABEI: (Continuing)

13-SueT

1 Q Mr. Brill, you have been using Strip Chart A
2 and Strip Chart B; is that correct?

3 A That is correct.

4 Q Okay. Strip Chart B is the first one we spoke
5 about which is TMIA Exhibit 41.

6 A Strip Chart B that is identified in my testi-
7 mony is the strip chart in question, the one that was
8 cut and taped back together.

9 Q The one -- right. And that's TMIA Exhibit
10 41.

11 JUDGE SMITH: Well, wouldn't it really be
12 nice if we had consistency between the channels and the
13 strip charts produced in each channel? I mean, the way
14 you have it now you are going to have Channel B producing
15 Strip Chart A and Channel A producing Strip Chart B, for
16 no probative value at all that I can see.

17 At least the record is unclear about that.

18 A Yes, I agree, but I'm trying to
19 follow the testimony. It was not I who made -- I would
20 have done it differently. But this is not -- I did not
21 compile this.

22 JUDGE SMITH: Well, let's take a break and
23 read his testimony. I want to see if I can understand
24 what has happened. Right now, not only am I confused
25 about what strip chart -- I think that you misspoke in

14-SueT 1

response to one of my questions about which one it is.

2

And I want to refresh my memory as to his testimony to

3

see how your questions seem to be following it.

4

MS. BERNABEI: Okay. We have now copies of the full extent of the strip charts. What I would propose is that we distribute those and take a break and try to identify which strip chart goes with his testimony.

5

6

7

8

JUDGE SMITH: Let me ask you, you said in your testimony that you had two channels, A and B?

9

10

WITNESS BRILL: That's correct.

11

JUDGE SMITH: And each channel produces its own strip chart?

12

13

WITNESS BRILL: That is correct.

14

JUDGE SMITH: And each strip chart has a low and high tracing?

15

16

WITNESS BRILL: That is correct.

17

JUDGE SMITH: Now, could I ask, just for the purpose of keeping the testimony consistent that when you talk about Strip Chart A, it be the strip chart that is produced by Channel A and when you talk about Strip Chart B -- you are the one that gave them these labels. And that when you talk about Strip Chart B, you know, just for neatness, that be the Channel B chart.

18

19

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21

22

23

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MS. BERNABEI: That's fine. And I would then represent that Strip Chart A if TMIA Exhibit 42, and

25

15-SueT 1

Strip Chart B is TMIA Exhibit 41.

2 JUDGE SMITH: And that's consistent with what
3 I just said.

4 MR. BLAKE: Now, I need a break after that
5 last statement.

6 JUDGE SMITH: All right. Just one second.
7 It is -- the strip chart produced by Channel B, is that
8 the one where you can see the pressure spike on both
9 tracings at 1350 approximately?

10 Is that it? Is that the one?

11 WITNESS BRILL: Okay. The -- yes.

12 JUDGE SMITH: You are looking at the actual
13 chart.

14 WITNESS BRILL: Yes. I am. And we are refer-
15 ring to that as Strip Chart B, that you are referring to.

16 JUDGE SMITH: Right.

17 WITNESS BRILL: Okay. The pressure spike or
18 dip that was indicated in my testimony is identified as
19 occurring at between 12:45 and 1 a.m. on March 29th.

20 MR. BLAKE: Judge Smith, could --

21 JUDGE SMITH: You want a break?

22 MR. BLAKE: No, I don't think I need it. Did
23 you just confirm that Exhibit 41 is Channel B, which is
24 the one that shows on both the narrow and wide ranges
25 the spike?

16-SueT 1

JUDGE SMITH: Yes. I think that is what we

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have confirmed.

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MR. BLAKE: All right.

END #4 4

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1 MS. BERNABEI: Judge Smith, we now have copies
2 that extend for the time period in question of TMIA Exhibit
3 41. So I would just propose that we distribute those at this
4 time.

5 JUDGE SMITH: What is this, a substitution?

6 MS. BERNABEI: That is correct.

7 (Pause while copies are distributed to the Board
8 and parties.)

9 JUDGE SMITH: We are just simply making a
10 substitution here, and I am going to throw away your first
11 one. That will no longer be of any value. The second one
12 continues on and contains a bold legend "Microfilmed" as compared
13 to the first one which does not. At about 11 p.m. it says
14 microfilmed.

15 MS. BERNABEI: That is TMIA Exhibit 41. TMIA
16 Exhibit 42 is the one which does not contain such a legend.

17 JUDGE SMITH: Would you repeat that?

18 MS. BERNABEI: Okay. Strip Chart B, or the channel
19 B strip recorder is TMIA Exhibit 41, which bears a large
20 "Microfilmed" legend at approximately 11 p.m.

21 JUDGE SMITH: You may proceed.

22 CROSS-EXAMINATION (Resumed)

23 BY MS. BERNABEI:

24 Q Mr. Brill, just to clarify, it is true that
25 assuming the sensors are operating correctly, a real pressure

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1 excusion would be recorded on the wide and narrow range of
2 TMIA Exhibit 41 as well as the wide and narrow range of TMIA
3 Exhibit 42?

4 A That is correct.

5 JUDGE SMITH: May I ask that when you refer to
6 these exhibit numbers, because of the confusion we have been
7 having, give both designations.

8 MS. BERNABEI: Strip chart A or B?

9 JUDGE SMITH: Yes. Refer to the exhibit number
10 and the strip chart designation.

11 BY MS. BERANBEI:

12 Q And it is your testimony that the dips which
13 you found on the narrow range and wide range strip chart B
14 at approximately 12 p.m. you did not find on the wide and
15 narrow range recording for strip chart A, TMIA Exhibit 42?

16 A I did find a dip in both.

17 Q I am talking now for the .2 p.m., the 12 p.m.
18 time period, the midnight time period on TMIA Exhibit 41
19 strip chart B, not the ones you referred to in your testimony,
20 but the ones I pointed you to.

21 A That is correct.

22 Q And for strip chart A, TMIA Exhibit 42, you did
23 not find corresponding dips at that time?

24 A The narrow range was not printing at that time
25 and for the wide range there is no dip shown.

5-3

1 Q Now you are referring to 12 midnight? TMIA Exhibit
2 42, strip chart A, at least our copy does indicate that the
3 narrow range is printing at that time. at or around midnight.

4 A Wait a minute. You are talking about strip chart
5 A now?

6 Q Right.

7 A That is correct. I was looking at 12 noon.

8 Q Okay. At 12 midnight there is no corresponding
9 dip at or near that time for either the narrow range or wide
10 range; is that correct?

11 A On strip chart A?

12 Q That is correct.

13 A There is no dip on strip chart A either at the
14 wide range or narrow range.

15 JUDGE LINENPERGER: Ms. Bernabei, one problem the
16 Board is having is, at least as I view your two exhibits, 41
17 and 42, I see no dips period corresponding to midnight on
18 either exhibit for either channel of recording.

19 Now should these exhibits show those dips?

20 MS. BERNABEI: It does not show up on the copy.
21 That is why we are having Mr. Brill identify the dips on the
22 original, and that is his testimony that there was a dip.

23 What I would propose is that perhaps Mr. Brill
24 mark a copy, or mark the Judge's copy and the record copy
25 of those dips. His testimony is there was a dip on both the

Sim 5-4

1 narrow range and wide range of strip chart A, TMIA Exhibit
2 41 at or around midnight and shortly before and there were
3 none in strip chart A, TMIA Exhibit 42.

4 MR. GOLDBERG: Ms. Bernabei just misspoke. Exhibi
5 41 is strip chart B.

6 MS. BERNABEI: Okay. There were dips in strip
7 chart B, TMIA Exhibit 41. There were not such dips at that
8 time on strip chart A, TMIA Exhibit 42.

9 JUDGE SMITH: All right. Why don't we look at
10 them right now. Let's walk over and look at them.

11 MS. BERNABEI: That is Mr. Brill's testimony,
12 however.

13 (The Board and parties walk over to the witness
14 table and review the charts just referred to.)

15 (Recess.)

16 JUDGE SMITH: I would like to talk about what
17 I see here, point out to other Board members what I see and
18 just have a roundtable discussion of it. I suppose it should
19 be transcribed. I don't know how else to approach it. I
20 see things that I don't know if my colleagues see them and
21 I don't know if you see them, but I would like to describe
22 what I see and let Judge Linenberger describe what he sees
23 and Judge Wolfe and just approach it that way.

24 We are not going to be able to get Xerox copies
25 which demonstrate what I believe is your point. I don't think

m 5-5

1 it is possible.

2 One alternative is to see if we can get a higher
3 resolution photograph. I don't even know if that is possible
4 or practical under the circumstances. I propose that to
5 preserve the point that this be a physical exhibit in the
6 proceeding with a proviso that the licensee would keep custody
7 of it and be required to produce it if required when required
8 upon appeal and in any court review if necessary. I think
9 that probably is the most practical way.

10 I really don't think it is going to be practical
11 or possible to capture the points that you are making in
12 an exhibit, a duplicating or reproduction type exhibit.

13 MS. BERNABEI: Well, I agree, Judge Smith. I
14 think the only thing I could suggest would be that perhaps
15 the witness could circle the anomalies or the dips that
16 we have been speaking about on a copy and that could be
17 reproduced for all the parties.

18 JUDGE SMITH: That would be satisfactory as
19 showing the time.

20 MS. BERNABEI: That was my suggestion. But it
21 is not going to show the amplitude. I think we should
22 gather around that strip chart and I would like to say what
23 I saw there and put it in the record and then you can comment
24 on it, and the same with my colleagues on the Board.

25 MS. BERNABEI: Okay.

Sim 5-6

1 (The parties and the Members of the Board gather
2 around the strip chart.)

3 JUDGE SMITH: Now where is the point? I have
4 lost it. Oh, it is on this one up here. What I see at some-
5 time prior to 12 midnight, say sometime after 11:30 but prior
6 to 12 midnight, I see a slight dip below the lowest line on
7 the chart at the lower level, the dip being abrupt and
8 approximately the width of the tracing.

9 Somewhat later at the high-level recording I see
10 a dip not quite the breadth of the tracing, about half the
11 breadth of the tracing.

12 I also, however, see as I look at other places
13 on the chart, I see other dips of that type, and I think that
14 anyone studying the chart could probably select some. I don't
15 know that I am able to see any that have such time coincidence --
16 you are looking at the other chart, Mr. Brill, and I am
17 looking at this one -- I haven't identified any that are
18 quite as coincident in time as those that we have, but I
19 haven't looked very much.

20 Here is one I see at 10 a.m., and there may or
21 may not be one coincident in time. I don't know. But I see
22 other comparable dips of the same magnitude on the lower
23 tracing.

24 I was looking at strip chart B, which is Exhibit
25 41.

Sim 5-7

1 Does anyone else want to make their observations?

2 MS. BERNABEI: Judge Smith, I would just note
3 that we did question Mr. Brill on the other strip chart on
4 whether or not there were any corresponding dips at that time,
5 that is approximately at 12 midnight on the other strip chart
6 recorder, and I believe his testimony was there were not.

7 JUDGE SMITH: Yes, I recognize that. Okay. That
8 is what I observed.

9 JUDGE LINENBERGER: I have been looking at this
10 same TMIA Exhibit 41 while Judge Smith was looking at it and
11 I observed the same things he has spoken about.

12 I would at perhaps some perile make the observation
13 that in my past experience at viewing things and being involved
14 in trying to use things such as this the very first thing
15 I would want to assure myself of is that calibration factors
16 might not have drifted to make sure that line voltage might
17 not have drifted and indeed a standard procedure in something
18 like this is to have a coincident trace from a line voltage
19 recorder and a coincident trace in which intentional line
20 voltage variations are introduced and one looks to see what
21 effect they have on the trace one is trying to adduce informa-
22 tion from.

23 I don't know whether this has been done in this
24 case. I have no feeling for a signal to noise ratios, for
25

Sim 5-8

1 example, but when one gets a trace running at or near the
2 zero value line as is the case with the dip we are talking
3 about here on Exhibit 41 for the lower trace, all sorts of
4 instrument phenomena creep into play because the machine is
5 recording at the very minimum of its capability and may be
6 subject to influences not relevant to any actual change in
7 transducer output.

8 That is all I can comment on it at the moment.

9 JUDGE WOLFE: I agree with Judge Smith's visual
10 observations. Obviously I have heard Judge Linenberger and
11 his comments and perhaps we could seek clarification of that,
12 of Judge Linenberger's comments through examination of the
13 witness.

14 JUDGE LINENBERGER: I should like to ask,
15 Mr. Brill, if indeed there is available or does he know
16 whether there is available a line voltage recording for that
17 same time period that could be used to shed some light on
18 whether the kind of thing I have talked about might be at
19 play here?

20 THE WITNESS: I don't know at this time that
21 there is anything available that would be able to give us
22 that information.

23 JUDGE LINENBERGER: Thank you.

24 (Board conferring.)

25 JUDGE LINENBERGER: As a follow-up question, let

im 5-9

1 me ask, Mr. Brill, are you aware of any information with
2 respect to these specific recorders that would indicate whether
3 calibration drifts of the small order of magnitude corres-
4 ponding to the dips we are talking about on TMIA Exhibit 41
5 have been looked for, screened out or in any way taken account
6 of by you or, to your knowledge, anyone else?

7 THE WITNESS: I have not done nothing in that
8 area and I don't know at this time if anybody else has.

9 JUDGE LINENBERGER: Thank you.

10 JUDGE SMITH: I might tell you one of my
11 observational concerns concerning your thesis, and that is
12 although the higher level dip and the lower level dip are
13 maybe within, I don't know, five or ten minutes of indicated
14 time, they are visibally apart an indicated time, and it
15 would seem to me that as I have looked at the literature on
16 the machine and as I have seen strip chart recorders that the
17 pens are exactly lined up.

18 And if you are going to have insult to the machine
19 or to the paper, the ' ult would be reflected at precisely
20 the time. For example, if, as you suggest, the paper was
21 distrubed, and that is indication of it, it seems to me that
22 that would be precisely at the time, or if the machine were
23 bumped, for example, both would be reflected precisely at
24 the time, and I don't see that on this.

25 MS. BERNABEI: If I could just refer you, Judge

Sim 5-10

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Smith, and I did speak both before the hearing today and
 I questioned Mr. Brill somewhat about it during the hearing,
 if you would notice the one pressure excursion which is
 obvious on TMIA Exhibit 41 is the pressure spike which occurs
 at 1:50 p.m.

end Sim
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1 If you will notice, ideally the conditions you
2 describe should exist, that 13:50, what is marked as 13:50
3 on the lower wide range recorder, is in fact some time before
4 the spike which occurs on the narrow range, and I think that
5 is obviously the same pressure that caused both those spikes,
6 but they are somewhat different in terms of the time of the
7 chart.

8 JUDGE SMITH: That is true.

9 MS. BERNABEI: My question to Mr. Brill is to
10 presume that same difference in time.

11 JUDGE SMITH: I missed the significance of that.

12 MS. BERNABEI: I think it is a comparable
13 distance between the two spikes on the narrow and wide range
14 recorder, and between the two anomalies that appear around
15 twelve midnight on the wide -- narrow range.

16 JUDGE LINENBERGER: Ms. Bernabei, can we
17 establish for sake of clarity and future considerations of the
18 record whether it is on either exhibit, whether it is the
19 upper trace that is referred to as the wide range, or the
20 lower trace that is referred to as the wide range?

21 MS. BERNABEI: My understanding the lower trace
22 is the wide range.

23 WITNESS: That is correct.

24 JUDGE SMITH: So, would it be satisfactory with
25 you, Mr. Blake, if at this time we constructively receive these

1 charts into evidence with custody to be in the Licensee, with
2 the understanding they would be produced upon need and demand
3 by any reviewing authority, and that there be no physical
4 changes made of these charts; nothing added, or nothing detracted
5 from them. That they be preserved exactly as they are now.

6 Would that be satisfactory.

7 MR. BLAKE: Let me just check on one thing.

8 (Mr. Blake confers with colleague.)

9 My -- what I was checking on, ordinarily an
10 exhibit in the proceeding lasts literally forever, and
11 you can go back and read about cases and find exhibits from
12 bygone years.

13 JUDGE SMITH: I would expect it to be an exhibit
14 only until the decision in this particular proceeding becomes
15 a final one.

16 MR. BLAKE: What I suggest we do is before we
17 leave today we put it in the box, the best box we have. Mr.
18 Brill brought these originals in, and we seal it up today and
19 we don't open it again I guess without authority of whoever
20 the presiding officer is at that point in time over the
21 proceedings.

22 JUDGE SMITH: That is really more than we asked.
23 I would not -- don't know if you are going to have any other
24 occasion for other purposes to look at it. Also, there is
25 another point too that you could possibly do, and I just didn't

1 think to capture the whole chart, that it would be practical
2 to have photographs, but it may very well be. As Judge
3 Linenberger points out, good photographic techniques can
4 capture these points, and if it becomes a need to do something
5 with the chart you could always substitute those.

6 MR. BLAKE: You have no problem with my commitment
7 that we will take every step reasonable so that these are, in
8 fact, preserved, and not monkeyed with. Obviously, I am not
9 going to keep them in my office. They will be provided to
10 somebody presumably at TMI in the records, but with some
11 instructions about an even added degree of caution and care
12 to be exercised over these particular charts.

13 I addition, we will attempt to make photographs.
14 We will distribute the photographs, and see whether or not
15 they serve the purpose or become a better -- an adequate
16 exhibit, or a substitute exhibit. We will distribute them
17 and see if the lawyers can agree.

18 JUDGE SMITH: Any objections to that procedure?

19 MS. BERNABEI: No.

20 JUDGE SMITH: Okay. Proceed.

21 BY MS. BERNABEI: (Continuing)

22 Q Mr. Brill, one more question along this line.
23 At the point of the wide range or lower recorder on Strip
24 Chart B, where there is a dip at or near twelve midnight,
25 from that point thereafter in time, the recording stays below

1 the line of the strip chart, is that correct? The calibrated
2 line of the strip chart?

3 A That is correct.

4 Q And before that anomaly it does not, is that fair
5 to say?

6 A It does not.

7 Q On page 4 of your testimony, you speak about --
8 talking now about the second paragraph -- the first sentence.
9 You speak about records indicating that a portion of strip
10 chart B was microfilmed on May 2, 1979, is that correct?

11 A That is correct.

12 Q Is that the first time, to your knowledge, that
13 the chart was microfilmed?

14 A To my knowledge.

15 Q That is the first time the record shows that it
16 was microfilmed?

17 A To my knowledge.

18 Q Okay. And my understanding of your testimony is
19 that at the time it was to be microfilmed it was already cut
20 in three pieces, is that correct?

21 A That is correct.

22 Q Now, do you have any knowledge or information as
23 to when the chart was cut into three pieces?

24 A I do not.

25 Q And did Ms. Imhoff, to whom you spoke, have any

1 such information?

2 A Only that she received the chart in three pieces.

3 Q Now, you said the chart was later microfilmed in
4 one piece on December 27, 1983, is that correct?

5 A That is correct.

6 Q Now, do you know if it was microfilmed at any
7 time between May 2, 1979, and December 27, 1983?

8 A I do not know.

9 Q Okay. So it may have been. You simply have no
10 knowledge of that?

11 A That is correct.

12 Q Now, at any time after December 27, 1983, has the
13 film been microfilmed or otherwise copied?

14 A I don't have that information.

15 Q Do you have any information as to who cut the
16 chart originally? That is, prior to May 2, 1979?

17 A I do not.

18 Q The last paragraph of your testimony is that
19 -- let me first go to the last sentence. You indicate here
20 that to keep the chart flowing freely in the recorder, one would
21 have to tape up the three pieces in order to continue the chart
22 running through the recorder, is that correct? That is the
23 sense of your sentence there?

24 A That is correct.

25 Q Now, if I understand correctly from other testimony

1 in this hearing, I would understand that one could keep the
2 paper or the chart flowing freely in the recorder merely if
3 one were to connect the end point of the chart to another
4 portion of the chart on the uptake roll.

5 In other words, it really doesn't matter what
6 portion of the chart it is connected to, is that correct?

7 A That would be possible. But after examining
8 the chart, it does not look like they were tampered with.

9 Q I am just asking you physically if that would
10 be possible.

11 A Yes.

12 Q So physically it would be possible to make a
13 cut, presumably after it passes through the plastic bar,
14 either before or after it passes through the plastic bar,
15 remove a portion of the strip chart entirely, and then tape
16 back together the portion which remains on the chart itself,
17 and a portion which remains on the takeup roll.

18 A It would be possible after the chart passes
19 the chart roll, approximately an hour to an hour and forty-
20 five minutes after that time to cut the chart and take a
21 piece out, microfilm it, bring it back, and put it back into
22 the chart.

23 It is my opinion, though, that due to the
24 straightness of the cuts, the configuration of the panel
25 where the recorder was mounted, that that was not done.

1 Q But it is possible. That is all that I am saying.

2 A It is possible.

3 Q Your testimony also states that you believed
4 that if -- let me establish this. We know today that Ms. Imhoff
5 made one taping of this chart. That is, the portions that are
6 cut at 2:00 a.m., and 10:00 p.m., is that correct?

7 A That is correct.

8 Q And what you are trying to determine in your
9 testimony on page 4, what your testimony speaks to is if at
10 any time prior to Ms. Imhoff taping the chart it was taped
11 by someone else?

12 A You are saying that is what I am trying to
13 determine?

14 Q Right. Isn't that what your testimony speaks to
15 on page 4. Any possible taping of the chart prior to Ms.
16 Imhoff taping it.

17 A Could you restate your question?

18 Q Sure. Ms. Imhoff taped the chart together after
19 microfilming the chart on May 2, 1979, is that correct?

20 A That is correct.

21 Q And we all know that that occurred. You have
22 no doubt that that occurred in your mind?

23 A That is correct.

24 JUDGE SMITH: I thought we struck that testimony
25 as being unreliable heresay? Now you are establishing that

1 there is no doubt in anyone's mind that that is the truth.

2 MS. BERNABEI: Well, it says before Ms. Imhoff
3 taped it -- it is referred to in the last paragraph which
4 remains. I am just trying to establish what he is talking
5 about in the last paragraph; that he is talking about a taping
6 prior in time to any taping Ms. Imhoff should have done.

7 I am just trying to establish what period of
8 time we are talking about.

9 BY MS. BERNABEI: (Continuing)

10 Q Now, Mr. Brill, your testimony in the last
11 paragraph on page 4 speaks to a taping that would be prior in
12 time to any taping Ms. Imhoff did, is that correct?

13 (Pause)

14 That is prior to May 2, 1979?

15 A Are you asking me do I feel that the strip chart
16 was taped prior to --

17 Q No. I am asking you in your testimony what period
18 of time you are talking about. You are talking about -- this
19 is a very simple question. I just want to establish a time
20 period you are talking about. 'I have examined the charts
21 to see if it shows any evidence of having been temporarily
22 taped together at some time before Ms. Imhoff taped it
23 together.'

24 A That is correct.

25 Q We are talking about now not the taping that we

1 see before us, but a taping prior to that taping.

2 A That is correct.

3 JUDGE SMITH: See -- 'a taping' and the way
4 the sentence reads it presumes that there was a taping.

5 MS. BERNABEI: His testimony addresses whether
6 or not he believes there was such a taping.

7 JUDGE SMITH: Okay. So --

8 MS. BERNABEI: I will try to clarify it.

9 JUDGE SMITH: I think it is clear. The preface
10 of the question that he answered is not that he concedes there
11 was a taping.

12 MS. BERNABEI: Right, right.

13 BY MS. BERNABEI: (Continuing)

14 Q Now, we are talking about a time period prior to
15 May 2 of 1979, is that correct?

16 A In regards to the taping?

17 Q That is correct.

18 A That is correct.

19 Q In order to make the statements you make on page
20 4, you essentially observed or examined the strip chart, is
21 that correct?

22 A That is correct.

23 Q And it is fair to say that basically there is
24 no special expertise required to examine the strip chart in
25 this respect. That is, to determine whether or not it had been

1 previously taped? In other words, you are not calling on any
2 special experience or knowledge you have about strip charts to
3 do that?

4 A Well, I have worked with strip charts before.
5 Reviewed strip charts, and in my opinion an examination of the
6 strip chart, I do not see where it was previously disturbed
7 or taped prior to that taping.

8 Q But I am asking you that doesn't call upon any
9 special expertise. Anyone here that was fairly observant could
10 observe whether or not it had been previously taped?

11 A A possibility.

12 Q Now, you say that there are no torn edges at the
13 places where the chart is taped together, is that correct?

14 A That is correct.

15 Q Okay. And that would be the 2:00 a.m. and 10:00
16 p.m. period?

17 A Yes.

18 Q Now it is true, is it not, that there are folded
19 edges where they are folded or non-consistent edges at the point
20 where it is taped. Those two portions. There are certain
21 portions of the strip chart that are folded in at the point at
22 which the chart is taped, is that correct?

23 A Yes.

24 Q And that would be true for both the 2:00 a.m. and
25 the 10:00 p.m. taping, is that correct?

1 A It is correct for the 2:00 a.m., but not
2 necessarily the 10:00 p.m.

3 Q Now, the 10:00 p.m., it is fair to say the portion
4 through which the wheel runs on the recorder is, in fact,
5 disturbed?

6 A That is on the 10:00 p.m. It is disturbed all
7 along here.

8 Q Yes.

9 A That is correct.

10 Q In fact, it is disturbed for the entire portion
11 of the strip chart between 2:00 a.m. and 10:00 p.m. on
12 March 28th, is that correct?

13 A Portions of it along the entire strip chart
14 are disturbed, that is correct.

15 Q And it is fair to say they are disturbed in a
16 manner in which that portion of the strip chart after 10:00
17 p.m., on March 28th is not disturbed? Excuse me. Prior
18 to 2:00 a.m. is not disturbed?

19 A That is correct.

20 Q Now, you state in your testimony that -- or you
21 suggest that there are not pieces of extra tape on the
22 portions of the strip chart in question, Strip Chart B, is
23 that correct?

24 A That is correct.

25 Q I would like you to review the backside portion

1 of Strip Chart B, specifically the point between 2:00 a.m. and
2 10:00 p.m. on March 28th.

3 A Yes.

4 Q Now, at 2:00 a.m. there is on the back side an
5 extra piece of tape that is not currently holding together
6 the strip chart, is that correct?

7 A That is correct.

8 Q And do you know when that piece of tape was
9 placed on the chart?

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Q Now, referring you to the 10 p.m. portion of Strip Chart B, TMIA Exhibit 41, again the back side, there is a portion of tape there which is not holding together the strip chart itself; is that correct?

(The witness is looking at the strip chart.)

A I don't see a portion of tape there.

There is a paper that is not fast on to the tape if that's what you are concerned about.

Q Well, there is a portion of tape on the back side at that time which is not connected to the other side of the strip chart; that is, that portion of the strip chart after 10 p.m. on March 28th?

A You mean this piece right here?

Q I'm talking about this piece right here.

A Why wouldn't that piece be part of the other piece, if it's holding it together.

JUDGE SMITH: I think it may be peculiar what is going on the record and what isn't. That I think was an aside.

MS. BERNABEI: Right. Okay. I will ask the question again.

JUDGE SMITH: When in doubt, it's on the record.

BY MS. BERNABEI: (Continuing)

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Q There is a portion of the tape, again at or near the 10 p.m. time on March 28th on the back side of Strip Chart B, which is not connected to the other side; that is, the later than 10 p.m. period of the strip chart; is that correct?

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A That is correct.

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Q And it does not appear to be holding the strip chart together at that point?

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A At that point in the tape, it does not hold the strip chart together; that is correct.

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Q Do you know when that piece of tape was put on the strip chart?

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A The best I can tell, that piece of tape is part of the original taping. I have no idea when that would have been put on the strip chart.

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Q Okay. And one last point, if you would look at Strip Chart A, which is TMIA Exhibit 42, at the time of the pressure spike, at or about 1:50 p.m. on March 28th, there is a wide range or lower range recording of the spike at that time; is that correct?

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A That is correct.

Q And that is in red on the chart?

A That is correct.

Q And there is at that time apparently no

recording on the narrow range recording; is that correct?

IMAGE EVALUATION
TEST TARGET (MT-3)

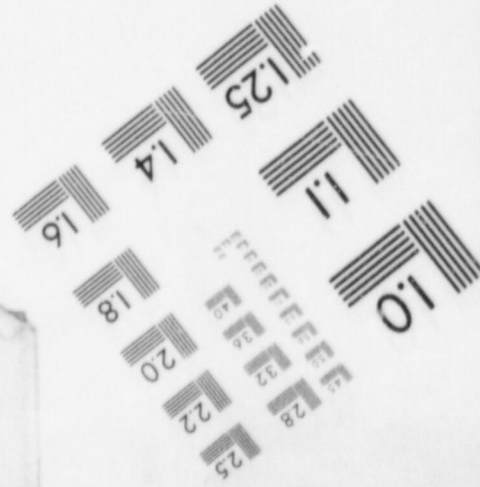
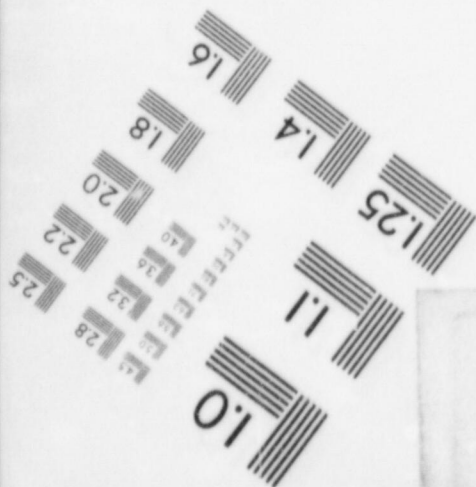
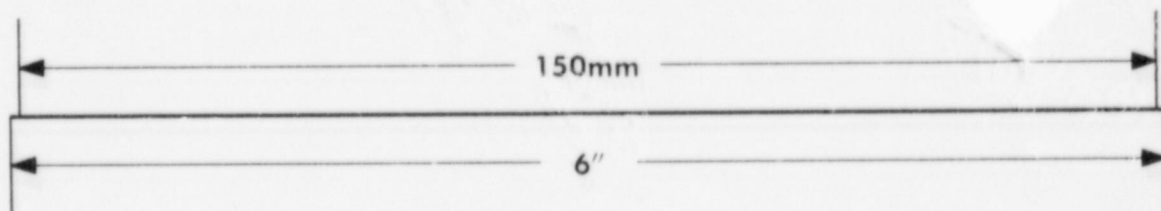
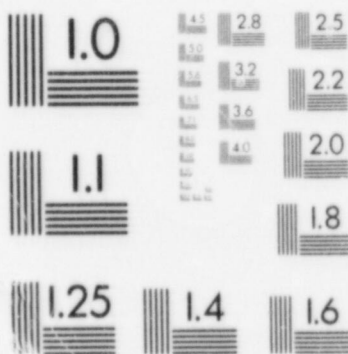
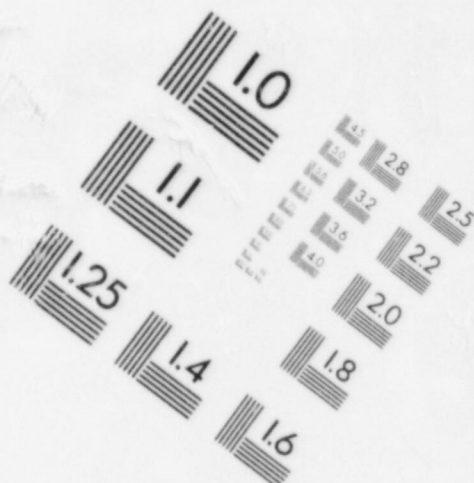
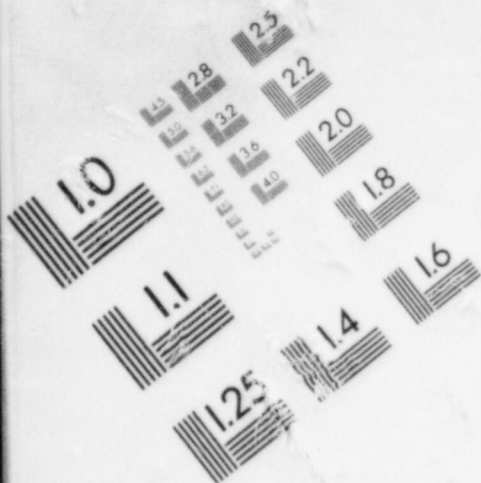
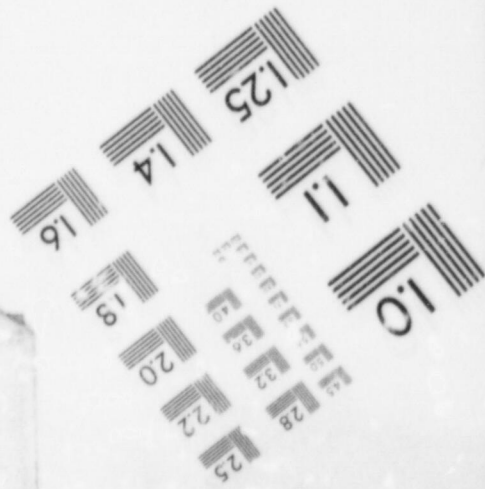
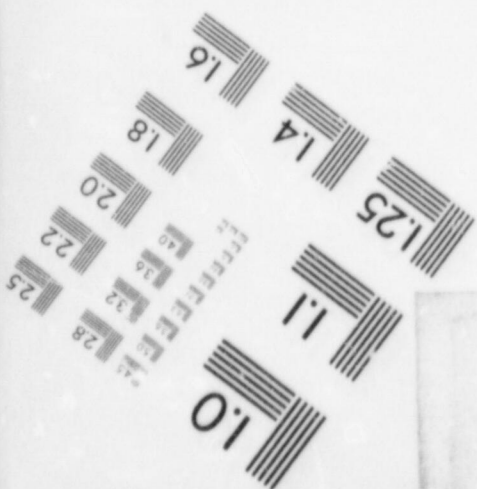
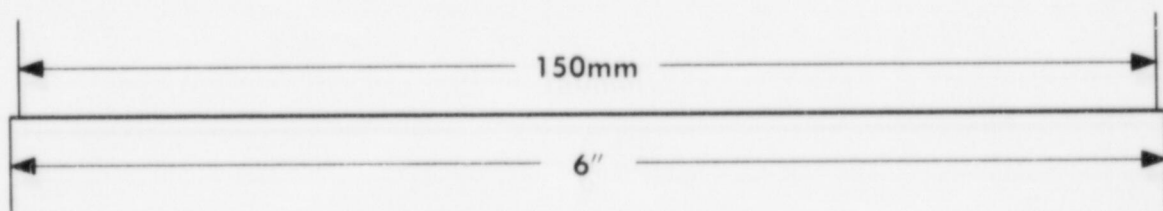
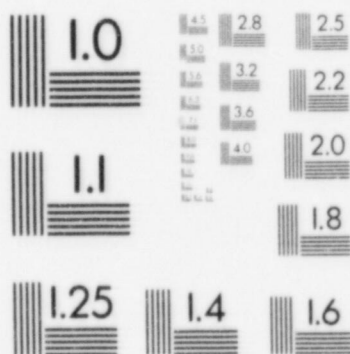
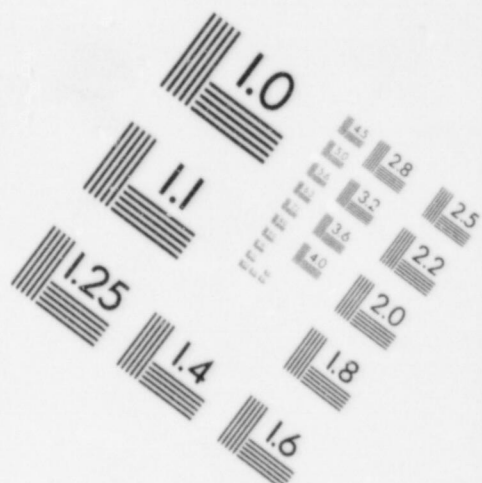
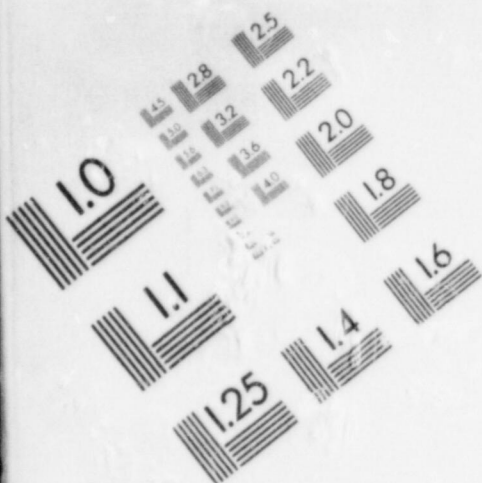


IMAGE EVALUATION
TEST TARGET (MT-3)



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Q And it's fair to say that for some period before the time of the spike, there is no narrow range recording of reactor building pressure?

A That is correct.

Q However, a very short time after the spike there appears to begin a recording of reactor building pressure thereafter?

A That is correct.

Q Now, if you were to judge from viewing the chart as it is today, one would assume that in fact the upper recording device or pin was not operating at the time of the spike; is that correct?

A That is correct.

Q And it would appear that at or near the time of the spike, someone put into operation or attached that upper pin recording; is that correct?

A I don't know.

Q Well, in any event, it did begin recording a few minutes after the pressure spike and continued thereafter?

A Yes, it did.

Q And that would have to be done manually; is that correct, putting into operation the recorder pin for the narrow range recorder on Chart A?

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2 A I don't know. It could have been done by the
recorder itself.

3 Q Automatically?

4 A If it stopped printing, it could have started
5 printing again after the pressure spike.

6 Q Okay. And how would that occur? That is,
7 how would it be automatically rather than manually activat-
8 ed?

9 A Well, the pressure spike might have activated
10 the recorder pin which in that period of time was not
11 printing, and then it started to print.

12 Q It could have also been manually activated;
13 is that correct?

14 A That is correct.

15 Q Just to return to one point, Mr. Brill,
16 Strip Chart B, focusing now on the portion between 2 a.m.
17 and 10 p.m. on March 28th, okay, the lower portion of
18 the chart has certain marking or sprocket marking where
19 it runs on the wheel of the recorder; is that correct?

20 A That is correct.

21 Q Okay. Now, those -- at those 2 a.m. and 10
22 p.m., those -- well, those at 2 a.m. are disturbed; is
23 that correct? They are folded over, both the sprocket
24 portion and the portion at the top of the chart?

25 A That is correct.

#7-5-SueT

1 Q Now, at 10 p.m. there is also disturbance of
2 those markings on the bottom of the Strip Chart B at
3 10 p.m.; is that correct?

4 A That is correct.

5 Q And that disturbance of the sprocket markings --
6 or the wheel markings, continues from 10 p.m. thereafter?

7 Is that correct, Mr. Brill? Or, the hole.

8 A Well, there is disturbances after 10 p.m.

9 Q Okay. And it's fair to say that one sees
10 no such disturbances in wheel, the holes, or the wheel
11 markings which appear before 2 a.m. on March 28th?

12 A That is correct.

13 Q And if you can generalize, one also sees no
14 such disturbances in the holes or wheel markings which
15 appear on the other strip chart, Strip Chart A?

16 A Would you --

17 Q For that period of time.

18 A Prior to 2 p.m.?

19 Q Right. Generally talking about the 2 a.m.
20 to 10 p.m. time period, generally there are no such
21 disturbances; is that correct?

22 A That's correct.

23 Q Have you examined this particular recorder as
24 it is located in the TMI-2, TMI Unit 2?

25 A Yes.

#7-6-SueT

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Q You have?

A Yes, I have.

Q And do you have any information or knowledge as to how paper in the normal course of business at the time of the accident was preserved or maintained? That is, paper that had already run through the strip recorder, the pressure recorder?

A I have reviewed seventeen strip chart accident recorder charts, and I have found that of the seventeen fourteen of those were cut in two places to preserve the accident information. One was not cut. And two were cut in one place.

Q Okay. I think I'm asking you a slightly different question.

Okay. If one -- I assume that the rolls of paper which are used in the reactor building pressure recorders are for a certain period of time.

A That is correct.

Q Okay. And, if you know, for these particular recorders, let's take Strip Chart B, how long a period of time is that?

A I don't know the answer to that.

Q Okay. For whatever period of time it is, how is the paper changed? In the normal course of operation, how would the operators come to change the paper in the

#7-7-SueT 1 strip recorder?

2 A Okay. After the strip chart recorder flow
3 mechanism for the chart starts with the supply reel, goes
4 from the supply reel around to a toothed-wheel reel, from
5 there back to a take-up spindle. And once the take-up
6 spindle is full the take-up spindle chart is taken off and
7 a new chart is put on, on the supply reel.

8 Q And then, if you know, in the normal course
9 of operation the chart would not be cut; is that correct?

10 A That is correct.

11 MS. BERNABEI: Okay. I have no other ques-
12 tions.

13 JUDGE SMITH: Mr. Au?

14 MR. AU: A couple of questions.

15 CROSS EXAMINATION

16 BY MR. AU:

INDEXX 17 Q The times which are printed on the bottom of
18 these strip charts, are those printed on by the machine
19 or are they preprinted on the roll of paper?

20 A They are printed, in this case, on the roll
21 of paper.

22 Q Preprinted?

23 A Yes.

24 Q How does the technician align the time with
25 the paper?

#7-8-SueT 1

2 A There is a toothed-wheel mechanism that he
3 can adjust the paper to the toothed-wheel take-up reel
4 which will give him the proper time, the actual time that
5 it is.

6 Q He is synchronizing it with his own watch?

7 A Well, with the watch or a clock in the control
8 room.

9 Q So his manual synchronization could be off
10 by a couple of minutes?

11 A It's possible.

12 MR. AU: Thank you.

13 JUDGE SMITH: Mr. Goldberg.

14 CROSS EXAMINATION

15 BY MR. GOLDBERG:

INDEXXX

16 Q Mr. Brill, the recorder that recorded the
17 pressure spike which occurred at 1:50 p.m. on March 28th,
18 1979 and which recorded the charts which you have before
19 you and which are reproduced in part by TMIA Exhibits 41
20 and 42, that was a Taylor Recorder, 830J or 930J, Model D?

21 A That is correct.

22 Q Is it one or the other of those?

23 A It's one or the other. I don't know right
24 off which one.

25 Q Could you briefly describe the sources of
error associated with the pin recordings on these strip

#7-9-SueT

1 charts?

2 JUDGE SMITH: Along this line, maybe it might
3 move things along a little better, the Board has been
4 reading the servicing and troubleshooting part and has
5 it pretty well gathered together there.

6 And if you could answer it in the context of
7 the troubleshooting guide it might be helpful.

8 While he is looking for that, Mr. Blake, we
9 have received this testimony into evidence together with
10 the attachment which is the Owner's Guide or whatever you
11 call it, which has accordian fold-ins. I wonder if that's
12 going to cause any trouble?

13 Let's go off the record.

14 (An off-the-record discussion ensues.)

15 WITNESS BRILL: Your question was the sources
16 of error?

17 BY MR. GOLDBERG: (Continuing)

18 Q Yes.

19 A Okay. In a strip chart recorder, there is --
20 that's part of a loop, and the loop has pressure transmit-
21 ters connected to it so the pressure transmitter would
22 have a certain error, the strip chart recorder would have
23 a certain error, combined error would be the loop error
24 for that particular loop.

25 Q Okay. There are various components of this

#7-10-SueT 1

recorder such as input filters, amplifier, modules, filters
for reducing interferences and smoothing out noise signals?

2

3

A Correct.

4

Q There is a certain amplification error?

5

A That's correct. There is a servo-drive mechanism

6

that drives the pin which is connected using a wire to the

7

pin mechanism. There is a chart-drive mechanism that

8

drives the pin at one inch per hour.

9

All those things would have some inherent

10

error in them. The accuracy of the recorder is identified

11

in the instruction manual, the overall accuracy.

12

Q And can you identify that for us on the

13

attachment to your testimony?

14

A I would prefer to look it up rather than say

15

something that might not be correct.

16

Q Yeah, could you do that, please?

17

A Sure.

18

(The witness is looking at a document.)

19

It identifies the calibration accuracy under

20

the operation instruction as plus or minus point two five

21

percent.

22

Q And that's a calibration accuracy?

23

A That is correct

24

Q Would that represent the actual total accuracy

25

for a particular trace? Or, is that just one of the

#7-11-SueT 1

components?

2 A No. That would be just one of the components
3 in a loop. The other components in a loop would have to
4 be factored in. And normally in loop calibrations the
5 accuracy is determined by the sum of the square, the
6 square root of the sum of the squares for that particular
7 loop, for the components in that loop.

8 Q Now, for the components which comprise this
9 recorder, is it the case that some of them are common to
10 both pin traces and some of them are not?

11 That is, each pin has associated with it
12 certain components which are associated with that particular
13 pin recording and not the other pin recording?

14 A That is correct, because the inputs on the
15 two-wire system that we use in this particular case is
16 derived from pressure transmitters, and there is two
17 pressure transmitters for each recorder. One drives one
18 pin -- one input from one recorder, or from one pressure
19 transmitter drives one pin and one from the other pressure
20 transmitter drives the other pin.

21 Q So that the total actual error associated with
22 one trace produced by this -- one of these recorders would
23 not necessarily be the same as the total actual error
24 associated with the other trace printed on the same recorder
25 at the same time; is that correct?

#7-12-SueT 1

2 A The error could be different at any given time;
that is correct.

3 Q Now I think you indicated before that you
4 examined a total of seventeen strip charts that were
5 operating at the time of the accident?

6 Did I understand that from your testimony before?

7 A That is correct.

8 Q Did you look at the sprocket holes of the
9 strip charts of the ones which you do not have in front
10 of you today?

11 A No, not specifically.

12 Q Do you have any knowledge as to whether
13 there are disturbances of the sprocket holes on the other
14 charts from the day of the accident?

15 A I do not recall.

16 MR. GOLDBERG: Okay. Thank you, Mr.

17 Brill.

18 END #7

19 Mary flws

20

21

22

23

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25

Sim 8-1

1 (Board conferring.)

2 BOARD EXAMINATION

INDEX

3 BY JUDGE SMITH:

4 Q What happens when you bump the machine? It is
5 totally insulated against a jar or somebody bumping into it,
6 into the console?

7 A Well, the consoles are pretty well built. Some
8 somebody bumping in the console would not disturb the recorder.

9 Q It is designed to avoid that?

10 A Yes, sir.

11 Q In fact, the consoles are seismically designed?

12 A Yes, sir.

13 (Laughter.)

14 BOARD EXAMINATION

15 BY JUDGE LINENBERGER:

16 INDEX Q Do you know, sir, whether there has been any
17 experience with attempting to correlate changes in pen
18 tracing on the chart paper with the functioning of major
19 pieces of equipment around the facility such as, I don't know,
20 heating and ventilation equipment in the control room and
21 certain things turning on and turning off in the reactor
22 bulding and that sort of thing? Have those been looked for,
23 do you know?

24 A I don't know if they have been looked for, but
25

1 they could provide an input for noise level, if that is what
2 you are referring to.

3 Q The calibration and maintenance portion of the
4 what I would call the owner's manual that accompanies your
5 testimony for this owner's manual for this equipment indicates
6 that certain calibration and check procedures should be done
7 or performed periodically, and in fact there is a section
8 under the maintenance portion labeled periodic servicing and
9 it indicats certain things should be checked periodically.

10 Do you have any knowledge as to what the time
11 interval prior to the accident was at which point these
12 intruments were serviced?

13 A I do not.

14 Q Also in the maintenance section there is a
15 discussion of the output signal from an operational amplifier
16 associated with these recorders and it indicates that the
17 normal wave form of this operational amplifier signal has a
18 small amount of noise and it defines small as approximately
19 two volts peak to peak at balance.

20 Are you in a position to correlate that normal
21 two volt peak to peak noise out of the operational amplifier
22 to correlate that in terms of resultant pen movement that
23 it might cause with the amount of pen movement we have
24 seen discussed in the context of the small dips on these
25 two exhibits?

Sim 8-3

1 A I am not in a position to tell you exactly how
2 much pen movement that that would cause.

3 Q All right, sir.

4 Finally, at the very beginning of the operation
5 section of this recorder manual attached to your testimony
6 there is a discussion of an input filter system whose purpose
7 is, and I quote, from the manual, whose purpose is to
8 reduce interference or is supplied for the purpose of reducing
9 interference and smoothing signals from noisy processes.

10 And, indeed, it indicates that a particularly
11 designated resistor and a particularly designated condensor
12 might be changed or replaced for the purpose of improving
13 this smoothing, if it is so desired.

14 Do you know whether any adjustments of this
15 input filter network were made by the licensee in setting
16 up this equipment?

17 A I do not know, sir.

18 JUDGE LINENBERGER: All right. Thank you
19 very much, sir.

20 BOARD EXAMINATION

21 BY JUDGE WOLFE:

22 Q When did you have occasion first to look at
23 these charts, Mr. Brill?

24 A Approximately two weeks ago.

25 Q That was the first time?

INDEX

Sim 8-4

1 A Yes, sir.

2 Q And at all other times these charts have been
3 in the custody of the GPU custodian, I believe her name is
4 Ms. Imhoff; is that correct?

5 A Yes, sir.

6 JUDGE WOLFE: No further questions.

7 JUDGE SMITH: Mr. Blake

8 REDIRECT EXAMINATION

INDEX

9 BY MR. BLAKE:

10 Q Mr. Au discussed with you the process of
11 calibrating the time on the chart by adjusting a cog. In
12 the process of doing that, could that result in any effect
13 on the pen tracing?

14 A Not normally such that there would be a disturbance
15 that would be that noticeable.

16 Q Could it result in an effect such as we have
17 been discussing here, that is the effect, particularly that
18 midnight effect?

19 A If the technician were to take the tooth wheel,
20 or if the operator were to take the tooth wheel and, you
21 know, seriously move it radically forward or back, I guess
22 there could be a slight disturbance in the pen tracing. That
23 is possible that that could happen.

24 Q You have been asked to describe tears or holes
25 or disturbances in the cog wheel, holes that run along the

Sim 8-5

1 edge of the tape. If that chart were handled a lot and
2 simply viewed a lot and handled by people, could such insults
3 to that piece of the paper occur just naturally from handling
4 it?

5 A It certainly could.

6 Q And you were focused on two portions of tape
7 which appear on the back of the original strip chart, one
8 adjoining the two o'clock cut and one adjoining the approximate
9 ten o'clock cut. Do those portions of tape which are on, or
10 which appear at those two places on the chart appear on
11 the two o'clock a.m. to ten o'clock p.m. segment of the chart
12 or on the other side of the cuts?

13 Now if you don't understand that question, I
14 will try it again.

15 Let me do it in two bites, if I can.

16 At the two o'clock cut, does the portion of the
17 tape on the back of the chart appear on the 3 a.m. side or
18 on the 1 a.m. side of that cut?

19 A It appears on the 3 a.m. side.

20 Q And with regard to now the 10 p.m. cut, does the
21 portion appear on the 9 p.m. or the 11 p.m.?

22 A I have not concluded that that portion of tape
23 which was referenced before is an additional portion of
24 tape other than that which holds the chart together.

25 MS. BERNABEI: Well, I don't mean to interrupt,

1 but I think that was his prior testimony.

2 MR. BLAKE: No, I think you are wrong. I think
3 that is precisely it -- what he has just said now, he
4 previously indicated.

5 MS. BERNABEI: Well, we will let the record show.

6 BY MR. BLAKE:

7 Q The segment which Ms. Bernabei referred you to,
8 as you look at it now does it appear to be on the 8 p.m. to
9 9 p.m. side or on the other side of the cut, the later side
10 of the cut?

11 A It appears to be on the 10 p.m. side.

12 Q And where is the cut made, in your view, then?

13 A The cut is made at about 10:15. Am I understanding
14 right as to what ---

15 Q Yes, sir.

16 And do you see any evidence -- let me focus you
17 on the 2 a.m. cut on the back of the chart.

18 A Yes, sir.

19 Q And the segment of tape which appears on the
20 3 a.m. side of that cut.

21 A Yes, sir.

22 Q If, assuming that that portion of tape which
23 you see there had been a portion of tape which connected that
24 segment of the chart with the segment of the chart which
25 precedes it in time, which currently is on the roll, would

Sim 8-7

1 you expect to see evidence of it on the chart?

2 MS. BERNABEI: I am going to object. I don't
3 understand the question.

4 JUDGE SMITH: I don't either. I don't understand
5 it.

6 (Board conferring.)

7 MR. BLAKE: No more questions.

8 JUDGE SMITH: Okay.

9 Do you have recross?

10 MS. BERNABEI: Just a couple.

11 RE-CROSS-EXAMINATION

12 BY MS. BERNABEI:

13 Q Viewing whatever portions of tape that appear
14 on the back side of the strip chart B today, either the
15 10 p.m. or the 2 a.m. period, do you have any information
16 or evidence as to whether or not there were prior tapings
17 below that tape which appears there today?

18 A I think I indicated in my testimony that I have
19 seen no evidence that there was prior tapings.

20 Q Now if the tape were placed over the same spot
21 there had been prior tape, other than what you have mentioned,
22 that is that extra pieces of tape may have been left or that
23 there may have been torn edges, you could not see evidence,
24 could you, of the prior tape, assuming the tape is exactly
25 the same where the tape is today?

INDEX

Sim 8-8 1 A Well, it would be like taping two pieces of
2 paper together. When you try and remove the tape, you tend
3 to fray and destroy the surface of the paper and there are
4 no such markings like that on the tape.

5 Q But if it were done carefully, one could not tell;
6 is that correct? If it were taped and untaped carefully and
7 another piece of tape put over it, you could not necessarily
8 detect the prior taping?

9 A No. I think there would be evidence there of
10 frayness and destroying the surface of the paper that you
11 would be able to see.

12 Q Even if it were done carefully?

13 JUDGE SMITH: This is a matter of common experience
14 and perception and it doesn't really matter if you get him
15 to agree with you or not. You can make your argument.

16 MS. BERNABEI: Okay.

17 (Pause.)

18 BY MS. BERNABEI:

19 Q Now the dip on the wide range recorder, or the
20 lower range recorder on strip chart B, I think it was
21 described by Judge Smith as an abrupt change if I am quoting
22 him correctly, isn't it true that changes in pressure for
23 the most part, and I am not saying uniformly, but are usually
24 gradual and not abrupt, that is changes that are recorded on
25

Sim 8-9

1 strip charts of that magnitude?

2 A Would you ask me that question again?

3 Q Yes. Focusing now on the wide range recording,
4 the dip that was acknowledged by you and also characterized
5 by Judge Smith as an abrupt dip or abrupt change, isn't it
6 true that for the most part small changes in pressure are
7 detected or recorded as gradual changes rather than abrupt
8 changes on a strip chart of this sort?

9 A That would depend on how the pressure change how
10 actually affected, whether it would be an abrupt pressure
11 change or a gradual pressure change. It could be either way.

12 MS. BERNABEI: Okay.

13 I have no other questions.

14 JUDGE SMITH: Anything further of Mr. Brill?

15 MR. BLAKE: One moment.

16 (Pause.)

17 MR. BLAKE: No questions.

18 JUDGE SMITH: All right, Mr. Brill, thank you
19 for coming.

20 (Witness Brill excused.)

21 MS. BERNABEI: I would move TMIA Exhibit 41 and
22 42 into evidence.

23 JUDGE SMITH: Any objections?

24 (No response.)
25

Sim 8-10 1

JUDGE SMITH: The exhibits are received.

2

(TMIA Exhibits 41 and 42, previously
marked for identification, were
received into evidence.)

3

4

5

JUDGE SMITH: Is there any other business before
we go to the proposed findings?

6

7

MR. LEWIS: Yes, there is. I have several exhibits
which I would like to identify.

8

9

JUDGE SMITH: All right. These are Licensee
exhibits?

10

11

MR. LEWIS: Yes. If I could identify them, the
first, which I would ask to be marked as Licensee Exhibit
No. 2, is an excerpt from the deposition of Richard Lentz
which was taken by TMIA on October 15th, 1984. The portions
are page 50, line 25 through page 58, and then page 60, line
12 through page 63, line 7.

12

13

14

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(The document referred to was marked
Licensee Exhibit No. 2 for
identification.)

18

19

20

MR. LEWIS: The second which I would ask to be
marked as Licensee Exhibit 3 is the answers to two interro-
gatories which deal with data collected by Richard Lentz.
These are answers to Interrogatories 20 and 21 and Licensee's
answers to Intervenor, Three Mile Island Alert's fourth set

21

22

23

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INDEXXXXXXX

INDEX

Sim 8-11

1 of interrogatories.

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

5 INDEX

6 end Sim
7 Joe fols

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1 TMIA and Licensee have discussed these, and I
2 understand they are in agreement.

3 MS. BERNABEI: Substantially that is correct.
4 The only -- I would suggest we tear down response 20 --

5 MR. LEWIS: And admit 21?

6 MS. BERNABEI: And admit 21.

7 MR. LEWIS: That is fine with me. Then I would
8 ask that these be admitted into evidence.

9 JUDGE SMITH: You handed two Lentz depositions.

10 MR. LEWIS: There is a third one. We are in
11 disagreement on the third one. We will get the easy business
12 over first.

13 JUDGE SMITH: I hadn't appreciated that there
14 were two, so I marked the first one I picked up as Exhibit 2,
15 -- Exhibit 2 is the smaller of the two, right?

16 MR. LEWIS: Yes, it is.

17 JUDGE SMITH: Exhibit 2 is the smaller of the
18 two --

19 MR. LEWIS: The longer. The one that starts
20 on page 50.

21 JUDGE WOLFE: Would you repeat those page numbers,
22 and line numbers for Licensee Exhibit 2, please?

23 MR. LEWIS: They are already lined out, the ones
24 that are not in evidence.

25 JUDGE WOLFE: I see. All right.

1 JUDGE SMITH: All right. There are no objections
2 to Exhibits 2 and 3?

3 MS. BERNABEI: Excuse me?

4 JUDGE SMITH: Exhibits 2 and 3 are not objected
5 to?

6 MS. BERNABEI: Three being the answers to
7 Interrogatories?

8 MR. LEWIS: Yes.

9 MS. BERNABEI: Yes. The only amendment I
10 would make, which I believe Mr. Lewis agrees with, is I would
11 include in three only the first page and the second page up
12 through the first two sentences of the interrogatory response
13 20, and strike the rest of that.

14 MR. LEWIS: In other words, Interrogatory 21
15 and its response should be lined out there. It should not be
16 part of the --

17 MS. BERNABEI: As well as the rest of response 20,
18 as to the first two sentences.

19 MR. LEWIS: Yeah, I have no problem with that
20 either.

21 JUDGE SMITH: What is the additional deletion?

22 MS. BERNABEI: Basically, the deletion would be
23 from page 18, which is the second page, everything after the
24 second sentence of the response.

25 JUDGE SMITH: Of the response 20?

1

MS. BERNABEI: That is correct.

2

JUDGE SMITH: Beginning with, "Mr. Lentz states?"

3

MS. BERNABEI: That is correct.

4

JUDGE SMITH: Is deleted.

5

MR. GOLDBERG: All of page 19 is gone.

6

JUDGE SMITH: All of Line 19 then is gone --

7

MS. BERNABEI: Page 19, that is right.

8

JUDGE SMITH: That is all gone?

9

MS. BERNABEI: All gone.

10

MR. GOLDBERG: One less piece of paper to carry

11

back.

12

JUDGE SMITH: Then we look at -- what is our

13

next one?

14

MR. LEWIS: The third piece of paper I handed

15

out, which I ask be marked as Licensee Exhibit 4, is an

16

excerpt from the deposition of Mr. Richard Lentz, taken by

17

TMIA on October 15, 1984. The portions that we ask be admitted

18

begin on page 68, Line 8, and run through page 71, line 19.

19

This excerpt addresses whether Richard Lentz obtained a copy

20

of the strip recorder on the evening of March 28, 1979.

XXX

21

(Above referenced document is

22

marked Licensee Exhibit No. 4

23

for identification.)

24

JUDGE SMITH: And you object?

25

MS. BERNABEI: Yes, we object. Essentially,

1 we don't think this is rebuttal to our direct case.

2 What we presented is testimony from Mr. Broughton
3 essentially as to his knowledge of what was obtained -- what
4 information was obtained from the control room, and what
5 information he would have had available, and apparently what
6 he would have communicated to Mr. Keaten.

7 We did not -- he didn't have any information,
8 as he testified as to whether or not Mr. Lentz made any copies
9 of strip recordings. His only testimony was that was the
10 kind of information that they would have wanted to get, but
11 he did not have on the stand any memory of whether or not that
12 information was obtained.

13 I think given this fact, that is not rebuttal
14 to any direct testimony we have presented, and therefore
15 without Mr. Lentz coming here to testify, we wouldn't agree
16 to that.

17 I would also state that we did agree to portions
18 of Mr. Lentz's deposition on a matter about which Mr. Broughton
19 did testify; the alarm printout. Somewhat reluctantly, given
20 the fact that Mr. Lentz is not here to testify.

21 But I think this is not in rebuttal to anything
22 we have presented.

23 MR. LEWIS: If I might address that point.

24 I am not sure that -- I don't believe that the fact that it
25 is not rebuttal to Mr. Broughton's testimony is a factor in

1 its admissibility. It is certainly relevant and probative
2 on a very central point. It has been the point of Mr. Brill's
3 testimony here today.

4 I think it is also rebuttal to TMIA's case in
5 chief, its direct case. TMIA has made the argument, and I
6 would like to read it to you, this is a portion of Tuesday's
7 transcript, at page 30,994, TMIA is discussing its theory
8 that the strip chart was removed and cut on March 28th,
9 and they state, and this is Ms. Bernabei: I also say that
10 it fits in with prior testimony of Mr. Illjes. That in fact
11 engineers and there is a suggestion that perhaps it was a
12 GPU Service Corporation engineer, and I think given the
13 total record, it was probably Mr. Lentz looked and xeroxed
14 the pressure spike and was interested in it. This means
15 there was attention, attention by top technical people on
16 site, GPU Service Corporation people, to the pressure spike
17 on late evening of March 28th.

18 We anticipate that TMIA will make the same
19 proposed findings that testimony by Theodore Illjes indicates
20 that the pressure spike was removed and photocopied at the
21 behest of a GPU engineer, or some finding to that effect,
22 that Richard Lentz was there collecting data, and they will
23 draw the conclusion that Richard Lentz obtained a copy of the
24 strip chart and brought it back to GPU engineers in the
25 observation center.

1 We want to show Mr. Lentz's statement, and I
2 think it is a very key piece of information that is needed
3 to make the record complete. That he doesn't remember -- he
4 doesn't believe that he wanted or obtained a copy of the strip
5 chart. That is the purpose this excerpt is being introduced.

6 The second point Ms. Bernabei raised that she
7 believes that it would be improper if Mr. Lentz is not here
8 to testify. It is a point that has been -- well, I think a
9 large number of deposition excerpts have come in over the
10 last week, often over Licensee's objection. I think it is
11 a procedure that TMIA has taken advantage of, and I think
12 in fairness we should have -- be able to take advantage of the
13 same procedure.

14 This is TMIA's deposition. Ms. Bernabei cross
15 examined Richard Lentz on it, and I don't think she would be
16 prejudiced. It is a very simple point also.

17 MR. GOLDBERG: The Staff supports Licensee's
18 motion.

19 MS. BERNABEI: Can I just respond to a few things
20 that Mr. Lewis said? We will stipulate that we intend to make
21 the argument he just laid out. What I am talking about is how
22 this evidence comes before the Board, and just to touch on the
23 second point, we proposed a number of witnesses, and the Board
24 -- and I can understand the Board's considerations -- that we
25 don't want to be here for the next three months of our lives.

1 If there is some other way of receiving evidence on those
2 witnesses testimony, we will accommodate that if they are not
3 central characters in this drama.

4 We agreed, and with Licensee's agreement, that
5 portions of depositions of these individuals would be entered
6 in lieu of their testimony. That was in lieu of testimony that
7 we wanted. And we were the party that were giving up their
8 live testimony in order to enter portions of their deposition.

9 That is number one. In this case what we have
10 is essentially use, as I see it, of Mr. Lentz's testimony --
11 first of all not as rebuttal. It is not rebutting anything
12 that Mr. Broughton testified to. It is just information that
13 happens to support the Licensee's case.

14 If it is true that it supported their case, they
15 should have brought Mr. Lentz here to testify or made some
16 arrangement in their direct case. But as far as I can see,
17 it does not rebut any testimony we have provided in what I
18 will call our direct case.

19 JUDGE SMITH: If it doesn't, then -- and it is
20 -- then it is moot, and we don't have to worry about it.

21 Where will you get the evidence from which you argue that
22 --

23 MS. BERNABEI: From the Joint Mailgram exhibits.

24 JUDGE SMITH: What?

25 MS. BERNABEI: From the Joint Mailgram exhibits,

1 and from the testimony we have here as to the mission of the
2 GPU Service Corporation.

3 JUDGE SMITH: This could be argued that it is
4 in rebuttal to portions of the Joint Mailgram Exhibits upon
5 which you rely in your case in chief.

6 MS. BERNABEI: But we did not present testimony
7 on that.

8 JUDGE SMITH: What is the difference?

9 MS. BERNABEI: There has been reliance by all
10 parties on portions of the Joint Mailgram exhibit, and that
11 doesn't mean that somebody in this hearing, any party, can present
12 rebuttal testimony to that. Everybody has been restricted to
13 doing is providing rebuttal testimony to the actual witnesses
14 in evidence that has been introduced --

15 JUDGE SMITH: Nobody has been restricted in
16 rebutting a material fact in dispute. That is a distinction
17 to be made to the means by which it is rebutted. Nobody -- I
18 see no difference in the substance of the case where the
19 testimony was adduced by a live witness sitting there at the
20 witness stand, or by stipulated mailgram exhibit with respect
21 to a person's right to rebut it or supplement it, or whatever.

22 If we went back over this case, I don't think we
23 would have seen that pattern at all. If it happened, I
24 certainly wasn't aware of it.

25 MS. BERNABEI: That I assume -- these are

1 stipulated exhibits. These are not part of any party's direct
2 case.

3 What we -- we have proceeded on the assumption
4 that Licensee has presented certain witnesses in its direct
5 case, and also brought attention to the Board --

6 JUDGE SMITH: You mean no part of that volume
7 there is going to be a part of your direct case? No part of it?

8 MS. BERNABEI: What I am arguing is the only thing
9 that we have talked in this hearing about rebutting is -- or
10 we considered we had the opportunity to rebut -- was evidence
11 that was presented in this hearing as part of the party's
12 direct case.

13 And as you know, when we had long discussions
14 about these exhibits, originally, as I understood the Board to
15 say, unless it was brought up in examination of witnesses,
16 there would not -- you would not pay attention to it.

17 You later clarified that to say no, you wanted
18 it brought to the attention of the Board in a timely fashion,
19 and to the other parties attention.

20 None of the parties is going to be able to
21 rebut the evidence in the Joint Mailgram exhibits. That
22 simply has not been a part of the context in which this hearing
23 has appeared. We could have another whole hearing on that.
24 But that is not what this has been about.

25 Essentially, it has been about rebutting testimony

1 presented to this Board for the first time.

2 JUDGE SMITH: I never understood the case to unfold
3 that way. I wish we had a better discussion, but I don't
4 understand any difference in substance as to whether you
5 rebut the testimony of a live witness or --

6 MS. BERNABEI: Let me run back to my original
7 objection. If you remember, when the Licensee filed their
8 first notification to the Board, we had a long discussion about
9 whether that would be permitted. That is, they would be
10 permitted notification to the Board about portions of the record
11 which were not used in examination of a witness.

12 And the Board said if it is done in a timely
13 fashion, even if it is done after the examination of a witness,
14 that is okay. I objected to that at that point, because I said
15 it will not allow the other parties to meet that portion of the
16 other party's case.

17 JUDGE SMITH: That was the timeliness purpose.

18 MS. BERNABEI: Well, once the witness is off the
19 stand, there is no chance to rebut that evidence. What I am
20 saying is here, essentially, is we are talking about allowing
21 a party to rebut evidence -- the joint mailgram exhibit, when
22 the other parties have not been able to do so.

23 JUDGE SMITH; No. I don't agree with you. You
24 have never been denied an opportunity to rebut evidence simply
25 because it existed in the form of a joint mailgram exhibit.

1 That has not been an exclusionary set of evidence.
2 You have failed to appreciate, I believe, the purpose of our
3 requirements that there be timely notification. The very
4 fact -- the very fact that we use the word, 'timely' with
5 respect to announcing the portions of the mailgram exhibits
6 that you intend to rely upon, anticipates that the parties
7 should have an opportunity to rebut. That is obvious. That
8 was the obvious implication of that. So obvious that I would
9 not think it would be necessary to even discuss it now.

10 You are simply wrong that we have had a rule
11 of this case which does not allow a person or party to rebut
12 a mailgram -- stipulated mailgram evidence.

13 MS. BERNABEI: Let me just say, then, that we
14 would propose to draw up a list of new witnesses. We did not
15 realize that opportunity was available, and I would just say
16 that the witnesses we have called have been put under incredible
17 scrutiny.

18 First, we went to a prehearing conference in
19 which that list was distilled. We then went through a long,
20 almost day, this week, on Tuesday, in which other witnesses
21 were allowed. Some were -- we were allowed only through
22 deposition testimony to introduce their testimony. At no
23 point was there any indication from the Board that we would
24 be allowed to produce new witnesses as rebuttal to the notifica-
25 tions that the Licensee had brought up during the hearing.

1 We would have taken advantage of that opportunity
2 if we had known it were available.

3 In fact, I remember specific statements from the
4 Board that if you didn't mention the witness before, we are not
5 going to go over that right now.

6 I assume the witness list we originally presented
7 to you, other than to rebut evidence that has come up in this
8 hearing, that that was the witness list we were stuck with.
9 That is what I understood our directions were. And similarly,
10 I think that would apply to Licensee, except if there is new
11 evidence that comes up during the course of the hearing that
12 they have to rebut, they are limited to the witnesses they
13 announced at the beginning of the hearing.

14 MR. GOLDBERG: Ms. Bernabei cannot point to any
15 rule that no evidence other than the live testimony of witnesses
16 can be rebutted in this case, because there has been no such
17 rule, and with respect to --

18 JUDGE SMITH: And I have never heard in all my
19 years of practicing law, such an approach. Is that the sole
20 basis for your opposition to the Lentz deposition?

21 MS. BERNABEI: Yes. I think without Mr. Lentz
22 being present and an opportunity for cross examination in
23 this hearing --

24 JUDGE SMITH: That is another basis, then?

25 MS. BERNABEI: Yes.

1 JUDGE SMITH: Okay. How do you distinguish
2 between Mr. Lentz' testimony and this deposition, and the
3 huge volume of interviews and depositions that we have received
4 into evidence?

5 MS. BERNABEI: That we propose to call the
6 witnesses. In the alternative, we gave up our right to call
7 witnesses --

8 JUDGE SMITH: You did not give up any right to
9 call witnesses.

10 MS. BERNABEI: Let me say we agreed to stipulation
11 of their deposition in lieu of their live testimony. Thereby,
12 our preference would have been to call them as live witnesses.
13 Given the complexity of some of the issues, and the narrowness
14 of what the use would be in terms of the issue before the
15 Board, we agreed to stipulate in portions of their deposition.
16 That was our right to call the person as a witness. And that
17 was because of Licensee's objection to large portion of our
18 witnesses.

19 In this case, we have not objected to calling Mr.
20 Lentz and having him come here. I think that would be the
21 first step. If there were an objection, and it could be worked
22 out that we would stipulate to this, fine. But I think the
23 first step is to propose Mr. Lentz as a rebuttal witness, at
24 which point we would, if we had an objection raise the objection,
25 and perhaps try to work out something.

1 We would rather have Mr. Lentz come testify
2 about this.

3 JUDGE SMITH: As a matter of fact, I think this
4 examination -- who was the party examining Mr. Lentz?

5 MS. BERNABEI: Me.

6 JUDGE SMITH: This is your own examination of
7 Mr. Lentz on this very issue, and you still don't feel that
8 accepting that deposition is giving you due process, and
9 you represent if you had Mr. Lentz here as a witness you
10 would have adduced different testimony from him?

11 MS. BERNABEI: Very likely. We did not focus
12 on this particular issue, that is right.

13 JUDGE SMITH: You didn't focus on this particular
14 issue? Oh, come on. This is an important sub-issue to you.

15 End 9.
16 SueT fols.

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2 MS. BERNABEI: Let me state that we did not
3 have the evidence we now have available at the time we
4 deposed Mr. Lentz. I'm just stating our position for the
5 record. We can be overruled, but I do not --

6 JUDGE SMITH: Well, no. Don't just state
7 things for the record. You don't anticipate the Board's
8 ruling.

9 You are not trying to persuade us anymore?

10 MS. BERNABEI: Certainly, I am. But what I'm
11 saying is that I think the proper use of deposition testi-
12 mony is either to impeach a witness who is available or
13 if the party that is offering the testimony is willing
14 to settle for the testimony rather than the live witness,
15 okay. And that's all I'm saying.

16 And in this case, we would prefer that Mr.
17 Lentz be brought here for cross-examination. That's our
18 position, and I think legally it's sustainable; that we
19 would object to the introduction of his deposition testi-
20 mony in this regard.

21 (The Board members are conferring.)

22 MR. LEWIS: Judge Smith, if I --

23 JUDGE SMITH: Do you want to be heard?

24 MR. LEWIS: Yes. I would just like to state
25 our position one last time. Regardless of what's in
those Joint Mailgram exhibits, there has been questioning

#10-2-SueT 1

2 of Mr. Illjes on whether the chart was xeroxed. There has
3 been testimony that -- on the 28th. There has been testi-
4 mony that Richard Lentz went to collect data and TMIA
5 stated that it was going to draw an inference from that
6 despite the fact that Richard Lentz himself says I didn't --

7 JUDGE SMITH: Mr. Lewis, I think you have
8 persuaded us as to the subject matter. The question is,
9 Mr. Lentz is available and that being the fact should we,
10 in the circumstances of this case, accept his deposition
11 testimony in lieu of his live testimony over the
12 objections of counsel.

13 I think you probably have one of the strongest
14 arguments that you can make where the deposition was con-
15 ducted by the very counsel objecting and with full ap-
16 preciation of what the issue was. But nevertheless
17 there is a very strong legal evidentiary precedent that
18 when you have a live witness available and that witness
19 could testify, and there has been no particular agreement
20 or stipulation or quid pro quo that I can identify, that
21 she is entitled to it.

22 Now, I'm troubled somewhat by the position of
23 counsel, that she would have us decide an issue with full
24 knowledge that there is evidence to the contrary and
25 foreclose the record to that evidence. I am troubled
by that. I would have preferred to have seen counsel have

#10-3-SueT 1

2 a more flexible approach to it. I don't know if it's a
3 tactic or if you really need the cross-examination of
4 Mr. Lentz on this point.

5 But I do recognize that throughout this pro-
6 ceeding you have been prepared to have us decide critical
7 issues on less than a full and accurate record. And this
8 is an example of it.

9 MS. BERNABEI: Let me state our position,
10 because I don't think that's correct.

11 We think Mr. Lentz gave very credible testimony
12 to the NRC in 1979. I think when he came to his deposi-
13 tion he gave less credible evidence, and it has changed
14 considerably from his 1979 testimony to the NRC on parti-
15 cular points of interest which he knew at that time would
16 be particular points of interest.

17 I think his prior deposition to the NRC frankly
18 is more credible and more reliable for this Board's --

19 JUDGE SMITH: Well, you expect us now after
20 this exchange to pay any attention to any stipulated mail-
21 gram evidence as his previous testimony when you frustrate
22 bringing his deposition testimony in? I don't know.

23 My inclination is, I'm making a judgment, and
24 I know what has transpired this morning and I'm looking at
25 prior interviews that you are offering, I don't know what
I'm willing to accept.

#10-4-SueT 1

2 MS. BERNABEI: Okay. Let me state, first,
3 where we started off. We agreed -- and I don't think
4 legally we had an obligation to do so, but we did agree
5 to stipulate in a portion of Mr. Lentz's testimony on
6 the alarm printout. That's the Licensee Exhibit 2 and 3.
7 And which is a much bigger portion than this, specifi-
8 cally on the alarm printout.

9 We did so because we felt we had an adequate
10 opportunity to cross-examine him. And we felt that his
11 very answers would indicate that cross-examination and
12 the various answers he gave at different times would
13 indicate the credibility or lack of credibility of his
14 testimony.

15 When we felt we had an adequate opportunity
16 to cross-examine him at his deposition on our point, on
17 that particular point, we agreed to stipulate into evidence.
18 And I think that shows some flexibility, because legally
19 I don't think we were obligated to do so.

20 On this particular point, I don't think we
21 took that opportunity, because that was not what we
22 were focusing on.

23 JUDGE SMITH: All right.

24 (The Board members are conferring.)

25 JUDGE SMITH: You are going to have to produce
Mr. Lentz if you want this testimony, not today but some

#10-5-SueT 1

other time I guess.

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MR. LEWIS: We will advise the Board as soon as possible.

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JUDGE SMITH: I beg your pardon?

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MR. LEWIS: We will advise the Board as soon as possible as to our decision. We will take a look at it.

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JUDGE SMITH: All right. We would -- we do have an interest in closing this record. I would be inclined to have some of the testimony next week in Washington if we want it. Okay.

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That's our ruling. So, the exhibit is rejected.

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(The document previously marked

15

as Licensee Exhibit Number 4

INDEXXX

16

for Identification is rejected.)

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JUDGE SMITH: That is Licensee Exhibit 4 that is rejected.

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It really would be very helpful in consideration of the parties who are going to a lot of trouble next week to travel and to change their plans and everything else to have an early notification of Mr. Lentz, of your plans for Mr. Lentz. There is going to be a substantial amount of personal hardship if we -- when we do this.

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There may be another solution to it. And that

#10-6-SueT 1

2 is to close the record with everything with respect to all
3 parts of this issue, begin a schedule for proposed find-
4 ings, defer this sub, sub, sub-issue, I guess is what it
5 is, until we return up here on the 2nd of January, and
6 reopen the record, take Lentz's testimony, and close it.

7 But in the meantime allow the record to be
8 closed in all other respects, allow -- this is a very
9 discreet point -- proposed findings to proceed and every-
10 thing else proceed. That's what I would recommend.

11 I don't want to see next week disrupted. I
12 don't want to see you foreclosed from what is obviously
13 relevant and important information with respect to your
14 case. So that is probably what I would propose that you
15 do.

16 MR. BLAKE: I suspect that will work out.
17 Mr. Lentz is no longer an employee of the Company, and so
18 it may frankly take us that long to make physical arrange-
19 ments.

20 JUDGE SMITH: Well, am I wrong about his
21 availability, then? Who is he, where does he live?

22 MR. BLAKE: He lives in upstate New York.

23 MS. BERNABEI: Syracuse, near Syracuse.

24 JUDGE SMITH: You know, I am distressed, Ms.
25 Bernabei, about your intrasigent attitude on this. I
simply don't think it is necessary. I think you have

#10-7-SueT 1

2 prevailed on a legal technicality. You are putting the
3 parties to a disproportionate amount of inconvenience.
4 You have accepted, throughout this proceeding, without
5 live witnesses, without examination, information of equal
6 importance. And I really don't understand it. I didn't
7 understand that Mr. Lentz was so far away.

8 Let's consult.

9 MS. BERNABEI: I would just say that we were
10 put to the inconvenience and the expense --

11 JUDGE SMITH: You are interrupting my consulta-
12 tion.

13 MS. BERNABEI: I'm sorry.

14 (The Board members are conferring.)

15 JUDGE SMITH: You stated, Ms. Bernabei, that
16 since you took this deposition you have come into pos-
17 session of additional information which you would use
18 in cross-examination; is that correct?

19 Is that what you stated?

20 MS. BERNABEI: Yes, that we would -- what I
21 said, or what I meant to say, is we would be better
22 prepared to cross-examine him today than at the time of
23 his deposition.

24 JUDGE SMITH: Better prepared?

25 MS. BERNABEI: That's right.

JUDGE SMITH: Just on the question of

#10-8-SueT 1

preparation?

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MS. BERNABEI: Well, you are talking now about additional information. I think we would have additional information in terms of the strip chart itself.

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We did not -- and I will state very frankly, at that point we did not focus physically on the strip chart, including the information Mr. Brill testified to here today. If you will note -- if you read the entire deposition, including the parts we stipulated in with the Licensee, our focus in that was on the alarm printout.

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And that is the part we felt we had an adequate opportunity to cross-examine Mr. Lentz on and we stipulated in with the Licensee. Our focus at that point was not removal of the strip chart. We did question him on that but not on this particular portion.

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And we would be better prepared today to cross-examine him, given what has happened in this hearing.

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JUDGE WOLFE: Well, this part of the deposition that the Licensee proposed to offer into evidence does not bear on the techniques of the recording mechanism whatever.

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MS. BERNABEI: I think --

JUDGE WOLFE: It was the rebuttal testimony

that the Licensee wishes to offer into evidence, as I

#10-9-SueT 1

understand it, is whether Mr. Lentz saw this, these tapes
and whether he had any custody or charge over these tapes.

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Isn't that it? So actually you have no

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right --

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MS. BERNABEI: It's --

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JUDGE WOLFE: -- to cross-examine him in

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extension of over the purpose for which they are offering
this portion of the deposition.

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Isn't that correct?

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MS. BERNABEI: I will have to review it. But

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I don't think that's quite correct. As I understand it,

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this has to do --

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Sim 11-1

1 JUDGE WOLFE: Well, let's get back to Mr. Lewis.
2 What is the purpose of the offer?

3 MR. LEWIS: The purpose of our exhibit will be
4 to rebut TMIA's findings, which, as we understand and as TMIA
5 has just today stated, will be that the chart was, according
6 to the testimony of Illjes, removed and Xeroxed at the behest
7 of a GPU engineer on the 28th.

8 Richard Lentz was an engineer who was on the
9 island to collect data that evening. Ergo, Richard Lentz
10 obtained the copy, and this last point is an inference which
11 we think is not supported, and in fact it is refuted by
12 Mr. Lentz' own statement.

13 The inference is that Richard Lentz obtained the
14 strip chart and brought it back to the observation center.
15 Richard Lentz was in fact part of the stipulation. The
16 stipulated portion of Richard Lentz' deposition that has
17 already gone in, that has already been received into evidence
18 was a portion where TMIA questioned Mr. Lentz on whether a
19 strip chart could be copied without removing the entire
20 strip chart from the rolls.

21 (Board conferring.)

22 MS. BERNABEI: If I can just address, Judge Wolfe,
23 your point and Mr. Lewis' point.

24 We do have more information today about the
25 specific portion that the licensee wants to address, and that

Sim 11-2

1 is whether or not the strip chart was Xeroxed on that
2 evening.

3 I would also say that we believe there is a
4 credibility problem in this regard with Mr. Lentz today,
5 and we will be very straightforward with that, and that the
6 Board should observe his demeanor on testifying on this
7 particular point. We don't think we focused on it in the
8 deposition adequately to bring that across to the Board.

9 JUDGE WOLFE: Well, see, here you go again.
10 We have told you that when you have objections that you are
11 to make your objection and exhaust yourself. Now you are
12 raising a new point, an altogether new point.

13 MS. BERNABEI: I don't think so. I think it is
14 the same due process ---

15 JUDGE WOLFE: It is an extension of the point
16 that you have a right to have a live witness.

17 (Board conferring.)

18 JUDGE SMITH: We will let the ruling stand. Any
19 time during the week of January 2nd or during the remainder
20 of this first segment of the hearing you can bring Lentz in
21 if you see fit and we will get him on and off, and it will
22 be that very narrow subject matter of this hearing which
23 will remain open. Other than that we are closing the record
24 on the Mailgram issue and we will move to the proposed
25 findings.

Sim 11-3

1 MS. BERNABEI: We have a couple of housekeeping
2 matters. We have made copies of TMIA Exhibit 38 and 39,
3 that is Mr. Abramovici's notes and one copy of Mr. Broughton's
4 notes.

5 We have also made copies of TMIA Exhibit 33-F
6 which is the Boyer questionnaire which had a page missing in
7 the original exhibit.

8 JUDGE SMITH: All right.

9 MS. BERNABEI: And we would also propose to
10 distribute to the parties those pages of the Keaten notes
11 which have been agreed to as an official stipulated copy
12 between the parties. This would be substituted or put
13 together with TMIA Exhibit 10.

14 JUDGE SMITH: Why do I have two?

15 (Pause.)

16 JUDGE SMITH: We have been handed the Keaten note-
17 book and what are we supposed to do? We are supposed to
18 substitute pages?

19 MS. BERNABEI: That is correct.

20 JUDGE SMITH: Are there any objections to the
21 substituted pages for Exhibit 10? That has been stipulated
22 to.

23 Now, Mr. Boyer, you have the whole questionnaire.

24 MS. BERNABEI: That is the whole questionnaire.

25 JUDGE SMITH: Which we will substitute for the

Sim 11-4

1 entire Exhibit 33-F.

2 And then we have this. What is this?

3 MS. BERNABEI: That is 38 I believe. Those are
4 the Abramovici notes.

5 (Pause.)

6 MR. LEWIS: No, Abramovici is 39.

7 MS. BERNABEI: That is correct, Exhibit 38.

8 JUDGE SMITH: All right. What is the other one?

9 MS. BERNABEI: It is one page of Mr. Broughton's
10 notes and it is Exhibit 39.

11 JUDGE SMITH: Abramovici is 38 or 39 now?

12 MS. BERNABEI: Abramovici is 38.

13 MR. GOLDBERG: Is that received into evidence?

14 MS. BERNABEI: Yes.

15 JUDGE SMITH: Yes.

16 MR. GOLDBERG: I don't have it in evidence.

17 MS. BERNABEI: Well, I will move it into
18 evidence.

19 JUDGE WOLFE: Well, it is part of another exhibit,
20 but it is smaller; isn't that right?

21 MS. BERNABEI: It is 39. Broughton is 39 and
22 that is the one that is a portion of another exhibit.

23 JUDGE WOLFE: Oh, all right.

24 JUDGE SMITH: I thought we had received Abramovici's
25 notes into evidence. But if we haven't, is there any

Sim 11-5

1 objection?

2 (No response.)

3 JUDGE SMITH: All right. It is received. I
4 think it has been received twice.

5 (TMIA Exhibit 38, previously
6 marked for identification, was
7 received into evidence.)

8 JUDGE SMITH: And Broughton is 39, and did we
9 receive that? I think we have.

10 In any event, if we haven't, we have now.

11 (TMIA Exhibit No. 39, previously
12 marked for identification, was
13 received in evidence.)

14 MS. BERNABEI: There are two remaining issues.
15 One is the joint stipulated exhibit which has been labeled
16 32 with subparts A, et cetera. We just have to know how
17 the Board wants those received.

18 It is essentially a big pile of exhibits.

19 JUDGE SMITH: Of 31-A, B and C?

20 MS. BERNABEI: And there are others which follow.
21 That is the stipulated book of exhibits.

22 JUDGE SMITH: I thought the stipulated book of
23 exhibits would just continue the item numbers in the Joint
24 Exhibit 1, or doesn't that work?

25 MS. BERNABEI: We made it a TMIA exhibit.

INDEX

Sim 11-6

1 JUDGE SMITH: The whole extra book?

2 MS. BERNABEI: That is right. That was on
3 Licensee's suggestion. We made it a TMIA exhibit. So it is
4 now in the record as TMIA Exhibit 32-A, B and C, through K.

5 MS. BERNABEI: It is in the record as 32. It is
6 the collective results of Tuesday's argument about portions
7 of depositions.

8 JUDGE SMITH: Right. I did not understand that
9 process.

10 MR. BLAKE: And we have had occasion since to
11 refer on the record to a couple of those and they have been
12 identified as 32-A, B and C so far. That doesn't include
13 all of those which would have been a portion of TMIA Exhibit
14 32.

15 JUDGE SMITH: All right.

16 MR. BLAKE: What we should do is identify the
17 other documents that are in that package and give them letters
18 beyond C and then just ---

19 JUDGE SMITH: That would be logical it seems
20 to me.

21 MS. BERNABEI: Okay. I can identify them at this
22 time.

23 JUDGE SMITH: How long is that going to take?
24 How many are there?

25 MS. BERNABEI: Through K. A through K. I don't
care. I just brought it up so that the Board would understand

Sim 11-7

1 this book of documents.

2 JUDGE SMITH: I guess we have to get it in
3 the transcript. Go ahead and do it quickly, would you please.

4 MS. BERNABEI: I will not repeat A, B and C.

5 D are portions of Mr. William Yeager's deposition
6 taken on October 10, 1984.

7 32-E are a portions of Richard Bensen's deposition.

8 32-F is a November 1, 1984 letter from Thomas
9 Crimmins to John Thorp.

10 32-G is portions of Walter Marshall's deposition.

11 32-H are portions of Mr. Abramovici's deposition
12 of October 15, 1984.

13 32-I are portions of Richard Lentz' deposition
14 of October 15, 1984.

15 32-J are portions of Michael Ross' deposition of
16 September 27, 1984.

17 32-K is the entire James Moore deposition of
18 September 26, 1984.

19 Plus corrections.

20 JUDGE LINENBERGER: Plus corrections to the entire
21 package or just to K?

22 MS. BERNABEI: To K.

23 JUDGE SMITH: That is a stipulated exhibit?

24 MS. BERNABEI: Yes.

25 JUDGE SMITH: All right, it is received. That

Sim 11-8

1 is received.

2 That is TMIA Exhibit 32 D through K?

3 MS. BERNABEI: It would be A through K. I don't
4 think the other ---

5 JUDGE SMITH: A through C had not previously been
6 received?

7 MS. BERNABEI: I do not believe so.

8 JUDGE SMITH: All right. That is a correction
9 then, A through K.

10 (TMIA Exhibit 32-A through 32-K,
11 inclusive, were marked for
12 identification and received into
13 evidence.)

14 MS. BERNABEI: The only other remaining exhibit
15 that I think is pending before the Board is TMIA Exhibit 25
16 which is the OIA report.

17 JUDGE SMITH: We dealt with that this morning.

18 MS. BERNABEI: You received that?

19 JUDGE SMITH: Yes.

20 MS. BERNABEI: Okay. Thank you.

21 JUDGE SMITH: Are you going to provide copies of
22 those latest exhibits to the Board, the 32 series?

23 MS. BERNABEI: Yes.

24 JUDGE SMITH: Are you going to do it now or are
25 you going to do it by mail or how?

Sim 11-9

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MS. BERNABEI: We can do it right now.

Unfortunately, we had some problem bidding it.

(Board conferring.)

JUDGE SMITH: See, this is what we did not want,
loose papers.

MS. BERNABEI: I understand that. That is why
I was hoping it would just be a continuance.

Well, we have no choice. So we will take them
the way you have them.

MS. BERNABEI: What we could do is provide them
to you next week in Washington bound, if you would like that.
The parties have the exhibits. So it is not a problem. It
would be for the Board and for the court reporters.

JUDGE SMITH: Well, we certainly can wait until
next week to get them.

MS. BERNABEI: Okay.

(Pause.)

JUDGE SMITH: Are you ready for the proposed
findings?

MR. BLAKE: I believe that is the only remaining
piece of business.

JUDGE SMITH: What will you do? You will provide
a bound version of the exhibits to the reporting service?

MS. BERNABEI: Yes.

Sim 11-10 1

JUDGE SMITH: I think that would be preferable.

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Well, can we move to the proposed findings now.

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I guess we will begin with licensee's proposal.

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I have read through it a couple of times and it somewhat surprised me. It is not exactly how I had envisioned it. However, I think that it covers every approach, every issue that we have heard here.

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I haven't consulted with the other two Board members, but I don't have any problems with it. I am sure it will direct us to the proposed findings.

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Just remember, the purpose of this is not to describe an issue or a sub-issue or anything else. It is to enable us to find the position of the party as to each issue without reading a large part of the proposed findings.

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We want to know where we can find each proposed finding on each issue.

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MS. BERNABEI: Okay. We have grave problems with this outline. I can just say that essentially the way we have perceived -- the way we have perceived this is as essentially licensee's argument on the issue.

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What I would propose is that we submit another outline for the Board's consideration. Essentially what we tried to do was outline the issues with two ideas in mind, one, to track as closely as possible the Board's language and the Appeal Board's language and their opinions.

Sim 11-11 1

2 Two, to ensure that the factual description of
3 any of the issues would not have to be repeated with each
4 argument, and I think the licensee's outline suffers from
5 both of those infirmities.

6 One, essentially the issues are phrased in terms
7 of the licensee's argument and not in terms of how the Board
8 itself phrased its issue.

9 And, secondly, that there will be several factual
10 points which will have to be repeated several times in each
11 argument.

12 I could propose to the Board now our alternative
13 structure, and again what we tried to do was track the Board's
14 own language in its opinion, since I think what should be done
15 is essentially a rephrasing of the issues in the logical form.

16 JUDGE SMITH: Well, I am afraid you want to get
17 into a debate on the substance of issues, and that is not
18 what we want. We simply want an identifiable place in the
19 proposed finding where an issue is discussed.

20 I read it through anticipating before I read one
21 word that you were going to argue about it. I just anticipated
22 it. So I read it through to see if it had the defect that
23 you say it did, and on my own I could not find that defect.
24 I could not find any bias in it.

25 I read these various words and I do not see what
you are talking about.

Sim 11-12

1 MS. BERNABEI: Okay. Can I give you an example,
2 Judge Smith?

3 JUDGE SMITH: All right.

4 MS. BERNABEI: For instance, first of all, I do
5 not understand the issue to be what it is stated to be on
6 Item 1, whether Mr. Dieckamp acted in careless disregard for
7 the mailgram's accuracy.

8 JUDGE SMITH: I am going to have a hard time
9 agreeing with you because I think they have captured almost
10 my own language.

11 MR. BLAKE: That came out of a Board memorandum
12 and order.

13 MS. BERNABEI: The Board memorandum that I
14 understand was did Mr. Dieckamp know or should he have known
15 that the mailgram was inaccurate. I believe that ---

16 JUDGE SMITH: Now you are arguing the issue.

17 MS. BERNABEI: No. I believe that is the issue
18 as phrased by the Board.

19 JUDGE SMITH: I am not going to argue the issue
20 with you. We have gone over it. And, as a matter of fact,
21 I recall two and maybe three times discussing with you your
22 inaccurate concept of the scope of that issue.

23 You can use it or not. I am willing to accept --
24 if this is going to be the basis of your argument, I am willing
25 to accept the licensee's proposal and you can be bound by it.

Sim 11-13

1 You can rephrase the issue if you want to in
2 your proposed findings. You certainly are not obliged to
3 accept that as your view of the issue.

4 We will accept this as licensee's burden of
5 proof. Having the burden of proof, the licensee then is
6 going to have to organize their proposed findings in some
7 way. This is certainly an appropriate way.

8 What we are telling you is if you want us to
9 be assured that we will pick up all of your argument on
10 this, you had better have a comparable organization. Other-
11 wise, it is physically impossible to every time you address
12 an issue to read all of the pages of proposed findings that
13 you have.

14 MS. BERNABEI: Okay. I can assure the Board
15 we will not make the same arguments that the licensee has
16 made in this outline, specifically whether Mr. Dieckamp had
17 a reasonable -- I do not believe that these are issues before
18 the Board.

19 On page 2, Item 4, did Mr. Dieckamp have a reasonable
20 basis to believe that subsequent evidence on the mailgram was
21 available to mailgram recipients, supposedly the Commissioners
22 in this case.

23 JUDGE LINENBERGER: Ms. Bernabei, excuse me, but
24 I hear you going into the very things that the Chairman just
25 said the Board does not want to go into at this time.

Sim 11-14

1 The Chairman further advised you that if you had
2 a different view of the matter, you had every opportunity
3 to follow your different view.

4 We only indicated our acceptance of what the
5 licensee has submitted. You have characterized that submittal
6 as an argument that this Member of the Board does not charac-
7 terize it as an argument. But that is a minor point.

8 Let's just say if you view life differently, you
9 certainly have a right to approach it the way you see it.

10 JUDGE SMITH: You see, it is not up to you to
11 say that the licensee cannot argue this as an issue at this
12 time.

13 MS. BERNABEI: I agree.

14 JUDGE SMITH: All right. Therefore, your remedy,
15 if you don't believe -- is that 4-B you were referring to?

16 MS. BERNABEI: I am talking about all the items ---

17 JUDGE SMITH: No. The one that you just read.

18 MS. BERNABEI: 4-A.

19 JUDGE SMITH: 4-A. All right. If you believe
20 that that is not appropriately an issue, no problem. Just
21 do not address it. But if you believe that that is an issue,
22 do not make us look for it someplace else throughout all of
23 your proposed findings.

24 MS. BERNABEI: Okay. So if I understand corectly,
25 we are free to organize our proposed findings in a way that

Sim 11-15 1 we think addresses the issues as outlined by the Board in
2 its prehearing orders and during this hearing?

3 We do not want to follow this outline because
4 this is the licensee's argument.

5 JUDGE SMITH: Look, if you do not follow an
6 outline which addresses these points or your version of
7 these points -- you are not ignorant of the issues in this
8 case.

9 MS. BERNABEI: I understand that.

10 JUDGE SMITH: When they make a statement on one
11 of these numbers, you know full well exactly what they are
12 talking about. You know what it is. If you don't know what
13 it is, then I would have to conclude that you cannot make
14 a contribution to the record. There is nothing here that
15 you sitting there do not know what they are talking about.
16 You know all of it.

end Sim
Joe fols

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1 Now, I want you to follow this organization. You
2 are free not to follow it. If you do not follow it, you have
3 no assurance that we will accept your proposed findings on
4 that particular issue, because we may not even find it.

5 MS. BERNABEI: What I would say, I would move --

6 JUDGE SMITH: I am giving you the opportunity to
7 present your proposed findings in a fashion which will assure
8 you the best; that the Board will see your arguments and
9 understand them.

10 MS. BERNABEI: Okay. Then I would move to
11 certify the Board's acceptance of Licensee's proposed findings,
12 and --

13 JUDGE SMITH: You are free to reject them. You
14 don't have to do it.

15 MS. BERNABEI: What I am saying is the Board has
16 indicated its predetermination to accept this outline, and
17 reject other parties organization issues. I do not think this
18 fairly states the issues. I think it is their argument.

19 If we are forced to address the issues in this
20 fashion, we are foreclosed from addressing the issues before
21 this Board.

22 JUDGE SMITH: You do whatever you wish. Anything
23 further?

24 MS. BERNABEI: Yes. I move to certify this to the
25 Appeal Board.

1 JUDGE SMITH: Denied. Anything further?

2 MR. GOLDBERG: I have just one comment on the
3 Licensee's outline. As a general matter, as far as the
4 substantive issues before this Board, I think it captures
5 everything, and the parties findings can be proposed in
6 accordance with this outline.

7 There is one concern that I do have, and that
8 is that over the Staff's objection, there was certain
9 collateral issues introduced into this proceeding which we
10 didn't feel belonged here, were necessary, but nevertheless
11 were litigated, and now for which I will propose findings.

12 And I am not certain at this time that it can be
13 done throughout this outline, and I may feel it necessary to
14 add another section which very clearly identifies another
15 sub-issue on which I can propose findings all in one place,
16 for the same purpose the Board wanted an outline to follow.
17 Rather than weave it through this outline, I may want a separate
18 section on other issues which are related to the Dieckamp
19 mailgram issue which were litigated in this proceeding.

20 JUDGE LINENBERGER: Mr. Goldberg, can you give
21 us a for instance of a collateral issue?

22 MR. GOLDBERG: Yes. The adequacy of the investi-
23 gation into information flow conducted by the NRC Staff.

24 JUDGE LINENBERGER: Okay.

25 JUDGE SMITH: I am somewhat concerned about what

1 is going to happen about the proposed findings.

2 Number one, you will recognize that the rules
3 provide that when ordered to file proposed findings, and
4 failure to file proposed findings on a particular issue would
5 be a default. You recognize that as being a part of the
6 Commission's rules?

7 MS. BERNABEI: Yes, I understand under certain
8 circumstances that is recognized as a default.

9 JUDGE SMITH: And consistent with that regulation,
10 you are directed to file proposed findings on issues that you
11 wish to pursue, and if you fail to do it you will be in
12 default.

13 This is an instruction to all parties, not just
14 you, but to all parties.

15 MS. BERNABEI: Perhaps I could suggest --

16 JUDGE SMITH: I am just now touching base with the
17 regulation which first requires we instruct you to file
18 proposed findings, and we are instructing you to file proposed
19 findings, and we are informing you if you fail to file proposed
20 findings, you will be in default.

21 MS. BERNABEI: I understand the regulations,
22 Judge Smith.

23 JUDGE SMITH: I know. And you also understand
24 the regulations require me to inform you of this?

25 MS. BERNABEI: Yes.

1 JUDGE SMITH: And I am done doing that.

2 MS. BERNABEI: So --

3 JUDGE SMITH: You understand you have received
4 the notice.

5 MS. BERNABEI: Of course. I read the rules,
6 and have participated in proceedings such as this.

7 JUDGE SMITH: You are being inpertinent.

8 MS. BERNABEI: I am not. I don't see the purpose
9 of the Board's admonition.

10 JUDGE SMITH: The purpose of the admonition is
11 that the rules require that we tell you this. And I am
12 satisfying that portion of the rule.

13 MS. BERNABEI: If I can state our position.
14 Our position is this outline does not fairly state the issues.
15 If we are forced to follow this outline, and the Board has
16 suggested we should, otherwise we may default on certain
17 points. We feel we would not be given a fair opportunity
18 to present our case. These are not the issues that you
19 outlined in your prehearing order.

20 These are not the issues that the Appeal Board
21 told you to address, and these are not the issues that have
22 been litigated in this proceeding.

23 JUDGE SMITH: You may, if you wish, however,
24 redefine the issues as you submit your proposed findings, but
25 you should follow this organizational outline. You are not,

1 I repeat, not required to accept this definition of any issue.

2 We are talking only about the physical organization
3 of your proposed findings. Nothing else. The physical
4 organization of your proposed findings. How we can look in
5 your proposed findings, and what you have to say.

6 If you wish you can, for example, take Item 1.
7 Use that and you can say your view of Item 1. Now, you have
8 not come to us and told us any view how the organization, qua
9 organization is unacceptable. Every word you have stated
10 now has been the definition of the issue does not meet your
11 standards.

12 And this is not what we are talking about. And
13 I am very frustrated that I can't seem to get you to understand
14 the difference between a physical place in proposed findings,
15 as compared to the language and ideas of the scope of the issue.

16 MR. AU: I am trying to understand your instructions
17 in regard to this outline. Suppose we were to file say "X"
18 facts relates to something. We then say that relates to
19 Issue 1-C and 2-B, and 3-D, or whatever?

20 JUDGE SMITH: You can do it that way if you wish.
21 It is very hard to work with that. I have seen very, very
22 often proposed findings that will take issue No. 1, for example,
23 whether Mr. Dieckamp acted in careless disregard, up here
24 in all places throughout all of the proposed findings.

25 Maybe throughout. Another example, and another

1 example of careless disregard. From page 1 through page 200.

2 When it comes time to write the decision, it
3 is virtually impossible to carry in your mind all those
4 references, and it is virtually impossible to go back to the
5 proposed finding and see what the parties believe on that
6 issue, and I am simply trying to afford Ms. Bernabei and you
7 an opportunity to have the most effective assurances that your
8 arguments will be understood.

9 Now, other than that we can't help you any more.
10 I have viewed this entire thing to be a matter to assist you
11 to have your point raised. We will read the Licensee's proposed
12 findings exactly the way they have them organized, because we
13 must.

14 MS. BERNABEI: Well, can I just -- I don't
15 understand how we can organize. I don't understand the
16 organization presented here. Let me give you one example.
17 The first question is whether Dieckamp in sending the mailgram
18 acted in careless disregard for its accuracy.

19 It seems to me that nowhere in there is there
20 some issue, or sub-issue about whether the mailgram is
21 accurate.

22 That is a necessary component of whether Mr.
23 Dieckamp acted in careless disregard for the mailgram's accuracy.
24 Whether the mailgram was accurate.

25 JUDGE SMITH: That is exactly right.

1 MS. BERNABEI: So where do we put the information
2 about whether or not the mailgram was accurate.

3 JUDGE SMITH: That is in there. I can find it.
4 If you are saying it is incomplete, that is another matter.

5 MS. BERNABEI: I don't understand the organization.

6 JUDGE SMITH: Then I can't help you, counsel.
7 As a matter of fact, however, I have watched your wrestling
8 with the issues in the case, and I do believe you have had
9 trouble understanding the issues, and I can't provide any
10 further guidance for you. You read what we had to say, and
11 this is what we are expecting.

12 MS. BERNABEI: Judge Smith, can I state for the
13 record what our proposed outline would be, and then maybe you
14 can see --

15 JUDGE SMITH: I don't want you to read it. It
16 is late.

17 MS. BERNABEI: I will only take a few minutes.

18 JUDGE SMITH; All right.

19 MS. BERNABEI: One, is the mailgram accurate?
20 That is --

21 JUDGE SMITH: That is a good point.

22 MS. BERNABEI: Two, assuming that the mailgram
23 is inaccurate, did Mr. Dieckamp know at the time he sent it
24 it was inaccurate. Specifically, what information was
25 available to him. Given the purpose of the mailgram, did he

1 expect the mailgram to be relied on in the regulatory process,
2 and did he intentionally misstate the information that was
3 available to him.

4 Third point, if it was correct that Mr.
5 Dieckamp did not know it was incorrect on May 9th, should
6 he have known that it was incorrect. First you define Mr.
7 Dieckamp's duty regarding the accuracy of the mailgram
8 given its purpose, and secondly, if he had any obligation
9 to do an investigation or inquiry to insure its accuracy,
10 and finally whether or not he took those actions to meet
11 up to his duty to ensure its accuracy.

12 And the last point being did he have any duty
13 to correct it. One, if it is inaccurate. If he did not
14 know at the time he sent it it was inaccurate, but he
15 subsequently learned it was inaccurate, did he have a duty
16 to correct it.

17 That would be a sensible outline for these
18 points. One predicated on the other.

19 JUDGE SMITH: I think you could make all these
20 points with Licensee's outline. It would assist us if you
21 would. However, if you make the points that you wish to make,
22 and you make them within an identifiable organization, and you
23 don't talk about them all throughout your proposed findings
24 we can work with it.

25 I am just simply informing you as my experience

1 in writing decisions, if you make arguments intertwined all
2 through your proposed findings, you may or may not succeed
3 in getting them considered the way you want to.

4 All right. Is there anything further?

5 MR. BLAKE: You want to discuss schedules?

6 JUDGE SMITH: What do you propose?

7 MR. BLAKE: Although I would like to do better
8 than the regulations, since we are talking about one issue,
9 it is an extended schedule, and we are also facing the
10 training hearing and, therefore, I would propose that we
11 follow the normal schedule, and not try to do better than
12 that.

13 That schedule would be for Licensee on January 14th,
14 for TMIA and the Commonwealth, on January 23; for the NRC Staff
15 on February 4; and then an opportunity for Licensee's reply,
16 after -- finally by the Staff February 14.

17 End 12.
18 SueT fols.

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2 That's what I put on the table, and that
3 essentially tracks the thirty day, forty day, fifty day
4 business accounting for week-ends.

5 JUDGE SMITH: Mr. Au.

6 MR. AU: Okay. I know I'm going to have a
7 problem meeting January 23rd. I have scheduled an
8 argument in the Sixth Circuit that preceding week.

9 JUDGE SMITH: You know, you are free to file
10 earlier if you wish.

11 MR. AU: I understand that. And certainly
12 we will begin working on that.

13 JUDGE SMITH: So, you oppose that schedule?

14 MR. AU: I don't have a calendar in front of
15 me. I'm trying to look at the precise dates.

16 JUDGE SMITH: Mr. Au, may I expect that your
17 proposed findings will have some relationship in proportion
18 to your participation in the case?

19 MR. AU: We will not be filing a broad range
20 of proposed findings. It will be on selected issues, as
21 we see it.

22 If I can be given until January 25th I think
23 that would be acceptable.

24 JUDGE SMITH: All right. We have 1/14 for
25 the first filing, 1/23 for --

MS. BERNABEI: We have an objection to that.

#13-2-SueT 1

JUDGE SMITH: Yes. I want to get these

2 scheduled.

3 MR. BLAKE: 1/23, TMIA/Pennsylvania. February

4 4 --

5 JUDGE SMITH: For TMIA and Commonwealth?

6 MR. BLAKE: Right. And then 2/4, February 4,
7 Staff. And 2/14, the reply.

8 JUDGE SMITH: All right. Would you comment?

9 MS. BERNABEI: Yes. At this point, we are
10 lead Intervenor on several issues on the training issue
11 and, therefore, we don't know exactly what the division
12 of responsibility on those issues will be at this time
13 until after we have had time to consult with UCS. But
14 it is expected that we will maintain that position on
15 some of the issues.16 Given that and given the holiday season at
17 the end of the month, I would propose three additional
18 weeks for our findings, until February 13th.

19 JUDGE SMITH: Mr. Goldberg?

20 MR. GOLDBERG: I don't have any objection
21 to the Licensee's proposed schedule.22 JUDGE LINENBERGER: Ms. Bernabei, do I
23 understand your proposal to be to defer the January 23
24 date to February 15th?

25 MS. BERNABEI: I said 13th, which I think is

#13-3-SueT 1

three weeks.

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JUDGE LINENBERGER: All right. The 13th?

3

Excuse me. Thank you.

4

MR. GOLDBERG: Does the Licensee have any position on Ms. Bernabei's request for additional time?

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MR. BLAKE: No. As I stated earlier, I started by hoping that it was one issue, that we would be able to improve on the phenomenal schedule but recognizing that we had the training hearing.

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I thought it was a fair schedule, since we have to go first and we are the closest in time to the holiday period and the training issue.

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To the extent the Board thinks that some additional time is in order, I would urge them to extend the schedule right along, keep the same intervals such that if TMIA's schedule is seen by the Board of January 23 to be too short on this issue and an additional week is granted to them I, too, would seek the additional week.

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We will meet the schedule, and we will meet whatever schedule is put on. But to the extent overall, there is some effect on the bottom line that we would like to get the same advantage that other parties do.

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(The Board members are conferring.)

23

JUDGE WOLFE: Off the record.

24

(An off-the-record discussion ensues.)

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#13-4-SueT 1

JUDGE SMITH: We will give some of the relief requested by Three Mile Island Alert but not all of it. Our consideration is, we can't really give too much weight to your perceived responsibilities in the training issue but we are also aware that you have been occupied full time here, and that the rest of the year is the holiday season.

We recognize that the Licensee has a right to as prompt as possible disposition in this issue, and that would begin with proposed findings. But at the same time, there is no point in pushing everybody to get proposed findings into our desk and have them sit there unread when we are too busy to read them.

So, we are taking into account the fact that we want to give the parties the maximum amount of time consistent with the utility. And we don't think that we can, given how the training issue is coming along, and other matters that we have neglected at the office, we think that probably the earliest we can begin dealing with proposed findings would be the 28th of January.

So, that would be adding two weeks. Even then it may be optimistic. I don't know how that training issue is going to go.

But we think that that is a realistic time when we will have that issue put to bed and be free to turn

#13-5-SueT 1

2 our attention to the training issue. And then we will
3 follow the regulatory intervals after that, which we
4 haven't calculated.

5 That would be the 28th plus ten days.

6 MR. BLAKE: If I can just get agreement now.
7 My suggestion would be for the TMIA/Pennsylvania then
8 following the Board's advice, rather than January 23rd
9 for the forty day interval it would now be February the 6th.

10 Do we have agreement?

11 MS. BERNABEI: Right.

12 JUDGE SMITH: Okay.

13 MR. BLAKE: The next date would be NRC Staff,
14 rather than February 4 would be February the 18th, although
15 I have a red -- it's red on my calendar which suggests to
16 me it may be a birthday of some sort, and so I would state
17 it would have to be the 19th.

18 MR. GOLDBERG: That red is also on the Federal
19 calendar as a holiday.

20 MR. BLAKE: All right. So, it's going to be
21 February 19th for the NRC Staff.

22 MR. GOLDBERG: I would rather have it February
23 15th instead of the 19th.

24 JUDGE SMITH: Yes, make it the 15th. We
25 are encouraging you, Mr. Goldberg, to use the method of
adopting piggyback findings, adopting those that you agree

#13-6-SueTQ

1 with by reference and then supplementing only where you
2 disagree or you have to supplement.

3 MR. GOLDBERG: Yes, that's our intention.

4 February 15th for the Staff?

5 JUDGE SMITH: Yes, that would be helpful.

6 MR. BLAKE: And that would be the 25th

7 for Licensee.

8 JUDGE SMITH: Okay. That would be satisfactory.

9 And we are going to impose a page limitation of two hundred
10 pages on this, including appendices but not including the
11 table of contents.

12 MR. GOLDBERG: And it must be double-spaced.

13 JUDGE SMITH: It must be double-spaced and

14 I guess footnotes, a reasonable amount.

15 END #13

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Sim 14-1

1 MR. GOLDBERG: I had two other matters in
2 connection with findings that I wanted to raise, and that
3 is that some Licensing Boards have asked the parties to
4 submit an opinion separate from and to be followed by findings
5 of fact, and that has not been this Board's practice in the
6 past in this proceeding, and I just wanted to get clarifica-
7 tion that you are not asking the parties to submit a separate
8 opinion to be followed by separate findings of fact?

9 (Board conferring.)

10 JUDGE SMITH: We don't require that.

11 I guess we have somewhat abandoned any hope
12 of having agreed upon background data.

13 MS. BERNABEI: Sure, we could do that.

14 MR. BLAKE: Don't abandon it. I am going to
15 make a draft and give it a try.

16 JUDGE SMITH: Okay. That would be helpful if
17 you could do that.

18 MR. BLAKE: We will keep trying.

19 JUDGE SMITH: All right. Anything further?

20 (No response.)

21 JUDGE SMITH: All right. With that we are
22 adjourned and the record is closed except as I indicated with
23 respect to Mr. Lentz.

24 (Whereupon, at 1:33 p.m., the hearing adjourned.)

25 * * * * *

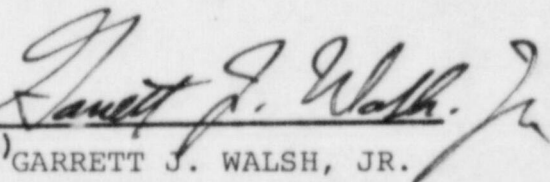
CERTIFICATE OF OFFICIAL REPORTER

This is to certify that the attached proceedings before the
UNITED STATES NUCLEAR REGULATORY COMMISSION in the matter of:

NAME OF PROCEEDING: Metropolitan Edison Company, Three Mile Island
Nuclear Station, Unit 1

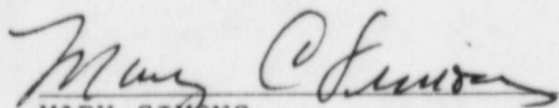
DOCKET NO.: 50-289-SP
PLACE: Harrisburg, Pennsylvania
DATE: Friday, December 14, 1984

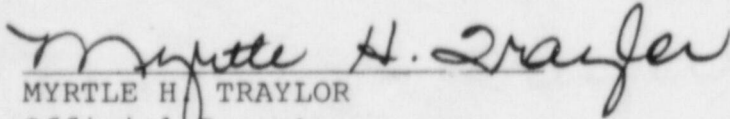
were held as herein appears, and that this is the original
transcript thereof for the file of the United States Nuclear
Regulatory Commission.

(Sigt) 
(TYPED) GARRETT J. WALSH, JR.

Official Reporter

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