



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

May 6, 1986

Mr. Sam A. Milam, III
Post Office Box 21633
San Jose, California 95151

Dear Mr. Milam:

Please find enclosed a copy of the deposition taken by the NRC while in San Jose during the week of April 14, 1986. This report is being provided to you for your review and correction as necessary.

After your review please return the marked-up copy in the self-addressed envelope to me at the above address.

Upon receipt a copy of the corrected version will be mailed to you.

Sincerely,

A handwritten signature in cursive script, appearing to read "Gary G. Zech".

Gary G. Zech, Chief
Vendor Program Branch
Division of Quality Assurance, Vendor
and Technical Training Center Programs
Office of Inspection and Enforcement

Enclosures:

1. Investigative Interview of
Sam A. Milam, III, dated
dated April 16, 1986 (total
pages - 86)
2. Self-addressed envelope

UNITED STATES NUCLEAR REGULATORY COMMISSION

IN THE MATTER OF:

DOCKET NO:

INVESTIGATIVE INTERVIEW OF
SAM A. MILAM III

LOCATION: SAN JOSE, CALIFORNIA

PAGES: 1 - 86

DATE: WEDNESDAY, APRIL 16, 1986

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Official Reporters
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UNITED STATES
NUCLEAR REGULATORY COMMISSION

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In the Matter of:)
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INVESTIGATIVE INTERVIEW)
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(CLOSED MEETING))
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Room 422,
Holiday Inn
Park Center
San Jose, California
Wednesday, April 16, 1986

An investigative interview was conducted
this date with SAM A. MEAM, III, commencing at 5:00 p.m.

Present:

For the Nuclear Regulatory Commission:

ROBERT L. PETTIS, JR.
RICHARD P. MC INTYRE, and
PETER J. PRESCOTT
Office of Inspection and Enforcement
Washington D. c. 20555

For the Government Accountability Project:

LOUIS CLARK, Esq.
1555 Connecticut Avenue, N. W.
Washington, D. C. 20036

C O N T E N T S

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WITNESS:

SAM A. MILAM, III

PAGE

Examination by Representatives of the NRC

4

EXHIBITS:

FOR IDEN-
TIFICATION

IN
EVIDENCE

(None)

P R O C E E D I N G S

6:20 p.m.

MR. PETTIS: On the record.

I would like to introduce myself. My name is Bob Pettis, with the Office of Inspection and Enforcement, Vendor Program Branch, located in Bethesda, Maryland.

This is Richard Mc Intyre (indicating) and he is also with the Vendor Program Branch; and Pete Prescott, who is also with the Vendor Program Branch.

What I would like to do is, ask Mr. Milam some general questions concerning his work activities during the time of his employment from March 1978 to April 1982, which correlates to his work record; and basically focusing on that five-year period rather than his total ten-year employment at GE.

The NRC has in its possession documents furnished by the Government Accountability Project. Those records include a report prepared by Mr. Stokes for the Government Accountability Project, which is entitled "General Electric's Record in Nuclear Safety." This report summarizes your work record over that period of five years: from March 1978 to April 1982.

Also in our possession is a package of Engineering Review Memoranda and Engineering Change

1 Notices that were changed after your signature and while
2 you were working under Mr. Cobler from the period March
3 1980 to October 1980. They are approximately one-half
4 inch thick.

5 We also have several thousand pages of your
6 work record, which cover your employment from March 2,
7 1978 through April 30, 1982. These are grouped in six
8 categories spanning that five-year time span.

9 In addition, we also have a package of
10 Deferred Verification Memoirs, which were written by Mr.
11 Milam; and, your report entitled "Deferred Verifications,"
12 which is approximately one-quarter inch thick. That was
13 generated, I believe, in July 1983.

14 Whereupon,

15 SAM A. MILAM, III

16 was called as a witness by and on behalf of the NRC and,
17 having been first duly affirmed was examined and testified
18 as follows:

19 EXAMINATION

20 BY THE REPRESENTATIVES OF THE NRC:

21 BY MR. PETTIS:

22 Q I am just describing those documents to you
23 so that you will understand what we have. This has all
24 been furnished to us by the people at GAP.

25 One of the questions we have is based on

1 that information, based on the work records, and other
2 information I just described.

3 Did you then, or do you now, have any safety
4 concerns that you would like to discuss with us? If you
5 could, please be specific.

6 A My answer to that might well lay some ground-
7 work for the rest of this discussion. I have tried to
8 make this clear to everyone I have talked to since this
9 situation began.

10 I am not prepared to say that some specific
11 piece of equipment has some particular safety function.
12 What I am claiming is: There was -- and possibly there
13 still is -- a design control system, a design change
14 control system, that is, in some way, deficient. I am
15 talking about generic inadequacies in a design control
16 system.

17 It is my opinion that that, at least
18 potentially, is a safety problem in its self. I am not
19 prepared to point to some specific piece of hardware and
20 say that hardware has a safety defect. I think it is kind
21 of important that we understand the nature of the thing
22 that I am trying to address here. We might or we might
23 not have safety problems in a particular piece of
24 hardware.

25 The point is: I don't believe -- and when I

1 say "we", I am going back in time now and speaking as if I
2 were at GE. I don't believe that we can prove how we
3 design something-- I don't think we can prove what we did
4 or did not do by way of verification or design change,
5 because I think a lot of information was lost, design
6 verifications that may not have happened, did not get
7 recorded; or the record, if it was made, was lost. I just
8 don't think that we have a good design history or good
9 design record. I don't think that we can prove that
10 something is safe or is not safe, and was done a certain
11 way.

12 That I think is the problem. It is a
13 generic malfunction is the design change control system, a
14 design verification system. I think that is a very
15 different kind of allegation than pointing to a pump and
16 saying that that pump won't start when it should.

17 BY MR. MC INTYRE:

18 Q When you say "lost," do you mean physically
19 lost or lost in the tracking system?

20 A I mean both. There were tracking systems
21 that were not used, or that did not work when someone
22 attempted to use them; and there was information that
23 never actually was put into a retrievable storage
24 location. Information that maybe was embodied only in a
25 memo rather than a design record file, and was stored on

1 he corner of someone's desk, rather than in a
2 documentation system.

3 So, I mean that in both senses, it was lost.

4 I personally tried to track down a record of
5 verification and ended up in exactly that situation. The
6 information just became a deadend. It was fairly common.

7 BY MR. PETTIS:

8 Q Was there any specific time frame in which
9 these concerns may be more predominant? In other words,
10 would they be earlier on in your work record, or later on
11 in your work record?

12 A My awareness of the problem grew. The
13 reason I was not aware of it during my first five years --
14 which you have rightly chosen not to look at -- is, that,
15 my first five years was rather academic. I did a lot of
16 scoping analyses and computer programming, and things that
17 did not relate to anything that was necessarily being
18 built right then.

19 When I moved into C&I, then I was in an area
20 where we were designing a product that was being built and
21 it was a different type of environment. There was much
22 more immediacy to the design and to the need to verify
23 things because they were being built. In fact, they were
24 being shipped even as we designed them.

25 But when I arrived at C&I, I was not aware

1 even that most of the rules existed. I was aware, really,
2 only of design record files. I did not know much about
3 ECNs. I did not know what an ERM WAS; I did not know that
4 the nuclear safety related drawings had to say nuclear
5 related safety on them. No one told me that. I learned
6 all of those things gradually about it: just simply
7 encountering the requirement in one way or another.

8 Of course, the more I learned the more I
9 realized there were things that I did not know. It took a
10 period of time to learn that. That process continued
11 throughout my last five years. Eventually, the things
12 that I became aware of were, to me, sufficiently important
13 that I guess that is why things just did not continue to
14 work out between me and GE. But it was a continuous
15 process of learning, becoming aware of things that I
16 perceived as wrong.

17 So there isn't any one period where I would
18 be more concerned than any other period. Just
19 continuously, through that last five years, I became
20 increasingly concerned with the nature of things.

21 Q I would like to point out that, the first
22 five years of your work record, we did not choose to pass
23 over. The first five years of your work record, we don't
24 have.

25 A Very probably, then, I chose not to give it

1 to GAP because, at the time, I probably decided it wasn't
2 really of any significance to this issue.

3 Thinking back on it, that first five years
4 probably only occupies one or two binders. At that time,
5 I was mostly recording information that would say what
6 project I had worked on. I don't believe I was recording
7 any relevant details of the work itself. And, at the
8 time, probably -- thinking back on it, the reason I kept
9 that record was just so I would be able to tell on my
10 weekly reports what projects I had worked on. There
11 wasn't anything particularly controversial or significant.

12 That changed a lot in C&I. I believe you
13 can see that if you know to look for it. As you go
14 through that first volume, where I worked with Chuck Hart,
15 I went back and read through it recently, in preparing for
16 this meeting, and, when I read through it this last time,
17 I was aware of a, I suppose you would say, an improvement
18 in my perception of what was important to record. Between
19 the beginning of that first volume, and the end of it, I
20 think that the relevance of what I recorded improved
21 through that first volume.

22 After the first volume, the nature of what I
23 recorded wasn't based so much on a changing awareness of
24 what was important; but just on the changing awareness of
25 what was there throughout the remaining volumes.

1 Q I would like to go over, one more time, what
2 it is we do have just so it is clear in your mind.

3 A We have six separate folders of your work
4 history, which began March 1978 and end at April 1982.

5 Q Let me say that that would be Chuck Hart,
6 Lee Cobler, Bob Reghitto. I divided it up by the manager
7 at the time. I believe after Bob Reghitto was Arnie
8 Koslow, that is four. Tom Wortham was the last one. I
9 don't believe I left out anybody. Probably the other one
10 would be the Reactor Mode Switch Volume. I am trying to
11 remember what is there.

12 Q These are six specific time frames--

13 A George Stramback, that is the one I left
14 out.

15 Q So, George Stramback--

16 A George Stramback fit between Bob Reghitto
17 and Arnie Koslow. That would be the six periods of time
18 and six different managers during that span of five years.

19 Q And you are saying that the last--

20 A The last one covered a period of 30 days,
21 Tom Wortham. Of all of those managers, he possibly was
22 the best. But I only knew him for 30 days. So it is
23 really hard to say for sure.

24 Q Based on the work record that we have, and
25 the documents that I mentioned earlier, which comprise the

1 deferred verification memoirs and the reports of deferred
2 verifications based on that, do you have any other
3 documents in addition to those already furnished to GAP,
4 or contained in your work record, that may affect the safe
5 operation of a nuclear power facility either domestic or
6 foreign?

7 A I have one volume that you did not mention
8 that deals with the reactor mode switch, and it is an
9 extraction from those six volumes of pages from the record
10 that dealt specifically with that issue.

11 Q We have that. I failed to mention that;
12 but, yes, we have that. We have the reactor mode switch.

13 A I can't recall right now any other volumes
14 that they did not mention. They mentioned the ERMs and
15 ECNs that were changed; they mentioned the deferred
16 verifications, reactor mode switch.

17 Q And a report by Mr. Stokes.

18 A I believe that is everything.

19 Q Could you briefly describe your present
20 position?

21 A I am an auditor. That is brief.

22 Do you want me to be not quite so brief?

23 MR. MC INTYRE: You can be a little more
24 specific.

25 THE WITNESS: I audit manufacturing areas

1 and supporting areas of the manufacturing in the
2 semiconductor industry. I verify compliance with military
3 specifications with our corporate policy documents, and
4 with the areas own controlling documents.

5 That is, in a nutshell, my charter at the
6 present.

7 BY MR. PETTIS:

8 Q Have you reviewed the report prepared by Mr.
9 Stokes for the Government Accountability Project?

10 A I reviewed it.

11 Q It summarizes your work record during that
12 five-year period.

13 A I reviewed a draft of the report. I did
14 receive another copy that I expected was going to be a
15 final version. But, I believe, it turned out that I
16 somehow ended up with another copy of the draft.

17 MR. MC INTYRE: There is no date on the copy
18 that we have.

19 THE WITNESS: Look at the title. Does it
20 say Control and Implementation Department?

21 BY MR. PETTIS:

22 Q Is this the report that you reviewed?

23 (The document was proffered to the witness.)

24 A Yes. This isn't final because this isn't
25 the correct name. I called the FSAR on this issue. It

1 should Controlling Instrumentation Department. I found in
2 this version that there was some typos, misspelled words
3 and things. I reported back the ones that I found to
4 Billy. And I have seen no other version since then.

5 BY MR. MC INTRYRE:

6 Q But basically, the format of the report is
7 the same?

8 A Let me thumb through it.

9 (After a pause.)

10 It looks very much like the report that I
11 saw. I mean, not reading every word; but, in general, it
12 does look very much like the same report based on the 60-
13 second glance at it.

14 Q If it were drastically different, I am sure
15 you would recognize that.

16 A Yes.

17 BY MR. PETTIS:

18 Q Could you describe your job capacity or job
19 description while employed at General Electric, San Jose
20 during the time period before and, also, during your work
21 record?

22 A Well, as I mentioned earlier, the time
23 period before the work record, the first five years, I
24 worked in a part of the organization that was doing some
25 advanced fuel designs. They were not designing fuel that

1 was presently being built; they were examining such things
2 as the benefits of using a nine by nine fuel array instead
3 of an eight by eight fuel array. Whether the fuel channel
4 should be 120 mills thick, or 100 mills thick; that sort
5 of thing. And, as I said, it was pretty academic. We did
6 a lot of computer analysis. We took a lot of numbers out
7 of one program and put them into another and we kept
8 design record files. But that was really the only kind of
9 documentation that we had to worry about. We were not
10 changing drawings in the sense of assembly drawings or
11 connection diagrams, or ECMS, or anything. We weren't
12 issuing any drawings so we did not use ERMs.

13 That is essentially the entire first five
14 years I spent doing that kind of work.

15 When I went to C&I, my first assignment was
16 in an organization that was doing, I guess you could call
17 it the mechanical design of the control panels. We were
18 not designing the circuits. We had people called systems
19 engineers here who did that. But we took their elementary
20 diagrams and, with the help of our drafting department,
21 produced panel designs that included assembly drawings
22 that showed the layout of instruments and switches on the
23 panels hopefully arranged according such as to satisfy a
24 divisional separation requirements, connection diagrams,
25 wire lists, that sort of thing. We did both design and

1 design verification of those designs.

2 My second assignment -- which, incidentally,
3 changed while I was working for the same manager -- about
4 half way through the Chuck Hart binder, my assignment
5 changed and I went to, what they called, the production
6 following. That job I was assigned to be responsive to
7 problems that arose during the manufacture of the panels.
8 I think that was where I really hit the steep part of my
9 learning curve on things that concerned me. I was helping
10 people who were trying to build the balance. I was trying
11 to document changes that I had to make during the assembly
12 process.

13 I was encountering problems that, in many
14 cases, had not been solved when unit one was built. And
15 it appeared that I had to solve them over again on unit
16 two, and I was puzzled for sometime over why that
17 happened.

18 But, at any rate, I was providing all kind
19 of engineering support during the assembly of the panels.
20 That included the welding of the structures together,
21 installing the instruments, installing the wiring; doing
22 all of the QA inspecting, during the time when the QA
23 inspecting was happening, clear up to shipping and through
24 the final touch-up operation on the paint. I was
25 providing engineering support for that entire range of

1 operations. And, in fact, I was involved in occasionally
2 changing purchased part drawings, which dealt with things
3 that were relevant before we even welded it together,
4 buying some of the pieces that it took.

5 So I provided engineering support for the
6 whole range of assembling the panels. The next assignment
7 was in the technical licensing unit. I went through my
8 remaining four supervisors in that assignment.

9 Originally, that unit was supposed to
10 provide technical licensing support to the licensing
11 organization; primarily, the review of FSARs against the
12 design documents and responses to customers and NRC
13 questions. It turned out that we also had some occasional
14 temporary design and design verification responsibilities
15 that I thought we should not have had. But that was apart
16 of the job.

17 That set of responsibilities occupied my
18 last, I guess, three years. I am not sure exactly how
19 many years that represents. And that was the last
20 assignment.

21 Q When you mentioned the word "panels," are
22 these panels that would be eventually shipped to a nuclear
23 facility?

24 A Yes.

25 Q Would they be control room panels?

1 A Yes, control room panels and some local
2 panels, or remote panels; whatever phrase you use. But
3 they were primarily controlling panels and they would
4 house control systems or safety systems. I worked on both
5 kinds. Some PGCC and some non-PGCC panels--

6 Q Could you describe the PGCC concept?

7 A It stands for Power Generation Control
8 Complex. It was a different way of hooking the panels
9 together. Before PGCC, which is why we call it a non-
10 PGCC, we did not make a distinction, then. We did not
11 have a name for the distinction before we made the
12 distinction.

13 But, before non-PGCC panels were set up in
14 the control room separately, the wires were installed
15 point to point, wire by wire, by hand. The PGCC concept
16 was that the wires were not run from point to point on
17 terminal strips. They were run to connectors. So we
18 would have wire bundles instead of individual wires. We
19 would fabricate the wire harnesses, or the wire bundles,
20 in the same facility where we made the panels. We would
21 ship the panels and the wire bundles and just simply plug
22 it in. It reduced the amount of work that had to be done
23 at the utility installing the thing. It also enabled us,
24 in theory, to stage the whole control room and test it all
25 at once easier by not having to actually wire everything

1 up. We could just simply plug it all in over in a
2 building, which we called PGCC.

3 But that was the main difference. The
4 panels themselves were not all that different except,
5 instead of terminal strips, there were connectors. And we
6 had wire harnesses that went with the panels.

7 Q You referred earlier to unit one and unit
8 two. Can you expand on that?

9 A I suppose, in theory, unit one and unit two,
10 on a particular project, were supposed to be identical.
11 The reason I referred to it, the reason it is relevant to
12 me now in this discussion, is that, so often they were not
13 identical, and, so, often I would encounter some problem
14 during assembly that would require the change in the
15 drawing in order to make the panel buildable.
16 Interference problems or marker plate holes what were a
17 different distance apart than the holes in the panel where
18 the marker plate mounted. I puzzled over how they built
19 unit one for a long time.

20 It turns out, there are all kinds of ways, I
21 guess, that they can get unit one shipped out without
22 changing the drawings. But, what I would have to do is to
23 call the field, call the site, then have somebody tell me
24 what unit one looks like so that I could change the
25 drawing and make unit two look the same way.

1 It was a little bit embarrassing, as an
2 engineer, to have to do that. But the fact is, unit one
3 and unit two did not always look alike. It was a
4 situation where I knew something had to have been changed
5 because they could not have built it the way it was
6 designed. Maybe there would be a unit struck channel and
7 a stiffener that interfered with each other. And when
8 they got ready to put the unit struck channel on the
9 panel, they couldn't because the stiffener was in the way.
10 So what they are doing in a unit one, I don't know. The
11 drawing did not indicate any kind of a change.

12 BY MR. MC INTYRE:

13 Q They did not make any changes back in the
14 home office on the drawings?

15 A No. Well, of course, that particular
16 assembly problem would have been resolved while they were
17 building the panel. So, when it got to the field, nobody
18 was the wiser.

19 But, when we got ready to build unit two,
20 and we encounter the same problem. That was when I became
21 puzzled about what we did on unit one.

22 I remember one example of the utility outlet
23 that was supposed to be on the back of an enclosure. I
24 think it was a local panel. I don't remember the number.
25 And there was no cut out for it. The assembly drawing

1 showed the utility outlet; the cutout drawing did not --
2 what did they call it? The enclosure drawing did not show
3 a cut out. Now, different things happen on different
4 drawings. But the enclosure drawing show the cut outs;
5 the assembly drawings showed where to put the hardware.
6 You had to have a cut out to put the hardware.

7 And, I said, "Well, I don't know. Maybe
8 they did not even install the utility outlets.

9 So, I called the site. The guy went out and
10 looked and said, "Yes; there is a utility outlet there."

11 I said, "Can you measure where it is for
12 me?"

13 And he measured and I said, "I am going to
14 put the cut out on that location on that enclosure
15 drawing and put it on the same place on unit two."

16 That is just an example of how I know they
17 had to have done something to the enclosure when they made
18 it, but they did not change the drawing.

19 BY MR. PETTIS:

20 Q Was this within your area of responsibility
21 while working at GE, to make these changes?

22 A Yes; it was my job to resolve engineering
23 problems during assembly. The fact that some of the
24 problems should have been resolved earlier did not change
25 the fact that it was still my job to resolve them.

1 Q Could you describe the training afforded you
2 during the period covered by your work record?

3 A Well, a lot of it involved learning things
4 by doing them wrong and finding out about it somehow.
5 There was, I guess, an unspoken resistance among the
6 engineers to going to classes. Most of the classes were
7 sort of tedious. Most of the managers did not really
8 encourage engineers to go to classes because it took them
9 away from their jobs for a certain period of time. And
10 there wasn't a whole lot of incentive to take any classes.
11 And, initially, I did not take any. Initially, I avoided
12 them like everybody else. But, eventually, I came to
13 realize that there were a lot of things that I did not
14 know.

15 BY MR. MC INTYRE:

16 Q So, when you went over to C&I, you said
17 there were a lot of systems and drawings that were new to
18 you: ECNs and ERMs. You did not have any formal training
19 when you first moved over?

20 A No; there was none at all. In fact, at one
21 point, I told George Senn, who was the manager of the
22 whole manufacturing organization -- just happened to meet
23 him in the hallway -- that it was dangerous to do it. And
24 I got into a discussion and I told him I learned how to
25 fill out an ECN by doing it wrong. And it was the gospel

1 truth. That is the way I learned.

2 Now, there were classes available that were
3 not offered very often, and they were over at the Tenth
4 Street Facility. But C&I did not offer classes on ECN or
5 ERM, or design record files, or design verification, any
6 of those things.

7 Q So you had to go after the classes?

8 A Eventually, I started going after the
9 classes, and I started requesting them. But that was
10 probably, like, my last year, maybe my last year and a
11 half.

12 There was one class that I never was able to
13 get into. That was the one on, I guess it is 10 C.F.R.
14 21, Potentially Reportable Condition type things. I never
15 really got into that. I guess I did not last long enough.
16 But they training wasn't common.

17 At one point, when I was in the technical
18 licensing organization, we had, I don't know, eight or
19 nine engineers, I guess -- most of whom were not long-term
20 GE people; they had been hired from outside. There was
21 only me and one other fellow who had been with GE long
22 enough to understand very much about how the documentation
23 system was supposed to work. AND these guys were writing
24 ECNs and opening design record files not really knowing
25 how to do it.

1 At one time, I complained to Dave Reigel,
2 who was the section, subsection manager. I don't remember
3 the name of the subsection, but it was electronic, or the
4 elementary design, elementary diagram people. I told them
5 the engineers did not know how to follow these GE
6 procedures. He said, "These are all engineers with
7 degrees. We have confidence that they know how to do
8 things.

9 I said, "I am sure they are great engineers,
10 but I don't know how our documentation system works.

11 And he says, "Well, there are classes that
12 they can take over at Tenth Street.

13 And I said, "Yes, maybe once every six
14 months, or maybe once a year they will offer a class.
15 But, in the meantime, they don't know what to do.

16 And he said, "Well, I don't know."

17 You know, he just kind of shrugged it off.

18 Q Would these be job shoppers?

19 A No; these were permanent GE-type engineers.
20 They were the ones who were providing the technical
21 responses to the licensing unit that the licensing unit
22 was then taking to the customers and to the NRC.

23 BY MR. PETTIS:

24 Q Could you discuss the method used by GE to
25 control deferred verifications?

1 MR. MC INTYRE: I know it is confusing,
2 but--

3 THE WITNESS: That is real hard question to
4 answer. Because, while I was there, I did not see any
5 evidence that any method was being used. I discovered
6 that there was a method eventually. I started coming in a
7 little bit early and going into the boss's office and
8 reading the procedures manuals. I discovered a lot of
9 things doing that that I had not known before. I
10 discovered something called a design verification status
11 change notice that I had never heard of before, DVSCN.

12 I discovered that, whenever you did a design
13 change with a verification, you were supposed to fill out
14 one of these forms and send it over to Ken Dawley's people
15 at Tenth Street and they were supposed to be keeping track
16 of these things.

17 I went in and asked the secretary for one
18 and she did not know what it was; she had never heard of
19 it before. That makes me think that probably no one else
20 had ever asked her for one. I never saw anyone else use
21 one.

22 So I got the EOP manual and showed her the
23 picture and showed her what it is. And she did not know
24 how to get it.

25

1 BY MR. MC INTYRE:

2 Q You did not have your own copy of the EOPs?

3 A No; there was one in the boss's office.
4 There was no particular incentive for any of us to use it.
5 There were a lot of procedures manuals other than EOP.

6 Q So you were doing design verification and
7 were involved with them, but had never read the EOP on
8 independent design verification?

9 A Only to the extent that I went and looked at
10 it myself. There would be references to it in letters.
11 People would say we are going to do such and such per EOP
12 often without any reference to which EOP number. And it
13 was about two volumes about so thick (indicating). That
14 was another of the disagreements I had during this time in
15 the technical licensing unit. I told you that we had
16 occasional temporary design responsibilities that I felt
17 we should not have.

18 They would write a letter saying, for a
19 certain period of time, and for a certain systems, we are
20 going to -- and for a certain project -- the design
21 responsibility will be transferred from component 9012 --
22 I don't remember what component ours was at the time --
23 per EOP. And I complained to my manager at the time that
24 should have at least said which EOP since there were quite
25 a number of them.

1 MR. MC INTYRE: That makes sense.

2 THE WITNESS: That was the kind of use that
3 was typically made of the EOP. It was something to refer
4 to when you wanted the authority to do something.

5 BY MR. PETTIS:

6 Q So what method did you use to control
7 deferred verifications?

8 A Well, eventually, I started trying to use
9 DVSCNs. But there is more to it than that. I first had
10 to learn how to tell if my source document had a deferred
11 verification. It wasn't visible.

12 The drawings had a certain little bitty
13 letter right on the corner called an ICER CODE. And I
14 believe ICER stands for Incomplete, Complete, and two
15 other words that I don't remember, now, what they were.
16 But it dealt with the completion stage of the drawing.
17 And I eventually--

18 BY MR. MC INTYRE:

19 Q The design drawing, you are talking about?

20 A Yes; the elementary diagrams, connection
21 diagrams, assembly drawings, enclosure drawings, marker
22 plate drawings. The all had the ICER CODE right down at
23 the top of the revision block.

24 I eventually learned that that had nothing
25 to do with verification status. The fact that the drawing

1 had a "C" on it, did not mean that the design was
2 verified. It simply meant that that drawing was complete
3 and you had to look somewhere else to find out about the
4 verification status. And that was an important piece of
5 knowledge because I wasn't doing any deferred
6 verifications before. I had no real reason to do a
7 deferred verification. I would simply go get my changes
8 verified by somebody. But, when I realized that the ICER
9 CODE did not tell me anything about the verifications
10 status of the design, I looked further and I discovered
11 that in EIS they had something called a SUN Code. That
12 stood for, S-U-N, I don't remember what they "S" stood
13 for; and I don't remember what the "N" stood for; but the
14 "U" stood for unverified. You could not tell by looking
15 at the drawing whether it was verified or not. You had to
16 go run, I think it was, a DI program in EIS--

17 Q So this is the other--

18 A This is the computerized engineering system,
19 which isn't, well, it isn't a retrievable document system
20 in the sense that it is revision controlled. It is a
21 current information. And, when some particular piece of
22 data in the EIS is updated, the old data isn't retained.
23 To my knowledge, it is just simply updated. So it is a
24 current type data base, and it tells you the drawing
25 application, drawing revision, unincorporated ECNs, that

1 sort of thing. It is very useful. It is a wonderful
2 system as long as it isn't misused.

3 But, I learned that you could go look in EIS
4 and it was a "U" in the drawing, in the design status
5 column of that output, then you knew that there was on
6 record some incompleteness in the verification. So I began
7 to consider those documents, that they were unverified, to
8 be, in fact, unverified. And, when I used one of those as
9 a source, the change that I made, using that source, I
10 would make as an unverified change. My theory being that
11 I could use an unverified source to make a verified change
12 no matter who looked at it and verified it. It matched
13 what I started with. Because what I started with, was
14 unverified.

15 I was hoping to, by then, escalate this
16 deferred verification thing, or snowball it, to the point
17 where they could not keep ignoring it. And, single
18 handedly, it was kind of hopeless, looking back on it.

19 I eventually realized that even EIS wasn't a
20 completely reliable record. Because a lot of the deferred
21 verifications never made it into that record. And,
22 eventually, what I learned, and that I had to do, was
23 request every ECN and every ERM that had ever been written
24 against that drawing, and look individually at each one;
25 look at the verification statement on that ECN, or on that

1 ERM, and see if that particular change had been properly
2 verified. And I found, then, deferred verifications for
3 which there was no record at EIS probably because nobody
4 had filled out a DVSCN and sent it to Ken Dawley, whose
5 job it was to get the record into EIS. So it turned out
6 that there were very high proportion of drawings that had
7 deferred verifications that were not only not visible, but
8 were sort of hidden, hard to find, took a lot of work to
9 request all of those ECNs and wait for them to come back
10 and, then, look through them.

11 After that, I tried to use DVSCNs. That was
12 near to the end of my time at GE. It was one such episode
13 that, in my opinion, sort of contributed to the end of
14 things. I had changes that I was making on a particular
15 set of drawings that included a source that had a deferred
16 verification somewhere in its history. I completed my
17 DVSCN. I did not put, I was making a change in
18 application, I guess, as well as-- Okay. I was issuing
19 new drawings, making a change in application based on
20 another set of drawings for another project. The other
21 set of drawings for the other project had a deferred
22 verification. So I wanted to make sure that my new set of
23 drawings also was known to be unverified. I am trying to
24 snowball it.

25 You have seen the picture of the little

1 mouse flipping off of the Owl. That is what it was, I
2 guess.

3 MR. PETTIS: We will take a recess at this
4 point.

5 Off the record.

6 (Whereupon, a brief recess was taken.)

7 MR. PETTIS: On the record.

8 Where did we leave off?

9 THE WITNESS: I was just telling about my
10 efforts to use DVSCNs.

11 BY MR. PETTIS:

12 Q I just want to ask you one thing: Is there
13 a specific time that we are talking about right now when
14 you first encountered this deferred verification problem?

15 A That probably began within my last year at
16 GE. It was fairly near to the end that I started
17 realizing the situation with deferred verifications. it
18 was while I was doing some of this temporary design and
19 design verifications assignments.

20 One thing I should mention is: When we, in
21 the technical licensing unit, received a temporary
22 assignment of design responsibility, that design
23 responsibility would often be farmed out to a
24 subcontractor immediately. We would retain the
25 verification responsibility.

1 The whole thing, to me, at the time, seemed
2 kind of "flaky."

3 Q Was this the onset--

4 A Yes; that was -- No; I don't believe it was
5 C. F. Braun that was involved in that. C. F. Braun was
6 involved earlier in some C&V design work, I believe.

7 I was aware of that back when I was working
8 for Chuck Hart. I am not aware of C. F. Braun doing any
9 subcontract work for the technical licensing unit. But
10 Omtec was one of the companies that did, but I don't
11 remember the other names of the companies right offhand.
12 But it was during that period of time that I became aware
13 of deferred verifications as I now perceive them. And,
14 during the last year, I learned more about them and became
15 more determined in my efforts, well, not only to use the
16 system as it was; but to try to improve it.

17 There was some problems with DVSCN even if
18 it were used. For one thing, it did not have any kind of
19 an issue cycle; and it did not have any kind of a number
20 and it wasn't retrievable in any way. When it went to Ken
21 Dawley, it was his job to log them into EIS and, then,
22 file them. And, whether or not you could ever have
23 retrieved a particular one, I think is very questionable.

24 BY MR. MC INTYRE:

25 Q You would log it into EIS but it did not

1 have a number on it?

2 A I think he gave it some kind of number just
3 in his own filing system. But I never tried to retrieve a
4 DVSCN, so I don't know if it is possible. But they did
5 not have any kind of an issue cycle like any other kind of
6 a design document. It required a section level signature.
7 But they would usually rubber stamp it if you had
8 initialed it.

9 That leads me to the next part of my story.

10 As I am going through this effort to change
11 things, I guess it is inevitable that a few people would
12 get mad at me. And it happened that, once while Reigel
13 was out of town, Bob Reghitto was acting for him.
14 Reghitto was one of the people who was made at mew because
15 of another problem that had been going on.

16 While he was the acting section level
17 manager, I happened to finish this particular project that
18 I was going to tell you about a moment ago that included a
19 deferred verification. I wrote a DVSCN. I did not put a
20 design record file reference on the ERM because the
21 verification was not complete. There was no work to
22 support the verification in the design record file. One
23 of the things we historically had problems with was
24 referring to something in the design record file that
25 turned out not to be there when the auditors went looking

1 for it. So I was careful about that. So there was no
2 design record file reference, but there was a DVSCN. That
3 was in accordance with the original requirements as
4 specified in GE's procedures.

5 I handed the package to my manager and it
6 was routed to Reghitto. Because of the DVSCN it had to
7 have Barrentine's signature. Reigel normally just
8 initialed them and gave them to Barrentine, and Barrentine
9 signed them. But Reghitto did not. Reghitto drew a big
10 diagonal line across the DVSCN and said "Not required, per
11 EOP 42-6.00 -- I don't remember for sure the EOP number --
12 and sent it on back to me. He also included an
13 instruction to add a design record file number to the ERM.

14 I, to a certain extent, lost my cool and
15 sent a note back to him and said, "Yes; in fact, a DVSCN
16 is required. In the future, either read the procedures
17 more carefully before you mark up my work, or, you know,
18 so that I do not have to do it over again." And, I guess,
19 that just made him madder than he already was.

20 But I wrote a new DVSCN; I started over. I
21 instructed my manager that I did not want a design record
22 file opened. I did not want a reference to an existing
23 one put on the ERM because there wasn't any supporting
24 calculations or information of any sort in any design
25 record file that would back up what we were doing. I gave

1 it to my manager again and he sent it to Reghitto again.
2 It did not come back. I started watching, along the way,
3 in the issue cycle and I saw the work go by the drafting
4 department without the DVSCN and with a DRF number on it.
5 So I just took it and -- I don't remember if I did that
6 again or not. I may have done it again. I think I made a
7 new DVSCN, started over with a clean ERM; went back and
8 got the signatures on it, without the DRF number on it,
9 and put it into the cycle again. A second time, I had to
10 retrieve it in drafting when I saw it go back with a DRF
11 number added and without a DVSCN on it.

12 At that point, I misfiled it in my file
13 cabinet and, then, waited. On Wednesday of the week when
14 the work was due, my boss came around and asked me if the
15 package had ever been issued. And I said, "No."

16 He said, "Well, are you going to issue it?"

17 And I said, "No."

18 He said, "Why not?"

19 And I said, "Because of what is happening
20 here."

21 And he said, "But it is due Friday."

22 And I said, "Yes, I know. I took my three
23 months to do it. You can start with a new engineer or do
24 it my way. And you have two days to decide."

25 Friday, they came around and said that we

1 will do it your way. And they did it my way. But the
2 first of the next month I got laid off. So I did not ever
3 get to finish the battle of the DVSCNs. That was the last
4 one I ever tried to use.

5 BY MR. MC INTYRE:

6 Q And your way was following the procedures--

7 A My way was following the requirements for
8 both DVSCNs and design record files. And the design
9 record file was not required for every design change. A
10 design record file was intended to be used for anything
11 that was not otherwise retrievable. You could put your
12 entire support right on the he ECN, if you wanted to.
13 And, in fact, it was bad to use the design record files
14 too much, because they were not conveniently retrievable.
15 And ECN was retrievable by its subject. You could just
16 request from the drawing room by ECN number and get that
17 ECN.

18 The design record file, sometimes they were
19 used. And entire file cabinet could be one design record
20 file. But a design record file was only retrievable as an
21 entire design record file. You could not retrieve a page
22 of it. So it was not really a very convenient way to
23 store something that you might want to get back again
24 unless you opened a new design record file for every
25 particular thing. And, as I said, this procedure, EOP 42-

1 10 -- I am kind of guessing; I am kind of guessing. I am
2 not sure. I remember those numbers.

3 But the procedure said that the design
4 record file did not necessarily have to be used. I wasn't
5 required to use a design record file by the procedure. I
6 was required to use a DVSCN by the procedure and that is
7 what I tried to do, and it wasn't very successful.

8 BY MR. PETTIS:

9 Q Are you aware of any components or activity,
10 manufacturing activity, within General Electric which may
11 involve a high number of deferred verifications; is there
12 one area that maybe more prone to having more deferred
13 verifications?

14 A Systems Engineering Design organization,
15 under Dave Reigel, they might be kind of hard to find;
16 they are not very visible. But I think there are a lot of
17 them there. I think most of the elementary diagrams will,
18 somewhere in their background, have at least one deferred
19 verification that was never finished.

20 Q When you say "Deferred verification that was
21 not finished--

22 A I mean an ECN.

23 Q You don't have any, you can't recall any
24 closeout mechanism for that deferred verification; or is
25 it just your understanding that it hasn't been closed?

1 A Well, I can give you an example of one that
2 I tried to track down once. And I can't remember the
3 drawing number, or the system number; I just remember that
4 I tried to track down this particular verification and see
5 if it had ever been done.

6 This particular change had been made by --
7 maybe his name will come to me in a minute. It was one of
8 the people who was involved in doing some support for
9 production. He worked for Bob Parker. Larry Chamberlain,
10 his name was Larry Chamberlain. He had made this change.
11 He had not shown it to the system engineer who was
12 responsible for the system. At least there was no
13 evidence that he had shown it to this system engineer.
14 There was no system engineer signature on it. Well,
15 normally a system engineer would not have, would have
16 verified the change. I am not sure that that is proper
17 either, but that is the way it was done. The system
18 engineer would have verified the change to the production
19 support engineer that it had been made to the system. But
20 it was a deferred verification. There was no signature
21 there.

22 The lead system engineer over at Tenth
23 Street had not signed it either, where he would normally
24 have signed it in "A". Larry Chamberlain had signed it.

25 So, really, he and his boss were the only

1 one who had ever seen this change. It was quite a long
2 ECN and it made some technical changes to the panel. And
3 I wondered if a deferred verification had ever been
4 cleared up.

5 So I went to him and asked him, and he said,
6 "Oh, yes; we had a design review meeting that verified the
7 whole system."

8 I said, "Was there any kind of a record made
9 of that meeting?"

10 He said, "Yes; we issued a memo."

11 And I said, "Do you know where it is, how I
12 can get hold of it?"

13 And he was able to find one on his desk
14 somewhere in the stack of stuff and showed it to me. And
15 it was a short memo with an attachment that said that we,
16 the design review team, "We have reviewed this system."
17 and it listed some action items. One of these action
18 items are closed and the system is considered verified."

19 I said, "Were the action items closed?"

20 He said, "I don't know. They were all
21 assigned to different people." And the list was on the
22 back.

23 I looked, and there were about 52 action
24 items, I believe. And I checked the first one and it had
25 been done; the thing that needed to be done had been done.

1 I checked the second one, and it had not been done. And I
2 did not check anymore after that. It was just a deadend.
3 But it had sufficed to convince whoever was in authority
4 that needed to be convinced that the thing had been
5 verified. They had a design review meeting and they
6 issued a memo. And, if the action items never got
7 followed up, well, that was the fault of the people who
8 did not follow them up. It wasn't the design review
9 committee's fault.

10 That kind of illustrates how difficult it
11 can be to track down whether or not a deferred
12 verification was ever closed, especially when there isn't
13 any good record of the deferred verifications. If you can
14 find them, and find out what particular changes had a
15 deferred verification, it is difficult, maybe impossible,
16 to go back and find if they were ever closed. Because
17 there isn't any kind of traceability anywhere with respect
18 to deferred verifications. There is no traceability to
19 DVSCN if one was used.

20 The ECN is really the only specific record
21 of a particular deferred verification. And, if the
22 verification was ever completed, there won't be any
23 traceability from that ECN to that completion, wherever it
24 might be. Because, if the completion is done, the ECN is
25 isn't modified. At one point, I made a suggestion that

1 the DVSCNs should be issued with the same number as an
2 ECN; and, when the verification was closed, that the DVSCN
3 go to the documentation area and be attached to the
4 original ECN as an extra page. At least, that way, when
5 you requested the ECN, you would get the DVSCN with it;
6 that would have helped. But they did not want to do that
7 for some reason. But there was a lack of anyway to
8 retrieve that information, assuming it is there.

9 BY MR. MC INTYRE:

10 Q You could not find that in the EIS that you
11 had mentioned earlier, that you could look in that system
12 to find--

13 A EIS would give you the current revision of
14 the document and it would notify you of the existence of
15 any unincorporated ECNs, but that is all.

16 Q It would not include a DVSCN?

17 A No, no; I never saw a DVSCN listed in the
18 EIS. They did not even list ERMs -- and that was another
19 problem.

20 An ERM could be used to make a change in
21 application, which meant that you might have a parts list
22 calling out a particular drawing for a particular project,
23 when, in fact, there had been an ERM issued that changed
24 the application. So that that drawing did not apply and
25 another one did. And the ERM might not be incorporated

1 into the drawing yet. So you might have a drawing that
2 listed a number that was an incorrect number and you would
3 not know that the ERM existed because the ERMs were not
4 listed. An unincorporated ERM was not listed in the EIS.
5 And I tracked down the reason for that.

6 The reason for the ECM numbers, consisting
7 of two letters and five numbers; and ERM numbers consisted
8 of three letters and four numbers. And the format in the
9 EIS was set up to take two letters and five numbers, not
10 three letters and four numbers. And they did not have the
11 resources to have a programmer go change that to some sort
12 of algorithmic format. So they just did not include ERMs
13 in EIS. That is a typical reason.

14 Q And you never saw any documents listed in
15 the EIS system that would be consistent, verified?

16 A Well, I am sure there were documents that
17 were probably verified. I don't mean to imply that all of
18 them were unverified. But I think a lot of them, maybe
19 most of them, were unverified, maybe, depending on how
20 hard you look for the deferred verification. There might
21 also have been cases where you might question whether a
22 verification was in fact a verification or not, depending
23 on the statement. There were things like an ECN might say
24 something like: verified by review to appropriate
25 documents. And you wonder: Is that really a strong

1 enough verification statement to convince somebody that it
2 was really verified. It might be questionable.

3 BY MR. PETTIS:

4 Q Do you have any knowledge of any component,
5 specifically that was shipped to a domestic or foreign
6 nuclear power plant, which contains a known defect.

7 A Are you also interested in foreign plants?

8 BY MR. MC INTYRE:

9 Q If it would be a generic concern.

10 A It is hard to say. I remember one panel,
11 but I am not going to be able to tell you the project or
12 the panel number. It might be possible to dig it out of
13 my work record. But I may not have it recorded it. I
14 don't know.

15 I do remember one panel where there was a
16 ling of CR2940 switches, horizontal row of them, that was
17 above a horizontal stiffener and they were too close to
18 the stiffener. And, if they rotated slightly in the hole,
19 the screws could touch the stiffener. I wanted to cut the
20 stiffener out and weld it in a little lower. But I was
21 being transferred to the technical licensing unit at about
22 that time. So I did not have the opportunity to follow
23 through with that and one of the other engineers took it
24 over.

25 I heard a rumor that, what they did was,

1 just tape a layer of mylar to the top of the stiffener and
2 shipped it. So that might an example of what you are
3 talking about. But I don't remember the panel number. I
4 did ask if they thought to include the mylar on the parts
5 list for the benefit of the next unit. And they said no.
6 I mean, that at least would have been the minimum amount
7 of documentation; at least change the drawing to show that
8 you have to tape a strip f mylar to the top of the
9 stiffener.

10 Q So, as far as you know, they shipped that
11 panel?

12 A As far as I know, they shipped it with the
13 strip of mylar taped to the top of the stiffener.

14 Q And that would be the fix?

15 A That would be the fix to keep the screws
16 from shorting out. I never saw it; I was transferred out
17 of the job. But that was what I heard from someone who
18 worked down there.

19 BY MR. PETTIS:

20 Q Could you explain the term "bootleg" and
21 "mortgage"?

22 A Yes. Those are interesting terms. We kind
23 of made those up.

24 "Bootleg" means that, done without
25 authorization and without any record. An example would be

1 marker plate holes in the "fab shop." Well, marker plate
2 holes in the assembly shop.

3 When it came time to install a marker plate,
4 the holes in the panel were not the right distance apart.
5 What you do is: you go off somewhere, and you borrow an
6 electric drill, and you look both ways and make sure
7 nobody is watching; you drill a hole, you put the drill
8 back, and then you install the marker plate. And it is a
9 bootleg fix. That is what I call a bootleg fix.

10 Q Even though there were procedures that
11 probably prohibited that type of activity?

12 A Well, I considered that to be a de facto
13 design change myself. The panel doesn't match the
14 drawing.

15 Q Were these manufacturing personnel at GE on
16 the manufacturing floor taking it upon themselves?

17 A Yes; that sort of thing would happen.

18 BY MR. MC INTYRE:

19 Q And they would not document these changes?

20 A No, no.

21 Q Did this happen quite often?

22 A Well, it happened often enough that I
23 worried about it. That was just an example. It is easy
24 to remember.

25 I remember another example that involved a

1 guy named Bernie Gennetti, and a woman named Bubiak. I
2 am guessing at the name. I think it was Bubiak. She was
3 a QA Inspector and she was worried that some surface -- I
4 don't remember what the surface was; but she was worried
5 that it was mounted too close to the top of the power
6 supply and was going to interfere with the air flow, the
7 cooling. It was a convection cooling type thing through
8 this power supply.

9 She asked Bernie about it. Bernie said that
10 it was mounted on the unit struck channel and to just
11 slide it up a couple of inches and do it that way; and,
12 then, when you inspect it, it won't match the print.
13 Write up an inspection report and we will say: accept as
14 is.

15 And I said, "Not on my panel, you don't.
16 Let us change the design." But that was kind of the way
17 they worked.

18 The thing may not be a real important design
19 change; but, then again, it may be. The fact is: it is a
20 departure from the documented design. And the intent from
21 the very beginning was that the drawing was not going to
22 be brought up to date.

23 It was when I saw things like that happening
24 that I started to realize how it was that I was fixing
25 problems on unit two that had to have been accommodated

1 somehow on unit one; but the drawing was not changed. It
2 was "bootleg" fixes.

3 BY MR. PETTIS:

4 Q Did you feel obligated to raise this with
5 your management, that this activity was going on?

6 A Yes. Mr. Cobler really did not want to hear
7 things like that. He would usually sit there and sort of
8 keep reading something while I explained it to him. He
9 would then say: Well, thank you, Sam; you are doing a
10 good job. And that was the end of it.

11 Q Would you explain the term "mortgage"?

12 A That came from what we called MRB. It dealt
13 mostly with either, well, purchased things. MRB dealt
14 almost exclusively with purchase things, either equipment
15 that we bought, parts, meters, switches, power supplies,
16 or enclosures that were made at farmed out fab shops.

17 The biggest problem was the enclosures.
18 They would come back with variations from the design. A
19 good example is a case that I recall where there was a
20 built in interference between a channel and a stiffener.
21 They had to go past each other and the designer just did
22 not notice that, actually, they had to go through each
23 other with the dimensions that he had provided. And we
24 had three enclosures built to the same design, and I think
25 they had been built by two different subcontractors.

1 In one case, the subcontractor had chosen to
2 cut the stiffener; the other case they chose to cut the
3 channel. So, what we had was two different bootleg
4 solutions to the problem. And I was puzzling over what to
5 do about it. But, for that sort of thing, because of the
6 intense pressure to get things through receiving as
7 quickly as possible, there wasn't time to write an ECN.
8 Usually the engineers would, on the inspection report, say
9 something like there is not, accept form, fit or function;
10 accept as is. And they would send it right through and
11 not change any drawings at all.

12 But, occasionally, they would do something
13 that they would call mortgaging an ECN. This means they
14 would say this problem will be corrected by ECN number,
15 and they would write an ECN number that they got off the
16 log. The ECN was not written yet. The intention was that
17 maybe tomorrow they will get around to righting the ECN
18 because the number is reserved and mortgaged. And, if
19 they were real conscientious, they might write the ECN and
20 maybe they would not. Because, once the panel was on the
21 through the receiving, inspection, then, the pressure was
22 off to do anything about it and the pressure was on to
23 solve the next problem.

24 So I suspect as lot of mortgaged ECNs
25 probably did not get written and there would be no way

1 that anybody would know about it. Because, the inspection
2 report was never attached to the hardware. It just went
3 into a file and the record center and would never be seen
4 again. There was normally no record made of the
5 inspection report number on any piece of design
6 documentation. So the inspection report was just an
7 vehicle for getting discrepant things through receiving
8 and inspection, and filing the inspection report. It was
9 essentially not a retrievable document because nothing
10 referred to it by number. Although, it had a number; it
11 could have been retrievable if they had, somewhere on the
12 drawing, indicated drawing modified by inspection report
13 number, or something; you know, panel accepted with
14 discrepancies. But they never referenced anything, so it
15 became a nonretrievable document.

16 Also, when it was used to make what I
17 thought of as a de facto design change, where it allowed a
18 departure from the design to happen, I considered that, in
19 effect, to be a design change because the panel was
20 different. When it was used for that, I considered it to
21 be a design change that did not have a proper review cycle
22 like an ECN. We were required to verify design changes
23 commensurate with the design under 10 C.F.R. 50, Appendix
24 B. And I considered these IRs to be occasionally used to
25 make design changes without verifications. Because they

1 did not have the same kind of scrutiny that an ECN would
2 have. They did not go through anywhere near the same
3 issue cycle, a review cycle, that an ECN would go
4 through. Yet, they would accommodate a change in the
5 hardware. And I complained about that to no avail.

6 I only lasted a week on MRB and, then, I
7 went back to my other assignment.

8 Q What is "MRB"?

9 A Material Review Board.

10 Q Where was QC all of this time?

11 A Well, that-- I don't know. I guess there is
12 a lot of ways to answer that, and probably I would have to
13 give all of the answers before it would really be the
14 whole answer.

15 Part of the problem, I think, is: the
16 manager of QA reported to the manager of manufacturing. I
17 think that was the problem. Ferguson reported to George
18 Senn. I think he should have reported to somebody on a
19 level lower than George Senn, or I. I don't think QA
20 really had the authority that it needed because of the way
21 the organization was structured. I think, also, QA may
22 have been worn down, in some respects, to a state of
23 apathy just because they got so little engineering
24 support.

25 There were a lot of little ways in which

1 that was manifested. One kind of amusing example was the
2 fellow named Bill Trader, who was one of the production
3 engineers with me at the time I worked for Cobler. He and
4 Cobler went back a long way together. He, Cobler and
5 Gennetti, in fact, went a long way together with GE. They
6 were old buddies.

7 But Bill Trader had an interesting technique
8 for dealing with the CARs from QA. He had a whole list in
9 his head of quick answers to CARs like: Does not affect
10 form, fit or function; use as is. Or, check for current
11 revision; or, he had a whole bunch of them. And when he
12 received a CAR from QA, he would put down one of these
13 answers, not always, but often; then shoot it back to QA
14 as resolved.

15 A couple of days later, another CAR would
16 come back from QA with the same problem on it referencing
17 the previous CAR, and saying that your answer is
18 unacceptable; this problem really does exist.

19 In the meantime, Bill would have been
20 researching the problem. So, when the second CAR arrived,
21 he had the answer and he would put the answer on it and
22 send it back. And he got credit for very fast response to
23 twice as many CARs as I could handle. But that did not
24 endear him to QA.

25 QA did not get very much support from

1 engineering. In fact, I discovered, at one point, that
2 the fab shop wasn't getting any support at all from
3 engineering. I sort of took it upon myself to provide
4 some support. But I had to do it under cover because I
5 had not been told by my manager to support the fab shop.
6 So I had to kind of sneak in the support. But I had
7 discovered that there had grown into place a gentlemen's
8 agreement between the fab shop people and fab shop QA
9 where, if they encountered a problem in the design, they
10 would just simply fix it and then QA would accept it and
11 sign it off. Because they despaired of getting any
12 support from engineering and there was really nothing else
13 they could do.

14 I started giving them some support and
15 making some changes in the drawings that they needed for
16 awhile.

17 Q All done under the procedures of the GE?

18 A Well, the changed that I made, I made using
19 ECNs. I did it they way they should have been done. At
20 one point, somebody told me that the manager of the fab
21 shop QA people had told his people that, if they had a
22 problem, not to go to Cobler and try to get anything
23 through the system, not to try to get help through system;
24 but just go straight to me because I would help them. But
25 it was all sort of unauthorized. But they needed some

1 engineering support.

2 But that is part of the answer, like, where
3 was QA? QA was there, but, for a variety of reasons, QA
4 maybe wasn't very effective.

5 Q Well, QA, QC; I was more interested in QC
6 since they may have had the responsibility to follow
7 through some type of a traveler system and know where
8 these panels were at any stage during the manufacturing.

9 A They did not know where the panels were. I
10 don't know if you notice that in record. But there was
11 one sequence of time where I explored that issue and I
12 discovered that production control, who were the people
13 who supposed to know where the panels were, did not know
14 where the panels were. I would ask them where the panel
15 was and I would go look there and it was not there. I
16 would search for it and maybe, eventually, find it; and
17 maybe not.

18 There were cases where they told me that a
19 panel had not been started yet. And I would find it in
20 the paint shop finished. There were cases where they told
21 me that unit one had been shipped and unit two had not
22 been started. And I found both of the panels both labeled
23 unit one. But I don't know what to say. But it is
24 documented in the work record. And, for those panels, I
25 have panel numbers written down.

1 Q That are in your work records?

2 A They are in the work record, yes.

3 Q Were you aware, during this time frame, that
4 there was such a provision called 10 C.F.R. Part 21 where
5 you could report defects or noncompliance direct to the
6 NRC?

7 A Even now, I am not aware that, as a GE
8 employee, I can report directly to the NRC. GE procedures
9 provide that I report it through the GE chain of command.
10 I think it would have been very dangerous for me to try to
11 report something directly to the NRC.

12 Q So you used the mechanism within GE to
13 report?

14 A Only one time did I do a PRC. That was on
15 the reactor mode switch. And it took three months before
16 they could deliver it to the licensing organization.

17 Q Were you satisfied with the response for the
18 PRC?

19 A No; I wasn't satisfied with anything about
20 it. I felt like that the way they handled that PRC was in
21 itself a PRC. But I did not report that one. I was in
22 enough trouble already. But I thought they had lost it
23 for awhile. Barrentine said they he had sent it to
24 licensing, and licensing had received it; and nobody knew
25 where it was. I don't know where it was. Eventually it

1 turned up and got sent to licensing.

2 Q You are talking about the request?

3 A My report, that I felt that this was a
4 potentially reportable condition, had to go to my section
5 level manager. And it was his job to report it to the
6 licensing people, whose names I don't remember any more.

7 Q Could you briefly explain the circumstances
8 surrounding the mode switch issue?

9 A Well, there were a variety of things wrong
10 with the mode switch. And, in my opinion, some of them
11 were kind of little things. But, the thing that prompted
12 me to write the PRC was: When I discovered that it was
13 possible to desynchronize the contact unit so that the
14 switch selector handle in some specified position, you did
15 not get the contact closure that you thought you were
16 getting. And the way that you achieved that
17 desynchronization was very similar to the steps you had to
18 go through to in assembling the switch. So it is entirely
19 feasible that an operator, messing around with getting it
20 put together, could desynchronize those contacts and not
21 know it. And there was no functional test for that
22 switch, for that function, at any time that I could find
23 in any test instruction.

24 I considered that to be a PRC. And, in
25 combination with the other less important things that I

1 felt were wrong with the switch, I decided that was enough
2 to write a PRC. So I did, actually.

3 BY MR. MC INTYRE:

4 Q That issue was part of the evaluation in the
5 PRC, wasn't it, with the desynchronization?

6 A Yes; they decided that the reactor mode
7 switch did not have any safety significance. I think that
8 is the way they, in a nutshell -- they had a two- or
9 three-page letter that made the case for that. I had to
10 accept it because those fellows know a lot more about the
11 systems than I did, about the control systems and what
12 they controlled.

13 MR. PETTIS: Were you aware at the time that
14 there were procedures in effect such that, if you were not
15 satisfied with the results of the PRC evaluation, you
16 could, then, resubmit it to the safety and licensing?

17 A No; I don't believe I was aware of that. I
18 am not sure that GE had any such procedures. Maybe they
19 did, but I was not ware of them and I am still not. I do
20 know that, at the time, I was struggling real hard with a
21 lot of these issues, and, you know, I just did not have
22 the resources left to pursue that any further. In fact, I
23 got a bad appraisal for pursuing it after I should have
24 stopped pursuing it. The issue was still open when I was
25 transferred from production following up to technical

1 licensing.

2 One of the comments that Reghitto made on my
3 first appraisal was that, I was, I think he used the word
4 "preoccupied" or "overly occupied." I think he said
5 preoccupied with concerns outside of the unit. And I
6 asked him what he meant by that. He indicated that I
7 should quit pursuing this mode switch thing and get on
8 with the job that I had been assigned to do in the new
9 job. So I was under some pressure from my current manager
10 to leave it alone.

11 I did pursue it after we had a design review
12 meeting, a couple of problem review meetings, and done
13 some design changes on the way the switch was assembled
14 and they way it was supported that I did not think were
15 adequate, necessarily. But I was outvoted by the design
16 review team. So there wasn't too much more that I could
17 do beyond that.

18 BY MR. MC INTYRE:

19 Q Were you aware of the fact that, in the end,
20 they did make some modifications?

21 A Yes; as I recall, they used a thicker gauge
22 of metal. Are you familiar with how the mode switch goes
23 together?

24 It is assembled, it is purchased as
25 something that they call a CAM switch, a nonsafety related

1 unit. And then it gets assembled into a box, a metal box.
2 And they call that assembly the mode switch. And that
3 assembly is considered to be a nuclear safety related
4 assembly.

5 One of the things they changed was the
6 thickness of the metal that is used on one portion of that
7 box. Because there were little fasteners called avdels.
8 It is sort of like a routed nut. You crimp it into the
9 metal and that gives you some threads to put a screw in.

10 But the metal gauge that we were using was a
11 little thin and these avdels had a tendency to spin. They
12 were not crimping the metal. One of the changes was to
13 use thicker metal.

14 They also made a change in how the box was
15 held onto the switch. And I don't remember the details of
16 what they changed. But the result was that it was no
17 longer necessary to remove the screws from the front of
18 the switch. Originally, the front surface of the metal
19 box was attached with the screws that held the switch
20 together. And that was the problem with the
21 desynchronization. Because you had to take these screws
22 out, which loosened the front of the switch and we would
23 put the box on and you would put longer screws back into
24 the switch.

25 The way you desynchronize the contacts was

1 to loosen the screws, pull the front surface a little, and
2 click it; then, put the surface back on. And that would
3 cause the contacts on the inside to not be in the right
4 position anymore. That sequence is very similar to the
5 sequence that might happen when you were putting the front
6 of the box on the switch. Because you take the same
7 screws loose. That is why I was concerned about it.

8 So one of the changes they made was to
9 redesign the box so that you did not have to take the
10 screws loose in order to put the front of the box on. But
11 I don't remember how they made that change. That was a
12 good change.

13 Q They did this on -- what, present and all
14 future designs?

15 A Yes. I don't know if there was any
16 intention of retrofitting it to all designs; although,
17 that is one of the things that I said that I thought
18 should happen. They changed the way they supported the
19 rear of the box, also, on the newer designs. They did not
20 change it on Kuo Sheng and Cofrendes. And I think they
21 should have.

22 The reason is: the neck of the switch,
23 where it went through the panel, was a rather thin truss
24 section. And I saw one switch broken during the assembly
25 process. The assembler had it struck through the hole

1 and they just kind of lifted the back and snapped the
2 necks. It was fairly fragile. And that neck was being
3 used to support the front of the switch. I did not think
4 it was seismically a good idea. And they changed the way
5 they supported the switch.

6 But, even after they made the change, they
7 did not change the way they supported it on the Kuo Sheng
8 and Cofrendes. I don't remember where they are. I think
9 the Cofrendes is in Spain, and the Kuo Sheng somewhere in
10 the Far East. I don't remember now.

11 But I wasn't entirely satisfied with the
12 resolution of the mode switch problems. But I had to drop
13 it because I was in a new job and the new boss did not
14 want me to keep pursuing things from the old job.

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1 BY MR. McINTYRE:

2 Q So in the end, moving over to the new group
3 really killed any effort that you had in trying to resolve
4 that.

5 A I think that backfired on them. They moved me
6 out of that project support job into what I believe they
7 considered would be a safe place for me. I think they were
8 trying to get me away from where the panels were being
9 manufactured because I was creating a lot of ruckus there.
10 The reason it backfired was that they put me into an area
11 that was just as volatile because we were providing
12 technical support through the licensing people and legally
13 it was no better off than the panel shop I'd been. So I
14 think they tried to move me into a safe location
15 and just did not foresee how it was going to work out.
16 That move wasn't my idea by the way. They suggested that I
17 move. What happened was -- it is attributed to some of
18 the friends that I had. A lady I knew named Sophia Renda
19 came to me one day and she said that they thought they were
20 going to find a new job for me because somebody she knew
21 heard Bill Marklein talking to -- in the hallway -- and
22 said that we ought to find Milam a new shop. Review needs
23 a new job and to see if Reghitto would like to have him.
24 And she said based on that little thing that we overheard
25 that maybe they were going to suggest that you go work for

1 Reghitto. And I said -- well, that is interesting. And
2 about three days later Lee Cobler came to me and said --
3 Sam, I think we've found a real opportunity for you. There
4 is a job opening up with Reghitto in the licensing organi-
5 zation; I think it really would fit your skills well. And
6 I said -- well; and I tried to pin him down; I tried to get
7 him to tell me whether he wanted me to leave or not, and he
8 would not say whether he wanted me to leave or not. He just
9 said he thought it was an opportunity for me, so I left.
10 But it was arranged; I never even applied for that job
11 through the posting system. It was just offered to me.
12 And I had been applying for jobs and hadn't got anyone that
13 I applied for, and then that one fell in my lap.

14 BY MR. PETTIS:

15 Q Are you aware of any institutes in which a
16 potentially reportable condition was not properly evaluated
17 by G.E. as required under 10 C.F.R. 21, and also G.E.
18 procedures?

19 A I think we could probably make a case for
20 that since, as I understand it, the potentially reportable
21 condition is not just a safety defect and a piece of
22 hardware, but also a violation of any rule or regulation
23 procedure or requirement, et cetera; it's all required.
24 Remember the exact wording of it, but it says something to
25 that effect. I think using an unverified or -- well, I

1 think he's using unverified documents to support the FSAR,
2 and the support things that we sent to customers are things
3 that we sent to licensing might be sufficiently fraudulent
4 to be considered a reportable condition.

5 Q Could you be a little more specific?

6 A When we compared FSAR's to -- that were
7 designed documents -- and found some disagreement, we
8 needed to resolve that disagreement. And depending on
9 which document needed to be changed, we would either
10 propose a change to the text or the FSAR, or we would make
11 a change to our design documents. The way that we would
12 make a change to the design document was with an
13 engineering change request. It was written on an ECN form.
14 We would send the engineering change request to the
15 responsible engineer as request for a change. We would
16 send a copy of it, or maybe just the number of it, to the
17 licensing people with our statement that the design
18 documents did, in fact, support the FSAR. The licensing
19 people would take that statement and the engineering change
20 request and go to whoever they needed to go to in the NRC,
21 or a customer, and say -- yes, the design documents do
22 support the FSAR.

23 Meanwhile, the engineering change request was
24 not tracked by any kind of system -- did not go anywhere
25 retrievable -- and just went to the engineer, and he could

1 either do it, or do some of it, or throw it away. And we
2 never told licensing that. Now, I told Bob Strong that
3 once in licensing, but it was unofficial; it was just a
4 conversation I had, and he was perplexed by it, but I am
5 not aware that he ever followed up on it, so I think that
6 is the case potentially -- making a false statement, saying
7 that the design supported the FSAR when, in fact, the
8 design change may never have happened and we did not follow
9 up on it. Now, I don't know, maybe you can make a case of
10 that being a reportable condition, I don't know.

11 There were times with the answers to custom-
12 ers' questions and FSAR refused where we used NEDO-type
13 documents to support things. Now, those were like public
14 documents or licensing typical reports -- that sort of
15 thing. They were not controlling documents; they were
16 descriptive documents. Nothing was made according to those
17 documents, or inspected according to those documents. They
18 did not have any kind of defined system of efficient
19 control or any kind of review or issue cycle, but they were
20 used. Licensing typical report was a good example. They
21 were used to say that things were a certain way, that
22 certain design features were there, that certain statements
23 in the FSAR were supported, and I don't think that was
24 proper either. I know that if we used an unverified
25 document -- and by that I mean a document with a deferred

1 verification -- if we used an unverified document in
2 support of any of these statements, we did not tell the
3 licensing that it was unverified. We just let them assume
4 that it was, in fact, a verified design; and I don't think
5 that that was right either.

6 I am not sure that these circumstances are the
7 kind of answers you wanted to that question. If they are
8 not, ask the question again and I will try to give you a
9 different kind of answer.

10 Q I was just hoping that you could be more
11 specific with the particular instance or activity, or
12 something a little bit more definitive.

13 A Could you give me a little more help about
14 what kind of thing you are looking for?

15 Q Something that might be related to a specific
16 plant, or something that may be related to a specific
17 safety-related component or piece of equipment.

18 A It is real difficult to remember which problem
19 went with which plant. I was involved with a lot of plants
20 -- a whole bunch of plants -- and the problem is that the
21 design documents all looked very much alike from one plant
22 to the next. All of the problems that existed on one
23 existed on several because they had all been made from some
24 earlier different one, and after this length of time I just
25 can't remember which plant or which system had which

1 problem. There were too many different ones I worked with
2 and most ways they were too similar. So I just can't do
3 that without actually going back into the record and try to
4 find some particular example that I might have recorded.
5 That would be the only way I can remember that. I can only
6 remember the kinds of things that happened in a generic
7 sense.

8 MR. PETTIS: Do you have anything further, Mr.
9 McIntyre?

10 MR. McINTYRE: No, not without getting into
11 specifics, but that would be hard for you to recall. Were
12 we to do that, I would have to spend some time searching
13 into the work record to find whatever specific thing you
14 were asking about, and it might be reasonable to do that,
15 but I don't happen to have my work record with me right
16 now.

17 MR. CLARK: Are you willing to do that?

18 THE WITNESS: I don't mind doing it if it is
19 useful. I am not sure that it would be useful since what I
20 am talking about is the generic misbehavior of the system.
21 I told Al I never intended to try to point to some specific
22 instance of a defect and say that it was in any way more
23 important than any other instance of a similar defect. I
24 am looking at it from the point of view that the system did
25 not work right to me -- that is what is important. The

1 system did not work right; it routinely did not work right;
2 for years and years it did not work right, and nobody was
3 able to change that. To me, that is what is important; and
4 that fact that my efforts to change it and, my opinion,
5 resulted in me losing my job there and ending my career in
6 the nuclear industry, which is an industry I care for quite
7 a lot. I think if you want specific examples, pick a plant
8 -- pick a system -- and you will probably find specific
9 examples.

10 MR. PETTIS: Well, we would need something
11 from you that was highlighted in your work record that
12 resulted in a specific plant panel involved in a safety-
13 related-type application. We are basically concerned with
14 only safety-related-type equipment.

15 THE WITNESS: Well, not all of my work was
16 with safety-related-type equipment. But the fact is the
17 same design control system was used regardless of whether
18 it was safety or non-safety-related equipment. So any
19 generic malfunction in the system would affecte either
20 kind of equipment. We did not have a separate design
21 folder for non-safety-related equipment. So I would
22 assume that any malfunction that I was aware of would
23 eventually come to bear on some safety-related system or
24 component.

25 //

1 BY MR. PETTIS:

2 Q Would it be correct to say that your concerns
3 are basically general?

4 A Generic. I guess general is a good word.

5 BY MR. MCINTYRE:

6 Q Generic within the GE system you are talking
7 about?

8 A I'm not speaking for any other participant in
9 the nuclear industry. I'm speaking only for GE and only
10 for the San Jose facility. Maybe in Wilmington they have a
11 wonderful system -- I don't know. The only place I ever
12 worked was the San Jose facility and in fact it seemed that
13 C & I was probably worse than 10th Street people. I don't
14 know why but, before I went to C & I, I had heard of the
15 place and it had a reputation as being the most screwed up
16 part of the whole company. And when I went there I came to
17 believe that that was, in fact, true. That was the way I
18 perceived it after I had been there awhile, but I don't
19 know why.

20 Q They were more production-oriented?

21 A It would be a shame to think that being
22 production-oriented necessarily means you have to be
23 screwed up.

24 MR. PETTIS: Well, if there is no other
25 comments or questions from any of the other members of the

1 team --

2 MR. McINTYRE: Do you have anything you want
3 to ask, Mr. Prescott?

4 BY MR. PRESCOTT:

5 Q The only problem I have -- did they tell you
6 that -- did a team come back and tell you that this PRC for
7 the reactor mode switch was closed out? Were you aware
8 that they had closed that out formally, and what they had
9 done to close it out?

10 A I was notified by letter from Barrentine even-
11 tually that it had been closed out. I don't remember the
12 date of the letter, but it was a good many months after I
13 wrote the PRC. I, perhaps naively at the time, thought
14 that a PRC had to be answered within a matter of days.
15 There is some provision in the Code of Federal Regulations,
16 I guess, and also in the GE procedures. I don't remember;
17 I think it is something like two to three days. But it
18 turned out they had a way of interpreting that. I guess
19 that they had to respond within a certain number of days
20 after having decided that it was reportable or something
21 and they could take years to decide that if they wanted.
22 There was some kind of an interpretation that gave them,
23 what appeared to me, a loophole that was in conflict with
24 the spirit of the thing, but they did not seem to feel that
25 it was necessary to respond within any defined length of

1 time after I sent my letter.

2 Q Were you aware that they made some design
3 changes to the actual switch?

4 A Yes; I was in on the design review team that
5 made those changes.

6 Q Remember making that design change part of
7 your work record showing?

8 A Yes; it's there.

9 Q It is in your work record?

10 A My thoughts on the meeting are a part of the
11 record. I wrote that down in some detail. The easiest
12 place to find it would probably be in the volume of the
13 reactor mode switch, but you could find it in -- near
14 the end of the Lee Cobler record, and the beginning of the
15 Reghitto record, if you wanted to look in those volumes.
16 But you would find it a lot easier to follow the history of
17 that issue if you looked in the mode switch volume because
18 I have taken all of the pages from the record, put them in
19 one binder and drew a circle around the item number on each
20 page of the item that is a part of the mode switch chron-
21 ology. It would just be a lot easier to follow because,
22 often, one item on a page of half a dozen or so items would
23 relate to the mode switch.

24 BY MR. PETTIS:

25 Q Do you feel the mode switch is the most

1 significant part of your work record?

2 A No; I think the deferred verifications is, and
3 that the deferred verifications affects everything. It is
4 either the philosophy or deferred verifications got down
5 into the production area too, but I did not recognize it at
6 the time because I had not thought about deferred verifica-
7 tions then, but we had things we call conditional shipping
8 releases that we were supposed to use. I guess I was
9 becoming aware of deferred verifications even while I was
10 in the production area, and I began to worry about whether
11 or not we needed a conditional shipping list for things
12 that were one way or another incomplete and did not have
13 something finished that they needed to have finished. But
14 I did not have it as well-defined in my head then, but
15 looking back on it I can see that the doctrine of not
16 completing something before you ship it was, in effect,
17 down in that assembly shop as well.

18 The doctrine is somewhat pervasive. You don't
19 have to complete anything before you are finished with it.
20 You just do what you have time to do, or what you feel like
21 doing, or what you are capable of doing -- whatever the
22 circumstances that causes it to not be complete -- and then
23 issue it or ship it just to meet the schedule. The billing
24 schedules were very important, that is an issue.
25 Dates were very important with the drawings. But it is the

1 same doctrine -- to meet the schedule.

2 BY MR. McINTYRE:

3 Q What did you call that -- conditional?

4 A Conditional shipping release. It was supposed
5 to define what was wrong, or what wasn't there, or what
6 wasn't complete. It was another one of those systems that
7 you show an auditor to demonstrate that you are controlling
8 something. I imagine the DVSCN was probably generated for
9 the benefit of some auditor to show that we were control-
10 ling deferred verifications and then just never used. That
11 was kind of a typical way of doing business. In fact,
12 indeed, there would already be a procedure in place, but
13 somebody did not know about it somewhat, or would catch
14 them doing something they should not do, so they would just
15 write a procedure, and then they would have people
16 violating two procedures instead of one.

17 BY MR. McINTYRE:

18 Q I have one other question going back to your
19 early years in I & C, where you said you did not
20 have your own copy of the operating procedures -- the EOPs.
21 I was just wondering -- was that common practice for all of
22 the engineers?

23 A Certainly. Very few people had any EOPs. In
24 fact, there were a lot of other procedures manuals. I
25 never was able to learn of all of the ones that existed.

1 Toward the end I started trying to collect procedures
2 manuals. There was a quality assurance procedures manual,
3 manufacturing procedures manual and manufacturing standard
4 procedures. There was an engineering internal procedures
5 document, a drafting procedures manual and EOP, an NEBG
6 procedures manual, and I don't know what all else. I would
7 occasionally see one on somebody's bookshelf and ask what
8 it was. I found out once that it was some licensing
9 procedures manual and I tried to get a copy of that, but I
10 don't believe I ever did. There were procedures manuals
11 everywhere.

12 Q But the engineers did not have control
13 procedures of?

14 A Not at their desk, no. They were usually be
15 one of the areas somewhere -- usually in the manager's
16 office.

17 Q When you first would come on-board with this
18 unit, would you be required to sit down and read through
19 all of these procedures and, say, sign off on them?

20 A No; never. In fact, when I moved into the
21 technical licensing unit, I went looking for the EOP and
22 found it in the boss's office. And if you look in the
23 first -- probably the first dozen or so pages of the
24 Reghitto record -- maybe the first twenty pages of the
25 Reghitto record, you are going to find where I made a note

1 of how many revisions of the EOP were missing in his. It
2 seems to me that there were probably about ten revisions of
3 it that were not there -- had not been inserted -- and I
4 had to get them myself and insert them into the manual for
5 him. So nobody was even paying any attention to it. Nobody
6 was even bothering to insert revisions. I made a record of
7 that. Eventually I volunteered to take over maintaining
8 that manual, which was basically a secretarial job.
9 Normally it was some clerk or secretary who was delegated
10 the responsibility for just inserting revisions when they
11 came around, but nobody was doing it; nobody cared, and I
12 needed an up-to-date manual so I just told them I would be
13 glad to do this if you want me to, and they said okay. So
14 after that they routed all of the updates to me, and I kept
15 their manuals up-to-date for them.

16 MR. PETTIS: Did you two have anything else
17 that you would like to discuss that maybe we haven't
18 covered that is foremost in your work record?

19 MR. McINTYRE: What you feel is important.

20 THE WITNESS: I don't know. I guess we could
21 probably sit and talk about this for hours. There were all
22 kinds of incidents that happened, but I think they probably
23 revolve around the same general principles that we have
24 already covered. In five years a lot of things can happen.

25 //

1 BY MR. McINTYRE:

2 Q Could you see any positive changes within the
3 five years in this system?

4 A Not really.

5 THE WITNESS: Do I need to be careful about
6 quoting four-letter words here?

7 MR. CLARK: No; feel free.

8 THE WITNESS: I don't know if I related to you
9 what Barrentine said to me in the hallway one day, did I?

10 MR. McINTYRE: No.

11 THE WITNESS: It is just an amusing statement
12 to look back on I guess.

13 BY MR. McINTYRE:

14 Q Barrentine is your --

15 A He is the section level manager about three
16 levels above me I guess. I think I told you this story
17 after I -- Diane Taylor and I had written to PRC jointly
18 and simultaneously gave it to our managers--

19 Q On your reactor mode switches are you talking
20 about?

21 A Yes. She was in QA, I was in engineering, and
22 we weren't really supposed to be cooperating, but she knew
23 a lot about the QA record center and test instructions that
24 were relevant to the issue, and I knew a lot about the
25 engineering documentation. So on this particular issue,

1 our knowledge was sort of complementary to one another. So
2 we jointly researched this in each general area of
3 expertise and we put together this PRC , and wrote it. .
4 But a few days later, Barrentine stopped me in the hallway
5 and I came close to quoting what he said -- maybe not
6 exactly, but he said, "Sam, you have demeaned yourself as
7 an engineer by even allowing these QA pricks to be involved
8 in your work," and that is sort of the attitude that was
9 coming down to us I guess. That because I cooperated with
10 a woman in QA to write a PRC. It can have a chilling
11 effect on a lot of things -- like cooperating with QA.

12 BY MR. PETTIS:

13 Q There was a statement in your work record that
14 indicated testing of panels to elementary diagrams.

15 A That's an interesting area. I'm glad you
16 mentioned that.

17 Q Would you kind of expound on that a little
18 bit.

19 A Well, it was fairly common to have very
20 similar elementary diagrams for different projects. And
21 in order to save drafting man-hours, make one connection
22 diagram to satisfy more than one elementary diagram. Now,
23 the connection diagram shows where to run the wires point
24 to point within the panels in order to achieve the circuit
25 functions that are specified on the elementary diagram. So

1 if you had elementary diagrams with variations on the same
2 circuit, you end up with a connection diagram with
3 variations on the wiring. And you can't show that on one
4 connection diagram.

5 I found one particular example of a connection
6 diagram that applied to TVA and Grand Gulf which, when you
7 take it all together, there is at least half dozen Grand
8 Gulfs and a half-a-dozen TVAs, and they had revised
9 this connection diagram back and forth depending on which
10 plant they happened to be building at the time so that it
11 would satisfy the appropriate elementary diagram. In other
12 words, it had to agree with the TVA one month, and then
13 then would revise it to agree with the Grand Gulf elemen-
14 tary so they could build Grand Gulf and then they would
15 revise it back to agree with TVA again because they had one
16 connection diagram and two elementaries. Well, there were
17 other consequences of this.

18 One consequence to this is that if the connec-
19 tion diagram -- well, there was at least one case where I
20 know that they tested a panel to the wrong elementary
21 diagram because of the panel, passed all of the functional
22 tests, and the connection diagram did not agree with the
23 elementary diagram for the panel; it agreed with the
24 elementary diagram for the other panel, for the other
25 project. So the fact that the panel passed meant that the

1 wiring agreed with the one they tested it to, right? So
2 they could not have tested it to the proper elementary
3 diagram or it would have failed. I found the opposite --
4 that on one panel they could not get the panel to pass and
5 that it turned out they were testing it to the wrong
6 elementary diagram, and they did not know it. The tester
7 did not know he was using the wrong elementary diagram. I
8 don't know what you say about a tester who doesn't know
9 which element or diagram to use -- I guess he did not check
10 the number or something.

11 Q Did they have a procedure written by GE?

12 A They had a test instruction. They had a test
13 instruction that listed the number of elementary diagrams.
14 This particular test instruction was to both numbers -- did
15 not say which number was for which project. And he just
16 happened to use the first one on the list, and it just
17 happened to be the wrong one. And he'd read down on the
18 title block where it gave the name of the project on the
19 drawing. He could not tell that from the test instruction,
20 but he could have told it from the drawing but he did look
21 at the title block; he just started testing. So that
22 situation led to a lot of interesting consequences.

23 Q So what you are saying is that a panel for a
24 TVA could have been tested to a Grand Gulf elementary
25 diagram?

1 A Yes.

2 Q And it would have been apparent if the tester
3 had maybe looked down at the bottom of the title block and
4 saw that that elementary diagram was for the wrong plant?

5 A Yes. Of course, maybe he did not know which
6 plant the panel went with. I saw instances where panels
7 had the wrong tags on them and production control did not
8 even -- in fact, that was other game that production
9 control would play. They had something called a
10 inventory transfer notice that I supposed had originally
11 been intended to transfer bolts from one stock number to
12 another stock number when the bolts were identical and they
13 had been bought from different supplies or something. It
14 was for transferring that kind of inventory. They were
15 using this inventory transfer list to transfer panels from
16 one party to another just because both panels happened to
17 be a G36P2. If they happened to need a Hope Creek G36P2
18 and they happened to have another one sitting there in the
19 fabshop, they would just do an inventory transfer notice
20 because it was a G36P2. But they may not look the same.
21 They may have different cutouts or different arrangements
22 or things, but they would do it anyway, and it would become
23 a problem downstream that I would have to solve. It took
24 me a long time to realize that that was happening. It
25 explains a lot of strange problems I encountered where

1 things did not add up right and I could see no reason why
2 it did not match the enclosure drawing. Things were not
3 done in the right place, and I understood eventually it was
4 because they probably did not start out as a Hope Creek
5 panel. It was proved to be an enclosure drawing to some
6 different project, so that was another peculiar thing that
7 used to happen and, as I told you, production control often
8 did not even know where the panels were.

9 I remember one panel -- I don't remember which
10 project it was -- they told me that it was in assembly and
11 paint shop for a final touch up, and I finally found it on
12 the fab shop, laying on its front being welded together,
13 and I don't know what panel they thought -- what panel had
14 actually gone through into the paint shop had been shipped,
15 but it wasn't that one.

16 Q Could you explain what panel we are talking
17 about?

18 A It could have been any panel -- any control
19 panel or any local or remote panel. It just -- the
20 inability to know where a panel was had nothing to do with
21 what kind of panel it was; it seems to just be the way
22 their system worked.

23 Q Just for our discussion here, are we talking
24 about safety-related panels?

25 A Well, it might have been. Like I said, any

1 aspect of this system would apply equally well to either a
2 safety or a non-safety; in fact, most panels had something
3 in them that was safety-related. I would say almost any
4 panel would have something in it because we had -- well, we
5 had divisional wiring in almost every panel. I don't know
6 if there's any panel that had only one division of wiring,
7 so there was always at least divisional separation require-
8 ments, and probably at least one nuclear safety-related
9 something on the panel. It was very -- a lot of what we
10 had was nuclear safety-related.

11 Q So what you are saying is that the panels
12 manufactured were all manufactured under the same QA, QC
13 program?

14 A Right.

15 Q So there was no identification as to -- if a
16 panel was on its way to a fossil power plant versus nuclear
17 power plant?

18 A Well, all we made was nuclear panels, but
19 there wasn't a separate system of control for whether it
20 was a safety-related panel or not. They were all treated
21 pretty much the same. At least I am not aware of any
22 difference in the system; not any documented difference in
23 the way that they were handled.

24 Q So it is your understanding that the
25 activities conducted during this time were strictly for

1 nuclear power plants?

2 A Well, the only thing we made was nuclear and
3 nuclear panels. There was one point where George Senn was
4 talking about getting into some other kind of industry, but
5 I don't believe it ever happened. The only thing I am
6 aware of that we ever made was nuclear panels.

7 Q So there is a possibility that other panels,
8 non-nuclear related, are manufactured at a different GE
9 facility?

10 A Not by the nuclear energy division. The only
11 business we were in was the nuclear business, and we were
12 not making washing machines or anything. It was strictly a
13 nuclear energy division, or the nuclear energy business
14 group, depending on the point in time the name changed; but
15 it was always under the nuclear business. And that's all I
16 did; that's all we did -- nuclear work.

17 BY MR. McINTYRE:

18 Q What kind of a system did they have in place
19 down on the floor to follow the panels where you said that
20 they would not know where they were?

21 A I'm not too familiar with how production
22 control kept up with where things were. I don't know how
23 they did that.

24 Q How would you go -- when you said you would
25 locate -- how would you go about finding them?

1 A Well, I would just go around physically
2 searching. If I could not find one, I would go look for
3 them.

4 Q So you would not go through a tracking system?

5 A No; I would just -- the panels had little
6 tags, little metal tags on the bottom down on the inside
7 that usually told you the name and project of the panel,
8 but sometimes they were wrong. And there would also be
9 people working on the side of the panel, or a label stuck
10 on the panels somewhere. Any you eventually got where you
11 recognized the panels. I know that during my last month
12 when I was -- after I had received my layoff notice and I
13 was spending most of my time over in the Placement Center
14 on Pullman Way, one day I was tired of writing resumes and
15 filling out job applications, and I went walking around through
16 the back lot of the building, just to relax, and they
17 had a bunch of old panels stored back there, and I was
18 walking through this row of panels and suddenly I stopped
19 and I said I recognize that panel, and I went around, I
20 looked in the back and I said yes, there are things I
21 change; this is one of my petals, and you got familiar with
22 them -- you learn to recognize your own panels. They were
23 each individual, so you know that is how you find them; you
24 just know what you are looking for. I almost cried when I
25 saw that panel there because I worked so hard getting ready

1 to ship, and there it was in storage. They terminated the
2 project or something, and it never got shipped.

3 Q Were you ever involved with any internal GE
4 audits in, say, the years of your work record?

5 A No; I never had the opportunity to do any
6 auditing except just on my own. I was never part of any
7 kind of audit team or audit function.

8 Q So you don't recall any audits of your areas
9 turning up any other concerns that you had?

10 A There were occasional audits; I don't remember
11 any of them turning up. And of my particular concerns I do
12 remember once, toward the end, some fellow from the Tenth
13 Street QA Group called me. He had been referred to me by
14 Al Barkley under whom I'd taken a class -- I don't remember
15 the guy's name now, but he was going in the auditing of the
16 licensing organization and he heard of me and he wanted to
17 talk to me about things. And he called me and asked me a
18 lot of questions and I told him a lot of things, and I
19 never heard from him again. I don't know if he went over
20 and ordered a licensing or not, but that was the only time
21 I ever came close to being a part of an audit.

22 Q That was licensing, and you don't recall any
23 in the C & I?

24 A The problem is that everybody knew what the
25 problems were. It would not have been a matter of an audit

1 uncovering something nobody knew about.

2 Q It would be documented though.

3 A Well, you see, those guys are experts in
4 providing responses to that sort of thing. That is how a
5 lot of those procedures came to exist. They were just
6 written to resolve an audit finding, but it doesn't change
7 the way you do business. Your right of procedure to
8 resolve an audit finding and you promise to follow it and
9 the auditor goes away, and the system of procedures is so
10 complex and there are so many of them that it is almost
11 impossible for anybody to go in an audit and really **prove**
12 anything. You can always go into a procedure that you are
13 following -- that you are not following.

14 GE is really an expert at surviving
15 audits, snowing auditors, blowing smoke in front of them.
16 They are really very good at it. If they were as good as
17 that as -- if they were as good at running a design control
18 system as they are at surviving audits, there would not be
19 any reason to audit them.

20 Q So your biggest concern was the design to
21 deferred verifications systems I guess if you had to
22 pinpoint it down.

23 A I guess that would be my biggest concern --
24 that, and the fact that it sort of graphically illustrates
25 a philosophy or a doctrine of doing only what you have to

1 do to get the thing issued or shipped, pretending that you
2 follow up and do the rest later, and then dividing some
3 complex system for allowing it to get lost. That way of
4 doing things kind of recurs throughout the whole design
5 control system. And it is going to be very difficult for
6 somebody from the outside to be able to penetrate that dock
7 and document it.

8 Q It is a complex system?

9 A And do anything about it. And the way they do
10 those things isn't the way they will tell you. Barrentine
11 used to have all hands meetings and talk to us about how it
12 was necessary that we followed procedures. But I guess
13 nobody took him seriously. What they say and what they do
14 are two -- well, rather different things.

15 MR. PETTIS: I would like to thank Mr. Sam
16 Milam and his legal counsel, Mr. Lewis Clark from
17 Government Accountability Project, and the other members of
18 the NRC team for their contribution during this interview.
19 We would like to reserve the right in the future to have a
20 follow-up meeting if necessary.

21 MR. CLARK: Can I add something to the record.
22 Just as we discussed prior to the beginning of this -- what
23 was said -- at the beginning of the session before it was
24 on the record, we would like to request that the transcript
25 of this meeting not be sent to GE.

1 THE WITNESS: And I guess we want a chance to
2 review it.

3 MR. CLARK: And for the record we would also
4 like an opportunity to see the complete transcript and make
5 any corrections that might be necessary, and make it more
6 accurate.

7 MR. PETTIS: Then that concludes the
8 interview.

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This is to certify that the attached proceedings before the
UNITED STATES NUCLEAR REGULATORY COMMISSION in the matter of:

NAME OF PROCEEDING: INVESTIGATIVE INTERVIEW (CLOSED MEETING)

DOCKET NO.: NONE
PLACE: SAN JOSE, CALIFORNIA
DATE: 16 APRIL 1986

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

(Sigt) *James W. Higgins*

(TYPED) JAMES W. HIGGINS

Official Reporter

Reporter's Affiliation