

1 BEFORE THE PUBLIC SERVICE COMMISSION

2 STATE OF MISSOURI

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4 TRANSCRIPT OF PROCEEDINGS

5 HEARING

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10 ZOLTEK CORPORATION,)
11)
12 Complainant,)
13) Case No. EC-2001-345
14 vs.)
15)
UNION ELECTRIC COMPANY,)
d/b/a AMERENUE,)
Respondent.)

16

17

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BEFORE:

19 KEVIN A. THOMPSON, Deputy Chief
Regulatory Law Judge

20 KELVIN L. SIMMONS, Chair

21 SHEILA LUMPE,
STEVE GAW,
COMMISSIONERS.

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24 REPORTED BY:
TRACY L. CAVE, CSR
25 ASSOCIATED COURT REPORTERS

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1 JUDGE THOMPSON: We'll go on the record.
2 Mr. Park, you're on the stand and you are
3 cross-examining.
4 MR. VITALE: Thank you, your Honor.
5 JUDGE THOMPSON: Mr. Vitale, why don't you go
6 ahead and inquire?
7 MR. VITALE: Thank you.
8 (Witness previously sworn.)
9 DEAN A. PARK testified as follows:
10 CROSS-EXAMINATION BY MR. VITALE:
11 Q. Good morning, Mr. Park.
12 A. Good morning.
13 Q. Yesterday we were talking about events and
14 incidents and various causes for things and I just want to
15 ask you a question before we get back into your Direct
16 Testimony. Zoltek Corporation is not an isolated customer
17 on the UE system. Correct?
18 A. Not that I'm aware of.
19 Q. Okay. And there are other customers on the
20 same feeder, if that's the right term?
21 A. I expect that there are, although it -- the
22 mix I think changes from time to time.
23 Q. Okay. Well, do you think any of the changes
24 would have just simply isolated Zoltek to be the only
25 customer on a feeder?

1 A. I doubt it.

2 Q. Okay. Is a possible cause of sag or
3 voltage -- variation could that be caused by an event --
4 start-up of a piece of equipment, for example, another
5 customer on the same feeder circuit? Is that a possibility?

6 A. Oh, yes.

7 Q. Okay. And is that an event that you would
8 consider to be within UE's control?

9 A. Yes, I would.

10 Q. Okay. And how would you do that?

11 A. Well, based on the testimony and in -- in the
12 rules and regulations, Ameren or any similarly situated
13 utility can only do so much -- and we've talked about
14 that -- to assist a customer with problems such as those
15 facing Zoltek. Some of the things are within the utility's
16 control, some are not.

17 With that in mind, one of the things that
18 Ameren has within its abilities, according to its tariffs,
19 rules and regulations, is that it has the right to intervene
20 in a customer's business if that business's use of
21 electricity impairs its services to others. So, yes, Ameren
22 does have the right and responsibility to exercise some
23 control over another customer that may cause those dips.

24 Q. Sure. And I'll agree with that, but that's
25 somewhat an after-the-fact kind of intervention. I mean,

1 they can't prevent all incidents that -- the other customer,
2 somebody who starts a piece of equipment. There are other
3 manufacturing customers in the park; is that correct?

4 A. I believe there are.

5 Q. And somebody puts in a new piece of equipment,
6 starts it up, didn't have their plant wired correctly, UE
7 has nothing to do with that. They may notice it on the
8 system and then come in and talk to that customer, but
9 that's after the incident's already occurred. Correct?

10 A. That's right. That's all the rules provide
11 for.

12 Q. Okay. Now, you said yesterday your only time
13 out at the park was in February of 2001 --

14 A. Yes.

15 Q. -- for the meeting?

16 And you got a tour of the equipment or you saw
17 how the plant worked and it was explained to you by the
18 Zoltek people. Correct?

19 A. Yes.

20 Q. Okay. Was the CCL -- you've heard that I
21 think -- continuous carbonization line or something, maybe
22 that is it, I've been trying to figure that out, but I think
23 that's what it was. Was that in operation at the time?

24 A. It was in place, but it was not operating on
25 that day as far as -- as best I recall.

1 Q. You've heard the testimony here about a
2 changeover to a textile line at the plant from the CCL and
3 it's a different type of operation with that one room?

4 A. Yes. And my familiarity with the chemical
5 process that they have is quite limited. I do know from my
6 visits there and my reading of others' work is that there
7 are three processes they have and they operate somewhat
8 differently.

9 Q. Right. And we've got furnaces and oxidizers,
10 which as I understood the testimony, and correct me if you
11 know something different, has continued in the same basic
12 way they operate from when the plant opened in '92, '93?

13 A. That's correct.

14 Q. And I thought I understood from the testimony
15 that this CCL has been switched somehow to a different type
16 of operation to this textile operation?

17 A. I believe there's some sort of certification
18 process going on, but I'm not part of that nor do I know
19 much about it.

20 Q. Do you know if this textile operation is
21 something significantly different from the way the equipment
22 works or the product it produces from what the CCL was?

23 A. I'm sorry, I don't.

24 Q. Okay. Do you know was that change made before
25 or after you were out at the park?

1 A. The equipment was in place and I believe it
2 had operated in another fashion at an earlier time and was
3 shut down at that time. I don't mean shut down in the sense
4 that it was out of service, but it was not operating when I
5 was there.

6 Q. And let me make my question a little clearer.
7 When you went out in February of 2001, if you know, had they
8 made the switch from using it as a continuous carbonation --
9 carbonization line to doing it for textile operations?

10 A. I actually don't know.

11 Q. Okay. That's fine. Now, we were also talking
12 yesterday and you heard some of the testimony from some of
13 the UE witnesses with respect to -- this would be
14 Mr. Bradley and Mr. Eckelkamp -- with respect to voltage
15 variations and sags and 0 to 100 percent. Correct? You
16 heard that?

17 A. Yes.

18 Q. Okay. And you've got some of that in your
19 testimony?

20 A. Yes.

21 Q. Would you consider 0 to 10 percent -- you
22 know, we heard testimony from 10 to 90 percent, the UE
23 people at least define that as a sag. Would you degree with
24 that definition?

25 A. It was used in that fashion and I don't

1 disagree with it. There's a variety of ways to define that.

2 Q. So how would you define sag?

3 A. Well, a sag would ordinarily be defined as --
4 as a drop in the voltage. And -- and as you've stated,
5 10 percent would certainly be a sag, so would 5 percent, so
6 would 2 percent or 100 percent, 99 percent. It's just a
7 matter of its magnitude.

8 Q. Let's take it from the other end. I think the
9 testimony was that at least UE considers a drop of
10 90 percent or more down to 0 to be an outage or a loss of
11 service?

12 A. Yes.

13 Q. Would you agree with that?

14 A. Yes.

15 Q. Okay. So then we've got the remaining
16 90 percent. And you'd consider anything from a 1 percent or
17 any kind of a drop in voltage variation down to -- or drop
18 in voltage rather down to that 10 percent, anywhere in there
19 is considered a voltage variation?

20 A. Yeah. It's a voltage variation, sag, whatever
21 term you want to use there.

22 Q. So a sag as well. And could a 1 percent drop
23 in voltage cause a light flicker?

24 A. Not in any lights that are commonly used.

25 Q. Okay. How about 5 percent drop?

1 A. No. And I don't want to pretend that I'm
2 trying to think some deep thoughts here, but there are
3 occasions where you can take something like florescent lamps
4 such as these and lower the temperature in an environment
5 where a small variation would cause them to go out, but I
6 don't think that's the situation we're talking about.

7 Q. I'm not asking situations and I'm not talking
8 about going out, just lights flickering. What kind of
9 voltage drop percentage-wise would there have to be before
10 lights would flicker?

11 A. It's going to vary with the type of lamp
12 and -- and how quick that change happens. If a change in --
13 perhaps even 10 percent in an ordinary incandescent lamp
14 were to happen slowly, I don't think most people would
15 notice it. If it happened very quickly, the eye would catch
16 it.

17 Q. You're familiar with the Zoltek plant. For
18 the lights to flicker in that plant, what's the least amount
19 of drop in voltage there could be before the lights would
20 flicker?

21 A. I'd have to check the lamps specifically.
22 That did use a type of fixture I believe -- I don't know if
23 it was an HID fixture or some other ballasted fixture that
24 when the voltage sinks to a certain point, and that point
25 varies by manufacturer a little bit and type of lamp, that

1 they will actually extinguish and then take a long period of
2 time to come back. There's always some kind of back-up
3 lighting, usually incandescent, that does not -- is not
4 affected in that way.

5 I don't know specifically what their lamps are
6 comprised of. I'm not aware of statements or complaints by
7 Zoltek that that's a common occurrence. But the sags that
8 they have experienced in -- in their duration and the
9 magnitude of those sags have impacted their lighting and
10 that is one of the ways they identify it.

11 I'm not trying to -- to run around and not
12 answer your question, but I'm unable to fully understand
13 what kind of -- what kind of response you're seeking.

14 Q. Well, I'm just seeking -- you said it depends.
15 Do you know what the minimum voltage drop would have to be
16 at Zoltek for the lights to flicker? The answer, I gather,
17 is no?

18 A. That's correct. The answer is no.

19 Q. Okay. And one of the ways that Zoltek has
20 measured its incidents, especially in some of the early
21 years, has been to put lights flicker. Correct?

22 A. That's correct.

23 Q. So you don't know at what voltage those lights
24 might flicker?

25 A. That's correct. It would have to be fairly

1 substantial. And by "substantial" I mean well over
2 5 percent --

3 Q. Okay.

4 A. -- for it to happen.

5 Q. So from 5 to 10 percent possibly the lights
6 could flicker?

7 A. Possibly.

8 Q. Okay. And lights dim -- do you know what
9 Zoltek means by putting lights dim on their incident chart?
10 Do you know what exactly that means?

11 A. Yes. I know what it means.

12 Q. Is that the same as a flicker?

13 A. I think you'd say it was the same as a flicker
14 if the duration of that -- of that voltage change is -- is
15 very short. If it's -- if it's longer, as I discussed a few
16 moments ago, if that were to last several seconds, five
17 seconds or so, you'd probably identify that as a dimming of
18 the lights. If it lasted just a blink of an eye, then you'd
19 probably call it flicker.

20 Q. So a second incident would be a flicker?

21 A. Perhaps.

22 Q. Okay. Okay. And, in fact, if you look at
23 your testimony, your -- this is your direct -- if you look
24 at the charts that -- the incident charts that Zoltek
25 provided you from which you're basing your opinion, they

1 define a blip as -- or B in their charts less than one
2 second blip, slash, flicker. Correct?

3 A. Yes. And I can go to that if you'd like me
4 to.

5 Q. Well, I mean, if you don't know, I'll point
6 you to the page but, I mean, is that correct?

7 A. Yes.

8 Q. Okay. So these are all one second -- their
9 B's as they've recorded it by their own admission, are one
10 second or less because then they go from one second to a
11 minute is momentary and then they've circled an M. That's
12 the way their charts read. Correct?

13 A. Yes.

14 Q. Okay. So all of these blips could be flickers
15 of maybe a 5 to 10 percent voltage variation?

16 A. Some of them may be. We don't have data on
17 that except during the times when the more sophisticated
18 instrumentation --

19 Q. Sure.

20 A. -- was installed. Those periods of time can
21 be used for comparison and validation purposes. And where
22 incidents came up during the time that the Ameren and HP
23 monitoring went on, one could or can even at this time go
24 and match those up and generally find that those instances
25 exceeded 10 to 12 percent or actually was in what the

1 Commission calls an extreme zone.

2 Q. But you haven't done that? We have 27
3 measured events from the Ameren monitoring and from the
4 Hewlett Packard monitoring. Correct?

5 A. Yes. As a matter of fact, I have done that
6 and it's part --

7 Q. You've gone back to what determine the blips
8 and flickers and what the variation was other than for the
9 27 that have been monitored?

10 A. Well, those were the 27 that was monitored.

11 Q. Right.

12 A. That's how I was responding to your question.

13 Q. I'm sorry.

14 A. Yes, it has been validated in that manner and,
15 yes, I did it.

16 Q. With the 27?

17 A. Yes.

18 Q. Okay. Now, we've got 250 others?

19 A. Yes.

20 Q. And I think there -- if my count was correct,
21 I think we have 208 blips or flickers, as they are defined
22 by Zoltek, which they define to be as less than one second.
23 And you have no information as to what the voltage variation
24 was on any of those. Correct?

25 A. Well, that's not quite correct. The

1 information from those 27 has been utilized as a pretty
2 valid proxy for the measurement of the others.

3 Q. Mr. Park, answer my question. You're
4 extrapolating. I'm not asking you -- you don't know what
5 the voltage variation was for any of the other incidents
6 other than the 27 that were monitored by UE and by Hewlett
7 Packard. Correct?

8 A. No, that's not correct.

9 Q. Okay. Well, if I can pick one out, how would
10 you tell me what the voltage variation was? Let's pick a
11 blip on any day. How would you tell me what it was other
12 than those 27?

13 A. I simply have to repeat my answer back to you.
14 The methods that are utilized are statistically valid.

15 Q. You did a statistical extrapolation?

16 A. Yes.

17 Q. But on any particular one how do you know what
18 the voltage variation was on one day? Are you taking an
19 average of the 27 that you do know the measurement for?

20 A. No. That's not necessary.

21 Q. Okay. Well, let's pick one.

22 A. Okay.

23 Q. Because I'm trying to understand this and I
24 want to make sure I pick one -- okay. Let's look at
25 August 10, 1993, Incident No. 23. This is on schedule --

1 well, one of the schedules, I think it may be 5 to your
2 Direct Testimony, which is Exhibit 9. We have a flicker
3 at --

4 A. I'm sorry. I'm not quite there yet.

5 Q. Okay. I'm sorry.

6 A. What's that exhibit on mine?

7 Q. DAP-6.

8 A. Okay.

9 Q. I can't tell if the first one is a DAP, so
10 that's why I don't know if it's schedule -- yeah, that would
11 be Schedule 5 to Exhibit 9, which is the incident chart or
12 log.

13 A. And the incident you would like me to refer
14 to?

15 Q. The very first page of lists, No. 23,
16 August 10, 1993, 3:46 a.m., flicker. Do you see that?

17 A. Yes.

18 Q. Okay. What was the voltage variation that
19 caused that flicker that day?

20 A. Well, as a flicker, that's the -- perhaps the
21 least severe type of notation that the company has used, so
22 it would be in one of the areas where you have rather
23 minimal comparisons on my -- what I determine as DAP-12 in
24 my surrebuttal. And those would -- would -- would have
25 correlated accurately to one of the items -- one of several

1 items there where the impact on Zoltek operations was none,
2 but the voltage drop was typically in the 11, 12, 14, 15
3 percent range.

4 Q. So the voltage variation could have been 11,
5 12, 13, 14? It's in a range? You don't know what the
6 voltage variation was on that day because there was no
7 monitoring on that day. Correct?

8 A. And I think your characterization is very
9 good, 11 to 15 percent range is just fine.

10 Q. And you're basing that on what? How do you
11 pick that range as a valid correlation to what happened on
12 the flicker on August 10, '93 when there was no monitoring
13 and there is no measurement available?

14 A. Just the way any other technical specialist
15 would utilize a -- a small but representative sample to
16 represent a larger group.

17 Q. Okay. I understand that. But which sample?
18 Which one are you looking at? There's 27 listed on the
19 schedule that you're talking about to your surrebuttal, your
20 voltage disturbances during monitored period. So which ones
21 are you correlating over to say that flicker on a different
22 day could have been 11, 12, 13, 14 percent?

23 A. Well, take -- going, for instance, from the
24 most severe -- a flicker is not the most severe I think we
25 can agree on that.

1 Q. I understand.

2 A. And so it would not correlate with one of the

3 27 or so where the -- where the power's completely out.

4 Q. Okay.

5 A. We can certainly eliminate that.

6 Q. Certainly.

7 A. It's -- it's also not one of those where there

8 was lost production, so it would -- it would not be in that

9 level of severity. So it becomes one of the lesser

10 severe --

11 Q. Well --

12 A. -- items.

13 Q. -- let me stop you there. Some blips cause

14 lost production and some blips don't, but they're both

15 called blips so how can you correlate that at all?

16 A. You have to use some ranges. And since the

17 particular example you picked was an easy one to go with, I

18 appreciate that.

19 Q. Okay.

20 A. It was pretty --

21 Q. Well, that's only the first one.

22 A. -- easy to establish in the 11 to 15 percent

23 range.

24 Q. And, again, which ones -- just tell me how you

25 do the math to get to the 11 to 15 percent range for the

1 flicker on August 23 from using the numbers. We've
2 eliminated the outages?

3 A. Yes.

4 Q. And then you're going to eliminate the
5 zeros --

6 A. Yes.

7 Q. -- or 90 percent loss or below?

8 A. Yes.

9 Q. And you're eliminating the ones where there
10 was no effect on the production?

11 A. No. I think those are a pretty good
12 correlater. There's no effect on production and a flicker
13 is a -- is I think by all -- all counts, even if it's not a
14 technically well-defined term, it was something that was
15 perhaps an annoyance, but not a problem.

16 Q. Okay. So then what are we left with? How do
17 we get to that percentage? What's the math or correlation
18 or however you want to define it, the technical analysis you
19 do to get to that range to say that flicker was that
20 percentage?

21 A. I simply correlated it to the least severe
22 figures of the 27 in my surrebuttal.

23 Q. Okay. Which is which one?

24 A. Those would -- Items 1 through 4 would --
25 excuse me, 3 and 4 would not be good comparisons -- 1 and 2

1 would be a good comparison. That's in the least severe
2 range. Number 5 would be a good comparison, No. 8 would be
3 a good comparison, 10, 11, 12, 13 would be a good comparison
4 and 27 would probably be a good comparison.

5 Q. Okay. Correct me if I'm wrong, sir, but I
6 thought you said when we started this discussion of
7 flickering, that possibly a 5 to 10 percent voltage drop
8 could cause the lights to flicker at Zoltek. Correct?

9 A. I said I don't know if it could.

10 Q. Right. I thought you said pro--

11 A. I think it's possible for some -- some
12 fixtures. I don't know that it's possible there. Again,
13 we're talking about a duration of that and 5 to 10 percent
14 might or might not be noticeable.

15 Q. You don't know? And the testimony will read
16 as it reads.

17 A. Certainly 11 to 15 percent would be
18 noticeable.

19 Q. Sure. But it also could be something less,
20 could be under 10 percent that causes the lights to flicker?

21 A. Sure. And if you have some information that
22 shows that 5 percent will cause a significant flicker, I'll
23 be happy to examine it and agree with you.

24 Q. These are your extrapolations and your numbers
25 and your testimony we're talking about. I'm just trying to

1 get at -- you claim that your reading of these logs and
2 these incidents leads you to say that the service is
3 unreliable and unacceptable and I'm just trying to get at
4 how much will cause the lights to flicker, what kind of
5 voltage variation. I think your testimony was something
6 more than 5 percent, maybe 5 to 10.

7 Let's say 10 percent. 10 percent could have
8 caused the lights to flicker, yet there's no 10 percent
9 event on here, but you've gone to the 11 to 15. So it could
10 be 10 percent. Right?

11 A. I won't rule it out as a possibility. I think
12 it's more likely in the other range, but I won't rule it
13 out.

14 Q. As you said -- I think I picked a bad example.
15 Let's pick a blip. Let's pick -- and I'm just picking
16 one -- let's pick No. 67. It's on the next page. That
17 occurred on June 12, 1995 at 10:12 a.m. and it's listed as a
18 blip.

19 A. Okay.

20 Q. Now, by Zoltek's definition on their logs,
21 that blip could be one second to one minute. Correct?

22 A. I believe that's correct.

23 Q. Okay. And what was the voltage variation that
24 caused the blip if it was a voltage variation? We don't
25 know -- it's your testimony, I assume, that it's a voltage

1 variation of some kind?

2 A. Yes, it is.

3 Q. Do you know if it was an outage where the
4 power went to 0 or, you know, down to 10 percent or less
5 voltage, this incident?

6 A. This particular incident -- and if it's
7 defined as a blip, again, we've all been over these
8 definitions before, but it's of sufficient depth that it is
9 always noticeable and noticeable in a -- if not startling
10 way, at least a way that will grab your attention.

11 Q. My question, sir, is do you know if on that
12 day, June 12, 1995 at 10:12 a.m. the blip that's recorded
13 was a 0 power event, an outage at Zoltek or if it was just a
14 voltage variation of some sort?

15 A. I would suggest to you that it's a voltage
16 variation of some sort.

17 Q. Because of the duration?

18 A. That's correct.

19 Q. Okay. Then what was the voltage variation
20 that occurred on June 12, 1995 at 10:12 a.m.?

21 A. I would correlate that to something in the
22 20 to 25 percent range because of the -- of the comparisons
23 that are on my surrebuttal.

24 Q. Tell me how you do that.

25 A. Well, I simply took the -- the recorded and

1 verified items that are in that group of 27 on what I have
2 as DAP-12 and there are at least two that -- that conform to
3 that and perhaps three.

4 Item -- one of the items in the section of
5 Nos. 14 through 23, the first one noted there that was a
6 blip, those were all of a minimum of 24 percent by Ameren's
7 figures and then there's another item, No. 27, which is a
8 17 percent.

9 There are some of those also in that area that
10 have some production interruptions and those are hit on on
11 both sides of that, I'll call it a mean, of the 20, 21
12 percent range. There were some of those blips that caused
13 production interruption that were less severe in magnitude,
14 but their duration may have been sufficiently long to cause
15 some machinery to drop out So you're in the at least 15 to
16 probably 24 percent or more range in voltage drop.

17 Q. Okay. How do you get the at least 15? Are
18 there no blips where the voltage variation was less than
19 15 percent?

20 A. That's correct.

21 Q. And how do you determine that?

22 A. I didn't have to determine it. It was there
23 from the data.

24 Q. Tell me from the data how do you determine
25 that?

1 A. From the data that was recorded by Zoltek as a
2 blip and verified by Ameren -- I believe it was Ameren in
3 most of these cases, with Hewlett Packard in a couple of
4 cases -- verified by the percent drop.

5 Q. Well, let's look at one of July 20, 1994.
6 That's a 12 percent -- 12.6 percent voltage drop by your
7 calculation?

8 A. There were several on July 20, 1994.

9 Q. Okay. I'm sorry. You're correct. Number 5,
10 Incident No. 5, 12.6 percent drop. That was -- and you have
11 out. What does that mean?

12 A. The power was out or that was a zero point
13 crossing.

14 Q. A 12.6 percent drop in voltage knocked the
15 power out completely?

16 A. It was four seconds long.

17 Q. Well, I understand that. I see the four
18 seconds. What does out mean next to 12.6 percent drop in
19 voltage?

20 A. From Zoltek's records, they say -- they say
21 they lost voltage. And in the case of Ameren, they recorded
22 that as a 12 percent -- 12.6 percent drop.

23 Now, I should point out to you the methods
24 that I used for -- for recording on my testimony, the -- I
25 could go back to the individual one, but as an example,

1 yesterday Mr. Eckelkamp -- I believe it was Mr. Eckelkamp
2 was describing, and also Mr. Bradley -- how Ameren reports
3 information from their graphic charts.

4 There are three phases in an electrical
5 system -- and I don't want to bore you with technicalities.
6 In Ameren's records, when there were different readings on
7 each of the three phases, Ameren chose the lowest. I was
8 less severe than that and I took an average, which might be
9 higher.

10 So if this particular event -- and if we
11 needed to go back to your data, we could, there were two
12 phases that were at 90 percent of voltage or 10 percent drop
13 and the third phase had fallen to 50 percent. That might
14 very well have caused Am-- or excuse me -- Zoltek's
15 equipment to drop out, but the average was still --

16 Q. Okay.

17 A. -- a little bit higher. So I was somewhat
18 less severe in my analysis than Ameren's figures.

19 Q. Let's go back to my question and try to get an
20 answer. You have No. 5 an incident on July 20, 1994. This
21 is all from either UE's monitoring and Zoltek's logs, a
22 12.6 percent voltage drop. That's from UE's monitoring.
23 Correct?

24 A. Yes.

25 Q. Okay. And then you've got four seconds for

1 the duration of the event and then you've got the word
2 "out." My question to you is, was there an outage, a
3 complete loss of power? What does the word "out" mean with
4 a 12 percent -- 12.6 percent voltage drop?

5 A. Out from the perspective of this report as
6 reported by Zoltek would be it did, in fact, cause their
7 equipment to drop out.

8 Q. So that's equipment or the power being out?
9 Because you've got impact on Zoltek Corporation, on the
10 right side you've got no lost production. So their
11 equipment went out and they had no lost production?
12 Equipment was shut down?

13 A. I think you've heard earlier the testimony
14 that that was not an uncommon occurrence for the equipment
15 to shut down, but production was not lost because it was
16 short enough time for them to recover.

17 Q. Okay. So just to be clear then, when I see
18 out -- and you've only got it one other place in your
19 chart -- that out doesn't mean the power was out, that's
20 some outage with respect to the equipment of Zoltek?

21 A. It meant that there was certainly a sufficient
22 cause that as far as the equipment was concerned, the power
23 was out even if the voltage drop was not in all three phases
24 to zero.

25 Q. Okay. And it's your testimony that no blip is

1 less than 15 percent voltage variation by your extrapolation
2 of these 27 numbers; is that right? I mean, I asked you
3 about a blip, the one we were talking about, No. 67 that
4 occurred on June 12, '95. And you said that had to be at
5 least 15 percent?

6 A. Yes. By these records, yes. And when we're
7 talking about ranges, I'm not going to try to weasel and
8 say, well, it could be 14 -- in fact, it probably could be
9 14. In these it's 15 and I think 15 is reasonable.

10 Q. And the bottom line is you don't know the
11 number other than by extrapolating. You don't know exactly
12 what happened that day?

13 A. The ranges are indicative of the conditions.

14 Q. You don't know what happened that day other
15 than by extrapolating. Correct?

16 A. That's correct.

17 Q. Okay. Would you say it could be as little as
18 10 percent --

19 A. No.

20 Q. -- in voltage variation for a blip to be
21 recorded by Zoltek?

22 A. You want to talk about three phases or a
23 single phase?

24 Q. No. I want to talk about what they recorded
25 because this is their visual observation and their writing,

1 which by their definition is a blip flicker of less than one
2 second. So this duration of this event was less than one
3 second.

4 So you're saying in that less than one second,
5 the voltage had to drop at least somewhere 14 percent, you
6 gave me, or more in that period of time. Correct?

7 A. Correct.

8 Q. Okay. And it couldn't have been 10 percent?

9 A. It's unlikely.

10 Q. But it's possible?

11 MR. MAY: Your Honor, at this time I'd like to
12 object. I think the question has been asked repeatedly and
13 been answered repeatedly and I think the record is clear as
14 to what the witness's answer is.

15 MR. VITALE: Well, your Honor, if I may
16 respond.

17 JUDGE THOMPSON: You may respond.

18 MR. VITALE: It's not clear at all. We have a
19 number of extrapolations and I keep hearing it's these
20 numbers, it's that numbers. I'm trying to get him to answer
21 what happened that day. He clearly doesn't know but he
22 keeps saying, well, it's indicative, it's indicative.

23 I'm entitled to ask, could it have been
24 something less? Could it have been 10 percent? And I want
25 him to answer that question. If he wants to tell me that he

1 doesn't know about any days other than the monitoring,
2 that's fine because I think that's what I'm hearing.

3 JUDGE THOMPSON: Mr. May?

4 MR. MAY: Your Honor, those questions have
5 been asked for days other than the monitoring. That has
6 been the last half hour. He has answered -- for some reason
7 counsel's not happy with the answer that's been given, but
8 it has been answered repeatedly.

9 JUDGE THOMPSON: Well, this is
10 cross-examination, this is your expert witness. I believe
11 that Ameren is entitled to explore the bases of his opinion
12 and to hammer away. And if that involves some redundancy,
13 then we will simply live with that redundancy.

14 Will you please proceed?

15 BY MR. VITALE:

16 Q. Could that blip -- just to pick this one we're
17 working on, I'll try not to go to any others -- June 12,
18 1995, that blip have been a voltage variation of 10 percent?
19 Could that be within your range?

20 A. Since it is a qualitative analysis, it is not
21 an impossibility.

22 Q. Okay. Fine. And just to sum up, to ask a
23 nice overall question, your opinion as to the voltage
24 variation that occurred on any incident, whether it be
25 defined as a blip, dim, flicker by Zoltek other than the

1 27 that were actually monitored for which you have
2 information, that opinion would come from an extrapolation
3 of some sort from the data you have on those 27. Correct?
4 I think that's what you've said and what we've been going
5 over here.

6 A. I call it a sample.

7 Q. Okay. Fine. But it's from those numbers that
8 you make your analysis and give your opinion about those
9 other incidents?

10 A. Yes, it is.

11 Q. Okay. And those other incidents, when they
12 occurred, were within some range -- and we can debate what
13 that is, but they were in some range, you can't give a
14 precise number from your sample for the other incidents of
15 the percent of voltage drop?

16 A. Yes. I can give a range.

17 Q. Okay. Now, let's go to your Direct Testimony,
18 Exhibit 9, line 16. Zoltek could not have anticipated that
19 its plant would be subject to extremely frequent power
20 interruptions.

21 That's your testimony. Correct?

22 A. Could I have a page where that was?

23 Q. I'm sorry. I thought I said that. Page 4,
24 line 16.

25 A. Yes, I see that.

1 Q. Okay. And, again, so we're clear, power
2 interruptions means voltage sag or variation or a complete
3 outage of power. Correct?

4 A. Yes.

5 Q. Okay. And you say they couldn't have
6 anticipated it would be subject to extremely frequent power
7 interruptions. Could they have anticipated there would be
8 some power interruption by your definition of power
9 interruption?

10 A. Yes.

11 Q. What should they have expected?

12 A. I think they could have had reason to expect
13 the kind of service that Ameren has -- I won't say
14 advertised, but has utilized in its testimony in this
15 proceeding that 58 to 60 outage -- outage minutes per
16 consumer per year would not be out of the range of being an
17 acceptable performance.

18 Q. Well, your testimony here though is not
19 duration, it's frequency. Extremely frequent. How many
20 incidents should Zoltek have expected? How many power
21 interruptions by your use of the word frequent, because
22 that's your definition of what's unreliable here?

23 A. I think their expectation might have been very
24 few during the course of the year. What they might be able
25 to tolerate is something else and they haven't told me what

1 they could tolerate.

2 Q. Well, as an expert sir, how many power
3 interruptions, again as you define it, voltage variations,
4 power outages, sags should Zoltek have expected in a year,
5 not what they could tolerate?

6 A. In the kind of magnitudes that we've been
7 discussing, 10 to 15 a year wouldn't probably be out of
8 reason.

9 Q. And what do you mean by in the magnitudes
10 we've been discussing? I don't understand what that
11 qualification --

12 A. I'm sorry. I'll try to be more clear with
13 that.

14 Q. I just want to know what you meant by that.

15 A. Where you have a variety of severity in the
16 incidents, some of them being annoying flickers, some of
17 them being blips that would cause a momentary interruption,
18 some of them being outages as Ameren would prefer to define
19 outages. A variety of conditions all just kind of averaged
20 in together. I think that figure would be --

21 Q. So you would find a lot more short ones to be
22 more acceptable than one or two long ones; is that --

23 A. No. I'm not saying that at all.

24 Q. That's what I thought you were saying by
25 looking at the severity of them, that means duration I

1 thought.

2 A. Well, I was just trying to inform you that
3 there is a lot of variety in the power conditions from any
4 utility.

5 Q. Sure.

6 A. And the -- there are some long ones and there
7 are some short ones. There are some that are more severe
8 and some that are less severe. You were asking me for a
9 number all rolled into one and that's what I gave you.

10 Q. Okay. Fine. Thank you.

11 Now, continuing on with that sentence on
12 line 17, As a result, the plant processes were not designed
13 for immediate recovery from this type of activity.

14 Correct? That's your testimony?

15 A. That's correct.

16 Q. So had they anticipated what you call
17 extremely frequent power interruptions, they could have
18 designed the equipment for immediate recovery?

19 A. I don't know if they could have or not. I
20 know they did not.

21 Q. Okay. I agree. Because your testimony, as I
22 read it, is since they couldn't have anticipated the
23 extremely frequent interruptions, they didn't design their
24 processes for immediate recovery. So even if Ameren had
25 said, You're going to have a lot of extremely frequent power

1 interruptions, they still couldn't have designed their
2 equipment. Is that your testimony, or could they have?

3 A. I don't know whether they could have or they
4 couldn't have, but had they been given that advisory by
5 Ameren at the onset, they might have stayed in Lowell.

6 Q. They might have what?

7 A. Might have kept their plant where it was.

8 Q. That's not what you say here. You say, As a
9 result of that, the plant processes were not designed. So
10 your testimony is you don't know whether they could have
11 been designed or not for immediate recovery had they known
12 what they were going to get and what was going to happen in
13 the Missouri Research Park?

14 A. All I can say is they have, and as others have
15 testified, plant equipment that is reasonably typical of
16 other -- of other industries that are located in the
17 St. Louis area.

18 So I don't think there was any reason to
19 believe on their part that there was a necessity to do
20 something extraordinary. They didn't do something
21 extraordinary and had they known in advance that they needed
22 to do something extraordinary, they would have had to have
23 evaluated the cost of doing so.

24 MR. VITALE: Your Honor, I don't want to argue
25 with Mr. Park, but could you direct him to answer my

1 question? It's very simple.

2 BY MR. VITALE:

3 Q. Do you know had they been told that they were
4 going to have extremely frequent power interruptions, as you
5 define them, whether they could have designed their
6 equipment for immediate recovery or not?

7 JUDGE THOMPSON: I believe he did answer that
8 question.

9 MR. VITALE: Okay. Well, the record will
10 reflect. I don't think he did, your Honor, but we'll move
11 on.

12 BY MR. VITALE:

13 Q. Go up, if you would, to line 10 on page 4 of
14 your testimony and you say -- you're talking about the
15 oxidizing process here. If a power interruption occurs
16 during this process, the fibers can overheat and burn. Do
17 you see that?

18 A. Yes.

19 Q. And, again, power interruption we're talking
20 any type of loss of voltage. Correct?

21 A. Any type of loss of voltage --

22 Q. Right.

23 A. -- not necessarily reduction in voltage.

24 Q. Is there a difference between loss and
25 reduction?

1 A. Well, a loss would be an absence of voltage.
2 Q. Okay. Thank for correcting me. That power
3 interruption could mean any kind of variation or fluctuation
4 in voltage down to zero?
5 A. No.
6 Q. Okay.
7 A. When I say interruption there, that's what I
8 mean.
9 Q. Okay. So here you're talking -- when you use
10 power interruption, you're talking about zero power or that
11 bottom 10 percent area?
12 A. Yes.
13 Q. I just want to make sure when we see your
14 testimony, the terminology. So it's only when there's a
15 zero power situation that the fibers can overheat and burn
16 and all these various things that you describe could
17 potentially happen?
18 A. When the equipment sees it as zero. And as
19 you and I discussed just a little bit earlier, it may be
20 actually zero or it may be sufficiently close to zero that
21 the equipment sees it as the same.
22 Q. Let's see if I can phrase this properly. Do
23 you know at what voltage variation -- what's the minimum
24 voltage variation at which Zoltek's equipment sees the power
25 as zero, as you use that term?

1 A. Unfortunately, that, as with other things,
2 will vary with the duration of the reduction in the voltage.
3 So it might be able to tolerate and has tolerated 20 percent
4 drops in voltages for very short intervals and maybe less
5 for longer intervals.

6 I'm not trying to evade your question, but the
7 answer's a little more technical than simply zero voltage.
8 In most instances the zero voltage is probably the
9 appropriate thing and I didn't want to spend five pages
10 describing a curve to anyone. And I think I preceded this
11 explanation by saying the Zoltek representatives will have
12 much more detail about their processes.

13 Q. Sure. I understand. You're here as their
14 expert though giving the opinion the service is unreliable
15 and I'm just trying to understand how you come to that
16 conclusion.

17 And I just want to make sure when you use
18 power interruption on page 10, you're talking about zero
19 power or something very close. And when you use power
20 interruption on page 17, you're -- I'm sorry strike that.
21 Let me start again.

22 On page 4 of Exhibit 9, when you're using the
23 term "power interruption" on line 10, you're talking about
24 essentially a zero power situation. When you say power
25 interruption on line 17 on the same page, you're including

1 in that any kind of voltage variation, not just a zero power
2 situation?

3 A. No. I don't think that's entirely correct.
4 The line 10 I think we're clear and together on. And
5 although we've talked about 17, the extremely frequent power
6 interruptions included those that were identical to those in
7 10 and some less severe.

8 Q. Okay. And I think I asked you earlier what we
9 meant by extremely frequent power interruptions on line 17
10 and I thought you said that included sags?

11 A. And it can. And I understand this seems sort
12 of confusing, but that's why the terms that the industry
13 uses for some of these incidents are so difficult for a
14 customer to envelope in the context of a proceeding like
15 this because there is -- there's a lot of variability,
16 there's so many different conditions that we just can't
17 separate them all into neat little piles like you would like
18 us to.

19 Q. Well, I'm trying to confine it just to your
20 testimony. And you use power interruptions twice on the
21 same page. And as I understand your testimony, and correct
22 me if I'm wrong, your reference to power interruption in one
23 line is to a type of event that's different to what you mean
24 by power interruption on line 17?

25 A. I'll call them comparable.

1 Q. But they're not the same types of events. One
2 is a broader range of events on line 17 then what you refer
3 to on line 10?

4 A. That is correct.

5 Q. That's fine. That's all I wanted. Top of
6 page 10 --

7 MR. VITALE: I'm sorry, your Honor. I'm
8 losing my numbers here.

9 JUDGE THOMPSON: That's quite all right.
10 BY MR. VITALE:

11 Q. Exhibit 9, page 5, line 1. I don't know where
12 the 10 came from. You say, Long outages, those exceeding
13 one minute, cause significant plant downtime.

14 Do you see that?

15 A. Yes.

16 Q. Okay. And does that include -- a lot of their
17 definitions and a lot of their recording incidents have one
18 minute only. Do you include that as those exceeding one
19 minute? I just want to make sure we're clear.

20 A. Yes.

21 Q. Okay. And those are the M's that they've
22 circled on their chart? They have B, M and L.

23 A. I think perhaps that's correct.

24 Q. And they define M as one second to one minute?

25 A. When we get to one minute, there -- as we've

1 talked many times now, that measurement of time is -- is
2 close, but inprecise. So whether we have a minute at
3 60 seconds and 61 seconds is something entirely different,
4 that's not the case.

5 Q. Okay.

6 A. There are -- there are overlaps in all of
7 these times and what Zoltek is trying to convey, or I'm
8 trying to convey based on the information provided to me, is
9 that when you get to a minute outage, that's a complete loss
10 of power for that period of time, it causes the kinds of
11 equipment misoperation and lost product that were described
12 to you by their representatives.

13 Q. So this information and how you describe
14 what -- the impact is from what Zoltek people have told
15 you --

16 A. Yes.

17 Q. -- correct?

18 Okay. You've not witnessed any of these
19 events; is that correct?

20 A. That is correct.

21 Q. Okay. Now, is it your testimony -- of course,
22 long outages, we're talking about power, correct, not
23 machinery outages, or are we when you say long outages in
24 your testimony?

25 A. When we've gotten to that period of time,

1 there's no need to talk about ranges and whether it's near
2 zero or zero. It's zero.

3 Q. Okay. So you're talking about a complete loss
4 of power for a minute or more causes significant plant
5 downtime --

6 A. Yes.

7 Q. -- as you were told?

8 So would it surprise you if there are
9 occasions and incidents of one minute or longer where
10 there's no effect on any of Zoltek's equipment?

11 A. No.

12 Q. Okay. Explain how that could be.

13 A. Because they have several processes here as
14 you've -- as been described to you and you've described back
15 to me. Some of those processes will have more or less lost
16 product than others.

17 The -- the lines that are heated by natural
18 gas, I think, are the most sensitive to lost product. I
19 think the -- one of the others, depending on the part of its
20 cycle it's in, can have great losses. But if -- if there
21 are other parts of that product cycle that amount of --
22 excuse me, the -- the amount of product is minimal or zero.

23 So they have -- they do have three processes
24 there. Some of them will have more lost product than
25 others. And in certain parts of those cycles, even at a

1 minute they'll have downtime and restart time, but they
2 won't have lost product.

3 Q. Okay. But it will have some impact on the
4 equipment?

5 A. It will shut the equipment down.

6 Q. Okay. And if something in Zoltek records
7 would show a minute or more when none of the equipment was
8 shut down, would that surprise you?

9 A. Yes.

10 Q. Okay. Okay. Let's go on. Line 6, page 5.
11 Again, since you say there are a lot of definitions, I just
12 want to clarify what you mean here when you use the term
13 "outage," an additional problem occurs after an outage. Is
14 that a zero power event or is that an event that the Zoltek
15 machinery sees as a zero power event, as you've said which
16 could be at little as a I think a 15 percent fluctuation?

17 A. This particular one we could consider as
18 absolute.

19 Q. Okay. And as we sit here, of the 277 --
20 strike that.

21 Excluding the 27 that we have measured numbers
22 for of the 250 incidents left on the log, can you tell me
23 which ones were total outages and which ones were not?

24 A. We'd have to count them. It's not something
25 I've done.

1 Q. You'd do that by just looking at the duration
2 and making a judgment?

3 A. Yes.

4 Q. Would any of the blips be an outage if you
5 were to count them that way?

6 A. No.

7 Q. Okay. So we take out the blips. Do we take
8 out the flickers?

9 A. Yes.

10 Q. Do we take out the dims?

11 A. Yes.

12 Q. What other -- I think that's most of the
13 terminology they used. Let me make sure I get -- okay.

14 So your testimony is none of the blips,
15 flickers, dims on the chart would be complete loss of power?

16 A. No.

17 Q. It would be voltage sags?

18 A. I didn't say that.

19 Q. Okay.

20 A. I said it's not an outage as referred to in
21 line 6 of my testimony.

22 Q. I thought you said that outage is referred to
23 as a zero power situation, a total loss of power.

24 A. And it is.

25 Q. Okay. And you consider a voltage sag, a

1 variation of 15 percent, a total loss of power?

2 A. No.

3 Q. Okay. I'm not trying to confuse the issue.
4 I'm just trying to understand. You're using that definition
5 in that part of your testimony as a total loss of power.
6 And I'm asking you, if you know, of the 250 unmonitored and
7 unmeasured incidents on the log, how many of those were
8 outages or total loss of power, as you use that term in your
9 testimony? And you said we'd have to count them. Correct?

10 A. That is correct.

11 Q. And you would count them by looking at
12 duration?

13 A. Yes.

14 Q. Okay. And let's take all of the blips. How
15 would you know if -- are the blips an outage, a loss of
16 power, as you use that term in your testimony?

17 A. The blips do not fall in that range.

18 Q. Okay. That's what I thought I said. So we're
19 taking the blips out, they don't count to that definition of
20 outage as you use it in your testimony there. Correct?

21 A. That's correct.

22 Q. And we also wouldn't include the lights
23 dimming or the flickers as they describe it on their log?

24 A. That's correct.

25 Q. Okay. What about anything of a second or

1 less? Would you include that in your use of the term
2 "outage" there?

3 A. That wasn't my intent.

4 Q. Well, you're defining in your testimony
5 additional problems that occur after an outage. And I'm
6 trying to understand how many times they have additional
7 problems by your description here and you're using the term
8 "outage." We've knocked out blips, flickers and dims and
9 now I'm at one second or less. I'm taking that as a group
10 if we go down the log. Does that fit into what you're using
11 as the term "outage" there?

12 A. I think in most and perhaps all instances
13 you're correct. The reason I am -- I'm hedging a little bit
14 there is simply because I'm using a specific example that --
15 and the specific conditions were provided to me by the
16 company. The company has testified to you that they have
17 multiple processes and that there might be some unusual
18 conditions where something of shorter duration might cause
19 this situation, but that's not what I'm referring to in this
20 example.

21 Q. Okay. And actually what we've been going
22 over, this is all -- you're just restating what you've been
23 told by the Zoltek people. This isn't really within your
24 personal knowledge?

25 A. It is my personal knowledge to the extent I

1 have evaluated what they have told me, I've evaluated data
2 provided by Ameren and have evaluated data that Zoltek has
3 provided to both Ameren and its attorneys.

4 Q. Okay. I'll go back to -- I think we've
5 knocked out one second. If we look at an incident on the
6 chart that's one second, would that be considered an outage
7 that causes the additional problem? You said you could tell
8 by looking at the incident chart.

9 A. In my judgment, it would not.

10 Q. I see a couple that are two seconds. I'm not
11 going to go through each one, but two seconds?

12 A. That would be a gray area where the question
13 would be better directed at -- at the Zoltek
14 representatives.

15 Q. So what time duration would you have to see on
16 the incident chart to say, that's the kind of outage that
17 I'm talking about in my testimony?

18 A. I would have to examine that with -- with the
19 company representatives. I'm citing a specific example to
20 show to the Commission how things can happen. It's an
21 accurate example, but it's one of many examples that can be
22 offered. If we want to get specific beyond this example,
23 then we'll need to examine with the company the
24 circumstances for those processes.

25 Q. So the Zoltek people would have to testify to

1 that?

2 A. Yes.

3 Q. Okay. That's fine. Going to your testimony
4 on page 7, Exhibit 9, line 4, I think I have those numbers
5 right. You say, Reliability is far more important to
6 manufacturers, especially those with critical processes such
7 as Zoltek.

8 Do you see that?

9 A. Yes.

10 Q. Okay. Yesterday we had some discussion about
11 what is the standard of reliability for Union Electric. And
12 we had some discussion -- do I understand your testimony
13 here to be that the standard of reliability is a subjective
14 thing depending on the customer that's being served?

15 A. In the context where I've offered it where the
16 prior paragraph is a comparison of residential and small
17 business customers, I think it's quite distinct and
18 separate.

19 Q. Okay. And it depends on the impact to the
20 customers and the manufacturing customers' operations that
21 determines the reliability or is it just --

22 A. It is that, but not just that. I don't want
23 to infer from that that a manufacturer can just go in and
24 throw in any piece of sloppy equipment and have the
25 expectation that the utility will just have to provide

1 service sufficiently reliable for that piece of equipment.
2 That would be a unique situation. As I've testified and
3 others have testified, we don't have a unique situation. I
4 think we have typical industry equipment here.

5 Q. Let me ask you this. Union Electric comes to
6 you and says, Mr. Park, we want to be reliable to Zoltek.
7 What is going -- how would we meet that? What's your goal
8 for 2003 to be reliable? Are we going to measure that on
9 frequency or duration of events, impact to Zoltek's plant?
10 What? What is the goal? What would you tell them they have
11 to meet?

12 A. I think they'd have to have -- "they" meaning
13 Ameren would have to have a positive influence in all three
14 of those areas, but I would concentrate really on the first
15 two, the frequency and duration of the incidents.

16 Q. Okay. And incidents, again, we're talking --
17 just so we have the right definition here, any kind of
18 voltage fluctuation when you use the term "incidents" there.
19 Correct?

20 A. The full range of fluctuations, yes.

21 Q. Right. And what would the number be you'd
22 tell them they have to meet, the frequency?

23 A. Well, in my previous answer I said I'd want to
24 see improvement from what it is. It would be, I think,
25 pretty easy to provide some improvement. How much is

1 necessary I understand is what you're after.

2 Q. Right. Because you've said 2001, based on
3 just the half year of incidents that was provided to you by
4 Zoltek, was unreliable?

5 A. Yes.

6 Q. So we want to get to reliable for 2003. And
7 we want to do this and know what we've got to do before
8 instead of waiting until after and being told it was
9 unreliable. So what are you telling Ameren they have to do
10 that would satisfy you in terms of reliability?

11 A. I would first be interested in reducing the
12 frequency of incidents. And I would be happy to in a
13 different place than this -- in other words -- excuse me.
14 Let me restate that.

15 Ameren has highly qualified staff that knows
16 how to address these kinds of issues as far as the frequency
17 of these sags. I've testified on it in my direct, others
18 have testified on it. It's a matter of present disagreement
19 but needn't be disagreement as to what types of activities
20 Ameren could undertake to reduce the frequency of especially
21 the flickers, the blips, the short interval problems that
22 are caused at Zoltek. That's, I think, two of the three
23 areas that you wanted me to address.

24 The third one is the impact on Zoltek's
25 operations. And I think that that impact could be measured

1 more readily when one was able to address with Ameren
2 directly what will happen with the other two areas.

3 Q. Okay.

4 JUDGE THOMPSON: If I could break in, we'll
5 take a 10-minute recess now.

6 (A RECESS WAS TAKEN.)

7 JUDGE THOMPSON: I should warn you that I have
8 an item on the agenda today, so we will also take a short
9 recess and I will have to leave to take care of that. I
10 don't know exactly when that will be, but that will be
11 probably roughly in the ten o'clock region.

12 MR. VITALE: Okay.

13 JUDGE THOMPSON: Let's go ahead and go back on
14 the record.

15 MR. VITALE: Thank you, your Honor.

16 BY MR. VITALE:

17 Q. Mr. Park, before the break we were talking
18 about what AmerenUE would have to do to meet your assessment
19 of reliability for the year 2003. And I think you started
20 by saying they'd have to reduce the frequency of events?

21 A. Yes.

22 Q. To what?

23 A. Well, we hadn't gotten there yet.

24 Q. Well, that's why we're there. To what? What
25 number?

1 A. Well, first I'd like see some improvement.
2 Let's start with that. I know that's not a specific number.

3 Q. Sure. And everybody wants to get better
4 service, but I want to know -- so there's been improvement,
5 but then you say, But you're still unreliable. So I want to
6 know what improvement I have to make in frequency to get to
7 reliable so that I don't come in after the year 2003 and
8 somebody tells me I haven't given reliable service to
9 Zoltek.

10 A. So you're talking about an improvement that
11 would be a lasting improvement, one that if we looked over
12 the next eight years and said, okay, if we did this well
13 each of those next eight years, plus or minus a few events.

14 I think back -- going back to the deposition,
15 if you can get that -- that down into the -- the 10 to 15
16 event range per year and -- and all 10 or 15 of those aren't
17 one-hour outages, then I think that would probably show some
18 improvement. So if the overall duration shrinks in a
19 noticeable fashion and the frequency of events shrinks a
20 great deal, I think we're probably getting pretty close
21 together.

22 Q. So we've got the frequency should be to
23 10 to 15 a year. And what should the total duration be to
24 get to reliable?

25 A. I think that if the total duration gets down

1 within fairly close to the system average in terms of outage
2 minutes per year per customer, I think that would -- my
3 client would find that to be satisfactory.

4 Q. Well, let me interrupt you. I'm not talking
5 about what your client would find to be satisfactory. I
6 want to know what you consider to be reliable service. Is
7 that the same thing?

8 A. I think that's the same thing. I'd certainly
9 like it to be the same thing.

10 Q. And if another customer found the same thing
11 satisfactory and your client did not, does that one make it
12 reliable and the other not reliable?

13 A. No. There may be a difference in level of
14 tolerance between two customers over reliability.

15 Q. So we're back to that subjective definition.
16 Reliability depends on the customer's perception of what the
17 same type of service -- whether one is just annoyed and the
18 other one says, no, I'm not satisfied with that?

19 A. No. That -- that's not the implication I'm
20 trying to make. I can make myself more clear. If you and I
21 both have a new automobile from the same manufacturer and
22 both of them are terrible cars but you're willing to live
23 with that and I'm just not willing to put up with it, the
24 fact that you don't go to the manufacturer about that
25 doesn't diminish my claim.

1 Q. Okay. I'm afraid you've lost me.

2 A. Unreliable is still unreliable. You may be

3 willing to tolerate it while I'm not.

4 Q. So other customers may be satisfied with

5 unreliable service?

6 A. That's correct. I can't speak for them.

7 Q. Okay. And when you talk about things have to

8 be at the system average to be reliable in duration, what's

9 the system average?

10 A. I don't know what it is today. All I know is

11 what's been provided in the document.

12 Q. Which is what?

13 A. And I heard --

14 Q. Was it 60 minutes a year? I think I've seen a

15 lot of numbers.

16 A. -- 56, 58, 60 minutes.

17 Q. Okay.

18 A. And I don't think that is a poor score either.

19 I think Ameren's done very well on system average. And

20 we're only here because we don't believe we're near that

21 point.

22 Q. So you have to be at the average number to be

23 reliable? You can't be above the average? I mean, that's

24 the only way --

25 A. Someone has to be above the average.

1 Q. Sure. Of course.

2 A. We'd prefer it not be us based on the contract
3 between Ameren and the park.

4 Q. I understand. Well, is something above the
5 average unreliable or do you have to be at the average to be
6 reliable?

7 A. We're getting into some subjective areas
8 that -- that really we can't say that 60.3 minutes is -- is
9 reliable and 60.4 minutes is unreliable. There is no such
10 absolute number.

11 Q. Okay. And I agree with you. I'm trying to
12 get something objective so I know ahead of time. Are you
13 saying that we can't then review the reliability of past
14 performance until another eight years goes by, or would you
15 be able to do that after one year, say, 2003 and at the end
16 say you've been reliable or you haven't, or could you only
17 say you've improved?

18 A. Well, I think you can say you've been
19 reliable. What I don't want to happen is, okay, we've said
20 it's reliable and then that be taken in isolation and have
21 four years of very poor reliability and then come back here
22 and say, Well, park said we were reliable so we're reliable
23 and this doesn't count, this is a different set of
24 circumstances. I'm just guarding against that.

25 Q. All I'm trying to get at is some objective

1 standard that AmerenUE can shoot for so that afterwards
2 somebody says this certain thing didn't happen, you've been
3 unreliable.

4 Now, factored into all this is the impact on
5 Zoltek's operations. Correct? Does that have anything to
6 do with your determination of reliability, or is it just
7 frequency and duration?

8 A. Even if Ameren is able to produce a result
9 that I would say and agree this is reliable service, that
10 doesn't mean that Zoltek will not have any outages. It
11 doesn't mean they'll not have any lost production as a
12 result of it. Those are -- those are separate things. And
13 this is not a damage proceeding. This is --

14 Q. Sure.

15 A. -- about reliability. So I don't think we
16 need to consider in this argument damage or inoperability of
17 Zoltek's equipment for the purposes of creating damages.
18 We're only talking about reliability of service.

19 Q. I understand. And I'm not talking about
20 dollar damages, but as I think I recall your testimony
21 before the break when I asked you how you would determine
22 reliability, you said frequency, duration and impact on
23 operations, I thought.

24 So does the impact on the customer's operation
25 not factor into your definition of reliability? I'm not

1 talking dollars and damages, but just an impact, tangible
2 effect, the kind of thing we've been talking about.

3 A. Okay. I think the first two will have a
4 positive impact on the third. I have no reason whatsoever
5 to believe that Zoltek's operations will not approve --
6 improve very, very appreciably if those first two are met.

7 Q. Okay. My question is, does the impact factor
8 into your definition or your opinion if you look at it after
9 the year 2003 is over as to what's reliable?

10 A. Yes, it will.

11 Q. Okay.

12 A. And here's why, if you want to know.

13 Q. Sure. Go ahead.

14 A. Because we were grasping for figures of
15 10 incidents, 15 incidents per year. If -- if we try to get
16 an entirely objective quantity there and if each of those
17 incidents is just long enough, let's say, four, five
18 seconds, to cause a production disruption each time,
19 certainly Zoltek will not find itself to have reliable
20 service even though the number of incidents that we agreed
21 upon met the standard that we tried try to create from this.
22 So all of them are interrelated.

23 If, on average -- we go back to the discussion
24 we had just before break, I think it's reasonable, I think
25 Ameren would be improved, I think Zoltek's operations would

1 be improved and I think all would be satisfied.

2 Q. Okay. If I understood your answer, are you
3 saying if the frequency and duration goals or objectives are
4 met, but Ameren -- strike that -- but Zoltek has down time
5 on their plant from these incidents, they would still not
6 consider it reliable service? Is that what you said?

7 A. I think it's possible that they wouldn't
8 under -- under the most extreme conditions you could create
9 from those parameters, but I don't think it likely. And it
10 would not be my recommendation to -- to them or to you that
11 the service was, in fact, unreliable simply because they had
12 some incidents that caused them operating difficulties.

13 Q. So you would probably say to Zoltek, That's
14 probably reliable, but they may not agree with you?

15 A. That's -- that's possible.

16 Q. Okay. You talk on the bottom of page 7 and
17 the top of page 8 about uniqueness and you say Zoltek is not
18 unique, they're not different from other modern
19 manufacturers. And then you go on to say, But their
20 situation, they believe, is unique.

21 Now, what do you mean by that?

22 A. Well, the first half of that statement I
23 think's probably clear the way it's written. That we don't
24 believe -- and I think all of the Zoltek witnesses have
25 said -- that the processes are for high-tech manufacturing,

1 but they're not unique to Zoltek. We believe they're
2 typical of other similarly situated manufacturers.

3 The part that you may be concerned about then
4 is the -- the uniqueness of their situation. What I mean by
5 that -- I thought it was clear -- is that we don't believe
6 that service to them is comparable to service Ameren
7 provides other customers in other parts of its service
8 territory.

9 Q. And other than the Missouri Research Park?

10 A. And perhaps other than that piece of the
11 Missouri Research Park.

12 Q. How do you -- yeah, that was going to be my
13 next question. If we're limiting it to the park, but now
14 you're saying they're unique to other companies that may be
15 in the park?

16 A. Well, that's -- that's part of the difficulty
17 we've had because Ameren does not keep records of each and
18 every switching operation that they conduct. There are
19 times when we believe, and I don't think Ameren has denied
20 but Ameren doesn't seem to know, if Zoltek was switched to
21 what has been characterized as a rural feeder for periods of
22 time and that during those periods of time, their service
23 was even less reliable than is ordinarily the case.

24 While we've not been able to ascertain exactly
25 when those times were, we believe they existed. So what I'm

1 trying to say to you is that there -- there are times when
2 Zoltek is not served with all of the other customers in the
3 Research Park and there are other times when we believe,
4 from the evidence, that they are served by the same
5 facilities as everybody else in the Research Park. So it's
6 not the same answer every day of the year.

7 Q. Okay. You used the term "rural service" and
8 I've heard that used -- I think Mr. Rummy accused UE of that.
9 What do you mean by that term, "rural service"?

10 A. Well, it wasn't my term, by the way. It was
11 another witness's term.

12 Q. Okay. Well, you've said just now as you sit
13 here, there's been a time when Zoltek has been on rural
14 service. What rural service are you referring to that
15 Zoltek was on? What's the source of your knowledge?

16 A. I utilized the term that somebody else had. A
17 feeder line that was not dedicated to that park or was not
18 primarily used for service to that park at all times.

19 It was what has been characterized by both
20 Ameren and company witnesses as a feeder that has a larger
21 exposure, it has more overhead miles of line, it is in an
22 area that -- or serves -- passes through an area, excuse me,
23 that is somewhat wooded and somewhat more susceptible to
24 wind damage, to bird and animal strikes and such, than are
25 the feeders or feeder that sometimes serves the park from

1 another direction.

2 Q. Okay. I think you lost me there. Are you
3 saying rural feeder is not really the appropriate term --

4 A. It --

5 Q. -- you just picked up what somebody else used?

6 A. That's correct. It may serve through some
7 rural areas and maybe rural line is not either correct nor
8 incorrect. It may characterize it and it may not. None of
9 the area around that Missouri Research Park remains
10 particularly rural except perhaps the wildlife area.

11 Q. I just want to make sure when we're talking
12 about that rural term, you're just talking about a feeder
13 line that may have more exposure and other things, but the
14 rural or urban nature of it really isn't the issue here?

15 A. You're correct.

16 Q. Okay. That's fine. Now, is it possible that
17 Zoltek is unique to all the customers in the Missouri
18 Research Park of AmerenUE?

19 A. I don't know.

20 Q. Well, I asked you, I thought, to start with
21 the fact that Zoltek believes they're unique within the park
22 as opposed to outside the park. And then you said within
23 the park there may be other customers that they're not
24 comparable to. So there's going to be other customers that
25 have the same -- that are in the same situation as Zoltek

1 and receiving the same service. Correct?

2 A. Yes. But they may or may not -- in fact, I
3 have no idea what other customers are served on the same
4 piece of feeder serving Zoltek at all times, whether they
5 have manufacturing facilities of the same or similar to
6 Zoltek's. What my testimony said in terms of that
7 uniqueness is that service to similar customers to Zoltek in
8 locals other than Missouri Research Park may be much better.

9 Q. I understand. But you don't know whether
10 Zoltek has ever been on a sole feeder just for that
11 particular -- that plant only within the park?

12 A. I believe that that is not the case.

13 Q. Okay. So other customers are on the same
14 feeder and are getting the same service?

15 A. Yes.

16 Q. Okay. Now, you go on to say on line 4,
17 Reliability is not a homogenous condition.

18 And, again, I don't want to beat this to
19 death, but when we were talking reliability before and how
20 you measure it in frequency, duration and possibly impact,
21 do those numbers change in a different part of UE's
22 system --

23 A. No.

24 Q. -- the frequency that you would find reliable,
25 the duration?

1 A. No. I don't believe so.

2 Q. Okay.

3 A. What I meant by homogeneity, there is simply
4 that -- when one talks about 55 or 58 or 60 minutes, that's
5 a system-wide average and that there may be particular
6 customers, my office, for instance, where any kind of a sag
7 or outage is so uncommon that it's not even -- not even a
8 consideration even though that's a very old part of
9 St. Louis. We don't know why it's that good.

10 Other parts -- certainly everyone's heard
11 tails of the customer whose lights go out every time the
12 wind blows, so it is variable in making that. And my -- my
13 testimony -- testimony is going to that difference.

14 Q. Okay. And so you're not saying that the
15 standard of reliability is different in the City of
16 St. Louis as opposed to out in Missouri Research Park?

17 A. Not at all.

18 Q. Okay. And in page 9, I think this kind of
19 goes along with what we've been talking about, you say
20 you're not asking the Commission to adopt a definition of
21 power reliability or power quality; is that correct?

22 A. That's correct.

23 Q. And that's because you believe there's lots of
24 different definitions out there, but you're not picking
25 any one in particular?

1 A. No. We're asking the Commission to look at
2 this situation and make a judgment based on the facts.

3 Q. After the events have occurred?

4 A. Yes.

5 Q. Okay. So you're not asking the Commission to
6 adopt a standard that UE has to live up to in the future?

7 A. If the Commission would choose to do that,
8 that would be on their notion.

9 Q. But you're not offering anything today?

10 A. That's correct, I'm not.

11 Q. You go on to say, Zoltek recognizes no power
12 system is perfect, that storms, accidents and other
13 conditions will always have an impact on reliability.

14 But as I understood your testimony today,
15 those storms and accidents and things are things you count
16 when you are making your determination of frequency and
17 duration to decide whether the service has been reliable.
18 Correct?

19 A. Yes.

20 Q. Even though they're outside of UE's control
21 because they're on their system?

22 A. That's right. But it's also factored into
23 the -- into the figures that Ameren has either published or
24 offered as part of this. Again, when we talk about 56, 58,
25 60 minutes of outage time during the course of a year, some

1 of that is completely beyond Ameren's control, some of it
2 undoubtedly is well within it.

3 Q. And it's all factored in, but that average
4 time is not the limit of reliability. It could be above
5 that average time and still be reliable. Correct?

6 A. Yes.

7 Q. Okay. Okay. Now, you say that Ameren's
8 improvements and its efforts -- this is now line 11, page 9
9 of Exhibit 9 -- have been aimed at improving the system to
10 serve more customers rather than specifically improve
11 Zoltek's situation. You say, Such improvements have reduced
12 the frequency of interruptions at Zoltek.

13 Do you see that?

14 A. Yes.

15 Q. What improvements are we talking about there?

16 A. These are --

17 Q. Start with that.

18 A. -- improvements that Ameren has offered up in
19 its testimony, deposition, data requests. They include the
20 eventual installation of some line looping within the park.
21 It includes some substation improvements. It includes the
22 addition of a recloser, I think some capacitors, a number of
23 items that were considered by all parties as -- as system
24 improvements. Whether or not they were intended for direct
25 improvement at Zoltek --

1 Q. Sure.

2 A. -- or aimed at some other purpose, they are
3 improvements that I think all parties agree were made.

4 Q. Okay. I tried to write real fast here. You
5 said line looping within the park, substation improvements,
6 recloser installation?

7 A. Yes.

8 Q. One?

9 A. I believe it was one.

10 Q. And capacitors, is that connected to the
11 recloser or is that something different?

12 A. It's something different.

13 Q. And any other improvements that you can
14 identify or that you're referring to in your testimony?

15 A. I think there were some other improvements and
16 they're in the record. I'm not failing to consider them
17 purposely. I just don't recall them right now.

18 Q. Okay. You say these improvements, which were
19 done for customer growth basically, have also reduced the
20 frequency of interruptions at Zoltek. Correct?

21 A. On a qualitative basis, yes. I see you look
22 confused there.

23 Q. No. I don't consider qualitative and
24 frequency -- I consider that quantitative so that's what I'm
25 trying to understand.

1 A. The staff at Zoltek has reported to us that
2 in -- in terms of performance from 1993 to 2000 -- I think
3 there's some exceptions in 2001 more recently. They
4 detect -- and I use that word though it's quite
5 subjective -- they detect that there has been improvement in
6 the overall operation of Ameren's facilities serving
7 Zoltek's facilities.

8 That is not quantitatively correct in the
9 number of incidences, because I think they've remained
10 rather high, but the combination of numbers of events and
11 the severity of those events, as we discussed a little
12 earlier, they believe has been an improvement over time
13 though, as I indicate, that's not satisfied either with the
14 pace of those improvements or the overall improvement.

15 Q. So, first of all, are you just restating here
16 Zoltek's opinion or is this your opinion about the
17 improvements and what that has done?

18 A. Well, it's --

19 Q. Are you just restate--

20 A. -- certainly easy to share with them the
21 opinion that the impact has been lessened because they have
22 told me it is so and I believe them in that regard. I can
23 see certainly from the data, without talking with Zoltek at
24 all, that the quantities of these things have -- have varied
25 and do not show a particular trend of improvement.

1 Q. Okay. That's what I'm -- I guess that's what
2 I'm trying to understand. The sentence is, Such
3 improvements have reduced the frequency of interruptions.
4 So you're saying it's not necessarily frequency, but it may
5 be the impact on Zoltek that Zoltek feels has been an
6 improvement or duration, the whole kit and kaboodle?

7 A. The whole thing.

8 Q. The whole package?

9 A. And rather than stretch that out for four or
10 five paragraphs, I've chosen the words that you've been able
11 to help me clarify.

12 Q. In fact, the worst -- well, strike that.
13 What capacitors -- what has that improvement
14 done to Zoltek's service?

15 A. I have no idea. I know what capacitors are
16 designed to do and I know that they were installed. I don't
17 have any idea if they were effective in some way or if in
18 concert with other improvements they made a difference.
19 It's impossible for me to isolate the particular improvement
20 that -- in service quality that any of these things had.

21 Q. Okay. So it's really just kind of a before
22 and after? Certain things happened and then from the
23 incidents reported by Zoltek, there's been a change in
24 frequency and duration and impact so you attribute that to
25 the improvements?

1 A. Yes. We have nothing else to attribute it to.
2 We know that the improvements were made and we're hopeful
3 they made a difference. They didn't make enough difference,
4 didn't make it fast enough, but we know some things were
5 done.

6 Q. And they didn't make enough difference so
7 we're not there yet?

8 A. That's correct.

9 Q. But you can't tie anything and say cause and
10 effect? It's just things were done, Zoltek's incidents
11 changed or improved, or their situation improved, therefore,
12 the improvements must have caused it?

13 A. We hope that is correct, yes.

14 Q. Okay. Fine. And you said -- I think you
15 caught up with all these, but all four things you can't say
16 how that particular improvement -- if I went through the
17 recloser, the substation and the line looping, how that
18 improved service to Zoltek?

19 A. That's right.

20 Q. Okay.

21 A. I can't and I don't think anyone else who's
22 commented on them is able to isolate them either.

23 Q. Okay. I'm not asking you about anyone else's
24 testimony, but this is your -- you say such improvements
25 have reduced the frequency. So we're down to it's not just

1 frequency, but maybe it's duration? Because at least by my
2 numbers, the frequency -- do you know when these
3 improvements occurred? Let me stop there. Bad question.
4 Stop there.

5 When did these improvements occur?

6 A. They occurred over a period of time and some
7 of them I think may be quoted in my testimony. It's
8 certainly part of the record. As I sit here today, I can't
9 tell you a specific date that any of them were done.

10 Q. Okay.

11 A. But I know those dates are known.

12 Q. Any one of these four improvements you've been
13 able to identify you consider the major improvement or one
14 more significant than the others?

15 A. No. I really can't.

16 Q. Okay. On page 10 of your testimony, line 11,
17 you're referring to some specific correspondence between UE
18 and Mr. Rummy and why Mr. Rummy should have been not consoled
19 by Ameren's average reliability record or system-wide
20 because that wasn't his experience. Is that a fair summary
21 of what you're saying there?

22 A. I think so.

23 Q. And we're talking about -- and you say by that
24 date, this is August '93, Zoltek had a cumulative outage
25 time of 765 minutes and 24 separate outages. Correct?

1 A. Yes.

2 Q. Okay. Now, what are we talking here when
3 we're talking outages? Are we talking total loss of power
4 or just an addition of all the different incidents, however
5 they're defined and recorded by Zoltek?

6 A. I think the intended thing is incidences
7 there.

8 Q. So it could include variations, sags, all the
9 way down to zero?

10 A. Yes. Events.

11 Q. And the same for 24 separate outages, that
12 we're also talking about that mix of types of events?

13 A. I thought that's what we were talking about.

14 Q. Well, you use outage twice and I just want to
15 make sure it's the term here. Outage time --

16 A. I'm sorry.

17 Q. -- and outage effects.

18 A. Let's back up then. The outage time of
19 765 minutes is adding up figures from Zoltek's log sheets.
20 The 24 separate outages is 24 separate incidents.

21 Q. Okay. Because both those include not just
22 loss of power, but also voltage fluctuations of whatever
23 percentage they might have been?

24 A. I believe it does.

25 Q. Okay. That's fair.

1 Now, it's true, isn't it, that '93 was -- in
2 St. Louis and lots of other places, but '93 was a severe
3 weather year?

4 A. It certainly was a memorable year for floods
5 and I suspect that had some impact on Ameren's operations.
6 I don't know if it had a particular effect in that area or
7 not. I don't deny that it may have. I just don't know.

8 Q. Have you seen Mr. Angeli's Direct
9 Testimony -- or Rebuttal Testimony in this case about the
10 lightning incidents and the other various weather incidents
11 that Ameren incurred on its system in 1993?

12 A. I did read that some time ago.

13 Q. Do you have any opinion as to whether the
14 weather conditions in 1993 had any impact on Ameren's
15 service to Zoltek?

16 A. I think it certainly could have and I'll say
17 I've not read Mr. Angeli's testimony in some time. It --
18 there's no question about what lightning incidences are
19 weather related. What is less clear is how that might
20 impact one customer or another at any given time. So many
21 strikes per hour, so many strikes per day, none of -- it
22 could be that none of those strikes is direct on Ameren
23 facilities. It could be that all of them are.

24 Q. Okay. Would you be surprised to know -- and I
25 think this may be Mr. Carr's testimony -- that, you know,

1 Ameren had recorded on its system an unusual number of
2 outages and incidents and even complaints from customers
3 during the year 1993 resulting from the weather conditions?

4 A. Certainly would not surprise me.

5 Q. And do you consider 1993 because of the
6 weather to be any kind of an aberrational year, if that's a
7 term, aberrational, or any kind of an aberration to the
8 statistical data?

9 A. Well, if you'll give me a moment to just look
10 over something or refresh myself on some of those incidence,
11 I can give you a better answer.

12 Q. Sure.

13 MR. VITALE: Or, your Honor, if you want to --

14 THE WITNESS: This will not take long.

15 MR. VITALE: I was going to say, if we're
16 going to take a break, we can do that during a break.

17 BY MR. VITALE:

18 Q. Have you had an opportunity, Mr. Park, to --

19 A. Yes.

20 Q. Okay.

21 A. The -- of course, the data recorded by Zoltek
22 does not have any recording of any particular weather
23 condition, but the number of events in 1993 appears to be
24 substantially in excess of the other years. I would not be
25 surprised if that's weather related. Whether it's lightning

1 related, I don't know.

2 Q. And at least some of these weather-related
3 things are beyond Ameren's control, I think you testified
4 yesterday. Correct?

5 A. Yes.

6 Q. But you include that as part of your analysis
7 to determine whether the service has been reliable or not?

8 A. Yes.

9 Q. Okay. Even though Ameren couldn't have done
10 anything to prevent those problems?

11 A. I don't believe that would be a factor.

12 Q. The fact that they couldn't do anything about
13 it?

14 A. Right.

15 Q. Okay.

16 A. It may not be their fault, but that -- fault
17 is not necessarily a measure of reliability.

18 Q. Okay. So we are -- I mean, to boil all that
19 down, we could have a number of years where Ameren does
20 nothing to contribute to what you believe to be an
21 unreliable level of service and where Ameren can do nothing
22 to prevent that unreliable level of service?

23 A. Unusual, but not impossible.

24 Q. Okay. Going on to page 11, and this is a
25 little redundant, but I think you've said it now. You list

1 the changes on page 11, line 12, or the improvements that
2 you're talking about and you say, May have contributed. So
3 you acknowledge there that you don't know if they did or
4 didn't. Correct?

5 A. Page 11?

6 Q. Page 11, line 15. Those are the different
7 improvements that you just --

8 A. Yes.

9 Q. -- mentioned?

10 Okay. Page 12, lines 8 and 9. You talk about
11 the power quality monitoring that Ameren did at Zoltek. You
12 say, That monitoring has probably been aimed at establishing
13 generally unsuccessfully the source and validity of alleged
14 outages.

15 Do you see that?

16 A. Yes.

17 Q. So are you saying that AmerenUE's monitoring
18 was unsuccessful to determine the source of the outage? Is
19 that what that's saying?

20 A. Yes.

21 Q. Okay. So Ameren's own monitoring, they
22 couldn't determine the source of the outage?

23 A. The -- I think that is generally correct, but
24 it requires a little expansion in that as -- as the
25 gentleman from Ameren testified yesterday, they could pretty

1 much tell if a particular incident was due to Zoltek's
2 actions or inactions or that it happened externally on the
3 Ameren system. As far as the ability to pinpoint the source
4 of an event, that instrumentation doesn't have that level of
5 sophistication.

6 Q. And without determining the source, you can't
7 affect a cure or an improvement to that?

8 A. No. But within the context of my testimony
9 there and the earlier depositions of some of those
10 witnesses, it -- it certainly appeared that the objective of
11 some of the testing was more at -- at demonstrating
12 something that couldn't be demonstrated, that this was all
13 Zoltek's problem. And I don't think the results of those
14 monitoring tests established that.

15 Q. Okay. Without knowing the source of a
16 problem, is it fair to say you can't fix it or improve it?

17 A. No.

18 Q. No? Do you just then take stabs and try this,
19 try that to see if that might fix things?

20 A. You find that to be a pretty common way of
21 approaching many utility problems. When you don't know the
22 exact solution, you try a scatter gun approach. That may
23 not sound very scientific, but it is commonly done. And I
24 think Ameren and every other utility in the country has done
25 that from time to time.

1 Q. Okay. What's the scatter gun approach you
2 suggest AmerenUE try to improve the reliability to Zoltek
3 here? You don't know if these other improvements have
4 contributed or not so now we're here and we want to make
5 sure we're reliable. What do you suggest AmerenUE do?

6 A. I'm not examined nor have I been asked to
7 examine Ameren's system in detail. We know what's
8 happened -- what has happened at Zoltek, what the result of
9 that is, but we rely on Ameren to monitor and engineer its
10 own system.

11 Q. So --

12 JUDGE THOMPSON: We're going to have to break
13 now. I just got a message to go up.

14 MR. VITALE: Can I just ask one question to
15 close that?

16 JUDGE THOMPSON: I need to go to the agenda
17 meeting. I apologize.

18 We will be in recess until I get back, which I
19 hope will be about 10 minutes.

20 (A RECESS WAS TAKEN.)

21 JUDGE THOMPSON: Let's go back on the record
22 and you may inquire, Mr. Vitale.

23 MR. VITALE: Thank you, your Honor.

24 BY MR. VITALE:

25 Q. Going back to close a thought we had before

1 the break, it's your testimony then, Mr. Park, that you have
2 no opinion on what improvements UE should make to its system
3 to improve the reliability of the service to Zoltek?

4 A. No. If the company would ask me to go out and
5 investigate that on their behalf, I'd be pleased to do so.

6 Q. But as you sit here today, you have not done
7 that for Zoltek?

8 A. I have not.

9 Q. Okay. Let me ask you a question. I asked you
10 at the very outset yesterday and you said you've never
11 testified as an expert before in a power quality type of
12 case; is that correct?

13 A. That's correct.

14 Q. But I think you've also said you've done some
15 consulting work?

16 A. Yes.

17 Q. Tell me what the extent of that is in the
18 power quality area.

19 A. Our practice of engineering also includes a
20 certain amount of what we call service work through a
21 related corporation that we own and I'm also president of.
22 Most of our clientele is comprised of small utilities rather
23 than industries. Most of those small utilities lack large
24 engineering staffs and they utilize us on a day-to-day basis
25 as they would an internal staff if they had one.

1 So for those situations where those particular
2 utilities have a question of their own or a customer has
3 inquired of them about reliability or power quality or
4 similar issues to what we are discussing here today, they
5 will from time to time engage us to utilize our equipment or
6 additional equipment that we might acquire to go out and do
7 some monitoring on those facilities.

8 Q. Okay. And monitoring, I'm sorry, on customer
9 facilities?

10 A. On customer facilities.

11 Q. In order to make recommendations to the
12 customer as to things they could do?

13 A. So that the -- so that our client, the
14 utility, can make recommendations. We are seldom, if ever,
15 the persons directly recommending to those utility
16 customers.

17 Q. Okay. And do you, yourself, get involved in
18 that or is this other people in the company that do that
19 work?

20 A. Sometimes I am present because I desire to be,
21 but as far as the person who hooks up the wires and sets the
22 up the machinery, generally we have a technical staff that
23 does that for us.

24 Q. Then do you just read the results and make the
25 recommendation to the utility so they can pass it along to

1 the customer?

2 A. When you say "you," me personally?

3 Q. You personally, yes.

4 A. I will often read that over. I am generally
5 not the person who would prepare those. That would be one
6 of our engineers or senior engineers or project managers.

7 Q. I guess what I'm trying to get at is what
8 experience you personally have in the power quality
9 monitoring field or power quality field, let's put it that
10 way, in giving opinion, consulting?

11 A. It will often be my personal recommendations
12 to utilize a particular piece of equipment or approach the
13 situation in this manner or if -- if something in the
14 results seems odd or if there's something that appears to be
15 a malfunction, I'll be asked to consult with our staff on
16 those matters or perhaps the utility on those matters.

17 Q. And the end of result of that ultimately is
18 your company tells the utility what your findings and
19 recommendations and opinions are and the utility goes and
20 recommends to the customer what the customer can do at its
21 place of business?

22 A. If it rises to that. It may very well be, and
23 often is, that the utility needs to do something themselves.
24 In our experience, that is more often the case. And I'm not
25 saying that because of anything associated with this

1 particular case, but the nature of some of those clients is
2 that they may have believed at the onset that they had a
3 problem and they simply wanted us --

4 Q. Sure.

5 A. -- to help them cure it.

6 Q. And the end result then is an opinion as to
7 what the utility or the customer should do in that
8 particular situation?

9 A. Yes.

10 Q. Okay. And these small utility companies, are
11 those investor-owned companies, do you know?

12 A. None of them are investor-owned.

13 Q. And none of them are regulated by the
14 Commission?

15 A. That's correct.

16 Q. Okay. Okay. Going to your testimony at the
17 bottom of page 12, top of 13, you conclude from reading a
18 letter from Mr. Carr that Ameren doubted the truthfulness of
19 Zoltek's outage claims. Is that your testimony?

20 A. Yes, it is.

21 Q. Okay. And that's because Mr. Carr said, As
22 far as -- and this is the quote that you have from his
23 letter in your testimony -- As far as we can determine, you
24 have not experienced any power interruptions either
25 instantaneous or sustained since December 1993.

1 That's why you say he --

2 A. Yes.

3 Q. -- Mr. Carr is saying Mr. Zoltek -- or the
4 company is being untruthful; is that correct?

5 A. Yes.

6 Q. And isn't it fair to say what he's saying
7 there is we don't have anything showing on our system by
8 what UE would call a power interruption?

9 A. Yes.

10 Q. Okay. So he's not saying, Mr. Zoltek, you're
11 lying about what you're experiencing at your plant?

12 A. I don't know what was going through Mr. Carr's
13 mind at the time that he wrote the letter, but as I -- as I
14 read it and -- and -- and interpret the tenor of the
15 language, I think it was saying just that, that, Zoltek, we
16 don't believe you.

17 Q. Okay. Why do you say that the monitoring that
18 was done -- this is just continuing down on the same
19 page 13 -- that this time frame, this is the monitoring that
20 was done in '93, was a very good selection as there were
21 only -- and I think you changed that to two disturbances
22 during that period. What do you mean by it was a good
23 selection?

24 A. Well, I mean by that the particular period of
25 time had very few incidences and was favorable to Ameren. I

1 don't mean by that that Ameren selected a period and made
2 any special effort to make it look good. It simply turned
3 out to be a very good period for Ameren.

4 Q. On lines 8 and 9 you say, This is hardly the
5 level of reliability contemplated by Ameren and University
6 of Missouri officials in their 1988 agreement.

7 Do you see that?

8 A. Yes.

9 Q. Okay. And fair to say that you're inferring
10 that from the agreement solely?

11 A. Yes.

12 Q. Okay. So the level of reliability is whatever
13 you read into the agreement yourself?

14 A. The agreement, of course, is -- as we all
15 know, is itself subjective, but out of only a few points
16 made in the agreement, the -- in the very first description
17 it talks about a more reliable system.

18 Q. I understand. But all I want to get at right
19 now as a starting premise, you weren't involved in any of
20 those negotiations or discussions between Ameren and the
21 University in terms of what they meant by that agreement.
22 Correct?

23 A. I was not.

24 Q. So your testimony here is strictly from your
25 reading of the agreement?

1 A. That's correct.

2 Q. Okay. Now, when it says more reliable service

3 from a loop system, that's, what, as opposed to a radial

4 system?

5 A. Yes.

6 Q. Okay. And is a radial system unreliable?

7 A. Not on its face, no.

8 Q. So a radial system could be reliable and a

9 loop system could be reliable?

10 A. Yes.

11 Q. Okay. Could a loop system be unreliable?

12 A. Yes.

13 Q. Okay. So are you saying that Zoltek -- and

14 you're interpreting the contract here. It's your testimony

15 that Zoltek was entitled to some different level of service

16 than just reliable service? If the radial that we're

17 talking about provided reliable service, you're saying

18 Zoltek was entitled to some different level of service?

19 A. No. I think my testimony says that I expect

20 that Ameren should offer Zoltek as good a service as the

21 best it provides to anyone else. Now, that is slightly more

22 lenient with Ameren than what I think that contract

23 contemplates, because it does distinctly say more reliable.

24 And beyond that, the phrase that was

25 originally written in there was different and it was changed

1 and initialed by Ameren people. So I know that particular
2 clause was scrutinized carefully before it was put in. So
3 clearly it was an agreed-upon objective.

4 Q. Okay. Between the University and Ameren?

5 A. Yes.

6 Q. Okay. And, I mean, it's your testimony that's
7 brought the contract into play so that's why I want to ask
8 you some questions about it.

9 More reliable than a loop system doesn't mean
10 that the radial system was unreliable to begin with.
11 Correct?

12 A. That's correct. It does not.

13 Q. So your interpretation of the contract is that
14 that contract somehow obliged AmerenUE to provide a
15 different level of reliable service than reliable?

16 A. Yes. I believe it does.

17 Q. Okay. And how do we measure that more
18 reliable service? We've talked about the different types of
19 ways you measure reliability. Those definitions, were we
20 talking -- that we spent a lot of time on -- frequency,
21 duration and impact, was it the reliable service that all
22 customers in the system should expect or the reliable
23 service that Zoltek was entitled to expect because of this
24 contract?

25 A. That's why I limited my testimony to what I

1 believed was reliable service and what I believed that the
2 customer was entitled to, which is reliable service. If
3 that contract affords them something better than that, so be
4 it. That's a matter of the contract and that's for lawyers
5 to debate and I'm merely an engineer.

6 Q. That's fine. I just want to -- so your
7 testimony about the reliability that Zoltek should expect
8 and your standards and definitions of reliability you've
9 been testifying to are the reliability that any customer of
10 UE should be entitled to?

11 A. Yes.

12 Q. And you're not giving an opinion as to what
13 more reliable service UE -- I'm sorry -- Zoltek should be
14 entitled to by this agreement?

15 A. No.

16 Q. Okay. So then why are you referencing all the
17 outages in your testimony that Zoltek experienced to the
18 level of reliability contemplated by the contract?

19 A. The contract, as a minimum, reinforces my
20 opinion that they're entitled to reliable service.

21 Q. Does a customer need a contract to be entitled
22 to reliable service?

23 A. They shouldn't, but they apparently do.

24 Q. So you don't know -- you have no opinion as to
25 what the different level of reliable service that Zoltek was

1 entitled to by this agreement?

2 A. I don't know. It's not been discussed with
3 me. I've not had any discussions with University officials.

4 Q. So you have no opinion?

5 A. I do not.

6 Q. Thank you. Okay. Line 12, you say, Actual
7 hours of outages are consistently higher than Ameren's
8 claimed system outage performance. This is on page 13
9 still. Do you see that? Line 12, page 13 of Exhibit 9.

10 A. Yes.

11 Q. Okay. The first part, actual hours of
12 outages, are Zoltek outages. Correct?

13 A. Yes.

14 Q. And that includes all the different types of
15 things we've talked about and used all different terms with,
16 but power -- 0 power, 10 percent voltage fluctuations?

17 A. It's more limited than that, because actual
18 outage hours you can only add up from those log items which
19 have one second, one minute, one hour, whatever, items that
20 you can add up in terms of measurable time. So that is what
21 I'm using. It should be quite objective in that reference.

22 Q. So you didn't count any time for blips,
23 flickers, dims when you count the incidents --

24 A. No.

25 Q. -- on the log?

1 Okay. Anything from one second above you
2 counted?
3 A. If there was a numeric entry --
4 Q. Okay.
5 A. -- I counted it.
6 Q. Okay. Including the .3 seconds and .4 seconds
7 of voltage fluctuations that were monitored by AmerenUE?
8 A. I believe so, but they'd have such a diminmous
9 impact on that total, they wouldn't make any difference.
10 Q. I understand. You took whatever -- whether it
11 was a recorded number, whether it was an actual loss of
12 power or voltage variation on the incident log, if it was
13 there, you added it?
14 A. That's my recollection.
15 Q. Okay. Were you here yesterday, I know you
16 were, for the testimony -- I believe it may have been the
17 day before -- of Mr. Moran who said that a minute on the
18 incident log could be anywhere from a second to a minute?
19 A. I believe so.
20 Q. Okay. So if we took each minute entry and
21 turned that down to a second, that would have a fair impact
22 on the number of the final total of minutes that you add up.
23 Correct?
24 A. Actually not. If the total number of minutes
25 involved was in the -- in the range that Ameren offers as --

1 as one of its measures of reliability, it might actually
2 have an impact on that, because you could be talking about a
3 few minutes during the course of the year. Since the number
4 of outage minutes was so extraordinary, any of those
5 one-second to one-minute events would have virtually no
6 impact on the statistics that I've generated here.

7 Q. Okay. But regardless of whether it was a
8 total loss of power or variation, if it's recorded on the
9 incident log, you counted it up to the actual hours of
10 outages?

11 A. I believe I did.

12 Q. Okay. Then when you say that's consistently
13 higher than Ameren's claimed system outage performance, how
14 does Ameren measure its outage performance on its system?

15 A. The measure that we had, we had to take from,
16 I believe, Mr. Carr's statements in some correspondence.
17 And he gave, I believe, one measure that had been taken for
18 the particular service area and one, I believe, for Ameren
19 as -- as a whole.

20 Q. Okay.

21 A. They were similar and pretty good.

22 Q. Okay. Do you understand those numbers to
23 include just simply loss of power outages?

24 A. No. I think Ameren uses an entirely different
25 mechanism for -- for measurement that is much more favorable

1 to itself than the -- than the level I used.

2 Q. Then aren't we kind of comparing apples and
3 oranges when we compare the way Zoltek measures time of
4 outage and Ameren time of outage?

5 A. Another reason why we're here.

6 Q. Okay. So that's correct. So you would expect
7 to find the way Zoltek measures it to be higher than the way
8 Ameren measures it because you think Ameren measures it
9 favorably to itself and I suspect Zoltek measures it
10 favorably to itself?

11 A. I'll agree with half of that.

12 Q. The part that Ameren does it favorably?

13 A. Yes.

14 Q. Okay. So that wouldn't surprise you though,
15 the fact that one -- that Zoltek's numbers are higher than
16 Ameren's?

17 A. No.

18 Q. Okay. And are we talking here Ameren's
19 claimed system outage performance? Are we talking that
20 average performance that we talked about earlier?

21 A. Yes.

22 Q. Okay. So, by definition, if that's an average
23 performance -- I don't want to say half because I'm not a
24 mathematician, but maybe it is half. To get to that being
25 an average, somebody's got to be above average?

1 A. And somebody has to be below.

2 Q. The people that are above average, that

3 doesn't mean they have unreliable service, does it?

4 A. If they're sufficiently above average, yes, it

5 does.

6 Q. Just the fact they're above; otherwise, you

7 wouldn't have an average number. Correct? It doesn't mean

8 that they are by definition?

9 A. That's right. An average has to be created

10 mathematically.

11 Q. Okay. You say loop feeders were installed

12 much later than contemplated by written agreements. And I

13 think the only agreement we've got is the 1988 agreement

14 with the park. Right?

15 A. That's correct.

16 Q. And what's the time contemplated in that

17 agreement for when that was to be put in?

18 A. The times contemplated were to be immediate.

19 Q. And where do you see that in the agreement

20 attached to your testimony?

21 A. It is not a date that is stipulated in there,

22 but none of the terms say it is not immediate and it is said

23 and I'll -- if you'd like, we can turn to that --

24 Q. Sure.

25 A. -- that agreement, which is one of the

1 schedules attached to my testimony.

2 Q. And that's Schedule 4 -- well, it's actually
3 Schedule 3 of Exhibit 9.

4 A. Okay. And I have that --

5 Q. DAP-4, I'm sorry, for the record.

6 A. I have that in front of me. On page 1 there's
7 a paragraph 1, and I don't guess I need to read it. Most
8 people have it before them. But everything within one is
9 sort of inclusive. They'll -- the company would install and
10 maintain a primary electric distribution system, it should
11 be installed underground, it has so many cable feet and
12 associate pull boxes and it will be looped.

13 Q. No timing in there?

14 A. There's no timing in there.

15 Q. Okay.

16 A. But it -- it seems to me since all of these
17 other things were required to provide service, they are part
18 and parcel of the same thing and they ought to be there when
19 service is instituted for a customer.

20 Q. Okay. But wasn't your testimony earlier this
21 morning that the loop system -- you can't say whether it had
22 any effect at all on Zoltek's service or reliability of
23 service to Zoltek?

24 A. No. That's -- that's not quite the case.
25 When we were talking about all of those things, I can't cite

1 anything specific that would lead me to this outage or that
2 outage or this improvement or that improvement would be led
3 by this.

4 In terms of the loop, as many people -- or at
5 least several people have testified, a loop system does not
6 necessarily provide any reduction in the number of events.
7 It can and does frequently shorten the term of them. So I
8 don't want to get tied up in that I can't say that this does
9 something. I just can't cite it specifically as a cure for
10 any one of them.

11 Q. Well, I thought we just went through that in
12 your testimony. On page 11 you cite Ameren -- this is
13 page 11 of Exhibit 9 starting at line 12. You say, Ameren's
14 made a number of physical changes, including the
15 installation of physical loops.

16 That's the loop we're talking about. Correct?

17 A. Yes.

18 Q. And you say, These may have contributed to
19 improvements.

20 So it may not have contributed to any
21 improvements?

22 A. And I still agree with that.

23 Q. I thought that's what I asked you. So the
24 loop system may not have done anything to Zoltek?

25 A. It may not have.

1 Q. Okay. So that may not even be an issue here
2 in what Zoltek is experiencing?

3 A. I think it's still an issue because they were
4 entitled to it.

5 Q. But they don't necessarily need it to have
6 reliable service?

7 A. No.

8 Q. You can't tell that. Correct?

9 A. I can't tell that.

10 Q. Right. And you're not saying that here?

11 A. No. But I want them to have it.

12 Q. I want to have perfect power, but I'm not
13 going to get it.

14 JUDGE THOMPSON: If I could interject at this
15 time, particularly as we are running out of time during our
16 three scheduled days and haven't even begun Union Electric's
17 case yet, your answers need to be yes, no, or I don't know
18 unless the question clearly calls for a narrative. Okay?
19 And I would appreciate that. That will move us along.

20 And I would urge you, please, interrogate the
21 witness, but don't argue with him.

22 MR. VITALE: Thank you, your Honor. I will
23 and I apologize.

24 JUDGE THOMPSON: Let's go forward.

25 BY MR. VITALE:

1 Q. At the top of page 16 of your Exhibit 9, your
2 Direct Testimony, you state that, Improvements in the outage
3 statistics at Zoltek in recent years are due solely to
4 improvements made by Ameren and are unrelated to operating
5 changes at Zoltek.

6 Do you see that?

7 A. Yes.

8 Q. And I thought your earlier testimony that we
9 just looked at earlier in Exhibit 9 was these improvements
10 may have contributed to the improvement -- I don't want to
11 use improvements twice. These improvements made by AmerenUE
12 may have contributed to the improved service at Zoltek?

13 A. Yes.

14 Q. Okay. So if you don't know if those things
15 that Ameren did had any impact on Zoltek, they may or may
16 not have, how can you say the improvements at Zoltek were
17 solely due to Ameren's improvements?

18 A. Different question, different context.

19 Q. Explain that.

20 A. The improvements in the outage statistics as
21 stated here are due solely to improvements made by Ameren.
22 Now, those are improvements that we discussed which I said
23 may or may not improve also by those circumstances that may
24 not be in Ameren's control. But in any event, it was off of
25 the Zoltek system.

1 Q. Okay. So improvements made by Ameren may have
2 been improvements not within Ameren's control? I mean, you
3 said made by Ameren. What improvements made by Ameren are
4 you referring to that contributed to the improvement in the
5 outage statistics at Zoltek?

6 A. The intent of the statement, and I think it's
7 clear, is simply that Zoltek didn't do anything to change --
8 change the events recorded at the plant, so any improvements
9 that happened were as a result of Ameren's efforts.

10 Q. Well, at the risk of arguing with the witness
11 as the Judge has asked that I not do, if you can answer my
12 questions.

13 Improvements in the outage statistics at
14 Zoltek in recent years are due solely to improvements made
15 by Ameren. What improvements made by Ameren contributed to
16 the improvements in the outage statistics at Zoltek?

17 A. They may have been improvements in the
18 transmission or substation area. I don't know. I only know
19 that it wasn't due to anything Zoltek did.

20 Q. Okay. But that's not what you say here. You
21 say they were due to what Ameren did. And you don't know
22 what Ameren did, if anything, that improved the statistics
23 at Zoltek. Correct?

24 A. Then I take away credit from Ameren then.
25 That's fine.

1 Q. Okay. So it may have been an act of God, that
2 the weather's been great?

3 A. That would be wonderful.

4 Q. Okay. And that's out of the control of
5 Ameren. Correct?

6 A. I think so.

7 Q. Okay. So it may have been things entirely --
8 you say it's not Zoltek. Zoltek didn't do anything to
9 improve things. And you don't know what Ameren did to
10 improve things. You don't know if the things that we've
11 talked about, the loop system and all, contributed or not,
12 so it's possible that it's just dumb luck and the alignment
13 of the planets that statistics have improved at Zoltek?

14 A. Then I'm sorry I gave Ameren too much credit.

15 Q. That's possible. Correct?

16 A. Yes. That's possible.

17 Q. So things outside of either parties' control.
18 Correct? Zoltek didn't do it, Ameren didn't do it, it just
19 happened?

20 A. I don't know that Ameren didn't do it. I'm
21 just agreeing with you that it might necessarily be
22 something that just went well for the company.

23 Q. Okay. So it's possible neither one did
24 anything that contributed to the improvement in the outage
25 statistics at Zoltek?

1 A. I think that's possible.

2 Q. Okay. But as the date of your testimony here,

3 June 2001, service quality is still inadequate. Correct?

4 A. Yes.

5 Q. Okay. Do you know of anything -- do you still

6 believe it inadequate today? Do you have any basis to base

7 an opinion?

8 A. You asked me not to do that earlier this

9 morning.

10 Q. Well, I don't recall doing that, but we have

11 statistics and that's all we could look at up to June 2001.

12 I just want to know if there's anything after that point

13 that you can use to give an opinion.

14 A. I've not observed it personally. I did hear

15 testimony in the room yesterday and the day before that it's

16 not good.

17 Q. And the testimony leads you to conclude it's

18 still not reliable?

19 A. Yes.

20 Q. Okay. Despite the loop system being put in

21 and all these other improvements?

22 A. Yes.

23 Q. I think we kind of did this yesterday, but you

24 talked about -- on page 17 you're talking about UPS systems

25 and other types of things that could be done by Zoltek. And

1 you testify here that there would be cost prohibitive and
2 possibly environmental issues as well. That's your
3 testimony. Correct?

4 A. Yes.

5 Q. But you haven't analyzed that to look at that,
6 you're just relying on your general knowledge of how UPS
7 systems work and what they cost?

8 A. Both UPS systems and back-up generators, both
9 of which I have some knowledge.

10 Q. My question is, you haven't analyzed to see
11 what Zoltek would have to do or what it would cost here?

12 A. No. I simply know it would be large.

13 Q. Okay. You were asked the question in your
14 testimony on page 17 of what level of reliability does
15 Zoltek require. And just to make it clear here, you're
16 responding to -- when you give your levels in your
17 definitions and your testimony here, you're talking about
18 the level of reliability that all AmerenUE customers should
19 expect?

20 A. Yes.

21 Q. Not the higher level, if any, that this
22 contract may have contemplated?

23 A. Yes.

24 Q. At the bottom of page 17, I think you're
25 talking here to what Ameren improvements might be made. You

1 say, Ameren cannot control every facet of its system at all
2 times, but it does have reasonable control of its
3 construction, operation and maintenance practices which, if
4 properly directed, can have a very positive influence on
5 service reliability.

6 Do you see that?

7 A. Yes.

8 Q. And as a general statement, I guess I would
9 agree with you. Are you making that statement with respect
10 to what could be done for Zoltek?

11 A. It would certainly help Zoltek and probably
12 other customers as well.

13 Q. Well, do you know what in Ameren's
14 construction, operation and maintenance practices are being
15 improperly directed or not being properly directed with
16 respect to Zoltek? That's who we're here about.

17 A. There are practices that I would certainly be
18 willing to -- to examine and those that I have a strong
19 feeling have -- have impacted upon Zoltek's reliability that
20 fall into the range of operation and maintenance practices
21 as opposed to construction activities.

22 Q. Okay. You're talking about tree trimming,
23 animal traps, things like that?

24 A. Yes.

25 Q. And those are things, I think you said

1 yesterday, that you have no specific knowledge of whether
2 they impact Zoltek or not in this Wentzville area?

3 A. That --

4 Q. Okay.

5 A. That is correct.

6 Q. So it's possible you may get in to look at
7 their practice and say, this is exactly what I would have
8 suggested you do. So they may not be able to do anything
9 more in this area that you talk about?

10 A. Though unlikely, that's possible.

11 Q. Well, you just don't know. Correct?

12 A. I don't know.

13 Q. Page 11 -- I'm sorry. Page 18, line 11, No
14 one but Ameren can implement measures to reduce the
15 frequency of outages at Zoltek.

16 And, again, I don't want to beat this to
17 death, but this is your testimony and I thought you said
18 earlier that, you know, you have some general
19 recommendations or if you got into the system and Ameren
20 asked you, you could give some ideas, but as you sit here,
21 you can't define what those measures are. Correct? To
22 reduce the frequency of outages at Zoltek?

23 A. No. And I don't think I need to.

24 Q. I'm not asking you whether you need to, sir.
25 I just asked you, you don't know what those measures are

1 that they should implement?

2 A. That's correct.

3 Q. Okay. You just know Zoltek can't do anything
4 about it. Correct?

5 A. Yes.

6 Q. And it's possible that UE may not be able to
7 do anything about it? As we talked before, things out of
8 its control could also contribute. Correct?

9 A. Only if we could agree on what out of their
10 control is.

11 Q. Well, you consider weather and those kinds of
12 things to be on their system but not in their control was
13 your testimony yesterday. Correct?

14 A. I think that mischaracterizes the totality of
15 my testimony.

16 Q. Okay. Well, do you recall we talked about
17 things that are -- you said were on their system, I think
18 was the term you used, so I guess maybe you attribute that
19 to Ameren. And that included things not in Ameren's control
20 but which you said you put into the statistics in how you
21 consider reliability. Correct?

22 A. Yes.

23 Q. Okay. So are there things outside of UE's
24 control that can contribute and reduce the frequency of
25 outages at Zoltek?

1 A. Yes. But we're skipping the part about the
2 things that are within its control.

3 Q. But you said --

4 JUDGE THOMPSON: If I could break in here just
5 for a moment. Yes, no, I don't know. Okay? Please
6 proceed.

7 BY MR. VITALE:

8 Q. Well, let's take your answer. You're skipping
9 the things -- you just said you can't tell us what's within
10 their control that they can do. You have no opinion of
11 that. Correct?

12 A. Yes. I have an opinion and it was offered in
13 the testimony.

14 Q. Okay. Better tree trimming, better animal
15 protection if they're not already affording that out there.
16 Correct?

17 A. Yes.

18 Q. What else can they do to reduce the frequency
19 of outages at Zoltek? What measures can they take?

20 A. They can certainly take a strong position with
21 regard to keeping Zoltek on the shortest and best feeders
22 that provide service to Missouri Research Park.

23 Q. Do you know of all the time, this eight years,
24 that they weren't on the shortest and best feeder?

25 A. No, I do not.

1 Q. Okay. What else?

2 A. I think that covers the items in my testimony.

3 Q. Okay. So they do that, but then there's still

4 other things outside of its control that Ameren can't

5 implement to reduce the frequency of outages. Correct?

6 A. There may be.

7 Q. Okay. I want to try and understand your

8 testimony beginning at the bottom of page 18 of Exhibit 9

9 and continuing through page 19. You say, to kind of

10 summarize -- and if I'm misstating your testimony, please

11 tell me -- that an individual incident may have an

12 explanation for something that may be beyond Ameren's

13 control or may be attributable to something Ameren couldn't

14 do anything about, but -- and that's fine to look at that

15 incident, but if you take a lot of those incidents together,

16 then it becomes unacceptable?

17 A. Yes.

18 Q. Okay. So if all of this stuff is from things

19 outside of Ameren's control, you still think Ameren has

20 provided unreliable service?

21 A. Yes.

22 Q. Okay. And by definition, out of its control

23 means Ameren can't do anything about it?

24 A. Yes.

25 Q. Bottom of page 19 you say, All of the service

1 reliability problems at Zoltek have utility-based solutions
2 ranging from improved maintenance -- and we've talked about
3 tree trimming and animal control and such -- to additional
4 substations and larger conductors.

5 Do you see that?

6 A. Yes.

7 Q. Earlier you just said the only measure that
8 Ameren could implement that you could identify was better
9 maintenance-type practices, although you're not sure if they
10 are failing in that department out there.

11 Additional substations. Would building an
12 additional substation -- is that a measure you're suggesting
13 that Ameren should implement to improve the reliability for
14 Zoltek?

15 A. I'm providing a menu of opportunities that can
16 be looked at.

17 Q. Okay. The scatter gun approach that you
18 talked about earlier?

19 A. No. Not in this instance. I'm not talking
20 about scatter gun. Here are some things that Ameren could
21 look at and evaluate.

22 Q. So they could build an additional substation
23 and larger conductors and that may not have any impact on
24 the outages at Zoltek?

25 A. I didn't suggest they build them. I suggested

1 they evaluate them.

2 Q. Well, sir, your testimony says, All of the
3 reliability problems at Zoltek have utility-based solutions
4 ranging from improved maintenance to additional substations.

5 So are you saying an additional substation is
6 a utility-based solution to the reliability problem at
7 Zoltek?

8 A. It may be. I don't know.

9 Q. Okay. And I appreciate that. That's all I'm
10 asking. Your testimony as I read it -- well, strike that.
11 The Commission will read your testimony.

12 Same question for larger conductors. That's a
13 maybe? That's something they might try, but it may not have
14 an effect?

15 A. Correct.

16 Q. Okay. And as you say, these things are not
17 inexpensive?

18 A. That's right.

19 Q. Okay. You have some idea of how the
20 Commission works and rate setting issues and things like
21 that?

22 A. I do.

23 Q. Okay. Are these types of improvements, these
24 expensive solutions that may or may not work, is that the
25 kind of thing that AmerenUE then is entitled to pass on to

1 its ratepayers, do you know?

2 A. Well, I think I do know in general, but we'd
3 have to separate these into capital items, which would be
4 rate based items, and operation of maintenance which is an
5 expense item.

6 Q. I'm talking about additional substations and
7 larger conductors. Those are capital items?

8 A. Yes, they are.

9 Q. So that solution that may or may not work
10 that's expensive is something that gets passed to the
11 ratepayers?

12 A. Yes.

13 Q. Okay. Page 20 you say Ameren is unwilling to
14 make the necessary investments. And are these the
15 investments that you were just talking about, substations
16 and larger conductors, things that may or may not work? Or
17 I should ask -- let me ask a little better question.

18 What investment is Ameren unwilling to make?

19 A. Ameren should be willing to make whatever
20 investment is necessary to create reliable service as is
21 required by Commission rules and anybody's agreed-to
22 procedure that would come from this process.

23 Q. And you don't know what that is?

24 A. I don't know what that is.

25 Q. Or what it would cost?

1 A. That's correct.

2 Q. And even the things you might suggest or have

3 suggested may not even do anything?

4 A. That's why I've asked they be evaluated first.

5 MR. VITALE: If you'll give me a moment, your

6 Honor, I might be able to skip a few things here.

7 I just had a few specific questions.

8 JUDGE THOMPSON: You may.

9 BY MR. VITALE:

10 Q. And we may have gone over this before and it's

11 certainly in your testimony, I just want to confirm. The

12 looping system that we've talked about, as you read that

13 agreement, would not reduce the number of incidents at

14 Zoltek. Correct?

15 A. Yes.

16 Q. Bad question or maybe bad answer or both.

17 Would not reduce -- they would not. So you put the loop

18 system in, that has nothing to do with the frequency, the

19 number of incidents?

20 A. I would not expect it to.

21 Q. Okay. Just duration?

22 A. Yes.

23 Q. Okay. Would you expect a loop system to bring

24 the time duration of an event or an incident down to a blip?

25 A. It can depending on its -- on its

1 configuration, how it's constructed.

2 Q. There's two types of -- and I'm a novice at
3 this, I've been learning. As I understand it, there's
4 automatic loop systems and there's manual. Correct?

5 A. Yes.

6 Q. Is either one contemplated by this agreement?

7 A. It's silent.

8 Q. Okay. And can a manual loop system, which I
9 presume would meet the meaning of the contract, could that
10 bring the duration of an incident down to the level of a
11 blip?

12 A. No.

13 Q. Manual means somebody's got to go out
14 physically when something happens to the line and switch it.
15 Correct?

16 A. Generally, yes.

17 Q. Okay. Would an automatic loop system be able
18 to bring the duration of an incident down to a blip? And a
19 blip, I'm defining it by less than a second, which is the
20 terminology used by Zoltek, it's their blip.

21 A. It's an awfully general question, but
22 sometimes, yes.

23 Q. Okay. Do you have an opinion -- you've read
24 the contract and you have talked about the loop system quite
25 a bit in your testimony -- whether that was an automatic or

1 manual that was contemplated?

2 A. I contemplated a manual system, because I
3 think that's more common in the UE service area.

4 Q. Okay. And so you wouldn't -- that wouldn't
5 bother you?

6 A. No.

7 Q. Okay. I'd like to go to your Surrebuttal
8 Testimony, Exhibit 10. You talk on the top of page 3 of
9 Exhibit 10, and you're responding to Dr. Morgan's testimony,
10 you say, Breaker recloser operations are normal reactions to
11 an abnormal condition on a system. Correct?

12 A. Yes.

13 Q. And just so we're clear -- well, I'll just let
14 you say it. What is an abnormal condition?

15 A. An abnormal condition would -- when referring
16 to a breaker or recloser, would tend to be a fault on a
17 system created by any number of events.

18 Q. Okay. And, as you admit, sometimes outside of
19 the utility's control?

20 A. Yes.

21 Q. And so when the breaker recloser works in a
22 normal reaction, that's what the system's designed to do?

23 A. Yes.

24 Q. Okay. You state in your surrebuttal, still on
25 page 3 going down to line 13, you say, There is, however, an

1 apparent desire to convey to the Commission that Zoltek's
2 professional staff and witnesses lack the requisite
3 technical competence to differentiate between those problems
4 caused by the utility and those that might be
5 self-inflicted.

6 That's your testimony?

7 A. Yes.

8 Q. Is there a third category of problems that are
9 not caused by the utility or are not self-inflicted; that
10 is, things outside of the utility's control and Zoltek's
11 control as we've been talking at length?

12 A. They're either on the utility side or the
13 company -- or Zoltek's side.

14 Q. So anything on the utility side is caused by
15 the utility, in your definition?

16 A. Yes.

17 Q. Okay. Whether it's in the utility's control
18 or not?

19 A. Yes.

20 Q. And whether it's resolvable by the utility or
21 not?

22 A. Yes.

23 Q. At the bottom of page 3, again of your
24 surrebuttal, you say, Ameren attempts to show by utility
25 industry standards all of the incidents are completely

1 beyond its control. This conflicts with actual records of
2 data.

3 Do you see that?

4 A. Yes.

5 Q. So you're saying not all of the incidents are
6 outside of their control or beyond its control?

7 A. I'm sorry. I didn't understand your question.

8 Q. You're saying that Ameren is trying to say all
9 of these are not within its control or out of its control
10 and you say the data shows otherwise. Correct? Is that
11 what you're saying?

12 A. No. Not quite there.

13 Q. I thought you're disputing Ameren's statement
14 that all of the incidents are completely beyond its control.
15 Am I misreading your testimony?

16 A. No. I think the intent here -- I can read it
17 again. The intent is to show that Ameren believed that all
18 of the incidents or most of the incidents were within
19 Zoltek's control. And I'm simply saying that these are --
20 these are outside of Zoltek's control.

21 Q. But you're talking about Ameren's control in
22 this sentence?

23 A. Yes.

24 Q. Okay. So I guess we're back to this gray area
25 of things in neither sides' control. And I guess that's

1 where we've kind of devolved in this case as to whose fault
2 it is when it may be something outside of both sides'
3 control. Fault is probably the wrong term to be using.
4 Correct?

5 A. Yes.

6 Q. And when you talk about conditions and events,
7 and I'm talking now the bottom of page 4, top of page 5 of
8 your surrebuttal, Exhibit 10, you give an example of motors
9 and if the utility installed a larger conductor or replaced
10 a substation closer to the customer -- you're just talking
11 hypothetically to that situation. You're not relating to
12 Zoltek's situation?

13 A. Right. Just as Mr. Burke I believe was
14 talking hypothetically.

15 Q. Okay. Just wanted to make sure.

16 On page 7 of your surrebuttal, line 14, you
17 say, In fact, the impact from Ameren's improvements make the
18 best demonstration that the improvements were needed and
19 that Zoltek has been correct in placing the burden on
20 Ameren.

21 Is that your testimony?

22 A. Yes, it is.

23 Q. And the impact you're talking on Zoltek?

24 A. Yes.

25 Q. And we're back to this is your assumption that

1 these improvements had that impact. Correct?

2 A. Yes.

3 Q. So you don't know whether they did or didn't?

4 A. There are improvements experienced and I'm
5 giving that credit to Ameren.

6 Q. Okay. But you don't know? I mean, we've gone
7 through this enough times. That's all I'm asking you, yes
8 or no. You don't know whether any of the improvements
9 Ameren made had any impact at all?

10 A. I do not know.

11 Q. So how is that a demonstration -- this is the
12 best demonstration the improvements were needed and Zoltek
13 has been correct in placing the burden on Ameren. I don't
14 understand. If you can't tie the improvement on the system
15 to the improvement at Zoltek, how is that a demonstration of
16 anything?

17 A. Well, I think is certainly is. You've asked
18 me if it is absolutely certain. I've said, no, I'm not
19 certain. Do I believe that Ameren's efforts have caused
20 some improvement? Yes, I do.

21 Q. But you can't quantify that?

22 A. I can't go beyond that, no.

23 Q. And it may be none of those things had any
24 impact?

25 A. That's correct.

1 Q. Okay. I mean, you've said the frequency has
2 reduced, but that has nothing to do with -- strike that --
3 the duration, but that really has nothing to do with the
4 manual loop system. So I guess I'm trying to understand
5 what is it demonstrating? Improvements that may or may not
6 have had an effect, how does that demonstrate that Ameren
7 can do anything about it, that the burden should be placed
8 on Ameren?

9 A. I have no idea what you just said.

10 Q. Okay. Well, you said the impact from Ameren's
11 improvements, which you don't know what they are, is the
12 best demonstration that the burden to fix this problem
13 should be placed on the utility. And how do you make that
14 statement?

15 A. I am well aware, as you are, that -- that
16 capital investments were made that were asserted to be -- to
17 help the situation at Zoltek. Zoltek has said there has
18 been improvement and I attribute that improvement to the
19 capital expenditures that were made. That's really all I
20 can say about it.

21 Q. In your testimony you say Ameren really did
22 those things because of customer growth and load situations?

23 A. Yes.

24 Q. Okay. Okay. One last series of questions or
25 one thing I want to focus on in your surrebuttal and that is

1 your reference to the regulation Subpart 23. You've only
2 attached the beginning page. This is Schedule 10 or DAP-11
3 to Exhibit 9.

4 A. Yes, sir.

5 MR. VITALE: And I believe, for the record,
6 that's been separately identified, your Honor, as
7 Exhibit 26.

8 Mr. May, do you agree we're talking the
9 same --

10 MR. MAY: (Nodded head.)

11 MR. VITALE: So we're clear on the record, can
12 you agree that's what we're talking about?

13 MR. MAY: I'm sorry. I'm a little dazed right
14 now. Exhibit 26 you're saying?

15 MR. VITALE: All I'm trying to do for the
16 record is make it clear that the regulation that he has
17 attached as a schedule to his surrebuttal is the same
18 regulation that's been previously discussed as Exhibit 26.

19 MR. MAY: I would --

20 JUDGE THOMPSON: It is.

21 MR. MAY: It is.

22 MR. VITALE: That's all I'm trying to do is
23 just to clear up for the record so there's no question later
24 on. We're all going read this months from now and wonder
25 what we were talking about.

1 BY MR. VITALE:

2 Q. And you have taken that regulation and you
3 have created as the next schedule a schedule of voltage
4 disturbances during monitored periods, what you call extreme
5 zone conditions. Do you see that?

6 A. Yes.

7 Q. And, as I understand it, the 27 things on this
8 list are from the actual measurements recorded in 1993, '94
9 and 2000 by AmerenUE monitoring and 1997 by Hewlett Packard
10 monitoring. Correct?

11 A. Yes.

12 Q. Okay. And, first of all, you find the
13 monitoring results of AmerenUE to be significant to you in
14 rendering your opinion?

15 A. They're useful.

16 Q. Okay. I mean, they have some significance to
17 you?

18 A. Yes.

19 Q. Okay. Do you understand Zoltek's complaint to
20 be one of a voltage issue?

21 A. No.

22 Q. Okay. Is it your testimony that the voltage
23 variations that you have in your exhibit somehow violated a
24 Commission standard?

25 A. Yes.

1 Q. Okay. And that's the standard that we've been
2 talking about from Exhibit 26, Subpart 23?

3 A. Yes.

4 Q. Okay. Tell me what standard has been
5 violated.

6 A. The events that I cited in the particular --
7 particular schedule all fall into, as I've stated there, the
8 extreme zone that is explained in -- in the Code of State
9 Regulations on -- in 23-D.

10 Q. 23-D. Okay. Is there a time duration or a
11 minimum time duration that the Commission requires before an
12 event like this, an extreme zone condition, should be
13 considered?

14 A. I don't know what -- what the intent of the
15 parties who wrote this regulation was, but in -- in a strict
16 reading sense, and that's what I have done, the -- the
17 language in D precludes anything related to length of time,
18 rightly or wrongly. It says, At any time. And the
19 reference that you may be making to the one-minute standard
20 in paragraph 23, I'm -- I'm afraid I can't agree applies.

21 Q. Okay. So have you ever dealt with or had an
22 occasion to consider Exhibit 26 or this specific regulation
23 before --

24 A. I have not.

25 Q. -- in your experience?

1 Okay. Have you made any inquiries of anyone,
2 other experts in the field, anyone in your company as to how
3 that -- or anyone outside your company as to how this should
4 be read and whether there's any duration with respect to the
5 conditions in Subpart D?

6 A. I have.

7 Q. Okay. Who have you spoken to?

8 A. I've spoken with a member of the Commission
9 Staff.

10 Q. Okay. And who was that?

11 A. It was Mr. Ketter, Jim Ketter.

12 Q. And what did Mr. Ketter tell you about that?

13 A. As you -- as one would expect in his position
14 with the Commission, he could not render a binding opinion
15 on anything. We did discuss it. He talked about -- I don't
16 mean this to offer hearsay evidence here, but --

17 Q. We've had a lot of that the last three days.

18 A. What he told me is --

19 JUDGE THOMPSON: We'll let the lawyers make
20 the objections. What did he say?

21 THE WITNESS: He told me that -- that he was
22 somewhat familiar with it, that he had read it, he believed
23 it to be a pretty aged regulation, he did not do any
24 research as far as I know.

25 BY MR. VITALE

1 Q. What did he say?

2 JUDGE THOMPSON: I think he's telling you what
3 he said.

4 MR. VITALE: He's telling me he didn't do any
5 research. That's not what he told him.

6 THE WITNESS: That's what he told me, he
7 didn't do any research.

8 BY MR. VITALE:

9 Q. Oh, okay. I thought you were saying as far as
10 you know, that's not what he told you. I thought you were
11 speculating he didn't do any research.

12 What did he tell you about whether there's any
13 time duration required before the issues in subparagraph D
14 of paragraph 23 come into play?

15 A. My recollection of the conversation is that
16 when we read this together, he could not deny that the way I
17 read it was the way that it was written. It may or may not
18 be the way it was intended by the parties who prepared it,
19 but it's how it was written.

20 Q. Did he tell you how the Commission interpreted
21 it?

22 A. He did not.

23 Q. Well, that's kind of I guess what we're here
24 to talk about. It's the Commission's interpretation that's
25 going to be important. Correct?

1 A. Yes, it will be.

2 Q. Let's talk about these things. So it's clear
3 then if the reading and interpretation of the Commission is
4 that one minute is the minimum duration to consider an
5 extreme zone condition, then I think we have maybe one set
6 of circumstances, and that's the Hewlett Packard monitoring
7 in '97, where there would have been an extreme zone
8 condition. Correct?

9 JUDGE THOMPSON: Could I break in for a
10 moment?

11 MR. VITALE: Sure.

12 JUDGE THOMPSON: Is that in evidence?

13 MR. VITALE: Which?

14 JUDGE THOMPSON: The Hewlett Packard
15 monitoring.

16 MR. VITALE: Not directly, your Honor. That
17 is the monitoring that's been referred to and the data is in
18 his chart that is --

19 JUDGE THOMPSON: So the data is in evidence?

20 MR. VITALE: Well, no. The numbers he's used
21 in his chart. The underlying data is not. We don't have
22 Hewlett Packard, we don't have any documents from that in
23 the record. He's just taken those and used those in his
24 chart, as I understand it.

25 THE WITNESS: That's correct. They were

1 obtained --

2 JUDGE THOMPSON: The data was available to
3 you?

4 THE WITNESS: The data was available to us and
5 to Ameren.

6 JUDGE THOMPSON: Thank you.

7 MR. VITALE: I didn't --

8 JUDGE THOMPSON: I apologize for breaking in.
9 Please proceed.

10 MR. VITALE: That clarifies the record.

11 BY MR. VITALE:

12 Q. So is that a correct statement, the only time
13 there was a one minute or more duration of what you call an
14 extreme zone condition was on April 6th, 1997?

15 A. Yes. That's correct.

16 Q. Okay. So there is a one-minute duration in
17 the regulation. Correct?

18 A. It's -- it's in the paragraph 23.

19 Q. Does that apply to any of the subparagraphs
20 below it?

21 A. As I read the things that are written, it
22 applies to A and B and C and does not apply to D.

23 Q. And that's because of the, At any time?

24 A. That's correct.

25 Q. Okay.

1 A. That differs in a substantive way from the
2 other paragraphs.

3 Q. And that could be as little as a cycle?

4 A. It could be. I didn't write it.

5 Q. Okay. Is there anything less than a cycle
6 that's measurable?

7 A. Not that I can measure, no.

8 Q. Okay. Now, these you say are extreme zone
9 conditions by definition. Correct?

10 A. Yes.

11 Q. Okay. And as I read your chart that you've
12 prepared, you've got 27 listed. And if I can count
13 correctly, 12 of these extreme zone conditions were not even
14 incidents recorded by Zoltek. Correct?

15 A. Thereabouts, yes.

16 Q. Okay. And not necessarily the same
17 correlation, but I think I get 16 that didn't have any
18 impact on Zoltek operations by your schedule.

19 A. That may -- may also be correct.

20 Q. Okay. I mean, we can all add up, but you
21 wouldn't deny that?

22 A. That's correct.

23 JUDGE THOMPSON: When you say "your schedule,"
24 you're referring to --

25 MR. VITALE: Your schedule is marked DAP-12.

1 JUDGE THOMPSON: DAP-12.

2 MR. VITALE: Right. To Exhibit 10,
3 Surrebuttal Testimony.

4 BY MR. VITALE:

5 Q. So the fact of an extreme zone condition
6 really has no bearing on whether -- necessarily by itself
7 whether it had an impact on Zoltek's production or even
8 whether it caused an incident at Zoltek?

9 A. That sort of mischaracterizes it.

10 Q. Well, you have 12 that -- you say there were
11 extreme zone conditions on 12 separate conditions that
12 Zoltek doesn't have on its log?

13 A. Yes.

14 Q. Okay. So an extreme zone condition may have
15 existed by your term and your definition and how you apply
16 the reg that was not noted or may not have even caused
17 anything to happen at Zoltek?

18 A. It -- it is there to show that Zoltek
19 equipment could, in fact, endure some extreme zone
20 conditions and --

21 Q. I asked I think a yes or no question. It's
22 possible that an extreme zone condition, the way you've
23 described it, occurred that Zoltek did not record and didn't
24 do anything at its plant?

25 A. Yes.

1 Q. Okay. And the same is true with respect to
2 impact on equipment? Extreme zone conditions may or may not
3 have any impact, again as you define an extreme zone
4 condition, on the processes at the plant?

5 A. Yes. An extreme zone condition is required
6 before production loss happens, but not all extreme zone
7 situations cause a production loss.

8 Q. Okay. Now, does this regulation, by your
9 interpretation, say that there is never to be an extreme
10 zone condition even of any duration?

11 A. I'm sorry. I didn't understand the question.

12 Q. Okay. Is it your interpretation -- you say
13 that AmerenUE has violated the Commission's standard.
14 That's your testimony. Correct?

15 A. Yes. I think it is.

16 Q. By causing an extreme zone condition to occur?
17 What's the violation? You're just not supposed to have them
18 at all?

19 A. I don't know what the remedy is.

20 Q. I'm not asking the remedy. You said the
21 standard has been violated. Is the standard that you can
22 never have an extreme zone condition?

23 A. No. The standard, as written there, says if
24 this occurs, then the utility must cure it.

25 Q. Okay. And so what the utility does to cure it

1 is part of what you have to look at to see if there's been a
2 violation. Correct?

3 A. I'm sorry. I'm not following that question.

4 Q. I'll try to make it clearer. If there's an
5 extreme zone condition that the utility cures, is that a
6 violation of the regulation as you interpret it?

7 A. I suppose it's a violation that's been cured.

8 Q. Okay. So the cure is separate from whether
9 there's been a violation?

10 A. Perhaps so.

11 Q. Okay. So I guess put in a different way, if
12 the utility has cured each of these extreme zone conditions,
13 you'd still consider it a violation of the regulation?

14 A. I'm just not quite sure how you mean "cure."

15 Q. Okay. Well, let's continue -- let's read
16 subparagraph D. If you'll go to -- this is Exhibit 26, also
17 Exhibit DAP or Schedule DAP-11 to your surrebuttal, third
18 column, maybe about 10 lines down. When the system voltage
19 variations extend to within the extreme zone, which is what
20 you say we have here on these occasions, the utility shall
21 take those steps as may be required to improve the system
22 voltages or the subdivisions of the utility, as the case may
23 be, to within either the favorable or the tolerable zone.

24 Do you see that?

25 A. Yes.

1 Q. Did the utility take those steps on these
2 27 occasions?

3 A. You mean did they -- did the voltage ever
4 recover?

5 Q. Well, you're interpreting the regulation. You
6 tell me that one minute doesn't apply here and you say that
7 UE violated this regulation. This is part of the
8 regulation. The utility shall take such steps as may be
9 required to improve the voltages to within favorable or
10 tolerable. Did that happen on these 27 occasions?

11 A. I think they recovered on their own.

12 Q. Okay. But they recovered. They didn't have
13 to take any action. The reclosers and those kind of things
14 worked. That's the system. Correct?

15 A. I don't -- I understand where we're trying to
16 go here, but I don't agree with your premise.

17 Q. Okay. Well, what caused the system to recover
18 on their own? Or you said the voltage recovered on its own.
19 What do you mean by that?

20 A. What -- whatever long-term situation or
21 permanent situation on UE's lines that allow such events to
22 occur are not necessarily -- or are not cured simply because
23 one condition changes.

24 Q. Okay. I'm talking about the 27 that we've
25 monitored that you say were extreme zone conditions. Okay.

1 We'll just pick one. June 26th, 2000, Item 24 to your
2 schedule, we had a 15 percent voltage drop which was a blip
3 that interrupted production at Zoltek?

4 A. Yes.

5 Q. That recovered in 15 seconds -- I'm sorry --
6 strike that.

7 That recovered in a blip, a second or less,
8 that 15 percent came back. Correct?

9 A. Yes.

10 Q. And that you consider to be a violation of
11 this ordinance, the fact that that incident occurred?

12 A. By my reading, yes.

13 Q. Okay. And how did that 15 percent come back?

14 A. I don't know.

15 Q. The system -- UE's system worked. Correct?
16 That's the way it's designed?

17 A. It recovered.

18 Q. Okay. Any of these 27 where the system did
19 not recover so that voltage went back to the favorable or
20 tolerable zone?

21 A. No.

22 Q. Okay. And, in fact, only one day did any of
23 these extreme zone conditions come even close to being a
24 minute long. Correct?

25 A. That's independent, but yes, that's correct.

1 Q. Continue down, if you would, in Exhibit 26,
2 the same subparagraph 23 and subparagraph D. It says, The
3 utilities will not be held responsible for variations in
4 service voltage at a customer's premises caused by the
5 operation of that customer's apparatus in violation of the
6 utility's rules.

7 Do you see that?

8 A. Yes.

9 Q. Okay. Then it continues, Or by the action of
10 the elements or causes beyond the utility's control.

11 Do you see that?

12 A. Yes.

13 Q. Okay. So do you know of these 27 listed
14 extreme zone conditions that you've defined were caused by
15 things within UE's control or things not in UE's control?

16 A. I can't say which are within and which are
17 outside.

18 Q. Okay. So here we got a little definition
19 within the control. Even though it's on the system, this
20 regulation recognizes if it's not in the utility's control,
21 it shouldn't be counted?

22 A. It would be someone's responsibility to
23 determine if that particular event was or was not.

24 Q. Okay. No, sir, I disagree. If you're saying
25 it's been violated, I think it's the person that says it's

1 been violated to prove that it was within the utility's
2 control. And you don't have anything to say definitively
3 that any of these things were within the utility's control,
4 do you?

5 MR. MAY: Your Honor, I'll object to the form
6 of the question. I believe it's very argumentative and I
7 believe he's trying to get into some kind of debate,
8 argument with the witness beyond simple cross-examination.

9 MR. VITALE: Trying to get an answer, your
10 Honor.

11 JUDGE THOMPSON: The witness may answer if he
12 can.

13 BY MR. VITALE:

14 Q. You don't know of any of these 27, if any of
15 them were within the utility's control, do you?

16 A. Yes, I don't know.

17 MR. VITALE: Okay. Nothing further, your
18 Honor.

19 JUDGE THOMPSON: Thank you Mr. Vitale.

20 QUESTIONS BY JUDGE THOMPSON:

21 Q. Mr. Park -- is it Dr. Park or Mr. Park?

22 A. No. I'm afraid it's only Mr. Park.

23 Q. And do you feel the need of a recess at this
24 time?

25 A. No.

1 Q. Are you able to continue?

2 A. I can continue.

3 Q. Very well. I'm correct in understanding your
4 testimony to be that Subpart 23 of Regulation 4 CSR
5 240-10.030, the one you've been inquired concerning, it is
6 your opinion that it applies to the service provided to
7 Zoltek by UE; is that correct?

8 A. Yes, your Honor.

9 Q. And it is your opinion that it is Subpart D or
10 Subsection D in particular that applies?

11 A. Yes.

12 Q. The introductory portion under 23, before the
13 lettered subdivisions, that last sentence for lighting
14 service, the variation in voltage for periods longer than
15 one minute, you're familiar with that sentence?

16 A. Yes, I am.

17 Q. In your expert opinion, is the service
18 provided by Ameren to Zoltek, is that lighting service?

19 A. While they certainly use lights as every other
20 customer, no, I'd call it power service.

21 Q. So if, in fact, the one-minute measure in the
22 regulation is confined or limited to lighting service, then
23 that would not apply to Subsection D, is that correct, in
24 your opinion?

25 A. Yes.

1 Q. Very well. As you understand Subsection D, do
2 you view that as imposing one obligation on the utility or
3 two obligations on the utility?

4 A. I'm sorry. I don't understand the question.

5 Q. Well, for example, the very first sentence of
6 Subsection D states, For power service, the voltage at any
7 time shall not be greater than 10 percent above or below
8 standard service voltage. Correct?

9 A. Yes.

10 Q. And would you agree with me that that sentence
11 appears to impose a duty on the utility?

12 A. Yes, it seems to.

13 Q. It's a prohibition, is it not?

14 A. It seems to be that.

15 Q. Now, based on your analysis of the materials
16 that you've reviewed to prepare yourself for your testimony
17 here, is it your opinion or do you know whether at any time
18 the voltage provided by Ameren to Zoltek was ever greater
19 than 10 percent or less than 10 percent of the rated service
20 voltage?

21 A. It was outside those ranges often.

22 Q. When you say "often," can you give me a
23 number?

24 A. The -- within the incidents that we have very
25 good data on, those when they had measurement equipment,

1 those were -- those were cataloged and I think they follow
2 the schedule that I have here. I have at least 27 occasions
3 that were representative of many other occasions.

4 So to answer your question, there were quite a
5 large number of events that were in excess of 10 percent.
6 We didn't try to measure those that were 10 percent. In
7 fact, the only ones measured by Ameren personnel, as was
8 testified yesterday, were events that far exceeded
9 10 percent.

10 Q. So events greater -- of more than 10 percent
11 magnitude did occur?

12 A. Yes.

13 Q. Okay. And if, in fact, that first sentence of
14 D is a prohibition, then would it be your opinion that those
15 were violations?

16 A. I suppose it would be.

17 Q. Okay. And moving now to the third column, a
18 sentence states, When the system voltage variations extend
19 to within the extreme zone. Do you see that sentence?

20 A. Yes.

21 Q. Is it your view that that imposes a separate
22 duty upon the utility?

23 A. I believe it would. As I read it, the
24 sentences that follow that statement attach mostly to that
25 statement as opposed to the -- the statements above it where

1 the 10 percent favorable zone and the tolerable zone. It is
2 a difficult to read section.

3 Q. I understand that. Probably drafted by some
4 lawyer.

5 But, nonetheless, it states that if the
6 voltage falls within what's been defined as the extreme
7 zone, the utility then is required to take certain action.
8 Isn't that what it says?

9 A. Yes.

10 Q. Okay. And I realize there's been difference
11 of opinion between you and Ameren as to exactly what action
12 that might be or whether action is required at all if the
13 system immediately requires. Nonetheless, it imposes a duty
14 on the utility?

15 A. Yes.

16 Q. Okay. And so we have, in fact, found two
17 different duties within this section, have we not?

18 A. Yes.

19 Q. Okay. And it is your testimony that there
20 have been violations of that first duty?

21 A. Yes.

22 Q. Okay. And as I understand from the
23 cross-examination, however, you are not able to state with
24 certainty whether any of those violation events were within
25 or without the control of the utility; is that correct?

1 A. Yes. That is correct.

2 Q. Okay. And if, in fact, they were outside the
3 utility's control, then the section appears to relieve the
4 utility of liability; isn't that correct?

5 A. Yes.

6 Q. Okay. Very well. Now, there has been talk
7 about a contract and I want to talk about that contract.
8 It's your testimony, I believe, your opinion, that the
9 contract calls for the provision by Ameren to Zoltek of a
10 power supply of a reliability greater than that normally
11 provided?

12 A. I believe that's what the contract says.

13 Q. Okay. And you are familiar, you've indicated,
14 with regulated utilities?

15 A. Yes, I am.

16 Q. And the general constellation of rules under
17 which they operate?

18 A. Yes.

19 Q. Okay. I'm trying to understand. If you know,
20 at the time that the University of Missouri established this
21 Research Park facility, was that location within AmerenUE's
22 service area?

23 A. I have read some materials that are part of
24 the case, they were not prepared by me, that there was a
25 previous PSC proceeding that involved some service territory

1 disputes between -- I believe it was Quiver River Electric
2 Cooperative and Ameren or at that time UE. I did not delve
3 into the substance of those, but I'm aware something
4 existed.

5 Q. Okay. Maybe another way to get to that is on
6 October 18, 1988 when this contact was evidently executed,
7 do you have any reason to doubt that that location was
8 within Ameren's service territory?

9 A. No.

10 Q. Okay. And is it your understanding that a
11 public utility is obliged to provide its service on
12 non-discriminatory terms to anyone who requests it within
13 its service area?

14 A. Yes.

15 Q. So what I'm trying to understand is why did
16 the University pay half a million dollars to Ameren to
17 provide service to the Research Park?

18 A. Would you like me to speculate on that?

19 Q. If that's the best you can do, then please.

20 A. It is very common for utilities and potential
21 customers to agree for the potential customer to reimburse
22 the utility for certain expenditures it makes in extending
23 service to a particular facility.

24 Q. I see. That's all I need to know. So it's
25 not uncommon?

1 A. No, sir.

2 Q. And as far as you know, is that kind of
3 payment tariffed?

4 A. Some are. There's -- there's always a
5 provision -- there is a provision in the tariffs covering --
6 or the rules and regulations portion of the tariffs covering
7 AmerenUE that provides, I believe, for payments for primary
8 extensions. This is a rather gross form of primary
9 extension.

10 Q. So, in other words, if it's tariffed, it's
11 been approved by the Commission?

12 A. That's probably correct.

13 Q. Okay. Do you know whether or not this
14 particular contract, this specific contract, was ever
15 approved by the Commission?

16 A. I do not know.

17 Q. Okay. If, in fact, this contract was not
18 lawful, would that change your opinion as to the level of
19 service that Ameren was required to provide to Zoltek?

20 A. No, it would not.

21 Q. And why is that?

22 A. From my Direct Testimony, you may recall that
23 I asked that Zoltek be provided the level of service that
24 one might expect of the best service the company provides to
25 any other customer instead of insisting upon a higher level

1 of reliability that was contemplating by that contract,
2 because I was uncertain as to how much weight could be
3 placed on a contract like that.

4 Q. Okay. You are familiar with rules in the
5 regulated utility world prohibiting discrimination?

6 A. Yes.

7 Q. And would it be fair to say that the
8 discrimination that's prohibited is to charge similarly
9 situated customers different amounts of money for the same
10 service?

11 A. Yes.

12 Q. And would that discrimination also ban the
13 provision to similarly situated customers of different
14 levels of service under the same tariff?

15 A. That's a horribly complicated issue, your
16 Honor.

17 Q. I guess what I'm getting at is this. Is
18 Ameren, as a regulated utility, in your opinion -- and I
19 know -- well, I don't know if you're a lawyer or not.
20 Frankly, I don't care.

21 Within your opinion as a witness and as an
22 expert in this area, is Ameren free to make side agreements
23 with customers providing for service of greater reliability
24 than other customers get?

25 A. I don't know.

1 Q. Okay. I have some other questions, which I'm
2 going to go through as quickly as I can.

3 Do you have outage figures for each of the
4 years under consideration here? And I'm not referring to
5 Zoltek's list, the summary of Zoltek's list, but rather
6 you've spoken in terms of frequency and duration as measures
7 of reliability?

8 A. Yes, your Honor.

9 Q. And so I'm wondering if you have compiled
10 frequency and duration figures for each of the years under
11 consideration?

12 A. No, I have not. I have the number of events.
13 There is enough information to do that for many of the
14 events, there is insufficient ev-- or insufficient data for
15 others.

16 Q. Okay. Now, on page 19, you talk about blips.
17 And you state on line 4 that blips are annoying and often
18 cause some loss of product. And I was wondering what the
19 basis for that statement was?

20 A. The -- the first part or the second part, sir?

21 Q. Not that they're annoying. I will accept that
22 they're annoying. The part that they often cause some loss
23 of product.

24 A. That statement is -- is based upon the
25 representations to me by Zoltek representatives that are

1 related to this frequency versus duration information that
2 we've been discussing this morning and yesterday.

3 There are some occurrences of very short
4 duration, but great magnitude that do, in fact, cause lost
5 production. There are -- are other instances of really
6 quite great magnitude but of sufficiently short duration
7 that they do not. So it -- a generalized response is
8 difficult to make, but I think --

9 Q. Okay.

10 A. -- I think the statement is still correct.

11 Q. Are you familiar with Exhibit 19? And this is
12 the effects on production chart prepared by Witness Moran or
13 that came in during the testimony of Witness Moran.

14 A. I don't recognize it from your description,
15 but if I were to look at it, I might find that I am familiar
16 with it.

17 Q. Well, let me show it to you.

18 A. I've not seen this before.

19 Q. Okay. That chart lists 70 blips over a period
20 of time. I believe -- take a look at that first page and
21 tell me what the earliest date is.

22 A. February 5, 1998.

23 Q. Okay. And what's the last date on the last
24 page?

25 A. June 3, 2001.

1 Q. Okay. So very recent?

2 A. Yes.

3 Q. And I counted 13 blip events where Mr. Moran
4 had noted that there was an effect on the production
5 processes. And that works out, as I calculate it, to about
6 19 percent, about one out of five blips cause an effect
7 based on that chart.

8 Is it fair to assume that for the blips where
9 Mr. Moran notes no effect on the production process, that
10 there was no loss of product?

11 A. I think that's fair. I don't know from having
12 no more experience than that, but I believe that's probably
13 a fair assessment.

14 Q. I guess what I was focusing on was the word
15 "often" in your testimony. And one out of five to me
16 doesn't appear often. And I'm wondering if you looked at
17 figures other than those?

18 A. No. No, sir, I have not.

19 Q. Okay. Very good. Let me recover that from
20 you before I forget and I'll go off without my exhibit.
21 Thank you, sir.

22 Okay. That may be -- now, I think on cross
23 you established a standard of 15 incidents a year and 58 to
24 60 minutes a year as being essentially the threshold of
25 reliability?

1 A. I suppose threshold would be an adequate word.

2 Q. That at that point where we achieve that
3 number -- no more than that number of events and duration
4 not exceeding that number of minutes, that we're crossing
5 into the zone of reliability?

6 A. I think so. It is certainly a qualitative
7 statement, but I -- I believe it's a reasonable area.

8 Q. And I understand that with the minutes -- you
9 know, the two have to be taken together?

10 A. Yes, they do.

11 Q. Sixty incidents of one minute a piece is a lot
12 less reliable than one incident of sixty minutes?

13 A. Yes, sir.

14 Q. Okay. And you also talk in your testimony or
15 perhaps -- I think it was in your testimony -- about
16 localized problems, localized distribution problems
17 affecting reliability within a particular region of a
18 system?

19 A. Yes.

20 Q. And you have not analyzed the particular
21 system surveying Zoltek, have you, to determine what those
22 localized problems might be?

23 A. No, I haven't.

24 Q. But based on your experience, you're fairly
25 certain that there must be some?

1 A. Yes, I am.

2 Q. And you believe that some of these at least
3 could be ameliorated by Union Electric?

4 A. Yes, I do.

5 Q. That these might be such things as more
6 frequent tree trimming, more lavish use of animal guards,
7 for example?

8 A. Yes.

9 Q. Perhaps the relocation or addition even of a
10 substation?

11 A. Perhaps.

12 Q. In other words, if the feeder line serving
13 Zoltek is seven miles long and a new substation was built so
14 that the service line was no more than two miles long, that
15 would reduce exposure, would it not?

16 A. Yes, it would.

17 Q. And that's the sort of thing that would almost
18 certainly read to less incidents?

19 A. Yes, it would.

20 JUDGE THOMPSON: Okay. Very well. Thank you
21 very much.

22 We'll go ahead to recross based on questions
23 from the Bench. Ms. Shemwell?

24 MS. SHEMWELL: Thank you, Judge. Judge, you
25 had not asked the specific question, but you've asked a

1 number of times -- can we inquire as to what a loop system
2 is?

3 JUDGE THOMPSON: You may.

4 RE CROSS-EXAMINATION BY MS. SHEMWELL:

5 Q. And what manual and automatic loop systems
6 are?

7 A. Yes. I'll try to be as succinct as possible.
8 There are two types of systems that people generally refer
9 to. Radial, and I think you've heard that word this
10 morning, and loop. Radial is something very, very --

11 Q. Like this (indicating)?

12 A. Yes.

13 Q. I'm sorry?

14 A. Yes. I thought you were trying to stop me.

15 Q. My hand -- this would be a like a radial
16 system (indicating)?

17 A. Yes, it would.

18 Q. Okay.

19 A. And a loop would -- if I made a hand signal,
20 would be more circular in nature and would -- would be able
21 to serve a load -- an electrical load such as Zoltek's from
22 two or more directions. Now, that does not mean that it
23 would serve them simultaneously from each of those
24 directions because except in certain parts of the city of
25 St. Louis, I think Ameren does not have such facilities. So

1 a loop is capability to serve a specific load for more than
2 one direction.

3 Now, your question of automatic and manual is
4 in its simplest terms very much like a three-way switch in
5 somebody's dining room so that you can turn something on and
6 off from two ends of the system. That is sort of a loop in
7 itself. You can -- but it requires physical action with a
8 light switch. We -- we manually go over and flip that
9 switch. It requires somebody to go to the location and do
10 something.

11 An automatic system can be one of several
12 letter -- levels of automation. Most commonly are items
13 that sense the presence or lack of voltage and will take an
14 action based upon that. A more sophisticated system may --
15 may look at a variety of parameters. And parts of Ameren's
16 system do have pretty sophisticated supervisory controls on
17 them. I don't know that this part of the system does.

18 And then there's a more rudimentary automated
19 system that is simply called motorized switches where a
20 dispatcher can push a button on his console or her console
21 and cause an action to happen. That's somewhere between
22 manual and remote.

23 Q. Okay. Would both of these lines come out of
24 the same transformer?

25 A. They could.

1 Q. Okay. And the same substation?
2 A. They could.
3 Q. Okay. With the manual, is that going to take
4 longer? You're saying someone has to go out and physically
5 switch something over?
6 A. Yes, it will take longer.
7 MS. SHEMWELL: Okay. That's all I have.
8 Thank you, Judge.
9 JUDGE THOMPSON: Thank you. Mr. Vitale?
10 MR. VITALE: Nothing further, your Honor.
11 JUDGE THOMPSON: Redirect, Mr. May?
12 MR. MAY: Your Honor, may I have a few moments
13 to confer with Mr. Park before I go to redirect?
14 JUDGE THOMPSON: You can. You can have the
15 entire lunch break, if you'd like.
16 MR. MAY: That would be fine.
17 JUDGE THOMPSON: Okay. We'll go ahead and
18 break. And given that we're leaving early, we'll come back
19 at 1:15 today instead of 1:30.
20 Thank you very much, Mr. Park, for your
21 testimony.
22 (A RECESS WAS TAKEN.)
23 JUDGE THOMPSON: Let me correct my earlier
24 statement. I was looking at the wrong calendar here. The
25 14th and the 15th are available, the 27th and 28th are

1 available, the 5th, 6th, 7th, 8th of March are available.

2 MR. VITALE: From the Respondent's point of
3 view, I think the 14th and 15th apparently works for all the
4 witnesses that we may have left.

5 MR. MAY: That would be fine with us as well,
6 Judge.

7 JUDGE THOMPSON: Let me send a message then.
8 All right. We'll hear back from her about the room, and in
9 the meantime, let's go ahead and start with redirect.

10 MR. MAY: Thank you, Judge.

11 JUDGE THOMPSON: You may inquire.

12 MR. MAY: Thank you.

13 REDIRECT EXAMINATION BY MR. MAY:

14 Q. Mr. Park, during your cross-examination a
15 question was posed to you in regard to -- or the scenario
16 was that if you were making recommendations on behalf of
17 Zoltek to Union Electric in regard to the power for the year
18 2003, I think was the example -- do you recall that
19 question?

20 A. Yes, I do.

21 Q. Had you completed your response? Is there
22 anything else that you wanted to add to that as far as any
23 recommendation?

24 A. Well, I think I did mention several kinds of
25 opportunities. Certainly another one, as we talked about

1 later, was actually adhering to the Commission rules for --
2 for -- I don't think quality and service for voltage
3 constraints.

4 Q. Would that be the regulation detailed in
5 Exhibit 26 that you had discussed previously?

6 A. Yes. I believe it is.

7 Q. There was also some discussion, I believe, in
8 regard to express feeder. I think that was a question on
9 cross-examination. Do you recall that or some discussion
10 about the feeder?

11 A. Feeders, loop feeders, express feeders and so
12 on.

13 Q. What exactly is an express feeder?

14 A. It is a -- sort of a term of art in the
15 utility business, but ordinarily reflects a -- an electrical
16 feeder that is for the exclusive use or near exclusive use
17 of a particular customer or small group of customers and is
18 usually not encumbered by a lot of other attachments. For
19 instance, similar to the differences between an interstate
20 highway with limited access and an ordinary state highway.

21 Q. And there's been some discussion I believe in
22 the past few days and also the testimony to come I know
23 talks about express feeder continuously. Have you heard
24 that phrase?

25 A. I've heard that phrase only within the context

1 of this case. I've not heard it previously mentioned. But
2 as I understand it from others' testimony and our experience
3 at Zoltek, is that there was an express feeder available for
4 service to Zoltek, but unbeknownst to Zoltek earlier, it was
5 not available to them at all times. It was not an express
6 feeder for Zoltek's use continuously. And I believe Ameren
7 was alluding to offering an express feeder continuously.

8 Q. So just so I understand it, at certain time,
9 at certain dates it was an express feeder and other times
10 during that same time frame, it was not necessarily express
11 feeder service. Is that what that means?

12 A. Well, I wouldn't say in the time frame,
13 because as I understand from all who have testified about it
14 is that it was available during off-peak periods of the
15 year, but during the -- the on-peak, the summer -- the
16 difficult seasons for Ameren to serve, then Zoltek was
17 occasionally placed on another feeder. So it was more
18 damaging to them -- it was more difficult for them to be
19 served particularly in the summer from that alternate
20 feeder.

21 Q. Okay. And then also there was a lot of
22 questions asked of you in regard to weather, you know,
23 storms, lightning, things of that nature. You recall those
24 questions?

25 A. Yes.

1 Q. And I believe it was your testimony that a
2 utility such as Union Electric can't control storms; is that
3 correct?

4 A. They can't control storms, no.

5 Q. Is there a distinction to be made though in
6 the effects that a storm would have on service?

7 A. Well, there certainly is. No one can control
8 the weather itself at this point in time, but in many
9 industries, and specifically the utility industry, you have
10 a certain degree of control and sometimes a great deal of
11 control over the impact that that weather has on your
12 facilities.

13 Q. Okay. And then also there was a discussion
14 about the 1988 agreement, and I believe that's attached to
15 your testimony?

16 A. Yes, it is.

17 Q. Okay. And you're familiar with those
18 questions that were asked in that regard?

19 A. I am.

20 Q. And there's a sentence in there regarding the
21 loop system. Could you read that again? And I don't know
22 if it was ever read fully. I can't recall.

23 A. I have it here.

24 Q. Could you just read that particular sentence,
25 please --

1 A. The --

2 Q. -- from the agreement?

3 A. Which sentence would you --

4 Q. I'm sorry.

5 MR. MAY: May I approach, your Honor?

6 JUDGE THOMPSON: You may.

7 BY MR. MAY:

8 Q. In paragraph 1 the last sentence of
9 paragraph 1, could you read that, please?

10 A. Yes, sir. The service will be looped to
11 provide a more reliable system to serve the university's
12 tenants.

13 Q. Okay. And I just want to be clear. From that
14 sentence did you infer that the parties had contemplated
15 reliability at the time of making that contract?

16 A. Oh, yes.

17 MR. VITALE: I'm sorry, your Honor. Could I
18 have the question read back? I was writing a note from the
19 previous one.

20 JUDGE THOMPSON: Could you read it back,
21 please?

22 THE COURT REPORTER: "Question: Okay. And I
23 just want to be clear. From that sentence did you infer
24 that the parties had contemplated reliability at the time of
25 making that contract?"

1 JUDGE THOMPSON: Please proceed.

2 MR. VITALE: Thank you, your Honor.

3 MR. MAY: Thank you.

4 BY MR. MAY:

5 Q. And I believe that Ms. Shemwell asked you some

6 questions about the radial system, there was a discussion

7 about radial versus looped --

8 A. Yes, there was.

9 Q. -- do you recall those before we broke?

10 Of those two systems, which one would you

11 choose if given the choice?

12 MR. VITALE: Your Honor, I'm going to object

13 to the just open-ended nature what he would choose. If he

14 wants to tie that into required to give reliability of

15 service or something to this situation -- I think the

16 question is vague and ambiguous and I object on that basis.

17 JUDGE THOMPSON: Well, are you able to answer

18 the question?

19 THE WITNESS: Yes.

20 JUDGE THOMPSON: Then I don't think it's too

21 vague or ambiguous. Go ahead.

22 THE WITNESS: I would certainly choose the

23 loop system.

24 BY MR. MAY:

25 Q. And why would that be?

1 A. The loop system has advantages over a radial
2 system. Certainly we discussed this morning that there are
3 situations where a radial system could serve just as well as
4 a loop system, but on the whole I can't think of a reason
5 why a customer would choose, given the choice, anything
6 other than the loop system.

7 Q. Going back to the 1988 agreement in light of
8 your response you've just given, is that consistent then if,
9 in fact, the parties were contemplating reliability, that
10 they would in that context talk about a loop service?

11 A. Loop service -- a loop service is an
12 appropriate topic to be discussed in that context.

13 Q. Okay. Now, have you looked at correspondence
14 between Zoltek and Union Electric, you know, back and forth?
15 Have you reviewed those things?

16 A. Yes, I have.

17 Q. Okay. And are you familiar with or do you
18 know whether Union Electric ever represented to Zoltek that
19 certain changes in its systems would be made?

20 A. Yes. There were one or more --

21 MR. VITALE: Your Honor, I'm going to object.
22 If there's correspondence in evidence in the case, this
23 witness is commenting on somebody else's testimony and
24 correspondence and that's not evidence just as his
25 statements about what somebody else has told him isn't

1 evidence in his written testimony. So I'll object to the
2 hearsay nature of it, the secondary nature. We're talking
3 personal knowledge should be what this witness is testifying
4 about.

5 MR. MAY: Your Honor, if I may.

6 JUDGE THOMPSON: You may.

7 MR. MAY: First, I asked him whether he had
8 seen correspondence. Secondly though, Mr. Vitale -- it's
9 somewhat ironic he now raises that objection. In his
10 cross-examination he summarized and characterized testimony
11 of many witnesses in posing questions.

12 MR. VITALE: Well, your Honor, if I may, my
13 characterization was of the verbal testimony Mr. Park heard,
14 not of other documents not in evidence.

15 JUDGE THOMPSON: Okay. It looks to me like
16 the question was, Are you familiar with or do you know
17 whether Union Electric ever represented to Zoltek that
18 certain changes in its systems would be made.

19 And your purpose in asking him is what?

20 MR. MAY: Well, your Honor, we're going to
21 establish through these questions that Union Electric had in
22 correspondence -- and this afternoon the evidence will
23 clearly show that they had written letters and, you know,
24 correspondence to Zoltek saying, We're going to change this
25 or do that and it was --

1 JUDGE THOMPSON: In other words, if the point
2 of my question is this --

3 MR. MAY: Uh-huh.

4 JUDGE THOMPSON: -- are you pursuing this line
5 of inquiry in order to establish that the representations
6 were made?

7 MR. MAY: Well --

8 JUDGE THOMPSON: Or are you pursuing it in
9 order because this is an expert and you want to know if this
10 is part of what he considered in reaching his expert opinion
11 and giving his expert testimony? I want to know what the
12 purpose of the question is.

13 MR. MAY: Well, you know, there were questions
14 on cross-examination about improvements to the service at
15 Zoltek.

16 JUDGE THOMPSON: Okay.

17 MR. MAY: And Union Electric at least through
18 the correspondence had represented that it was going to make
19 certain changes in an effort to improve the reliability. So
20 I want to establish that he had seen that and that was the
21 basis for his opinion, because I don't think that came out
22 in cross.

23 JUDGE THOMPSON: So let me make sure I
24 understand.

25 MR. MAY: Uh-huh.

1 JUDGE THOMPSON: The basis of your inquiry is
2 to determine if he had seen such correspondence and if that
3 was part of the basis for his expert opinion --

4 MR. MAY: Correct.

5 JUDGE THOMPSON: -- is that correct?

6 In that case, I will overrule the objection.
7 Please proceed.

8 BY MR. MAY:

9 Q. All right.

10 A. I did indeed -- I was and am aware of that.
11 And, in fact, one of the pieces of correspondence is a
12 schedule in my Direct Testimony and it mentions --

13 Q. What is the --

14 A. The schedule on my Direct Testimony is denoted
15 as DAP-7. My copy does not have an exhibit number on it, so
16 I can't tell you the official exhibit number, but that is a
17 letter to Mr. Rummy from Mr. Hulse from 1993 and mentioned
18 two specific improvements that Ameren proposed. And in
19 Mr. Hulse's words, he found three reasons for the
20 interruptions -- for some of the interruptions and proposed
21 two solutions that he said would help in that regard.

22 Q. Okay. I don't know if you recall during your
23 cross-examination, Mr. Vitale had mentioned something about
24 the improvement of the service maybe being attributed to --
25 and I believe I got this right -- the alignment of the

1 planets. Do you recall that?

2 A. Yeah. I think he did mention that in passing.

3 Q. There's no scientific data you're aware of to
4 suggest that the alignment of the planets would have an
5 effect on power quality, is there?

6 A. No, sir.

7 Q. Okay. I just wanted to be clear on that.

8 Also, there's been a lot of discussion
9 about --

10 JUDGE THOMPSON: I'm tempted to ask if he's
11 aware of anything showing that they don't. Please proceed.
12 Pretend I didn't say that.

13 MR. MAY: It's very possible, your Honor.

14 BY MR. MAY:

15 Q. With respect to the extreme zone, there's been
16 a lot of testimony about 23-D, which is contained -- that's
17 what I call Exhibit 26, Section 23-D. And I believe -- and
18 correct me if I'm wrong, but I think Mr. Vitale pointed out
19 maybe 16 -- I don't know the exact number -- of instances
20 where the voltage had dipped into what the Commission would
21 deem to be an extreme zone, yet there was no impact on the
22 Zoltek equipment. Do you remember that line of questioning?

23 A. Yes, I do.

24 Q. Okay. And you were aware of that fact before
25 today. Correct?

1 A. Yes, I was.

2 Q. And what did you infer from that?

3 A. My purpose there, and it was actually part of
4 my Surrebuttal Testimony, was to establish or to refute
5 assertions that were made in the testimony of -- pre-filed
6 testimony of some of Ameren's witnesses that Zoltek's
7 equipment was too sensitive and was an inappropriate
8 application for that type of manufacturing process.

9 My purpose here established the fact that even
10 under extreme zone conditions, certain of those conditions,
11 Zoltek's equipment rode through it just fine.

12 Q. Okay. And then the last question I want to
13 ask you deals with Exhibit 26 as well. Do you have a copy
14 of that?

15 A. I don't have a full copy. Exhibit -- I have
16 the page that's from my Surrebuttal Testimony.

17 Q. Okay. I'm talking specifically Section 23-D
18 and if you look on the right top of the column --

19 A. Yes.

20 Q. -- to the far right. There was some
21 discussion about -- I'm going to partially quote from
22 this -- utilities will not be held responsible for
23 variations in service voltage at a customer's premises.

24 Do you see that? It goes on to say, Caused by
25 the operation of that customer's apparatus.

1 A. Yes, yes.

2 Q. Okay. What is your understanding of that
3 section? I know there was a lot of discussion about your
4 understanding of this section. What was your understanding
5 about that provision?

6 A. Well, within the context of our situation, if
7 Zoltek caused a problem, caused its own problem or caused a
8 problem on Union Electric's system, that Ameren should not
9 be held responsible for that.

10 Q. Okay. And, again, you didn't find anything in
11 reviewing the monitoring and those things, you didn't find
12 any unusual operations as this is stated here at the Zoltek
13 plant, did you?

14 A. No, I didn't.

15 MR. MAY: Nothing else, Judge.

16 JUDGE THOMPSON: Thank you, Mr. May.

17 MR. MAY: Thank you.

18 JUDGE THOMPSON: I believe we're done with
19 Mr. Park at this time; is that correct?

20 You may step down subject to possible recall
21 if a Commissioner should have questions for you. Thank you
22 very much for your testimony today, sir.

23 Give me a moment to figure out where we are.

24 Mr. May, do you rest at this time?

25 MR. MAY: Yes. Thank you.

1 JUDGE THOMPSON: Mr. Vitale, I believe your
2 first witness is William J. Carr, or are you going to take
3 them out of order?

4 MR. VITALE: If we could, your Honor, I
5 think -- I've spoken to Mr. May yesterday and today -- if we
6 could have the two out-of-town experts.

7 JUDGE THOMPSON: And who are they?

8 MR. VITALE: That's Dr. Morgan and Mr. Burke.

9 JUDGE THOMPSON: That's fine with me. Who do
10 you want to have first?

11 MR. VITALE: Dr. Morgan.

12 (Witness sworn.)

13 JUDGE THOMPSON: Please take your seat. State
14 your name for the reporter and spell your name if you would.

15 THE WITNESS: My name is John Derald Morgan.
16 And I know that you usually say spell your last name, I'm
17 going to spell my middle name, D-e-r-a-l-d, Morgan,
18 M-o-r-g-a-n.

19 JUDGE THOMPSON: You may inquire.

20 MR. VITALE: May I approach the witness?

21 JUDGE THOMPSON: Yes, you may.

22 JOHN MORGAN testified as follows:

23 DIRECT EXAMINATION BY MR. VITALE:

24 Q. Could you state your name for the record? I
25 think you've done that.

1 A. Yes. My name's John Derald Morgan.
2 Q. And by whom are you employed, sir?
3 A. I'm vice president at University of Alabama in
4 Huntsville.
5 Q. Okay. And do you have any other employment?
6 A. Well, I also do consulting work, yes.
7 Q. Okay. And you're here in that capacity?
8 A. Yes, I am.
9 Q. Okay. And do you have your Rebuttal Testimony
10 before you that you prepared in this case?
11 A. Yes, I do.
12 Q. It's Exhibit 17, I believe?
13 A. That's correct.
14 Q. Okay. And is that your signature on that
15 exhibit to this testimony?
16 A. Yes, it is.
17 Q. Okay. And as you sit here today, do you have
18 any corrections or changes to make to that testimony?
19 A. I do not.
20 Q. Okay. And if I were to answer -- ask you
21 those questions today, would your answers be the same as
22 they were when you prepared the written testimony?
23 A. I probably would expand on them, but the
24 answer's basically yes.
25 Q. Okay. Thank you.

1 MR. VITALE: Your Honor, I'd offer Exhibit 17.

2 JUDGE THOMPSON: Do I hear any objections to
3 the receipt of Exhibit 17?

4 MR. MAY: No objection.

5 MR. VITALE: Tender the witness, your Honor.

6 JUDGE THOMPSON: Thank you very much. There
7 being no objections, Exhibit 17 is received and made a part
8 of the record of this proceeding.

9 (EXHIBIT NO. 17 WAS RECEIVED INTO EVIDENCE.)

10 JUDGE THOMPSON: Ms. Shemwell?

11 MS. SHEMWELL: Your Honor, since I have to
12 step out this afternoon, perhaps I could go second in this
13 process if --

14 JUDGE THOMPSON: You may.

15 MS. SHEMWELL: Thank you.

16 JUDGE THOMPSON: Unless anyone objects.

17 MR. VITALE: No, your Honor.

18 MR. MAY: No, Judge.

19 JUDGE THOMPSON: So, Mr. May, please proceed.

20 MR. MAY: Thank you.

21 CROSS-EXAMINATION BY MR. MAY:

22 Q. Is it Mr. Morgan or Dr. Morgan?

23 A. I think that's your choice. It's probably
24 both.

25 Q. Oh, it's my choice, you said. I thought you

1 said it's not my choice. I'll call you Dr. Morgan. How's
2 that, sir?

3 A. That will be fine.

4 Q. In your history of testimony as a consultant,
5 you've testified previously, is that correct --

6 A. That's true.

7 Q. -- in other cases?

8 What proportion has been on behalf of
9 utilities?

10 A. Well, probably about 30 percent. It all
11 depends on what kind of case you're talking about.

12 Q. Have you testified on behalf of customers
13 also?

14 A. In -- in what type of a case?

15 Q. In a case such as this before the Public
16 Service Commission.

17 A. Before the Public Service Commission?

18 Q. Yes, sir.

19 A. The answer's no.

20 Q. You've not testified before this Commission
21 before?

22 A. I have -- that's -- I have testified before
23 this Commission before, yes.

24 Q. In what type of cases have you testified?

25 A. Let's see. I -- I had one case that I

1 actually testified before the Commission that involved a
2 study of the Crestwood 138 KV line that ran near the
3 Crestwood Elementary School. I worked for Union Electric in
4 making that presentation before the Commission.

5 I also prepared some reports on a high voltage
6 power line that went down to the lake. I've forgotten the
7 name of that particular circuit, but it was one that was
8 under design consideration, and I presented some evidence to
9 the Commission on that right-of-way hearing.

10 Q. Okay.

11 A. So those are two times that I've appeared on
12 behalf of Union Electric before the Commission.

13 Q. Have you testified in other matters anywhere
14 in the country, either before like a Public Service type
15 Commission or in court?

16 A. Oh, yes. In fact, I actually sued an electric
17 utility company as an individual for a rate reduction.

18 Q. I see. Would that be Union Electric?

19 A. No. That would be El Paso Electric.

20 Q. Okay. Wasn't sure.

21 Sir, when were you retained in this matter?

22 A. I don't remember exactly, but it would have
23 been back last year, probably somewhere about a year ago.

24 Q. Okay. And then how were you retained? How
25 did it come about that you were retained? Who contacted you

1 and what was discussed?

2 A. A gentleman who I've never met before,
3 Mr. Evelev called me and asked me if I would look over some
4 materials and provide him with some comments with regard to
5 the matter at hand. And we went from there and eventually I
6 guess he retained me to be a consultant and to write a
7 report.

8 Q. Okay. You looked at some reports, you said,
9 or some documents; is that correct?

10 A. Yeah. I don't remember exactly what he sent
11 me at that particular point in time. I think it was various
12 documents associated with the Zoltek facilities.

13 Q. And --

14 A. Reports, some monitoring results and things of
15 that type.

16 Q. And at that point Mr. Evelev, did he describe
17 to you what this case was about?

18 A. Oh, I think basically, yes. That there was a
19 quality of service complaint with regard to the utility
20 company and he wanted me to take a look at it and give him
21 an opinion.

22 Q. So then you got these initial documents, you
23 looked them over and you called him back; is that correct?

24 A. That's correct. We had lots of conversations.

25 Q. All right. So I'm talking about the

1 conversation after you've looked at the documents. You
2 contacted him back?

3 A. That's correct.

4 Q. And what did you tell him at that point?

5 A. Well, initially I asked for more information,
6 which he sent me. And the box got bigger and bigger.
7 Amazing amount of stuff that you can collect in one of these
8 situations. And so I looked at it and we had several
9 conversations. And then I -- then I developed my opinion
10 with regard to this matter and told him what I thought.

11 Q. Okay. Well, at what point did you become
12 retained then to write an opinion?

13 A. Well, I don't recall exactly.

14 Q. Well, I'm just trying to -- I'm not really
15 looking for a date as much as the timing of everything.
16 I've got you so far Mr. Evelev initially contacted you, sent
17 you some documents, you looked those over, called him back
18 asked for more documents?

19 A. Sure.

20 Q. I guess you then contacted him after you
21 reviewed those documents and did you at that point form an
22 opinion and express it to Mr. Evelev?

23 A. Generally, yes.

24 Q. Okay.

25 A. I would say that would be sometime in the

1 summer of last year.

2 Q. And then was it at that point after you had
3 expressed an opinion that he decided to retain you?

4 A. I think that's correct, yes.

5 Q. Okay. And then after you had been retained,
6 following the time line here, what did you do next?

7 A. Well, I received more materials. I received
8 materials that included Direct Testimony. And at that
9 particular point in time, which I think is probably summer
10 of last year, I was asked to prepare Rebuttal Testimony to
11 that Direct Testimony.

12 Q. Okay. Had you ever worked with Mr. Evelev in
13 any other matter?

14 A. I don't even -- to this day I don't know who
15 he is --

16 Q. Okay.

17 A. -- if he walked in here.

18 Q. Have you been to the Zoltek plant?

19 A. I have not.

20 Q. Okay. Did you do any kind of independent
21 investigation or testing in this matter?

22 A. I did not.

23 Q. Who have you worked with at Union Electric in
24 regard to this matter?

25 A. I have actually not worked with anybody at

1 Union Electric. I've only worked through the attorney.

2 Q. Okay. And what kind of documents did you look
3 at in forming your opinion or --

4 A. Well, the Direct Testimony.

5 Q. Okay.

6 A. I believe -- I'm trying to remember now that
7 you're asking the questions. I believe I had the Direct
8 Testimony before I wrote my Rebuttal Testimony and actually
9 did not have the depositions of a few of the parties until
10 after I had already written my -- my Direct Testimony.

11 So basically I would say that I reviewed a
12 number of Union Electric employees' direct -- or excuse
13 me -- Rebuttal Testimony, I reviewed Mr. Park's Direct
14 Testimony and several of the Zoltek individuals who had
15 given Direct Testimony up to that particular point and then
16 I prepared my Rebuttal Testimony.

17 Q. Okay. Turning to your testimony, which is
18 Exhibit 17, I believe --

19 MR. VITALE: That's right.

20 BY MR. MAY:

21 Q. Page 3, specifically lines 22 and 23. You
22 have a sentence there, it says, It is possible that a blip
23 or flicker can be -- could be caused by on-site problems not
24 related to the AmerenUE service.

25 You see that sentence there?

1 A. Yes. Uh-huh.

2 Q. Are you forming an opinion or should I infer
3 from that comment that you're saying that all the problems
4 in this case are not related to UE, they're related to
5 Zoltek or are you saying -- what exactly are you saying
6 right there? I'm confused by that statement.

7 A. Well, I think the statement speaks for itself.
8 It is always possible that an internal fault or an internal
9 condition can create in any plant a voltage blip or a
10 flicker. So one of the problems, at least at this
11 particular point in time -- and I think I still do having
12 sat here now for two days -- I still don't know what a blip
13 is. And at the time I was looking at the information, I
14 couldn't figure out what a blip was. And so I think we had
15 a major issue here with regard to how you interpret this.

16 Q. Okay. So if you don't know what a blip is,
17 then your comment about it is possible that a blip or
18 flicker could be caused, we shouldn't accept that opinion
19 then? You don't know what a blip is you said.

20 A. I still don't know exactly what a blip is,
21 but --

22 Q. Well, let's just say then.

23 MR. VITALE: Your Honor, let me object. The
24 witness has not finished his answer and Mr. May is on his
25 next question.

1 JUDGE THOMPSON: I agree completely.
2 Mr. May, please allow the witness to finish.
3 MR. MAY: Excuse me.
4 BY MR. MAY:
5 Q. You may finish.
6 A. But I believe having been a process design
7 engineer in a process plant, an electrical engineer in
8 particular, I am well aware of the types of things that will
9 cause the voltage to sag sufficiently to create a light
10 flicker or what may have been a blip, and those can
11 sometimes be a result of your own internal equipment.
12 So as I prepared this document with a lack of
13 definition, you have to say at that particular point in
14 time, and maybe even today, that it is possible that a blip
15 or flicker is an internal problem.
16 Q. Okay. But, again, your comment was you didn't
17 know when you prepared this, what a blip was?
18 A. I still don't.
19 Q. Okay. Is it also possible -- in light of the
20 fact you've written this, I guess it's also possible that a
21 blip or flicker can be caused by something within AmerenUE's
22 service; is that correct?
23 A. Oh, I wouldn't deny that.
24 Q. Okay. If you could turn to the next page
25 please, page 4.

1 A. Okay.

2 Q. See the sentence there that says, Because a
3 blip -- on line 4 -- or flicker could be caused by an event
4 internal to Zoltek, without being on-site for an
5 investigation and additional information, it would be very
6 difficult at this time to make any substantive claims for
7 blips or flickers over the nine-year period.

8 Do you see that sentence right there?

9 A. Yes, I do.

10 Q. So just to be clear, you did not make any kind
11 of on-site investigation at Zoltek; is that correct?

12 A. That's correct.

13 Q. Okay. So you're saying that because you did
14 not make an on-site investigation, it is difficult for you
15 at this time to make any substantive claims. Is that what
16 you're saying with regard to the blips and flickers?

17 A. Well, I think it would be difficult to
18 actually assign particular credit to either an internal
19 situation or an external situation without additional
20 information. And I think that's been born out pretty good
21 during all the two days that I've been sitting here
22 listening to things.

23 Q. With respect to -- in regard to, I should say,
24 the site investigation, you're saying that you're not in a
25 position to say whether it's something internal at Zoltek;

1 is that correct?

2 A. That's right. And neither are they.

3 Q. Now, how long did you take to prepare your
4 Rebuttal Testimony? How many hours did you put into that?

5 A. I would guess that I probably -- now, of
6 course, you're discounting all the time that I spent reading
7 the pre-documents or not? Just the time to write the
8 report?

9 Q. Yes.

10 A. Okay. I think I probably spent four or five
11 hours on it.

12 Q. And how long did it take you to review the
13 documents you're talking about?

14 A. I probably spent somewhere between 10 and 20
15 hours reviewing the documents.

16 Q. Okay. Now, also you heard some comments about
17 60-minute outage -- one 60-minute outage versus 60
18 one-minute outages. Did you hear that comment?

19 A. I did.

20 Q. Okay. Do you have an opinion as to which one
21 is more serious? Do you think that one 60-minute outage is
22 more serious or do you think 60 one-minute outages is more
23 serious?

24 A. I don't disagree with the characterization
25 that 60 one-minute outages would be worse.

1 Q. Okay. Now, if you can look on page 5,
2 line 5 --

3 A. Okay.

4 Q. -- I'm going to read this sentence to you. To
5 be correct, Zoltek and its experts should have described
6 each event in appropriate terms and categories.

7 With respect to Zoltek's obligation, as you
8 call it there in your sentence, was there some standard or
9 something that they should have applied in terms of
10 recording these events at their plant?

11 A. I think so, yes.

12 Q. Well, where is it that it says that you have
13 to record these in a certain fashion?

14 A. Well, I think if you're going to make a claim
15 with regard to quality of power service, that you should
16 know something about what your claim is. And that means
17 that you should try to follow some industry standards so
18 that we can have a -- a discussion that is going to be
19 meaningful, number one.

20 Number two, you ought to have the information
21 with regard to how the events are occurring, how long they
22 occur, what effects they have. In other words, you should
23 be doing some kind of in-plant quality -- power quality
24 measurement and study and not just do this by a stopwatch
25 and whether or not you see the lights flicker or not and --

1 and having no idea why they occurred or how long they
2 occurred and then make lists like this that no one else can
3 evaluate.

4 Q. Okay. So you're saying if you're going to
5 make a claim -- you prefaced your comment, as I understood
6 it?

7 A. That's right.

8 Q. Then you should do all this. In 1993 did you
9 hear any testimony to indicate that Zoltek was going to make
10 a claim?

11 A. It's my understanding that they were
12 complaining about the quality of power service.

13 Q. Sure. That's different then making a claim,
14 isn't it though? I'm just --

15 A. I don't know. I guess we could start slicing
16 on the word "claim" now along with "blip," but it seems to
17 me that when you call up somebody and you claim they are not
18 providing you with adequate quality service, you've made
19 some kind of a claim.

20 Q. Do you think that Union Electric at that
21 point -- in, let's say 1993, was it communicated to them
22 what the problem was at Zoltek?

23 A. Well, I guess I can't speak for -- I wasn't at
24 any of those meetings, but as I understand the record and
25 there were some letters and there was some discussion with

1 Union Electric in 1993 with regard to the power quality.

2 Q. So your answer to that question would be you

3 think there was communication or there was not communication

4 of the problems?

5 A. I think there must have been.

6 Q. Just bear with me for a second, if you could.

7 A. That's fine. Take all the time you need.

8 Q. Let's go down to page 5, line 15.

9 A. Which page?

10 Q. Page 5.

11 A. Page 5.

12 Q. Lines 15 through 21 at the bottom there.

13 A. Okay.

14 Q. And, again, I think this is just kind of a

15 continuation of our previous discussion with regard to the

16 use of the term "blip." Do you think that Ameren or Union

17 Electric's engineers were incapable of understanding the

18 terms used by Zoltek?

19 A. Well, I think they're very smart guys. In

20 fact, most of them are my students so they've been well

21 trained. And as far as I know, they don't know what a blip

22 is either --

23 Q. So you think they're --

24 A. -- and so --

25 Q. I'm sorry. Go ahead.

1 A. Well, no. I think unless you define the term,
2 how could you understand it?

3 Q. Well, do you think -- we've heard some terms
4 used by Zoltek. You've been here for most of the testimony.
5 Right?

6 A. Yes, I have.

7 Q. Do you think that Union Electric's folks were
8 incapable of understanding that, that they couldn't even
9 figure out what was going on because of the use of these
10 terms?

11 A. Well, I -- yeah, I think I'm having trouble.
12 I'm still having trouble understanding exactly what these
13 things are and how long they last. So, yeah, I think if you
14 just come in and tell me that I have a bunch of blips and
15 that it's your fault and that you've not delivered good
16 quality of power to me, we're not communicating, are we?

17 Q. Well --

18 A. So you have to start defining this. How long
19 do they last? What is the percent of voltage drop? When do
20 they occur? What times do they occur? What equipment is
21 actually being operated? What are the starting sequences of
22 equipment that you may be starting at the time that it
23 occurs?

24 So you need a whole series of information
25 in -- for anyone to try to make an intelligent determination

1 of what's happening.

2 Q. Well, that would be information that Zoltek --
3 I'm sorry, excuse me -- that Union Electric would request
4 from Zoltek; is that correct?

5 A. I think that would be information that Zoltek
6 would present to Union Electric in a claim that they were
7 having power quality incidents.

8 Q. Well, hold on a second. Let's understand
9 this. You're saying that if Union Electric is called with a
10 complaint --

11 A. Okay.

12 Q. -- about the service, you're saying that
13 unless the customer presents Union Electric with these five
14 or six things you just named, that Union Electric is not
15 obligated to address that problem?

16 A. Well, I don't know about their obligation, but
17 I think that in terms of a customer service, if you came to
18 me and you said, Now, here's what's going on and here's --
19 here's how many voltage sags I have, here's the percent of
20 voltage sag that I'm having, here's how long these voltage
21 sags are occurring, here's how often they're occurring, I
22 think that Union Electric could understand that.

23 I think that their customer representative
24 would then try to work with you to either do an in-plant
25 total power quality assessment and/or start working toward

1 problem solving if the problem was determined to be
2 primarily on their system.

3 Q. So you're saying that this information is
4 something that Union Electric would need to address a
5 problem. Is that what you're saying?

6 A. I believe that, yes.

7 Q. And so, therefore, if the customer did not
8 present that to Union Electric, should Union Electric ask
9 for that information?

10 A. I think they could ask for that if they find
11 it to be -- if they find the customer willing to do a -- a
12 power quality study and desires to have a power quality
13 study, I think that would be the next step the utility would
14 take.

15 Q. Okay. So just to be clear on this, I don't
16 mean to beat a dead horse, but if I understand your
17 testimony, you're saying that Zoltek should have had
18 these -- and, again, I think it was five or six things you
19 just mentioned -- should have presented this information to
20 Union Electric. Do you know if Union Electric in this
21 matter asked for those specific things from Zoltek?

22 A. I do not know what they asked. I was not in
23 any of those meetings.

24 Q. And you know there was monitoring done by
25 Union Electric at the plant; is that correct?

1 A. Some, yes.

2 Q. And would the information that you said Union
3 Electric would need, was that information not accessible via
4 the monitoring, at least some of it?

5 A. It was very limited monitoring. It was not
6 complete, it was not a complete power quality plant study.

7 Q. I didn't ask you about the quality of the
8 monitoring. I asked you -- again, you named five or six
9 things that UE would need.

10 A. Yes, I did.

11 Q. And I said at least some of those things,
12 would they not have been learned or discovered via the
13 monitoring results?

14 A. Yes, they would.

15 Q. Okay.

16 A. Some of them.

17 Q. Now, on page 6, lines -- well, in response to
18 the question lines 4 through 6 --

19 A. Yes.

20 Q. -- you talk about -- and I'm paraphrasing so
21 interrupt me if I've got this wrong. You said that Zoltek
22 has failed, in essence, to recognize that dips or sags are
23 normal in the course of providing service; is that correct?

24 A. That's correct.

25 Q. So I correctly summarized that comment there.

1 Are you talking about a sag -- and I'm saying singular, a
2 sag -- should be accepted? Is that what you're saying?
3 A. I think you have to expect in any utility
4 system there will be some sags, yes.
5 Q. Well, the fact that the voltage will dip, that
6 should be expected. Is that what you're saying?
7 A. Yeah. I can understand that one, yes.
8 Q. It's that law training I have, sir.
9 So if that is expected, is this number of
10 sags, is that to be expected? Is that your testimony?
11 A. This number of sags?
12 Q. Yes.
13 A. Now, tell me what you mean by "this number."
14 Q. Well, you've told me you've been here. Right?
15 A. Okay.
16 Q. And you've heard all this testimony, so I'm
17 sure you've heard about the incidents at Zoltek.
18 A. You're talking about the 277 --
19 Q. Service quality incidents.
20 A. Yes.
21 Q. You've heard those?
22 A. Yes.
23 Q. And I'm asking you, you've made a comment
24 that, in essence, says Zoltek should have expected this,
25 this is normal. And I want to be clear. You're saying that

1 this number of incidents through the years, you're saying
2 that that should have been expected by Zoltek?

3 A. Yes. Absolutely. In fact, I would have to go
4 on and say that it is, in fact, very good quality service on
5 the basis of what the average number of voltage sags would
6 be expected. If you were to poll the industry and the power
7 companies, you'd probably find somewhere between two and
8 five per month.

9 Q. Okay. Now, with respect to page 6 as well,
10 line 6 there and it goes through line 10 -- and, again, I'm
11 going to paraphrase your testimony so correct me if I'm
12 wrong -- but you say that Zoltek even fails to recognize,
13 and you go on to say that basically certain on-site things
14 can cause a dip. Is that accurate?

15 A. Yes. It appeared to me at this point in time
16 from the material that I had available to me that there was
17 no recognition that voltage sags could be caused on-site.

18 Q. Well, have you looked at the list of service
19 quality incidents? And I forget the exhibit number.

20 A. Twenty-one.

21 Q. Number 21. Thank you.

22 A. Twenty-one is one of them. This came a little
23 bit later, but yes, I have seen this.

24 Q. Would you not agree that there is an
25 acknowledgment on that exhibit that certain events on there

1 were because of something Zoltek had done? It acknowledged
2 that?

3 A. Yes. And, as I said, this came later.

4 Q. So that's somewhat -- I'm just checking. Is
5 that somewhat inaccurate then, lines 6 through 10, where you
6 say they failed to recognize?

7 A. At that point in time it was not recognized,
8 that's correct.

9 Q. Okay.

10 A. Some of them have now been recognized.

11 Q. Okay. So in light of what you know now,
12 you're saying that you would change those things?

13 A. Just slightly.

14 Q. Lines 16 through 19 on page 6, the question
15 was about the origin of voltage sags. And the way I
16 understand this, you're saying the principal cause of all
17 voltage sags is a short duration increase in current. Then
18 you go on to say that contributions to the sudden increase
19 in current are motor starting, transformer energizing and
20 faults; is that correct?

21 A. Yes.

22 Q. And you know more about this than I, but with
23 respect to line 19, transformers energizing and faults,
24 those are things that would happen within the utility
25 system; is that correct?

1 A. Not necessarily.

2 Q. Possible though?

3 A. Possible.

4 Q. Okay. Also on line -- I'm sorry -- page 6,

5 lines 20 through 23, the question was about solutions to

6 voltage sag. By the way, did you create these questions?

7 A. I did not create the questions. That's --

8 Q. They were submitted to you?

9 A. That would -- no. I actually wrote a prose

10 document with regard to my review of the material and

11 Mr. Evelev created the questions in front of some of my

12 prose.

13 Q. Okay. That's fine.

14 A. Okay.

15 Q. So you weren't, in actuality, responding to

16 these questions. Is that what you're saying?

17 A. That's correct.

18 Q. Okay.

19 A. I actually wrote a prose document and then he

20 inserted questions.

21 Q. But you reviewed this after it was in this

22 format and signed off on it; is that correct?

23 A. Yes, I did.

24 Q. so the question was in regard to solutions to

25 voltage sags --

1 A. Yes.

2 Q. -- correct?

3 And you say, A partial solution to improving
4 voltage regulation can, to a limited extent, be accomplished
5 by reducing the service transformer impedances.

6 Is that correct?

7 A. That's correct.

8 Q. Now, so if I understand your answer, you're
9 saying that there are certain things that can be done with
10 respect to voltage sags?

11 A. That's correct.

12 Q. One of which is reducing service transformer
13 impedances. What are service transformer impedances?

14 A. Well, any object that you put on to an
15 electric utility service has an impedance to it. And if
16 it's in a series with any other equipment in that line, it
17 will -- it will have a current limiting capability.

18 So when you put a transformer in the service,
19 you actually to some extent, learn -- limit the ability of
20 current on the secondary side of that transformer to be able
21 to flow. So it will impede the flow of current. So you can
22 buy a transformer that has a lower impedance and you will
23 pay a price for that in at least two ways. One --

24 Q. May I interrupt you one second?

25 A. Sure.

1 Q. You say you can buy --

2 A. Anybody could.

3 Q. A utility --

4 A. An electric utility company or even -- you
5 know, it all depends on how the service is. Some large
6 plants, some of the ones that I worked for, we owned our own
7 transformers, so we would buy them ourselves. And I believe
8 in this particular case the utility has provided the
9 transformer.

10 Q. Okay. I didn't mean to interrupt. Go ahead.

11 A. Sure. So if the utility decides that one of
12 the solutions could be to buy a transformer with a lower
13 impedance, you would then limit the voltage drop that would
14 take place on the secondary side because you would be
15 providing more current with less impedance and, therefore,
16 less voltage drop.

17 Q. And this would be something, just to be clear,
18 that would either prevent -- I guess prevent a sag or reduce
19 the number of sags; is that correct?

20 A. No.

21 Q. Well, explain that to me then. You said
22 that -- I'm going to go back again. On page 6 you say that
23 a partial solution to improving voltage regulation --

24 A. Yes. That doesn't say anything about sags,
25 does it?

1 Q. Well, let's go back then. What is a voltage
2 sag? Does it deal with voltage regulation?
3 A. Yes, it does. To some extent.
4 Q. Well, the answer you've given on page 6,
5 line 22, A partial solution to improving voltage regulation
6 can -- and you talk about the service transformer
7 impedances. Correct?
8 A. That's correct.
9 Q. And that was in direct response to a question,
10 Are there solutions to the voltage sag, slash, dip or
11 voltage flicker --
12 A. Right.
13 Q. -- as you defined them?
14 So you're saying that you're not answering
15 that question?
16 A. No. Your question was does it eliminate
17 voltage sags.
18 Q. No. I didn't say eliminate. Would it reduce
19 the number or potentially prevent them from occurring?
20 A. It will not reduce the number. It will reduce
21 the severity of the sag.
22 Q. Okay. Now, go to page 7, line 21, please --
23 A. Okay.
24 Q. -- at the bottom, the sentence saying, Again,
25 utilities have little control over such incidents which are

1 normally defined as sags, surges or voltage flickers.

2 Do you see that?

3 A. Yes.

4 Q. So you're not saying they don't have control,
5 you're just saying they have little control?

6 A. That's correct.

7 Q. But they do have some degree of control?

8 A. Some degree of control.

9 Q. Okay. Now, if we can go to the next page,
10 page 8 --

11 A. Okay.

12 Q. -- at the top there you're -- again, I'm going
13 to paraphrase before I ask you a question. You're saying
14 that the electric service provided to Zoltek, in essence,
15 was good? Is that what you're saying at the top there?

16 A. Yes. I said it in two different ways. I
17 think a minute ago I said that you would expect between two
18 and five per month, which would give you 24 to 60 per year.

19 Another way to express it is to look at the
20 minutes of outage per year. And as I recall from a letter
21 that I believe Mr. Hulse wrote, if I'm not incorrect, he
22 said that in the year in -- in that particular year of '93
23 or '94 when he was writing the letter, that the number of
24 minutes of outage was 60 minutes.

25 Q. Well, a couple questions about this in lines 1

1 through 4 on page 8. First of all, you say, Between '96 and
2 2000 Zoltek averaged less than 13 minutes of interruptions.

3 You see that sentence?

4 A. Yes, I do.

5 Q. And this would take us back to your earlier
6 comment that there is a distinction, and you would agree
7 with the assertion, that 60 one-minute outages are more
8 harmful or could be more troublesome than one 60-minute
9 outage. Correct?

10 A. Yeah. I don't have any disagreement with
11 that.

12 Q. Okay. So the 13 minutes of interruptions,
13 another way to look at that though during those years would
14 be the number of times that there was some service quality
15 incident, be it an interruption or sag or blip? Would that
16 be another way to look at the manner in which you came up
17 with the 13 minutes?

18 A. Well, it was just a summation of the number of
19 minutes that were actually applied. But normally a very
20 short time, not very severe sag should not cause a problem
21 on the -- on a plant.

22 Q. Okay. Now, you say on line 1, Except in the
23 year 1993. You kind of, you know, make an exception for the
24 year 1993?

25 A. I did.

1 Q. Now, should we infer from that that you
2 believe in 1993 the service was not reliable?

3 A. No. I don't think so.

4 Q. You think it was reliable in 1993?

5 A. As I recall, in 1993, which looked to me like
6 the weather from hell, if you look at the weather maps, I
7 believe -- I had a chart here a minute ago. I believe there
8 were only 40 service quality incidences, which is below the
9 number that I think you would normally expect.

10 Q. Your testimony talks about an extreme increase
11 in weather-related outages. You see that sentence there?

12 A. Yes.

13 Q. So why then did you make an exception for
14 1993?

15 A. Well, that just looked like a bad year. Also
16 had some personal experience with regard to '93.

17 Q. Okay. I just want to --

18 A. Yeah.

19 Q. -- be clear on this. Are you saying in 1993
20 then you're making an exception for that because there were
21 a lot of outages that year?

22 A. Well, it turns out there aren't and -- but at
23 my first look of the -- at the numbers, it looked at that
24 particular point in time as though there were quite a few by
25 comparison to later years.

1 But if you look over the entire period now
2 since I have collected some additional information then what
3 I had at the time I wrote the document, there are some other
4 years where, in fact, there were more power quality
5 incidences by Zoltek's definition, and one of those is 1998.

6 Q. So then just to be clear in light of your
7 testimony, you're saying that your written testimony on
8 page 8, lines 1 through 4, at least the exception to 1993,
9 that's inaccurate. Is that what you're saying now?

10 A. I just probably wouldn't say that today. I
11 would say that it's -- it was probably average even
12 considering how bad the weather conditions were at that
13 time.

14 Q. Okay. Let's look on page -- continue to look
15 on page 8, specifically line 10. You're saying that --
16 8 through 10 -- Zoltek says that -- I'm sorry.

17 You're saying that Zoltek should have known
18 that UE would not provide perfect electrical service; is
19 that correct?

20 A. Yes. They should have known that.

21 Q. Okay. Where is it that -- or what did you see
22 to lead you to believe -- let me strike that.

23 Do you believe Zoltek thought it was going to
24 receive perfect power?

25 A. Well, it's rather interesting, because I did

1 have a memo in my file that indicated that in some
2 discussions that -- and I find out later on that that
3 document was written by someone within Union Electric --
4 that had characterized Zoltek's interest in perfect power.
5 And so I drew from that when I made that statement.

6 Q. Okay. So --

7 A. And so at least there -- there must have been
8 something in my file that indicated that they expected to
9 have power that far exceeded what an electric utility could
10 deliver.

11 Q. Let's talk though about perfect power. You've
12 made an allegation here that Zoltek should have known that
13 UE couldn't provide perfect electric service?

14 A. Well, I agree with that statement.

15 Q. Okay.

16 A. I think anybody --

17 Q. I'm asking you this though. It's really a
18 simple question. Do you believe that Zoltek expected
19 perfect power?

20 A. I don't know.

21 Q. You don't know. Okay. So to the extent that
22 lines 8 through 10 are premised on this idea that Zoltek
23 expected perfect power, your testimony isn't accurate in
24 that regard because you don't know if Zoltek wanted perfect
25 power?

1 MR. VITALE: Your Honor, I'm going to object.
2 It mischaracterizes his testimony. He said they shouldn't
3 have expected it. He didn't say he premised it on what he
4 knew Zoltek expected. He's said he doesn't know what they
5 expected. He's just saying they shouldn't have expected it,
6 period.

7 MR. MAY: Your Honor, I would point out on
8 line 8 that the witness stated in his written testimony
9 Zoltek knew or should have known.

10 MR. VITALE: But that has nothing to do with
11 the premise of what Zoltek expected.

12 THE WITNESS: That's right.

13 MR. VITALE: He's saying Zoltek knew it, not
14 because -- that they expected it. They are two different
15 things.

16 JUDGE THOMPSON: Well, hang on a minute. Let
17 me read this back here.

18 I'm going to sustain the objection. Please
19 proceed.

20 BY MR. MAY:

21 Q. On page 8, look at line 10, if we could,
22 please.

23 A. Okay.

24 Q. You say that Zoltek fails, however, in any of
25 its testimony to assume any responsibility for its failure

1 to properly design its manufacturing process.

2 You see that?

3 A. Yes.

4 Q. What leads you to believe that Zoltek has
5 failed to properly design its manufacturing process?

6 A. The culmination of all of the testimony of
7 various people that I read. I didn't see anything in there
8 where they took any responsibility for evaluating the
9 systems that they had in place.

10 They purchased this system from Lowell
11 Massachusetts, they moved it down here. There's
12 testimony -- their testimony says they didn't do any
13 evaluation of how -- how the equipment performed in a
14 voltage sag environment. They made no measurements, they
15 made no determination.

16 That would be a totally improper way to design
17 and implement a plant, particularly one where there's a
18 large amount of claim that there is a tremendous opportunity
19 for loss of life or injury should pieces of equipment in
20 that plant fail. I found that very irresponsible.

21 Q. Okay. But let me ask you this question.
22 You're saying that -- if I understand, on line 11 you're
23 saying that this equipment -- or I'm sorry -- manufacturing
24 process was not properly designed. Is that what you're
25 saying?

1 A. That's correct. I believe that.

2 Q. And you infer that from?

3 A. From testimony. They bought a plant, they
4 brought it down here. I forget exactly whose Direct
5 Testimony. Maybe I have it -- I've got it piled up back
6 there. But that question was addressed, I think, somewhere
7 in the process where the questions were asked of some of
8 Zoltek's engineering people, had they evaluated the effect
9 of voltage sags on the equipment. They said, no, they
10 hadn't. I find that highly imprudent on their part.

11 Q. I understand that. But what makes you think
12 it wasn't properly designed?

13 A. Well --

14 Q. You're saying. Let me finish. You're saying
15 that certain things were not done and you think that's
16 inappropriate --

17 A. Sure.

18 Q. -- or improper. But what leads you to believe
19 specifically --

20 A. Okay.

21 Q. -- it was not properly designed? Have you
22 looked at the equipment?

23 A. I have not looked at the equipment.

24 Q. Okay.

25 A. But I think I have to infer from much of the

1 evidence that's been presented here that a 10 percent
2 voltage drop for a few cycles completely shuts down a plant
3 and creates a hazard to the employees is -- is an improper
4 design of a process plant.

5 Q. So would you believe then, taking that out
6 another step, that if there are voltage dips, regulation
7 dips that go into what -- at least there's been discussion
8 about an extreme zone according to regulations, and the
9 equipment withstands that, does that change your opinion
10 about their design process?

11 A. I don't understand the question.

12 Q. Okay.

13 A. Because, first of all, you've introduced a new
14 term here called a regulation dip, which I appreciate.

15 Q. Sir, I know you're having a good time. You
16 think this is funny.

17 A. No, I'm not having a good time.

18 JUDGE THOMPSON: Gentlemen, gentlemen,
19 gentlemen. If I could break in here for a moment, I don't
20 understand exactly what the question of the design of
21 Zoltek's equipment has to do with the scope of the
22 Commission's hearing.

23 Our determination, as I understand from
24 opening statements, is to decide whether the service
25 provided was in all respects just and reasonable, adequate

1 and safe. Isn't that correct?

2 MR. MAY: Your Honor, yes. And if I can point
3 out, the witness is saying that Zoltek bears responsibility
4 for their problems because their equipment was improperly
5 designed and I'm trying to find out exactly what leads the
6 witness to believe it was improperly designed.

7 JUDGE THOMPSON: Well, I'll let you explore
8 this a little bit further, but I'd like to see some direct
9 relevance to the issues that are in front of the Commission.
10 Please proceed.

11 MR. MAY: Thank you.

12 BY MR. MAY:

13 Q. Sir, just to be clear, you have stated in your
14 written testimony, have you not, that Zoltek improperly
15 designed its equipment?

16 A. I believe that, yes, I have.

17 Q. Okay. And your response to that was -- I'm
18 paraphrasing, so correct me if I'm wrong -- you had said
19 that equipment that can't withstand a 10 percent -- did you
20 say dip in voltage, would that be --

21 A. Sag.

22 Q. -- an appropriate term?

23 I don't want to get you going again, but a
24 sag.

25 A. A sag.

1 Q. Okay. Did you hear evidence previously -- you
2 were sitting in here, I saw you.

3 A. That's correct.

4 Q. Did you hear evidence regarding sags that were
5 15 percent, for instance? Did you hear that evidence?

6 A. I have seen evidence of some that went
7 15 percent, yes.

8 Q. And there was evidence also that sags of that
9 magnitude and greater, there were instances where Zoltek's
10 equipment withstood those sags?

11 A. That's correct.

12 Q. Okay. Are you familiar with any of the
13 discussions between Union Electric and Zoltek going back to,
14 let's say, 1991 approximately or 1992 before the plant was
15 constructed?

16 A. No.

17 Q. I'll ask you the same question with respect to
18 the discussions going on during the construction.

19 A. No.

20 Q. Okay. You say on lines 15 through 17, you say
21 that -- again, watch what I'm saying here, but that Zoltek
22 should have made pre-operation specific investments in
23 additional electrical supply production or requested special
24 services from UE.

25 You see those sentences?

1 A. Yes.

2 Q. Okay. Do you know if at any time Union
3 Electric had made that recommendation or demand to Zoltek
4 that it do these things, that it request special services or
5 that it have additional electric supply protection?

6 A. I know of no discussion of that type. I don't
7 think Union Electric would make that demand of someone who's
8 designing a process.

9 Q. Would it have made that offer?

10 A. If asked, it may have.

11 Q. Okay. Okay. We'll go to page 9 now. The
12 question is, Is it normal for a utility to phase its system
13 expansion?

14 A. Yes.

15 Q. That was the question. Right?

16 A. Yes, it is.

17 Q. And you say, Yes, Zoltek knew or should have
18 known before building its facility that the Research Park
19 and UE had agreed to complete the system as required.

20 Do you see that?

21 A. Yes.

22 Q. On what basis do you make the assertion that
23 Zoltek knew that? What evidence do you have to support that
24 assertion?

25 A. There's some letters of communication, I can't

1 remember exactly which ones they were, between Zoltek and
2 Union Electric with regard to -- and, in fact, there's kind
3 of some minutes of a meeting between the Missouri Research
4 Park Corporation and the Zoltek people and the Union
5 Electric people where there's a discussion of additions or
6 additional capacity being added to the park.

7 Q. Okay. And I want to limit your answer, if I
8 may, though. Again, line 2 you say that Zoltek knew -- and
9 we'll get to the should have known part in a second.

10 You say Zoltek knew before building its
11 facility -- before building its facility. You're saying
12 there were discussions in regard to this and, therefore,
13 Zoltek knew that?

14 MR. VITALE: Your Honor, I'm going to object
15 to the question as vague. I don't quite understand the
16 question.

17 THE WITNESS: Not quite getting there with you
18 either.

19 JUDGE THOMPSON: Okay. Why don't you go ahead
20 and read the question back?

21 MR. MAY: Judge, I can just rephrase it.

22 JUDGE THOMPSON: All right. Why don't you do
23 that?

24 BY MR. MAY:

25 Q. Page 9, line 2 and the question is regarding

1 phasing in, it's system expansion. You see the question?
2 A. Yes.
3 Q. And we've went down the road already of
4 that -- you make an assertion that Zoltek knew that this was
5 going to occur. Correct?
6 A. Yes.
7 Q. And your assertion is Zoltek knew it before it
8 built its facility at the Research Park, that's the timing
9 of its knowledge; is that correct?
10 A. Yes.
11 Q. And I'm asking you, what evidence do you have
12 that Zoltek knew this at that time?
13 A. Well, I think -- again, I go to what I said
14 earlier. I think there was some communication of meetings
15 between the two, the contract itself that Zoltek apparently
16 had in its possession.
17 Q. Which contract would that be? I'm sorry.
18 A. That's the contract that -- that Union
19 Electric made with the Missouri Research Park Corporation.
20 Q. Would that be the -- I'm sorry -- that Zoltek
21 made?
22 A. Excuse me. Union Electric I thought I said.
23 Q. I misunderstood. Would that be the 1988
24 agreement --
25 A. Yes.

1 Q. -- that's been discussed?

2 A. Yes. That was a basic document that I worked

3 off of, plus the -- the meeting that I discussed a little

4 bit earlier. And that's how I came to that conclusion.

5 Q. Did you attach to your testimony any documents

6 supporting that allegation, these documents you referenced?

7 A. No, I did not. Because I think they were

8 already previously attached to other testimony.

9 Q. Okay. Now, you've also said on line 2 that

10 Zoltek should have known before building its facility?

11 A. Yes.

12 Q. What leads you to believe they should have

13 known that the utility was going to phase its system

14 expansion?

15 A. Well, I think from personal experience as a

16 plant design engineer, electrical engineer. It's my

17 understanding Zoltek had electrical engineers on staff,

18 people knowledgeable in the field would know that these

19 types of things would take place or they would inquire with

20 regard to when they would take place as they built their

21 plant.

22 Q. So the contract in question was 1988.

23 Correct?

24 A. That's correct.

25 Q. The testimony I believe is that Zoltek I think

1 broke ground for the plant in 1992 or late '91. Correct?

2 A. That's my understanding.

3 Q. Okay. So you're saying that they should have
4 known that four years after that contract was signed, that
5 the system wouldn't be totally in place?

6 A. Or inquired. I said knew or should have
7 known.

8 Q. Let's go back, if we may to page 7 --

9 A. Okay.

10 Q. -- lines 16 and 17, your sentence, Even
11 assuming that Zoltek's claimed service quality incidents
12 occurred as alleged.

13 Is it your testimony then that you don't
14 believe that these occurred?

15 A. All I had at that particular point, and I
16 think all we have now, is their record.

17 Q. Well, are you doubting the voracity of the
18 folks at Zoltek? Do you believe they're not telling the
19 truth?

20 A. No. I don't think that's exactly what I'm
21 trying to imply here. I'm not implying at all that they
22 have tried to make up the story, but I think that I just
23 said if you assume that, this information, which as we
24 earlier started out, is correct and accurate and complete
25 and has the weakness of its definition and then I look at

1 the number of those incidences without knowing how deep the
2 sag was, what range of time that it occurred in, you still
3 had, on the basis of that analysis, a system that was very
4 good.

5 Q. So, sir, again, just asking you, are you
6 saying that you don't know if these occurred or you just
7 don't know exactly what occurred?

8 A. Well, since I wasn't there, I don't know if
9 they occurred. I have no first-hand knowledge that they
10 occurred. So I'm accepting that, you might say in this
11 statement. I have minimal information because at that point
12 in time and still today I do not know what a blip is --

13 Q. Well --

14 A. -- and many of these cases. But even if I
15 take that into account and I count up all of the instance --
16 instances by year that are being claimed, I still have high
17 quality service.

18 Q. So you're saying that -- in your statement you
19 said something about accepting that?

20 A. Yes.

21 Q. So I want to be clear. You're accepting that
22 they occurred?

23 A. With an "A."

24 Q. I know.

25 A. Yeah. Okay.

1 Q. The question, sir, you're accepting that they
2 occurred. Is that what your comment was?

3 A. That's correct, yes.

4 Q. Okay. On page 10 of your testimony line 6 --

5 A. Yes.

6 Q. -- and it talks about any operational system,
7 this possibly could be addressed by the coordination of the
8 Zoltek operator and the AmerenUE dispatcher?

9 A. Yes.

10 Q. You go on to say, Armed with this
11 information -- I'm sorry -- With information about what is
12 happening on the UE system, the Zoltek operator can make a
13 restart or delay restart decision.

14 Is that your sentence there, sir?

15 A. That's what it says, yes.

16 Q. This service, do you know was this offered to
17 Zoltek at any point since 1993?

18 A. No. I do not know. This is written from my
19 personal experience having worked in a petro chemical plant
20 where you had similar types of problems and issues.

21 The way we handled any -- the reason this was
22 written in my prose statement was that, as I recall, there
23 was a document where Zoltek was saying that they had a major
24 problem because if you had an outage and their equipment
25 shut down, they didn't know whether they should start back

1 up or not because they didn't know whether or not Union
2 Electric would be able to bring the system back on line or
3 not.

4 Now, the way we handled that in a petro
5 chemical plant is we had coordination between our people and
6 the electric utility company and we would immediately
7 communicate with them so that they could tell us whether or
8 not they're going to be down for a long period of time,
9 whether they have a major problem, and then we would make
10 the internal decision on whether to restart our petro
11 chemical plant or not.

12 Q. If I understand your previous answer, you're
13 not sure if this was offered to Zoltek. Correct?

14 A. I don't know if it was asked for either.

15 Q. Sir, you don't know if that was offered?

16 A. I don't know whether it was offered.

17 JUDGE THOMPSON: Sir, that's a yes, no, or I
18 don't know question.

19 THE WITNESS: Okay.

20 JUDGE THOMPSON: Which is it?

21 THE WITNESS: I don't know.

22 BY MR. MAY:

23 Q. You had talked about as, you call it, your
24 prose statement that was ultimately divided up by
25 Mr. Evelev; is that correct?

1 A. That's correct.

2 Q. Did you have on line 7 in your prose, did you

3 have the AmerenUE dispatcher or did you just have the

4 utility dispatcher?

5 A. Well, I put in AmerenUE probably because we

6 were dealing with this special -- specific case.

7 Q. And so you had based these sentences here on

8 your personal experience in a different situation. Correct?

9 A. That's correct.

10 Q. And was AmerenUE the utility in that instance?

11 A. No.

12 Q. Okay. On page 10, lines 20 through 22 -- or,

13 yeah, 22, you make some comments about batch furnaces one

14 and three?

15 A. Yes.

16 Q. And nine; is that correct?

17 A. Yes. That's correct.

18 Q. Okay. How many furnaces does Zoltek have?

19 A. I don't know at this time.

20 Q. Okay. Have you ever examined those?

21 A. Yeah. I counted them at one time. I don't

22 know as I sit here today.

23 Q. You've never examined the furnaces --

24 A. Oh, no.

25 Q. -- physically?

1 A. I've never examined them, no.

2 Q. Okay. Let's go ahead to page 13, if we may.

3 A. Okay.

4 Q. You say on lines 8 and 9, the sentence is, If

5 it wishes to cover such eventualities, it should seek

6 insurance coverage, in my opinion?

7 A. Yes.

8 Q. Are you saying then that -- I guess I'm not

9 sure what you're saying in that sentence so maybe you could

10 explain a little bit more to me. What exactly are you

11 trying to get at there? You're saying that Zoltek bears

12 full responsibility for the incidents and UE has no

13 responsibility?

14 A. No. That's not what it says.

15 Q. That's why I was asking you.

16 A. That's the way we handled it in our industry

17 was that we had insurance against acts of God and loss in

18 our plants that were created by power outages or any other

19 act of God where we did not have control and the utility did

20 not have control. And so we took care of that in another

21 method.

22 Q. Just to be clear, a power outage is not a act

23 of God. Correct?

24 A. It can be.

25 Q. It can be caused by an act of God. Correct?

1 A. Correct.

2 Q. But they're distinct things. Correct?

3 A. Correct. Well, maybe yes, maybe no.

4 Q. Is every power outage an act of God?

5 A. No.

6 Q. Okay. So you're saying then that in your --

7 because you base this on your previous experience --

8 A. That's correct.

9 Q. -- your comment?

10 A. That's correct.

11 Q. You're saying in your previous experience

12 that -- was this a company you had worked for, you said?

13 A. Yes.

14 Q. That it would not look to utility if the

15 utility, for whatever reason was the source of the problem,

16 it would just seek insurance coverage?

17 A. No.

18 MR. VITALE: I'm going to object. That

19 misstates his testimony.

20 MR. MAY: That's why I'm asking him, Judge.

21 MR. VITALE: He says it was outside the

22 control of the utility and he's asking the question when

23 it's caused by the utility. Two different things.

24 JUDGE THOMPSON: I'm going to overrule the

25 objection and allow him to explore this area, although I

1 will caution counsel once again that it appears this goes to
2 the issue of damages and responsibility for damages and
3 damages are not before this Commission.

4 I mean, you try your case the way you want to
5 try your case, but we're not doing damages.

6 MR. MAY: Your Honor, I would just say in
7 response to that, again, I'm just going over his testimony.
8 It's my opportunity to inquire about his testimony. He's
9 made the comments, not I. And it's kind of gone on that
10 subject.

11 BY MR. MAY:

12 Q. And so, sir, I don't know where we are with
13 this, but you're talking about the insurance coverage. You
14 said in your previous experience that for those things
15 outside of the control of the utility, was that your
16 comment?

17 A. Basically, yes.

18 Q. Okay. What about for those things -- and I'm
19 talking about your prior experience -- that were within the
20 control of the utility?

21 A. Well, I think those are always subject to
22 negotiation or litigation.

23 Q. Okay. Okay. Now, we'll go to the bottom of
24 13. You make a comment that -- I'm going to go ahead to
25 line 23.

1 A. Okay.

2 Q. You say, I found that AmerenUE was responsive
3 to improvements to the -- next page, 14 -- system?

4 A. Yes.

5 Q. Okay. What were these improvements that
6 you're referencing? What are they?

7 A. Well, basically they go to the communications
8 that a couple of the people from Union Electric have
9 responded to Zoltek's concerns. I believe one of them dealt
10 with upgrading the circuit breakers, add a substation. I
11 saw several documents as I went through this of Union
12 Electric being responsive to putting in additional equipment
13 or modifying equipment or upgrading the equipment based on
14 customer growth which would normally be anticipated.

15 Q. Okay. So these improvements that you cite
16 here, those were based on customer growth; is that correct?

17 A. Not all of them, but some of them are. Most
18 of them are.

19 Q. Okay. Were there any improvements that you
20 found, in light of your sentence here, that UE had done that
21 was in response to Zoltek's concerns or complaints?

22 A. Well, I guess all of the letters were written
23 to Zoltek that I read so I assumed that those were all
24 responding to power quality service complaints from Zoltek.

25 Q. Okay. I'm not talking about --

1 A. So they must be somehow related.

2 Q. I'm not saying the letters themselves, because
3 I know earlier you say the responses to be professional.
4 I'm talking about the improvements.

5 A. I guess the only way I can answer the question
6 is I have some -- I have a file, I have some letters that
7 are in response to Zoltek and they indicate system
8 improvements. They must somehow be tied together.

9 Q. Now, with respect to those improvements, you
10 had said that they were done in response to load growth?

11 A. There are statements in the letter to that
12 effect, yes.

13 Q. I'm saying today though you said those were
14 done in response to load growth; is that right? Is that
15 your testimony today?

16 A. Yes.

17 Q. Okay. I'll ask you one more time. Were those
18 done -- any of those improvements that you're citing and
19 we'll get those in a second, any of those done specifically
20 in response to Zoltek's complaints?

21 A. I guess I can't answer that question.

22 Q. Okay. And, again, what were these
23 improvements? Could you detail them again for me?

24 A. Well, they're in some letters. I think
25 they've been introduced and they're attached to a number of

1 documents. One -- one outlines circuit breaker upgrades,
2 increased sizes of circuit breakers, I believe there's one
3 that dealt with an additional feeder later on that was added
4 to the -- to the Research Park.

5 Q. Sir, let's go to page 9.

6 A. We're going backwards again, huh?

7 Q. Yes, sir.

8 A. Okay.

9 Q. Lines 14 through 17 --

10 A. All right.

11 Q. -- looking at the question. In that question
12 it states, Zoltek has a process that it admits is extremely
13 sensitive to power fluctuations.

14 Do you see that sentence?

15 A. Yes.

16 Q. Okay. On what basis do you make that
17 statement?

18 A. I didn't make that statement. As I told you
19 earlier, Mr. Evelev made that statement.

20 Q. Okay. So you don't know whether Zoltek has
21 admitted that its process is extremely sensitive to power
22 fluctuations?

23 A. I don't know that they've admitted it. I
24 think the evidence shows that it is.

25 Q. Okay. In anywhere in your answer to that on

1 page 9 or page 10, do you state that the question isn't
2 exactly right? That, in other words, Zoltek has not
3 admitted that?

4 A. No, I never said that. I just -- I -- as I
5 told you before, I wrote a prose and Mr. Evelev put the
6 questions in.

7 Q. Okay. So I'll finish on this one. So just to
8 be clear, you know of nothing where Zoltek has admitted such
9 a thing as contained in the sentence on lines 14 and 15?

10 A. I do not.

11 MR. MAY: Okay. Judge, I don't think I have
12 anything else.

13 JUDGE THOMPSON: Thank you, Mr. May.

14 We've had a temporary substitution of counsel
15 for the Staff. Mr. Schwarz, why don't you go ahead and
16 enter your appearance?

17 MR. SCHWARZ: My name is Tim Schwarz. I'm
18 deputy general counsel with Missouri Public Service
19 Commission and I am representing Staff during what I hope is
20 a very brief absence by Ms. Shemwell to represent the
21 Commission in circuit court.

22 JUDGE THOMPSON: Thank you very much,
23 Mr. Schwarz.

24 Ms. Shemwell had earlier asked that her
25 opportunity to examine be taken out of order after Mr. May

1 rather than before, so I'll ask at this time do you have any
2 cross-examination at this time?

3 MR. SCHWARZ: Staff does not.

4 JUDGE THOMPSON: Very well. In that case we
5 will go ahead and take a 10-minute recess and come back for
6 questions from the Bench. Thank you.

7 (A RECESS WAS TAKEN.)

8 JUDGE THOMPSON: First of all, I have a
9 question from Commissioner Lumpe. Okay? And she has given
10 me her question and I'm going to address it generally,
11 because I don't know if this witness can answer this
12 question but she wants an answer to this question. And I
13 don't care who provides it, but I'd sure like to see it and
14 so would she.

15 The question is this: What is the evidence,
16 if any, of promises, representations, agreements, whatever
17 you want to say, made directly to Zoltek, whether by Ameren
18 or by the University, with respect to the reliability of the
19 power supply? Okay? Directly to Zoltek.

20 Perhaps counsel would do best to deal with
21 that question and bring us perhaps an answer when you come
22 back on the 14th perhaps. That might be the best way to do
23 that. Everyone's got a good chance to look through all the
24 thousands of sheets of papers.

25 MR. VITALE: You mean in the form of bringing

1 a witness to testify, written testimony or just to verbally
2 inform the Commission the sources of our --

3 JUDGE THOMPSON: I would say this. If those
4 items are already in evidence, then you need only direct the
5 Commission to them. If those items are not already in
6 evidence, I think it would be important for you to get them
7 there. So depending on that, that's how you need to
8 respond. Okay? If you need to put on an unexpected witness
9 in order to get that information in, then we'll go ahead and
10 let you do that. Okay?

11 MR. MAY: Judge, could we also recall a
12 witness that had previously testified just to be clear on
13 that point?

14 JUDGE THOMPSON: Yes, you could. However you
15 want to do it. Okay? But that's the information that
16 Commissioner Lumpe wants and --

17 MR. MAY: Could you one more time --

18 JUDGE THOMPSON: -- that's your homework
19 between now and the 14th.

20 MR. MAY: I want to make sure I get my
21 assignment right. Could you repeat it one more time, the
22 question.

23 JUDGE THOMPSON: If I don't repeat it exactly
24 the same way, everyone's going to be confused.

25 Evidence of representations, promises,

1 agreements, whatever the word is you would like to use, made
2 directly to Zoltek by either Ameren or by the University of
3 Missouri, or anyone else for that matter, regarding the
4 reliability of the power supply at the facility, the
5 location where the Zoltek plant is. Okay?

6 I guess what I'm saying is we know about the
7 contract and the third-party beneficiary theory. We're
8 asking about direct representations to Zoltek. Okay?

9 QUESTIONS BY JUDGE THOMPSON:

10 Q. Now then, Dr. Morgan.

11 A. Yes, sir.

12 Q. I have some questions for you. And what I
13 wanted to do is make sure I asked you all the same questions
14 that I asked Mr. Park when he was here, but I can't find my
15 questions on this transcript. You were here when I inquired
16 of Mr. Park, were you not?

17 A. Yes, I was.

18 Q. Okay. And you heard Mr. Park testify, did you
19 not, that the power supply was unreliable for each of the
20 years at issue?

21 A. I did.

22 Q. And do you have an opinion yourself with
23 respect to that point?

24 A. Yes, I do.

25 Q. And what is your opinion?

1 A. It was my opinion that the power service was
2 reliable.

3 Q. And is that your opinion for each of the years
4 at issue?

5 A. Yes.

6 Q. And you heard, I believe, Mr. Park testify
7 that a threshold of reliability would be, in his opinion,
8 approximately 15 incidents per year and 58 to 60 minutes of
9 interruption per year. Did you hear that testimony?

10 A. I did.

11 Q. And do you have an opinion with respect to
12 those two points?

13 A. I do.

14 Q. And what is that opinion?

15 A. I don't agree with either of those criteria.
16 There are industry standards in this regard and much work
17 going on in the field that is important with regard to power
18 quality. He has picked numbers that are well below what is
19 achievable in a practical sense and actually in a physical
20 sense.

21 Q. Okay.

22 A. If you -- and I think I did in my direct or
23 re-- excuse me, the redirect testimony that I just went
24 through. If you were to poll utility companies around the
25 country and industries also, because you'd want to look at

1 both sides, what does the utility say what does industry say
2 actually happens.

3 You would probably find that -- that in some
4 areas of the country, probably those that had lower
5 lightning strikes and issues of weather-related incidences,
6 you would probably find at least an average of two such
7 events per month. If you go down to --

8 Q. In other words, say 24 events per year --

9 A. Yes.

10 Q. -- in the area of low lightning strikes?

11 A. Yes.

12 Q. Okay. Please proceed.

13 A. If you go to Florida, which is the highest
14 isochronic level in the United States, meaning numbers of
15 thunderstorm days per year, you would probably find five,
16 which would be 60.

17 Q. And that's per month?

18 A. Per month.

19 Q. Okay.

20 A. Which would be closer to 60.

21 Q. All right. And what about with respect to
22 minutes of interruption per year?

23 A. Part of the problem with the minutes --
24 probably it's 110 minutes average across the country.
25 That's what the professional society information is

1 basically showing us.

2 What we -- what we find out is that that's not
3 accurate information, because what happens when you actually
4 start doing power quality measurements and you start getting
5 more accurate data with regards to what's going on in
6 various plants and what's actually happening in the systems,
7 you probably find that the number of minutes of outages
8 larger than what is being reported in some cases -- in many
9 cases, in fact.

10 Q. Okay. Did you hear Mr. Park characterize the
11 items he had reviewed in forming his opinion?

12 A. I'll have to admit I don't really recall that.

13 Q. Okay. Well, let me ask you this. You are
14 familiar, are you not, with the list of 277 some events
15 compiled by Zoltek?

16 A. Yes. I have several of those lists, yes.

17 Q. Okay. And have you seen the results from a
18 monitoring performed by Union Electric on, I believe, three
19 occasions?

20 A. Yes, I have.

21 Q. And are you familiar with the results from a
22 Hewlett Packard monitoring, which evidently are not in
23 evidence but which Mr. Park did see?

24 A. You know, I don't recall whether or not I saw
25 those or whether those were just the three different --

1 Q. Okay.

2 A. -- reports. I'm not sure I remember that I --

3 Q. So you don't know if you've seen that one?

4 A. That's right.

5 Q. Very well. And based on your review of those

6 items, my next question is, do you have an opinion as to

7 whether or not the service rendered by Union Electric was

8 within the number of incidents and minutes of interruption

9 per year levels that you have given me?

10 A. Yes, they are.

11 Q. And your opinion is that they were, in fact,

12 within acceptable limits --

13 A. Yes, they were.

14 Q. -- with respect to those two standards?

15 A. That's correct, your Honor.

16 Q. Okay. Now, there was also testimony regarding

17 a particular regulation of this Commission?

18 A. Yes, there were.

19 Q. I do not know if you have a copy of that

20 available to you.

21 A. I have a copy.

22 Q. Very well. And for the record, I'm looking at

23 Exhibit 26, which is a copy of regulation 4 CSR

24 240-10.030(23). And do you have a copy of that regulation

25 in front of you?

1 A. I have it in front of me.

2 Q. And Mr. Park testified that in his opinion,
3 the service provided by Ameren to Zoltek falls within
4 subparagraph D as power service.

5 Do you have an opinion as to that point?

6 A. I agree that that's where it falls.

7 Q. Very well. And do you agree with me that
8 Subsection D prohibits the voltage from varying more than
9 10 percent above or below the rated service voltage?

10 A. As a normal operational voltage, yes, your
11 Honor.

12 Q. Okay. And do you agree with me that this
13 subpart or subparagraph, whichever it is, also imposes a
14 requirement on the utility if and when the system voltage
15 variations fall within what is defined in the regulation as
16 the extreme zone?

17 A. It -- it imposes some requirement for action,
18 yes, it does.

19 Q. Okay. Now, with respect to the prohibition of
20 greater than 10 percent variance imposed by this regulation,
21 do you have an opinion based on the materials that you've
22 reviewed and the testimony you have heard in this
23 proceeding, whether or not the service provided to Am-- or
24 by AmerenUE to Zoltek ever varied more than 10 percent? Do
25 you have such an opinion?

1 A. Yes, I do.

2 Q. And what is your opinion, sir?

3 A. Occasionally it did, yes.

4 Q. Okay. Now, with respect to those events, have
5 you been able to form an opinion as to whether or not each
6 or any of those events was due to causes within Ameren's
7 control or was due to causes outside of Ameren's control?

8 A. For some of the data, I have been able to make
9 that ascer-- to ascertain that situation, yes.

10 Q. Please tell me what you've been able to
11 ascertain.

12 A. Okay. There are -- some of the charts have
13 correlated storm information, for example, with outages and
14 with events where the voltage has been outside of that range
15 that indicate that those events are created outside of the
16 control of AmerenUE.

17 Q. Is it your opinion that this regulation
18 excuses the utility to the extent that voltage variations
19 are due to the action of the elements?

20 A. Yes, it does, in my opinion.

21 Q. And is it your opinion that the storm or
22 weather-related events you've just been talking about, in
23 your opinion, were those, in fact, caused by the action of
24 the elements?

25 A. That's correct. Yes, it is.

1 Q. Okay. And in your review of these materials,
2 have you identified any events of a greater than 10 percent
3 fluctuation that, in your opinion, was caused by
4 circumstances within the control of Ameren?

5 A. I have not been able to identify a specific
6 event that was specifically within the control of Ameren.

7 Q. It is possible there were such events?

8 A. That's correct. There are some where we were
9 outside of the 10 percent voltage, but the -- there may not
10 have been a storm, but there may have been an animal
11 situation or another situation that created that particular
12 outage or event.

13 Q. Okay. Are you familiar at all with the
14 contract or agreement of 1988 between the regents of
15 University of Missouri and AmerenUE?

16 A. Yes, sir, I read that.

17 Q. And did you hear Mr. Park testify that, in his
18 opinion, that agreement created a duty to provide power to
19 the tenants of the Research Park that was more reliable than
20 the norm? Did you hear that testimony?

21 A. I heard him say that, yes, sir.

22 Q. Do you have an opinion on that point?

23 A. Yes, sir, I do.

24 Q. What is that opinion?

25 A. I don't read it that way, your Honor. I read

1 it that basically it was a statement that Union Electric was
2 going to provide a looped service which they believed would
3 be more reliable than a radial service. And I -- and that's
4 the way I read it from the very first moment that I read the
5 document.

6 Q. And is it, in fact, true that a looped service
7 is more reliable than a radial service?

8 A. It is, your Honor.

9 Q. And I think you testified on cross-examination
10 that it's not in terms of number of incidences but in terms
11 of duration, is that correct or --

12 A. I never got asked that question, but I agree
13 with you.

14 Q. Okay. Reduces duration?

15 A. That's correct.

16 Q. Okay. Did you hear Mr. Park testify as to the
17 existence of localized problems in Ameren's distribution
18 system to Zoltek?

19 A. I did.

20 Q. And do you have an opinion on that point?

21 A. I'm not sure exactly what he's referring to.
22 I don't know of any localized problems on the AmerenUE
23 system.

24 Q. Again, is that there could be but you don't
25 know of them?

1 A. I did not find any in any of my investigation
2 of any localized problems that were within the control of
3 Union Electric.

4 Q. Finally, is it your opinion that the effect of
5 voltage fluctuations on Zoltek's equipment and processes --
6 is it your opinion that those effects are an appropriate
7 measure of the reliability of the power service?

8 A. I'm sorry, your Honor. I don't understand
9 fully your question.

10 Q. I don't understand the point either. In other
11 words, if we're measuring the reliability of power
12 service --

13 A. Yes.

14 Q. -- I believe Mr. Park told us in addition to
15 number of incidents and duration of incidents, that there
16 was also the question of the effect on the customer?

17 A. Yes.

18 Q. And I guess what I'm asking, is that third
19 leg, that third area of concern, in your expert opinion, is
20 that an appropriate measure of power supply reliability?

21 A. No, sir.

22 Q. And why is that?

23 A. Okay. Basically, when we -- when we talk
24 about power service reliability, what we have to look at is
25 the frequency of the incidents. I believe that is, of

1 course, a measure. I also believe that the severity of the
2 drop or sag is a measure.

3 Q. So this is, in fact, a new measure? This is a
4 number or duration, this is degree, amplitude?

5 A. That's correct.

6 Q. Okay. Continue.

7 A. Well, frequency, of course, is the number.

8 Q. Right.

9 A. Yeah. Those are correlated. In other words,
10 how many a year or how many a month.

11 Q. I understand.

12 A. Okay. So now we have frequency. Then we --
13 then we look at the severity of the -- of the voltage sag
14 and how many of those are below certain levels. And that
15 gets to the Commission's regulation with regard to the plus
16 and minus 10 percent. Okay? And there's one other
17 additional one. You want to know how many outages. Okay?
18 Because it's not just whether or not you're within the
19 10 percent, but how many times do you go out.

20 Q. Okay.

21 A. Now, if you have large numbers of outages,
22 then you probably have a problem that is on the electric
23 utility system that's within their control.

24 Q. But you would agree with me that the
25 Commission's regulation does not speak of outages?

1 A. That's correct.

2 Q. Okay. Please continue.

3 A. It doesn't. Now, the severity of that sag on

4 the power -- excuse me -- on the customer is not a measure

5 of power quality at all. It has no indication whatsoever as

6 to power quality, because power quality has a very tight

7 definition. How long, how much, and how often.

8 Q. I see. So the effect on the customer rather

9 is a measure of the customer's sensitivity --

10 A. Yes, it is.

11 Q. -- to fluctuations?

12 A. That's correct.

13 Q. So the process of hardening that I heard, I

14 guess it was Mr. Park or perhaps someone else talking about

15 it previously, that is an effort to reduce sensitivity?

16 A. That's correct.

17 Q. Okay. Now, were you here for the opening

18 statements?

19 A. No, sir.

20 Q. You were not. Okay. So if I told you that

21 the Commission's duty in this case is to determine whether

22 or not power supply was adequate, safe and in all respects

23 just and reasonable, do you have an opinion as to what

24 standard the Commission should use to measure that adequacy,

25 that safety, that justness and reasonability?

1 A. Yes, I do.

2 Q. And what standard do you believe the
3 Commission should use?

4 A. Okay. One should begin to evaluate this by
5 using some of the national standards. There, in fact, is
6 a -- coming out around the country and in the professional
7 field a percentage of customer interruptions, numbers of
8 customer interruptions. They're referred to as SAIDI, SAIFI
9 and MAIFI. I don't know whether you've heard those terms or
10 not.

11 Q. Never heard them.

12 A. Those are basically frequencies of
13 disturbances in electric utility systems. So you would have
14 to -- you'd have to begin to evaluate that as a Commission
15 and begin to look at what numbers that you were going to
16 decide and each state has taken this under advisement.

17 There are some general guidelines out there,
18 there are some committees that are working on this that can
19 provide the Commission with actual data, actual information
20 that it could take into account to derive those types of
21 standards.

22 Q. And if you know, do those standards differ
23 from the Commission's regulation?

24 A. Yes, they do.

25 Q. But given that the Commission's regulation

1 exists and is enforced, do you believe the Commission should
2 use its regulation as a standard?

3 A. Oh, I think you would -- you certainly should.

4 Q. Okay.

5 A. Now, I -- I would -- I would extend my
6 statement a little bit that I kind of disagree with how far
7 you went in your questioning of me with regard to that
8 regulation, because I think you missed one step.

9 Q. Please tell me what you think I missed.

10 A. Yes. Mr. Park also said in his response to
11 your questioning that he believed Subpart D had no
12 relationship to the first paragraph.

13 Q. Okay. And you disagree?

14 A. I disagree with that.

15 Q. Tell me what you believe the relationship of
16 the two is.

17 A. Okay. I think Subpart D is just a part of the
18 first paragraph. I have never, ever seen a document or
19 regulation written where a subpart is not related to the
20 first part.

21 For example, you really have your regulation
22 240, Subpart 23, of which there are four subparts. The four
23 subparts have to be inexorably tied to the first paragraph
24 or Section 23. And Section 23 says that the plus or minus
25 10 percent that you have or the tolerance of the -- and if

1 you recall Mr. Edward -- doggone it, under pressure I've
2 forgotten his name. Bailey?

3 MR. VITALE: Bradley.

4 THE WITNESS: Bradley. Excuse me. He said
5 that, you know, Union Electric had told him to set it at six
6 and eight. It's right in here. That's where it came from,
7 right out of this regulation. And -- and parts A, B, C and
8 D are tied to -- to the first paragraph 23. You make those
9 measurements over one minute.

10 BY JUDGE THOMPSON:

11 Q. So it is your opinion that the one-minute
12 period in the introductory paragraph of Subpart 23 applies
13 to subparagraphs A, B, C and D?

14 A. Each and every part, yes, sir, your Honor.

15 JUDGE THOMPSON: Okay. I believe that's all
16 the questions I have for you. Thank you very much.

17 We will proceed to recross based on questions
18 from the Bench. And I think that would be you, Mr. Schwarz,
19 if you have any questions.

20 MR. SCHWARZ: Staff does not have any
21 questions at this time.

22 JUDGE THOMPSON: Okay. Then, Mr. May?

23 RE CROSS-EXAMINATION BY MR. MAY:

24 Q. Sir, you discussed in your answers to the
25 Judge's questions some things about the effects of weather;

1 is that correct?

2 A. Yes.

3 Q. Can a utility control the effects of the
4 weather? Can it do things to kind of mitigate the effects
5 of weather on the system?

6 A. Let's see. I don't mean to be argumentative,
7 but you asked the question two different ways. Can they
8 control or mitigate and those are two different --

9 Q. Let's take one at a time.

10 A. Please let's do.

11 Q. Can it do something to control the effects
12 that a weather incident may have on the system?

13 A. No.

14 Q. There's nothing it can do?

15 A. No.

16 Q. Can it do things to mitigate the effects that
17 a weather-related incident might have on the system?

18 A. Yes.

19 Q. And what are those things it can do?

20 A. Lightning arresters, lightning shielding, BIL
21 level design of the system, things of that type.

22 Q. Okay. Now, in response to a question from the
23 Judge, you had given a number and you were -- I was a little
24 confused. You said something about Missouri was two and
25 Florida was five a month. Were you talking about lightning

1 strikes when you'd given that number?

2 A. No.

3 Q. What were you talking with?

4 A. Well, again, I don't want to be argumentative
5 with you. I never said anything about Missouri. I said
6 that in low lightning areas, you might expect to have --
7 because most of the incidences -- power quality incidences
8 that we're talking about probably have some correlation with
9 weather or some condition -- animals or weather-related
10 conditions.

11 So -- so I said that it -- more than likely in
12 areas that had lower lightning per year -- strikes per year,
13 you'd probably find outages or power quality incidences that
14 were in the two per month.

15 Q. Okay.

16 A. If you go down to Florida, which is the
17 highest isochronic level in the United States, thunderstorm
18 days per year, you'll probably push it towards five or six.
19 And I expanded it a little bit. Let's just say five. I
20 said five before. Let's stick with it.

21 Q. You were talking -- and, again, you're saying
22 a number. Is that interruptions?

23 A. It -- it would be voltage sags or outages. I
24 would combine them all.

25 Q. Okay. So you're saying in low lightning

1 areas, one would expect, if I understand this right, 24 sags
2 per year?

3 A. Sags or outages per -- per year.

4 Q. And where would Missouri fit into your scheme
5 about lightning --

6 A. Probably --

7 Q. -- would it be at the two?

8 A. Probably about the middle. If you look at the
9 isochronic level in Missouri, it's -- it's above low and
10 it's not as high as Florida so it's kind of in the middle.

11 Q. Okay. Well, what number would you place upon
12 that then?

13 A. I'd say you're probably in the 36 to 40 range.

14 Q. Okay. Now, did you review the monitoring
15 results? I know there were four incidents of monitoring,
16 three of which was performed by Union Electric?

17 A. That's correct.

18 Q. Did you review those?

19 A. Yeah, I did some time ago. I have not
20 reviewed them recently. And, unfortunately, I didn't bring
21 them along with me.

22 Q. What else did you do with respect to the
23 monitoring results? Did you conduct any sort of
24 investigation based on those results?

25 A. No. I basically looked at the -- again, going

1 back to my previous testimony, I looked at how large the
2 voltage drop was, how long it lasted and what was the
3 frequency.

4 Q. Okay. Did you go a step beyond that and try
5 to determine -- for each incident listed on the monitoring
6 result for each year, did you do any sort of investigation
7 to see what caused that to occur?

8 A. Yes. There was --

9 Q. What did you do?

10 A. Well, I was -- I had to use whatever
11 information was provided to me, but some various people had
12 either written down a storm or whatever. And so I tried to
13 correlate those events to see whether or not a storm
14 correlated with any of those events.

15 Q. Are you talking about -- you said someone?

16 A. Yes.

17 Q. You were here yesterday when Mr. Bradley and
18 Eckelkamp testified --

19 A. Yes.

20 Q. -- correct?

21 A. Right.

22 Q. And they had discussed in their testimony the
23 investigations they had done. Correct?

24 A. Yes, they did.

25 Q. Okay. And they had listed or had a

1 discussion, I should say, as to what their investigations
2 produced; is that right?

3 A. They did.

4 Q. Okay. So those are the things you relied upon
5 in making your comments to the Judge's questions about what
6 occurred with the monitoring --

7 A. That's correct.

8 Q. -- or for the incidents that were reported?

9 A. That's correct, yes, sir.

10 Q. So you didn't do any independent
11 investigation? You just relied upon what those gentlemen
12 had?

13 A. Yes.

14 MR. MAY: That's all. Thank you.

15 JUDGE THOMPSON: Thank you, Mr. May.

16 Redirect, Mr. Vitale?

17 MR. VITALE: Thank you, your Honor.

18 REDIRECT EXAMINATION BY MR. VITALE:

19 Q. In response to -- Dr. Morgan, in response to
20 the Judge's questions and the same questions I think you got
21 from Mr. May with respect to low thunderstorm areas and high
22 thunderstorm areas, were you speaking to an absolute number
23 each year that you would apply to determine reliability when
24 you said two in the low and five in the high thunderstorm --

25 A. No. What I was saying when I gave those

1 numbers, is that I think if you did a study across the
2 country and you ask both electric utility companies and you
3 ask industrial users, you would probably find that in low
4 lightning areas you would get down as low as two and in high
5 lightning areas, you're probably pushing it up around five.

6 And there are people -- in fact, I've read
7 some reports where those kind of surveys have been done in
8 the professional community amongst industrial and utility
9 users.

10 Q. And then you put Missouri -- again, to sum it
11 up a little bit -- in the middle or a little higher than the
12 middle?

13 A. Yes.

14 Q. And then would you then consider each --
15 starting from that standpoint, then look at each year's
16 actual events to determine if a particular year -- Missouri
17 may be in the middle, but may have had a high event, high
18 weather situation to adjust your figures accordingly?

19 A. Well, sure you would. In fact, in '93 if you
20 look at the weather maps, the lightning maps --

21 Q. Yes.

22 A. -- Missouri was -- if you -- and red is bad,
23 you know, Missouri's basically red in 1993.

24 Q. Missouri was Florida basically?

25 A. That's right. It was Florida then. And then

1 in another year you'll see that -- that it's more in the
2 green, which shows that it's very low.

3 Q. Okay.

4 A. So it's -- it's a function of time. And I
5 think that's one of the things that the Commission would
6 have to struggle with if it was setting a standard is what
7 would you do if you had a year like '93 and you had imposed
8 a number of outages as a standard and it was well beyond
9 that and outside of the control of the electric utility
10 company? They'd have to have some way of managing that.

11 Q. Okay. Now, in response to Mr. May's
12 questions, he asked you -- you said you don't know what a
13 blip is. Do you remember that question?

14 A. Yes, I do.

15 Q. What do you mean when you say you don't know
16 what a blip is? What did you mean by that?

17 A. Well, it was never really defined. There
18 are -- there are -- they were written down by people who saw
19 a flicker in the lights.

20 And so sometimes it appeared to me from all of
21 the testimony that I've read and the information, that you
22 couldn't tell how much voltage drop there was, how long it
23 lasted or what -- what any of these relationships were that
24 I think are important to determine what that situation was
25 when it was written down.

1 Q. Okay. So a blip, as described by Zoltek,
2 could mean any number of different types of electrical
3 events that you understand as an electrical engineer?

4 A. That's correct.

5 Q. Okay. And talking about voltage variations
6 when talking about sags, is one of those events if the
7 voltage goes down -- up to 10 percent, is that considered a
8 sag or is that a different type of event?

9 A. If the voltage goes down?

10 Q. Up to 10 percent or only up to 10 percent and
11 below.

12 A. Well, that -- that could be categorized as a
13 voltage flicker.

14 Q. Okay. But not a sag as you define it?

15 A. Not a sag.

16 Q. So that's another event entirely?

17 A. That's another event.

18 Q. And that's within -- or outside of the extreme
19 zone that we've talked about?

20 A. That's correct.

21 Q. Now, let me direct your attention -- Mr. May
22 asked you some questions on page 4 of your testimony on
23 lines 4 and 5 and 6. And you're talking here about blips
24 and flickers.

25 You say, Without being on-site for an

1 investigation and additional information, it would be very
2 difficult at this time to make any substantive claims for
3 blips and flickers over the nine-year period.

4 Is that your testimony?

5 A. Yes, it is.

6 Q. And Mr. May asked you a question about, are
7 you saying that that is impossible for you to make a claim.
8 What did you mean by what you said there?

9 A. Well, I think that was kind of the royal you.
10 I meant anybody, either Zoltek or Union Electric or any
11 electrical engineer who was trying to evaluate that.

12 Q. And the on-site investigation you're talking
13 about -- I think the term you used was in-plant power
14 quality assessment?

15 A. Yes, sir.

16 Q. And was that that was done in 1993 or '94 by
17 UE? Is that --

18 A. No.

19 Q. -- what you would consider an in-plant power
20 quality assessment?

21 A. No, it was not.

22 Q. Or in 2000?

23 A. No.

24 Q. I think you said it was part of it?

25 A. 2000 did a little bit of it, yes.

1 Q. And you heard Mr. Park's testimony and you've
2 read his written testimony. Correct?

3 A. Yes, sir.

4 Q. And is anything that Mr. Park did what you
5 would consider an in-plant power quality assessment?

6 A. No.

7 Q. Okay. And Mr. May asked you -- you said 2000
8 was some of it. What else would you do to do your in-plant
9 power quality assessment to make the determination of the
10 possible causes of these events?

11 A. Well, I think you'd have to, first of all,
12 look at the plant, evaluate where you should make your
13 measurements and you should set up whatever number of
14 measuring points that you need in order to assess the
15 sensitivity of individual pieces of equipment to power
16 changes that might occur within the plant.

17 You would also then isolate which buses those
18 occurred off of or which motor control centers they came off
19 of. And so then you would be able to make a general plant
20 assessment as to sensitivity of equipment, possibly even
21 sensitivity of plant, because sometimes people don't put
22 a -- put a large enough conductor between parts inside the
23 plant itself. So you could even have that become part of
24 the problem.

25 Q. So where would those possible places be? I

1 think you said -- you mean at the equipment itself?

2 A. Yeah. Primarily at the operating equipment
3 itself. Possibly at the -- at the service panels.

4 MR. VITALE: Okay. Thank you. Nothing
5 further, your Honor.

6 JUDGE THOMPSON: Thank you.

7 Thank you very much, sir. I believe we're
8 done with you, Dr. Morgan.

9 THE WITNESS: Thank you, your Honor.

10 JUDGE THOMPSON: Appreciate your testimony
11 today. I will excuse you subject to possible recall if a
12 Commissioner comes up with a question. I guess that would
13 be a problem since he's from Alabama.

14 MR. VITALE: We can arrange something, but for
15 today he can go. Correct?

16 JUDGE THOMPSON: Today he can go.

17 Have a safe trip.

18 Now, who are we doing?

19 MR. VITALE: Mr. Burke.

20 JUDGE THOMPSON: Mr. Burke, please come
21 forward.

22 MR. VITALE: Can I have just a moment, your
23 Honor?

24 JUDGE THOMPSON: You may.

25 (Witness sworn.)

1 JUDGE THOMPSON: Please take your seat. State
2 your name for the reporter and spell it, if you would.

3 THE WITNESS: My James Joseph Burke,
4 B-u-r-k-e.

5 JUDGE THOMPSON: And we'll just wait then for
6 a few moments. Are you ready, Mr. Vitale?

7 DIRECT EXAMINATION BY MR. VITALE:

8 Q. I'm sorry. I wasn't listening. Is it
9 Dr. Burke?

10 A. No, it's not.

11 Q. Mr. Burke. By whom are you employed, sir?

12 A. ABB.

13 Q. And what is ABB?

14 A. ABB is Asea, Brown, Boveri. They're a --
15 primarily a large manufacturer of electrical equipment.

16 Q. And in what capacity are you employed by ABB?

17 A. Executive consultant for them.

18 Q. And you have Exhibit 16 before you. Is that
19 the Direct Testimony you prepared in this matter?

20 A. Yes, I do.

21 Q. Is that your signature to that testimony?

22 A. Yes, it is.

23 Q. Okay. And do you have any corrections or
24 changes to make to that testimony at this time?

25 A. No, I do not.

1 Q. Okay. And if I were to ask you the same
2 questions that were asked in that written testimony, would
3 your answers be the same today?

4 A. Yes, they would.

5 MR. VITALE: Your Honor, I'd offer Exhibit 16.

6 JUDGE THOMPSON: Do I hear any objections to
7 the receipt of Exhibit 16?

8 MR. MAY: None, Judge.

9 JUDGE THOMPSON: Hearing no objections,
10 Exhibit 16 is received and made a part of the record of this
11 proceeding.

12 (EXHIBIT NO. 16 WAS RECEIVED INTO EVIDENCE.)

13 MR. VITALE: Thank you, your Honor. I'd
14 tender the witness

15 JUDGE THOMPSON: Thank you, Mr. Vitale.

16 Cross-examination, Mr. Schwarz?

17 MR. SCHWARZ: Staff does not have any. Thank
18 you, Judge.

19 JUDGE THOMPSON: Mr. May?

20 CROSS-EXAMINATION BY MR. MAY:

21 Q. Good afternoon, Mr. Burke.

22 A. Good afternoon.

23 Q. Sir, when were you retained in this matter?

24 A. Approximately two years ago. I was retained
25 prior to the June -- what was it, 2000 -- 2000 -- the

1 monitoring.

2 Q. Yes.

3 A. Okay. I was the one that asked for the
4 monitoring.

5 Q. Okay. So you were involved in the litigation
6 of this matter at that time?

7 A. Yeah. That's when I started, in that frame.

8 Q. And how did you come about being retained?
9 Did someone from Union Electric or did the lawyer call you?

10 A. I think I was retained because people at Union
11 Electric knew I was the chairman of the IEEE group on
12 voltage quality and the groups that make the standards for
13 the sags and the flicker report to me as does the group that
14 creates the mitigation devices for those problems.

15 And the other reason I think that they did
16 that was because I am one of the five IEEE liaisons to the
17 American standard on voltage which is ANSI C 84.1.

18 Q. I appreciate you telling me why. I was
19 wondering how you were retained?

20 A. I think that's the reason. They saw my name
21 and some of them know me.

22 Q. Someone contacted you. That's what I'm trying
23 to get at. Did someone call you from Union Electric or from
24 the attorney's office?

25 A. The attorney's office. Dorothy called me.

1 Q. She called you and that's how you became
2 retained. What did you do at that point when she contacted
3 you and asked if you were interested, I guess, in
4 participating?

5 A. Yes, sir. She explained the situation and
6 I -- I told her that it was within my professional
7 capability. And I -- from what I had heard, I tended to
8 agree with the premise that she was suggesting.

9 Q. So at that point what did you ask her to do?
10 Did you ask her to send documents to you?

11 A. Yes, sir. She sent documents to me and I read
12 many documents. And the problem that I had was it contained
13 that familiar term that everybody knows here, which is blip.
14 And I said I don't understand, I need to monitor, otherwise,
15 I can't comment, I can't professionally make -- have an
16 opinion.

17 Q. Okay. But were you sent documents? I may
18 have missed that.

19 A. Yes. I was sent all the previous depositions.

20 Q. And this is stemming from the case that was
21 pending in circuit court; is that right?

22 A. I believe so, yes.

23 Q. In the City of St. Louis?

24 A. I believe so.

25 Q. Now, after you had received these documents,

1 what did you do then? You reviewed all those and I think
2 you said you requested that there be some monitoring done?

3 A. Yeah. I -- I -- as I recall, I -- I told
4 Ms. Coleman that the -- I could not make a technical
5 judgment based on the data that was presented, I would have
6 to have some monitoring to make a decision as to what I
7 thought was going on out there.

8 Q. Okay. And that monitoring was done. Correct?

9 A. Yes, sir, it was.

10 Q. Okay. And was that done at your direction?

11 A. Yes, it was.

12 Q. Did you go out to the plant?

13 A. Yes, I did.

14 Q. And you assisted Mr. Eckelkamp?

15 A. Yeah. He installed the units before I got
16 there. I went out and did an inspection of the plant and
17 then made sure that the parameters that were set on the
18 machine conformed to the industry standards.

19 Q. And I believe that in 2000 the monitoring
20 equipment was hooked to an oxidizer?

21 A. There was four -- four units, one to an
22 oxidizer, one to the main and then one to each -- one to
23 each main and then one to the meter.

24 Q. And these are locations that you had wanted --

25 A. Yes, sir.

1 Q. -- these to be attached; is that correct?
2 A. Yes.
3 Q. Okay. Since this matter -- I'm not sure of
4 the timing of this, but at least since this matter has been
5 before the Public Service Commission, there's been a
6 different attorney or different law firm involved with the
7 case for Union Electric. Correct?
8 A. I believe so, yes.
9 Q. Have you worked with the attorneys from the
10 new law firm on this matter?
11 A. Yeah. I probably outdate all of them. I
12 worked with Dorothy, then I worked with Dave Evelev and now
13 with Mike.
14 Q. Okay. As far as your testimony, Exhibit
15 No. 16 --
16 A. Yes, sir.
17 Q. -- did you prepare this testimony?
18 A. In a similar fashion, sir, as did the previous
19 witness.
20 Q. Okay. So let me get this straight. You
21 worked with Mr. Evelev specifically on this testimony.
22 Correct?
23 A. Yes, sir. I -- I wrote it as prose and then
24 he -- he and I worked on the questions to fit the prose.
25 Q. So you assisted him with the questions?

1 A. To some degree.

2 Q. Okay. So what do you mean by "to some
3 degree"? Did you draft them or --

4 A. I drafted the prose and then he -- he inserted
5 questions and we changed -- you know, we changed the
6 questions to fit the prose a little bit better, but --

7 Q. Was that the only time or the only
8 circumstances under which you had gone to Zoltek plant was
9 in regard to the 2000 monitoring?

10 A. Yes, sir.

11 Q. And how many times did you go?

12 A. Just the one time.

13 Q. Okay. And that was just to verify, as you
14 said, the parameters and the locations of the monitors?

15 A. Yeah. And to -- and to view the process and
16 get some feedback from the employees primarily.

17 Q. Who did you speak with at Zoltek?

18 A. Well, it was the pri-- I got a terrible memory
19 for names. Mike -- what was his name? Mike Arnold.

20 Q. Okay. And did you find Mr. Arnold to be
21 cooperative?

22 A. Terrific, yes, sir.

23 Q. Do you have any expertise in the manufacture
24 of carbon fiber?

25 A. No, sir, I don't.

1 Q. Okay. Now, is it your opinion that Zoltek's
2 equipment is oversensitive?

3 A. Yes, sir, it is.

4 Q. And what do you base that opinion on?

5 A. The monitoring that was done and the data that
6 I've seen, the 27 events that I saw. The --

7 Q. Let me interrupt for a second.

8 A. Yes, sir.

9 Q. The 27 events would be the ones from the
10 monitoring through the years?

11 A. Right.

12 Q. Okay. Go ahead.

13 A. The -- there's a lot of equipment out in the
14 world that's sensitive and no one's picking on Zoltek.
15 Hospitals are sensitive. I've worked in many -- many areas
16 where motors are sensitive, relays are sensitive. No one is
17 suggesting that the -- that this is defective equipment.
18 It's just sensitive equipment, which is all over the world,
19 all over the world.

20 Q. Okay. So you would disagree with the previous
21 gentleman, Dr. Morgan, who testified that the equipment
22 was -- at least his written testimony, such that it's poorly
23 designed?

24 A. No, I don't. I agree that -- I don't -- I
25 don't think the equipment is poorly designed. I think that

1 the design is poor in the sense that the design of the plant
2 is not complete.

3 Let me try to give you an example. In a
4 hospital, there's life-threatening situations. And in a
5 hospital they design a UPS system to handle things that --
6 when people -- that people could die immediately with a
7 power loss, they put in back-up generation in case there's
8 an outage of the utility and they put in dual feeds. It's
9 designed -- the system is designed. No -- none of that
10 equipment is defective in the sense that it can't -- it
11 performs its function.

12 Q. So you're saying that the equipment is
13 sensitive. And I think your comment was that that's no
14 one's fault. Is that what you had said or --

15 A. Computers are sensitive, they're not
16 defective.

17 Q. Okay. Now, so what was it that you find about
18 Zoltek's equipment that is -- did you say poorly designed or
19 what was the comment you had made?

20 A. Well, if you have the -- the sags that they
21 tripped out on are very small. Contrary to whatever --
22 what's been said today, those sags are minor, minor sags.
23 In studies that we do, we don't look at -- we don't really
24 consider sags that are -- aren't more than 30 percent,
25 70 percent of voltage. These were all above that level.

1 This makes this equipment extremely sensitive, in my
2 opinion.

3 Q. Let me ask you this question. Have you seen
4 Exhibit 26?

5 A. I -- I -- what is -- is that the voltage
6 standard?

7 Q. That is the regulation. I can get you a copy.

8 A. No. I've seen it. I've seen it, yeah.

9 Q. There's been a lot of discussion about the
10 Public Service Commission's regulation with respect to
11 voltage dips or sags. Do you recall that testimony --

12 A. Yes, sir, I do.

13 Q. -- you're familiar with that?

14 And you had mentioned -- I'm sorry. Strike
15 that.

16 In there it talks about -- I believe the
17 number's 11 percent, would put it into an extreme zone. Are
18 you familiar with that?

19 A. Yes, sir, I am.

20 Q. Now, there were incidents, would you not
21 agree, that occurred that were caught on the monitoring
22 where the sag was in excess of 11 percent?

23 A. Yes, sir.

24 Q. And there were incidents where it was in
25 excess of 11 percent and the equipment did not trip off

1 line; is that correct?

2 A. I believe so, that's true. Can I --

3 Q. No. That was the question. Now, on page 6 of
4 your testimony, line 20, you make a comment -- 19 and 20,
5 Again, utilities have very little control over sags?

6 A. Yes, sir, I do.

7 Q. So are you saying there's nothing a utility
8 can do with respect to sags or there's something --

9 A. I don't believe I said that. I think I said
10 they have very little control over sags. Now, let me
11 explain that, because in the course of this -- this
12 litigation it doesn't seem to be very clear.

13 A sag is a different thing than reliability.
14 Reliability is a relatively local thing. If I have poor
15 reliability to my plant, I can -- I can do things fairly
16 locally. When I say "locally," within miles of the plant
17 and be fairly effective.

18 Sags are global. And as I put in my original
19 statement, you can have faults on parts of your system over
20 100 miles away which will cause sags which will effect
21 equipment. And I've been involved in those types of
22 studies. And so the problem with a sag is it's -- it's hard
23 to control because you have to fix everything. You can't
24 just zero in on a feeder or a substation or a loop won't do
25 it. You have to do everything.

1 Q. Well, as an expert, do you see any reason to
2 distinguish between a single 60-minute outage and 60
3 one-minute outages?

4 A. Depends on the process. In the case of
5 Zoltek, I agree. Other people might disagree. My wife
6 would probably rather have 60 one-minute wattages, but I
7 don't know. Never asked her.

8 Q. Well, probably not a good subject to broach at
9 home, but nevertheless, we're talking about Zoltek today.

10 A. I'll ask her when I get home.

11 Q. I think your comment was that obviously that
12 would have a greater impact on Zoltek. Is that what your
13 comment was? Just repeat to me what you said.

14 A. Yeah. I mean, 60 one-minute outages to a
15 sensitive process like a computer or Zoltek is a disaster.
16 And I agree with that. But 60 one-minute outages to my
17 refrigerator might not be as bad as one 60-minute outage.

18 Q. But we're not talking about your refrigerator.
19 Correct?

20 A. Well, I was trying to qualify that.

21 Q. I understand.

22 A. Okay. Thank you.

23 Q. Now, we'll skip ahead to page 9. I apologize
24 for jumping around. Page 9, lines -- say, 13 we'll start
25 there, Sags are for the most part unavoidable?

1 A. Yes, sir.

2 Q. Mitigation of sags can only be accomplished at
3 the customer's facility and is the responsibility of the
4 customer?

5 A. Yes, sir.

6 Q. Okay. I'm going to go back to -- on page 6
7 you said, Utilities have very little control over sags?

8 A. Yes, sir.

9 Q. And I don't know if we fully explored that
10 comment there on page 6. By little control that would mean
11 there is an element of control?

12 A. Yes, sir.

13 Q. Okay. Now, we'll go back to page 9. You're
14 saying that mitigation of sags can only be accomplished at
15 the customer's facility?

16 A. Yes, sir. And would you like me to explain
17 that?

18 Q. Sure.

19 A. Okay. The sags are global. And as we've
20 discussed, some are unavoidable on the utility system. They
21 happen. These sags that you've seen on this system are
22 normal in every overhead system in the entire world. And
23 I've worked all over the world. Okay?

24 The -- the -- the problem with a sag is that
25 you can't fix everything. In order to mitigate it properly

1 for the kind of process that they have, you would have to
2 fix the entire system, which would just be too expensive.

3 So what the industry is has done is it's
4 created devices called custom power devices, which that
5 group reports to me, which is a utility group trying to
6 solve this problem.

7 The only way to solve it to the degree that a
8 sensitive process will -- you know, will operate properly
9 over all these things we've talked about over this week is
10 to put a device right next to the -- next to the load, which
11 is a very expensive device. Okay?

12 And that's -- that's the purpose. That Union
13 Electric could -- or Ameren in this case couldn't possibly
14 spend the money to mitigate all the sags on their system.
15 It just wouldn't work.

16 Q. Well, could they do things to mitigate some of
17 the sags on their system?

18 A. Oh, absolutely, sir.

19 Q. Now, you'd mentioned -- on page 8 you talk
20 about two categories of mitigation being used today, and I
21 assumed you were talking about at the customer level.
22 Correct?

23 A. Yes, sir, that's true.

24 Q. One of which was UPS?

25 A. Yes, sir.

1 Q. Okay. How much would a UPS system cost for
2 Zoltek?

3 A. Fifty million dollars.

4 Q. Okay. And would you deem that practical?

5 A. No, sir, I wouldn't.

6 Q. Okay. Now, correct me if I'm wrong, but your
7 testimony focuses on sags; is that correct?

8 A. Because the -- the data that we got was sags,
9 yes, sir.

10 Q. And you don't address interruptions that have
11 occurred?

12 A. No. My testimony does address interruptions.
13 The interruptions is --

14 Q. Where in your testimony does it --

15 JUDGE THOMPSON: Excuse me. Please allow him
16 to finish before you ask your next question.

17 THE WITNESS: The -- it should be in here.

18 Page 6.

19 BY MR. MAY:

20 Q. Okay.

21 A. I address the interruptions, which is the
22 reliability. That's reliability to me. The industry -- the
23 industry does not have standards, by the way, on
24 reliability. It has guides to calculate the -- your
25 numbers. It has no standards.

1 Q. May I interrupt you for one second?
2 A. Yes, sir.
3 Q. What line on page 6? I'm sorry.
4 A. All of this from line 5 through -- well,
5 through at least 14 is reliability.
6 Q. Well, I was asking where do you address
7 interruptions and you'd pointed me to page 6, lines 5
8 through --
9 A. Well, let's see here, 277 service incidents.
10 I don't know what -- could you rephrase the question? I
11 don't understand the question.
12 Q. I'd asked you before -- sorry if you're
13 confused, but I'd asked you before your testimony focuses on
14 sags. Would you agree with that?
15 A. No, sir, it doesn't.
16 Q. Okay. I then said, do you address
17 interruptions? And you said, yes, you did. And I asked
18 you, where in your testimony do you discuss interruptions?
19 A. Okay. I -- I misunderstood. My testimony
20 addresses sags and reliability. Reliability in terms of
21 cus-- what we call customer minutes outage or SAIDI, which
22 is S-A-I-D-I. Okay?
23 The -- the reliability by industry
24 standards -- by industry gauges, because there are no
25 standards, is exceptionally good. Okay? These numbers,

1 especially in latter years, are tremendous numbers. Hard to
2 believe numbers, in fact, they're so good. And the sag --
3 the sag situation is certainly not out of line with anything
4 I've ever seen.

5 Q. Let's go to page 9 again.

6 A. Sure.

7 Q. Let's go back to line 15.

8 A. Sure.

9 Q. And you say that no utility in the world with
10 an overhead system provides the level of service that Zoltek
11 apparently requires for their extremely sensitive loads?

12 A. Yes, sir.

13 Q. Have you spoken with anyone at Zoltek besides
14 Mr. Arnold specifically about their equipment?

15 A. No. I don't think so.

16 Q. Have you reviewed any documents about their
17 equipment?

18 A. The only -- no. I haven't reviewed documents.
19 I just have to look at the data to see if their -- their
20 loads are sensitive to those relatively small sags.
21 They're -- it's just very sensitive equipment. I've seen
22 that many times.

23 Q. So you extrapolated from this monitoring
24 that -- and, again, looking at line 16, the level of service
25 that Zoltek apparently requires?

1 A. Oh, absolutely.

2 Q. So you just -- but you didn't look at the
3 equipment or study the equipment parameters?

4 A. All I have -- sir, all I have to know is the
5 sensitivity of the equipment. I don't have to understand
6 its function, which I'm not capable of doing.

7 Q. Okay. And, again, I'm not trying to beat that
8 too much. You're talking about the sensitivity of the
9 equipment?

10 A. Right.

11 Q. There were instances where the voltage had
12 dropped to what is deemed to have been the extreme zone,
13 according to regulation of the PSC, and it withstood those
14 drops; is that correct? In other words, it stayed on line?

15 A. Yeah. Let me clarify my position on that.
16 The -- the standards on voltage, there's a number of
17 standards on voltage. There's an international standard on
18 voltage and there's an American standard on voltage, which
19 the American standard has three zones also. I'm not as
20 familiar with the Missouri code.

21 They specifically state in those -- in those
22 guides that -- that momentary operations are not to be
23 considered. The standard -- voltage standards are for
24 regulation. It means that if I put load through a line and
25 I get voltage drop, I'm not allowed to go either above or

1 below a certain voltage.

2 I believe -- I firmly believe that the way
3 this standard is being used is totally incorrect by -- by
4 99 percent of anything I've ever seen. Okay? So I don't
5 believe that this -- that your -- that the standard that's
6 being discussed here applies to a momentary situation. It
7 couldn't possibly.

8 Q. Well, are you talking about Exhibit 26 --

9 A. Yes, sir, I am.

10 Q. -- the regulation?

11 Have you reviewed Exhibit 26?

12 A. Yes, sir, I have.

13 Q. Are you familiar with it?

14 A. I'm as familiar as I think I'll get, yes, sir.

15 MR. MAY: Okay. Your Honor, may I approach?

16 JUDGE THOMPSON: You may.

17 MR. VITALE: I think there's one up there.

18 MR. MAY: Do you have an Exhibit 26?

19 THE WITNESS: I don't have one, no. I don't
20 see it.

21 BY MR. MAY:

22 Q. Okay. You have my copy of Exhibit 26, so
23 I'll --

24 A. You can have it if you want. I think I can
25 remember.

1 Q. Well, that's fine.

2 A. Okay. Here you go.

3 Q. It's up to you.

4 Now, you were talking about I guess the
5 applicability of we'll call it Exhibit 26 --

6 A. Yes, sir.

7 Q. -- the regulation? And what was your last
8 comment that you said it couldn't apply?

9 A. It couldn't apply. In my opinion -- this is
10 my opinion. The purpose of a voltage standard -- as I said,
11 the American National Standard, which is C 84.1, which is
12 very similar in its areas in terms of its limits and the IEC
13 standard which applies to probably the largest part of this
14 world.

15 Both are very specific in excluding the events
16 that we're trying to fit a sag into. They specifically
17 state sags and faults and switching operations are not --
18 are not applicable to this standard. This standard is meant
19 for voltage regulation --

20 Q. Okay.

21 A. -- okay?

22 Now, the one-minute -- I suggest to you and to
23 the Commission that the one-minute situation that's
24 discussed is -- was put in there originally, which is
25 probably 100 years ago the way it's written, to -- to stop

1 this type of litigation in the sense that it -- most sags
2 and faults you get rid of within a minute and so they would
3 be excluded from this type of document. And that's my
4 professional opinion.

5 Q. Well, sir, how do you know why this was put in
6 there 100 years ago?

7 A. Because I believe, sir, that -- that the
8 standard is probably trying to be consistent with other
9 standards in the world.

10 Q. Are you just speculating?

11 A. I'm speculating.

12 Q. You don't have any inside information about
13 what occurred 100 years ago?

14 A. Well, it would be very hard -- it would be
15 very hard to guarantee people that they wouldn't get sags.
16 Because one of the things that we haven't discussed, if you
17 get a fault --

18 MR. MAY: Your Honor, may I interrupt and say
19 it was a yes or no question I asked the witness?

20 JUDGE THOMPSON: Let me hear the question read
21 back, please.

22 THE COURT REPORTER: "Question: You don't
23 have any inside information about what occurred 100 years
24 ago?"

25 THE WITNESS: I do not.

1 JUDGE THOMPSON: Please proceed.

2 BY MR. MAY:

3 Q. You also said that this was probably put in
4 place 100 years ago to prevent litigation like this?

5 A. I think that I'd be speculating. You can hit
6 me up on that. I -- I believe that the purpose of putting
7 in one minute was to exclude momentary situations like we're
8 discussing today, yes, sir, I do.

9 Q. That's just your opinion. You have nothing --

10 A. No, sir, I don't.

11 Q. Let me finish. You have not read any kind of
12 call it legislative history or any notes from when this was
13 adopted?

14 A. That's correct, sir. I'm basing it on other
15 standards of similar nature.

16 Q. You would agree that 23-D states for power
17 service; is that correct?

18 A. Yes, sir.

19 Q. Do you need to look at it again?

20 A. No, I don't.

21 Q. And you would agree that under this
22 circumstance, as the previous witness agreed, that this is
23 power service we're dealing with?

24 A. I'm not familiar with the -- I'm actually
25 probably one of the -- probably the oldest person here, but

1 I'm not familiar with lighting and power, the
2 differentiation between them.

3 Q. Okay. So you don't know the differentiation
4 in Section 23 of Exhibit 26 between lighting and power. Is
5 that your testimony?

6 A. I don't know the intent at that time, no, I
7 don't, sir.

8 Q. I'm saying you don't understand the
9 differentiation. Is that what you're saying?

10 A. No, I don't, sir.

11 Q. Okay. And you would agree that 23-D does not
12 have any mention of a one-minute time period?

13 A. I -- you can read it as well as I can, I
14 guess. I believe that the one-minute applies to it, yes,
15 sir, I do.

16 Q. I'm not asking if it applies. I'm asking you
17 specifically does 23-D mention any -- or make any mention
18 about one minute? Do you need to look at it again?

19 A. No, sir, I don't. No, it doesn't.

20 Q. Okay. So I'll ask you again and I'll finish
21 with this. You've heard the testimony and I think it's
22 pretty clear that there were several incidents where the
23 voltage had dipped into the extreme zone according to
24 Exhibit 26. Correct?

25 A. I don't -- I don't agree it's being

1 interpreted properly, so I can't --

2 Q. Let me just ask you. The numbers that are in
3 23-D, the percentages --

4 A. Yes.

5 Q. -- the percentages that would put something
6 into an extreme zone --

7 A. Yes.

8 Q. -- there were incidents that were in a --
9 percentage-wise were equal to or greater than this number,
10 therefore, they fell into this extreme zone definition.
11 Would you agree with that?

12 A. I -- no, sir, I don't. I don't know how to
13 explain this. I don't think it applies and I'm trying --
14 you're trying to get me to say it falls into the zone. Does
15 it -- are those voltages in that zone? Yes. But I don't
16 think that zone is set up for those voltages.

17 Q. I understand that. You've made that clear.

18 A. Okay.

19 Q. Nonetheless, I think you just said it. There
20 were percentages -- a drop in voltage and a percentage equal
21 to the amount for the extreme zone. Correct?

22 A. I -- yes, sir.

23 Q. Okay. And there were times when the equipment
24 at Zoltek withstood those --

25 A. Yes, sir.

1 Q. -- drops. Correct?

2 A. Yes, sir.

3 Q. And despite that, you continue to say that
4 their equipment is too sensitive?

5 A. Yes, sir, I do.

6 MR. MAY: Okay. I don't think I have anything
7 else at this time, Judge.

8 JUDGE THOMPSON: Thank you, Mr. May.

9 Proceed with questions from the Bench.

10 MS. SHEMWELL: Judge, might I be permitted to
11 inquire?

12 JUDGE THOMPSON: Did we not ask you before?

13 MS. SHEMWELL: I wasn't here. Did you ask
14 Mr. Schwarz?

15 JUDGE THOMPSON: I did ask Mr. Schwarz, but
16 since you weren't here, I will allow you.

17 Let the record reflect that we've had another
18 substitution of counsel for the Staff and that
19 Ms. Shemwell's back representing the interests of the
20 Commission Staff in place of Mr. Schwarz.

21 Ms. Shemwell, you may inquire.

22 MS. SHEMWELL: Thank you, your Honor.

23 CROSS-EXAMINATION BY MS. SHEMWELL:

24 Q. Mr. Burke, I'm Lera Shemwell. I represent the
25 Staff of the Public Service Commission. And I apologize

1 that I was not here for your whole testimony. Circuit court
2 called.

3 But when you were talking about standards and
4 you were referring to the Commission's standards and you
5 said you were -- I think you said you were comparing
6 standards of a similar nature?

7 A. Yes, ma'am.

8 Q. Do other states -- just tell me what you were
9 talking about. Other states or --

10 A. There's --

11 Q. -- these ANSI standards?

12 A. I'm sorry to interrupt.

13 Q. Don't worry.

14 A. Okay. There is an American National Standard,
15 which is called ANSI C 84.1, of which I am one of the
16 representatives from IEEE's. There's five of us.

17 Q. Yes, sir.

18 A. Okay. That standard is applied -- many
19 utilities -- public utility commissions adopt that standard
20 as their own. States can do what they want to do. Okay?

21 The -- that standard has similar limits and
22 similar zones. They're not exactly the same, but there's
23 three zones and they're fairly similar in their -- in how
24 they're separated.

25 In that -- in that standard it specifically

1 states that things like momentary events, which sags are
2 momentary events, are excluded because -- because the
3 purpose of the -- the intent of that standard is -- is to
4 regulate what they call sustained voltage. It has nothing
5 to do with abnormal events.

6 Q. So ANSI's written this standard which states
7 could adopt or not adopt?

8 A. Yes, ma'am.

9 Q. What about other standards?

10 A. There is an international standard called an
11 IEC standard, which has -- it's not stated the same way but
12 it does -- this gets a lot more complicated. It's actually
13 a much more generous standard in terms of utility -- from
14 the utility viewpoint, because it allows the utility to do
15 an averaging.

16 And it does what they call a 10-minute
17 averaging, which if you do a 10-minute averaging of a -- of
18 your voltage and you're only outside of that voltage for a
19 couple of cycles, it's meaningless. So sags would not
20 apply. You wouldn't --

21 Q. I don't mean to stop you, but you're
22 getting --

23 A. I'm getting --

24 Q. -- a little more technical than probably I can
25 get to.

1 A. I apologize.

2 Q. Thank you. Calling these standards, are these
3 guidelines that others may accept?

4 A. That's a wonderful question. The only -- the
5 only thing in power quality that's referred to as a standard
6 is that voltage standard.

7 Q. This ANSI standard?

8 A. This ANSI standard. Now, that doesn't mean
9 the commissions have to adopt it directly. All this other
10 that stuff we've talked about with sags and flicker and
11 reliability, there are no standards. There are -- the
12 industry right now very rarely puts together standards.
13 They put together guides. It's a legal issue, as you
14 probably know.

15 Q. On a little more generic and maybe slightly
16 more personal level, I, in reading this, have been comparing
17 to my own experiences with service and what I consider to be
18 reliable. And when I lived in Kansas City, I lived in an
19 area where it was all underground and had absolutely
20 outstanding service, maybe a power outage once every three
21 years.

22 A. Yes, ma'am.

23 Q. Here I'm not experiencing -- or I don't know
24 about perhaps 30 incidents, maybe even once a month of the
25 lights dimming. Do you think that's happening and I'm not

1 realizing it or -- and let me -- I'm sorry. I know I'm
2 getting lengthy here, but I've talked to other people who
3 live in other areas and their indications are generally
4 maybe once a month.

5 So my question is, am I just not noticing
6 these sags? They're probably happening, but --

7 A. Try to bear with me on this.

8 Q. Okay. You bear with me.

9 A. Perceptibility of lights dimming is called
10 flicker. Okay? Contrary to the testimony that was given
11 this morning, it doesn't take 10 percent or 15 percent
12 voltage change to get flicker.

13 The flicker -- the flicker guide, the -- what
14 we call the old GE curve says that you can visually see
15 flicker with less than a 1 percent voltage change. In fact,
16 the curve only goes up to 3 percent. So you can have very
17 small voltage changes and perceive them.

18 So if -- if you -- if you mark down a chart
19 every time you see a voltage change, theoretically you could
20 be doing that for a 3 percent voltage change or less, which
21 is not sags. Sags are 90 percent down to 10 percent.

22 Now, the other -- the other thing that has
23 been driving me crazy sitting in the back there is that the
24 flicker -- you can have -- flicker is just perception. It
25 has nothing to do with equipment misoperation. And I -- in

1 my last meeting with the flicker group, because that does
2 report to me, I said to the group, Has anybody seen a
3 flicker problem cause equipment misoperation? And they
4 said, No.

5 Q. I'm sorry. Let me interrupt you. I guess
6 here's my question. I'm not noticing -- I call it a dimming
7 of --

8 A. Right.

9 Q. -- the TV or the lights or anything, which may
10 last several seconds. Maybe once a year tops. So do I just
11 have extraordinarily reliable service or --

12 A. You got an extraordinarily reliable house too.
13 I don't know. I can't answer that question. Because I made
14 the comment at lunch today that when I turn my television
15 set on, my lights dim. I'm serious.

16 Q. Yeah.

17 A. I mean, and my wife starts the washing machine
18 and they dim, so that's flicker.

19 Q. So you're saying it's internal? I'm --

20 A. No, no. I'm not saying it's always internal,
21 but most of the bad flickers that you perceive in your house
22 is internal, I would suggest. Because you -- most of the --
23 you can perceive 1 or 2 or 3 percent. Okay?

24 Now, I've done a zillion studies on this
25 stuff. If I start a piece of power equipment, I'll drop

1 40 volts and I'll see that real -- so it depends. Most of
2 your big -- your big ones are in your home. It depends on
3 the way your home is wired and how big your air conditioner
4 is and everything else.

5 Q. Thank you, sir.

6 A. But that normally -- as most of us have
7 experienced, that doesn't cause equipment to misoperate
8 normally, you know, computers in your house and stuff like
9 that. I'm not sure that helps you or not.

10 Q. Well, I'm just trying to, I guess, compare the
11 numbers with what I'm experiencing in my home and perhaps
12 that's not at all a fair comparison. Because, again, maybe
13 one outage a year I think that we probably have. And,
14 again, I'm saying it's maybe one of these power drop
15 situations, so I'm not experiencing anything like 15 minutes
16 a year probably.

17 A. Well, the -- I can give you some statistics.
18 The average industrial experiences, according to industrial
19 surveys, 350 sags a year, 50 of which are externally caused.

20 Q. I think we've probably covered this topic.

21 MS. SHEMWELL: Thank you, sir. I appreciate
22 your time.

23 THE WITNESS: Thank you very much. I'm sorry
24 I couldn't explain it better.

25 MS. SHEMWELL: No, no. Thank you.

1 JUDGE THOMPSON: Thank you Ms. Shemwell.
2 MS. SHEMWELL: Thank you, Judge.
3 JUDGE THOMPSON: Did you get the advice you
4 needed to fix --
5 MS. SHEMWELL: Thank you, Judge. Yes.
6 JUDGE THOMPSON: Let's proceed to questions
7 from the Bench.
8 QUESTIONS BY JUDGE THOMPSON:
9 Q. Mr. Burke -- and I appreciate you being here
10 from North Carolina.
11 A. Thank you, sir.
12 Q. You don't sound like a North Carolina guy?
13 A. Upstate New York.
14 Q. Upstate New York.
15 A. Most of my life, yes, sir.
16 Q. It's coming clear to me now.
17 I want to try to get to what I need as quickly
18 as I can. Taking into consideration the Commission's
19 regulation, Subpart 23 -- you have it in front of you, I
20 believe, or you don't?
21 A. No. I've seen it though.
22 Q. You've seen it. I understand, I believe, what
23 your particular interpretation of it is and how that differs
24 from some other interpretations that have been suggested.
25 Do you have a professional opinion as to

1 whether or not the testimony that you've heard and any data
2 that you've studied with respect to Ameren's service to
3 Zoltek that's under consideration here, do you have an
4 opinion as to whether that service violated or did not
5 violate this regulation?

6 A. My overwhelming personal opinion on this is
7 that that regulation does not apply to the situation we're
8 discussing. I don't know what to say beyond that, sir.

9 Q. Whatever you say to my question is what I want
10 to hear. Now I want you to explain your answer.

11 A. The voltage standards are created un--
12 essentially universally for what we call voltage regulation,
13 which is if I -- if I go out to your house and measure your
14 voltage, under normal situations it must fall within those
15 limits.

16 Q. Okay.

17 A. Okay. If the utility is doing some unusual
18 operation, abnormal operation they call it in the national
19 standard, that doesn't apply. If I make that measure at
20 that point in time, that is not a valid measurement.

21 That's -- the voltage standard is strictly for
22 sustained steady state conditions. It has nothing to do
23 with abnormal conditions, which certainly a sag is. A sag
24 is caused by -- usually by a fault on the utility or inside
25 the plant.

1 Q. So if I understand your testimony correctly,
2 it is your opinion that this regulation should not be
3 applied in this case to determine whether or not the service
4 provided to Zoltek was within acceptable limits?

5 A. Absolutely, sir. I'd stake my reputation on
6 it.

7 Q. Okay. Do you know of any standard that should
8 be applied in a case like this, indeed in this case, to
9 measure whether or not the service provided by Ameren to
10 Zoltek during the period under consideration was within
11 acceptable limits?

12 A. There -- there -- to the best of my knowledge,
13 there is no -- there -- there is no standard on sags in the
14 world. Okay? To the best of my knowledge, there is only
15 one utility that actually measures sags in -- in the United
16 States and they don't -- they don't measure anything that's
17 above 70 percent. That's their limit.

18 I have said many -- many times in my own group
19 that there will not be a sag standard in my lifetime. It's
20 a major problem. It's virtually an unsolvable problem, in
21 my opinion, by the utilities, because it's such a global
22 problem.

23 To address it as a solvable problem is, I
24 think, ludicrous. Because the only way to address this is
25 to fix -- you have to get a piece of equipment that sits

1 near the machine that's having the trouble to keep that
2 voltage up. You just can't do it globally. It's very, very
3 difficult. And that's why people buy UPS's for computers.
4 I mean, that's the reason.

5 Q. So sags are an industry-wide problem?

6 A. They're a worldwide industry-wide problem,
7 yes, sir, they are.

8 Q. Okay. And is it your opinion that the
9 majority or the largest number of the incidents that are
10 under consideration here are, in fact, sags?

11 A. Yes, sir. I think the industry pretty much
12 agrees that the biggest -- the biggest cause of misoperation
13 of sensitive equipment is sags.

14 Q. And based on what you have heard in this
15 proceeding and what you have read in preparation for your
16 testimony here today, do you have an opinion as to whether
17 or not Zoltek has experienced an unusual number of equipment
18 misfunctions based on power supply? And I'm not talking
19 about whose fault. I'm just talking about unusual number.

20 A. Now, it's -- one of the problems here is that
21 the -- they -- the No. 277 could be flicker, which could be
22 a one -- a one or two volt change, which is not outside any
23 standard. Okay?

24 Q. I understand that. It's, in fact, been
25 established for at least part of that list that more than

1 half of the events did not cause any machine --

2 A. Exactly.

3 Q. -- malfunction. I'm talking about machine
4 malfunction. And, I'm sorry, I can't tell you what the
5 exact number is for the period. But do you have an opinion
6 as to whether they've encountered an unusual number of
7 machine malfunctions?

8 A. If you believe industry -- industry
9 standards -- or not standards, but work that's been done by
10 EPRY, which is the body of utilities that are -- or the
11 research group that is funded by the private utilities to do
12 major studies, they -- they did a power quality study and
13 they concluded that the average industrial complex sees
14 50 sags per year caused by the utility.

15 If you multiply 50 times 9 years, you get
16 400-- you would expect on the average in this country to
17 have 450 sags. If they have 277, they got half of what most
18 people get.

19 Q. Okay. Now, with that 450, are we talking
20 about sags that cause equipment malfunction or is there no
21 reference to whether or not --

22 A. Sags -- no, sir, they don't necessarily cause
23 equipment malfunction. They are numbers -- voltages between
24 90 percent of voltage and 10 percent of voltage.

25 Q. What I'd like to know though is whether or not

1 you have an opinion as to whether there has been an unusual
2 number of equipment malfunction instances based on power
3 supply. And maybe you have no opinion and that's fine. I'm
4 wondering if you do have one?

5 A. I think there's been a large number of
6 equipment malfunction, but I don't think it's -- I don't
7 think that the power supply is the problem.

8 Q. What do you think is the problem, if you have
9 an opinion?

10 A. I believe that the problem is you have
11 sensitive equipment that has to be buffered by some external
12 means, either UPS or what we call a custom power device.
13 That's the only solution.

14 Q. So, in other words, the equipment, in your
15 opinion, is sensitive equipment?

16 A. Extremely sensitive equipment.

17 Q. And the only way to solve that would be to put
18 a corrective device next to each machine?

19 A. Or on the whole plant. The custom power
20 devices are designed to be put on the whole plant.
21 Sometimes it's very difficult to put a UPS inside because
22 they get very large and they're also very expensive.

23 Q. That's the \$50 million figure you quoted
24 earlier?

25 A. That's an estimate. That's -- the cost of UPS

1 is approximately \$500 per kilowatt. Somebody told me that
2 the plant was 5 megawatts, so that's about -- no, 25 --
3 multiply -- it's a lot of money. It's much too much money.

4 Q. That works for me.

5 A. Okay. It's \$500 a kilowatt for UPS.

6 Q. And that's kilowatt of load?

7 A. Yes, sir.

8 Q. Okay. Now, let's say -- here's a hypothetical
9 for you. Let's say you own Zoltek.

10 A. Yes, sir.

11 Q. You're experiencing all the problems that
12 you've heard about here, that you've read about in
13 preparation for coming here. What would you do, if
14 anything, as the owner to ameliorate this situation?

15 A. My honest opinion is that the only solution is
16 a custom power device, which is always, in my opinion, a
17 last resort. Because they are also expensive.

18 I -- if they feel that they can't accept these
19 downtimes like other industries that have very sensitive
20 loads, chip industries and stuff like that, there's no other
21 solution in my honest opinion if you -- I just don't know
22 that -- what else you can do, because you can't -- you just
23 can't fix enough things on a utility system.

24 And let me give you another paradox. When you
25 put in a loop system, as we've talked today, that loop

1 system increases the reliability. Everybody agrees with
2 that. To get a loop, sometimes we add a line and that
3 increases reliability, but that also increases exposure, the
4 amount of line I have on that system and I get more sag. So
5 I could make an argument that it hurts me. It depends what
6 you want. And -- so the solutions are not simple. I
7 understand.

8 MS. SHEMWELL: Or inexpensive.

9 JUDGE THOMPSON: Ms. Shemwell, you have
10 something to add?

11 MS. SHEMWELL: I'm sorry, your Honor. I was
12 thinking or inexpensive and I did not intend to say it
13 aloud.

14 THE WITNESS: They're not cheap.

15 JUDGE THOMPSON: We're a little bit informal
16 here, but this is an administrative proceeding.

17 See if I can think of what other questions I
18 have for you.

19 THE WITNESS: Okay.

20 BY JUDGE THOMPSON:

21 Q. Now, two other experts have testified just
22 prior to your testimony. One of them told me that a
23 threshold of reliability would be achieved at 15 incidents
24 per year and 58 to 60 minutes of interruption per year. The
25 other one told me that if I were in a low lightning area,

1 which I'm going to assume for purposes of this question that
2 I am, that 24 incidents per year would be a threshold of
3 reliability and 110 minutes of interruption per year.

4 Do you have an opinion with respect to the
5 standard that these figures represent?

6 A. Yes, sir. I'm heavily involved in the
7 creation of the surveys that come out in this -- this
8 particular topic. I would suggest that some people may not
9 have lightning, but they have -- like up in the northwest
10 the big problem they have is wind and trees and so they have
11 very poor numbers but no lightning. And so it's dependent.

12 The -- the general wisdom of the industry is
13 that the commissions look at the numbers that they presently
14 have. The utility gives them the numbers that they
15 presently have and if their customers are basically
16 satisfied, they try to hold those numbers or make them
17 better over the years, but they don't want to see them go
18 up.

19 They do not try to create a number, because
20 it's -- 60 minutes -- I run -- in my work right now I run
21 many, many reliability studies. And I can tell you that the
22 average system in the United States cannot meet -- no matter
23 what you do, you cannot meet 60 minutes. It depends on the
24 way the system is designed.

25 One of the situations -- in New York City

1 there's a network system and that system theoretically you
2 should have one outage every 100 years. That's how reliable
3 the network system is in New York; whereas, in -- in Maine,
4 400 minutes a year is good. In Bogota, Colombia, 56 days is
5 the average.

6 Q. That's interruption?

7 A. That's interruption time.

8 Q. Okay.

9 A. So it depends on the system, yes.

10 Q. And what about the 110-minute figure?

11 A. The 110 is a number that's used. It's the
12 average that the industry has reported to the IEEE in the
13 Document P13-66. And the -- one of the comments that was
14 made, which is true, is that those numbers tend to be lower
15 than they really are because as -- as the industry gets
16 better techniques in terms of -- in terms of recording the
17 data, the numbers will go up.

18 Q. So it's your opinion that -- I think you said
19 this earlier -- that there probably are more incidents than
20 have been counted?

21 A. Undeniably.

22 Q. And I think I also heard you say that based on
23 what you've seen here and heard here and read in preparation
24 for coming here, is that the quality of service delivered in
25 this instance was excellent?

1 A. Exceptional.

2 Q. Is that your opinion?

3 A. Absolutely.

4 JUDGE THOMPSON: Okay. Commissioner Gaw, do
5 you have any questions for this witness?

6 QUESTIONS BY COMMISSIONER GAW:

7 Q. This may have already been covered, so -- I
8 haven't caught up with the transcript yet.

9 Following up on the Judge's inquiry, when
10 you're assessing whether or not quality of service is
11 excellent --

12 A. Yes, sir.

13 Q. -- is that a standard that you are utilizing
14 based upon a comparison to other systems in the state, other
15 systems in this country or other systems internationally?

16 A. Good question. Other -- other systems in this
17 country. You -- the last thing you want to do is compare
18 with other countries.

19 Q. Well, I assumed that from --

20 A. Yeah.

21 Q. -- your earlier response, but I wanted to make
22 sure that that's what you were referring to.

23 Do you believe that there is a specific
24 minimum standard of reliability in Missouri, or do you know?

25 A. I don't -- I -- you mean a -- do you mean a

1 number?

2 Q. Well, of any sort.

3 A. I don't think --

4 Q. Giving you quite a bit of breadth to answer.

5 A. Boy, I get myself in trouble. I think that
6 there should be -- there should be levels of reliability
7 that utilities should try to meet, but I don't think you can
8 go -- you have to go on individual basis, because the
9 systems are so different.

10 Q. And so when you would do that, would you do
11 that on a company-by-company basis or would you -- help me
12 to understand what you mean by that.

13 A. Okay. One state that has some degree of
14 standardization is New York state, which I'm very fairly
15 with. And New York state has targets for all the utilities
16 in New York state. They're not the same target. Okay?

17 Each utility, Orange and Rockland, Niagara
18 Mohawk, and the different Con Eds, they're all different.
19 Okay? They have -- basically what they do is they did what
20 I said. They look at their past history and say how -- is
21 that good power quality -- or good reliability?

22 And if it's good, many states don't want to
23 have better reliability because they don't want to increase
24 cost. New York state has given many talks on this, that
25 they do not want their rates to go up. So that they -- they

1 do want better reliability if it's going to cost them a
2 cent.

3 So -- and with deregulation it's very hard to
4 hold reliability. But basically that's the procedure they
5 go after, is we try -- we try -- if it's good and most
6 utilities in this country are quite good, we try to hold
7 that number at least. Okay? But they don't set the same
8 standard for every utility.

9 Q. So if they don't set it for every utility the
10 same in New York, how do they determine how to set it for
11 each one?

12 A. Based on past history.

13 Q. And do they just simply look at the past
14 history and say that's the standard it's been and if it's
15 better than that, it's good or -- it's more complicated than
16 that, I'm assuming?

17 A. Well, it's -- it's probably a -- as subjective
18 as you can get. The -- New York Con Ed has an interesting
19 situation. They have very high rates and they have downtown
20 New York, which has a very high reliability, exceptionally,
21 I mean probably less than three minutes a year on the
22 average. And then they have West Chester County, which is
23 an overhead system, which probably has, you know, 40 minutes
24 and they pay the same rates. So they have a peculiar
25 situation.

1 So they have a special system. You know, they
2 try to bring these numbers closer. But, no, they -- they
3 basically -- everyone that I've seen has looked at past
4 history, because that's the only way you can gauge what
5 you're capable of.

6 Q. I see. So the historical significance has to
7 do with an underlying assumption at least that past history
8 ought to take into account or -- or assume that there was
9 good effort placed in reliability?

10 A. Absolutely.

11 Q. All right. And is that a good assumption to
12 make from your standpoint?

13 A. I think it's the way to go, yes, sir.

14 Q. And if a company had no such good intention of
15 having decent reliability, would that be a flaw in the
16 assumption?

17 A. That's where you step in, sir. I -- most -- I
18 mean, I've never run across a utility that wasn't focused on
19 reliability so I wouldn't consider that a major problem in
20 this country.

21 Q. Yeah. Well, if the Commission at some point
22 in time in your experience in other states is required to
23 step in, is it in your experience, based upon an aberration
24 from what historically has been the service reliability of a
25 particular system?

1 A. I've never known a -- how do I phrase this?
2 The only -- I don't want to start something in this state
3 and get myself in trouble with the folks in the back.
4 Some -- in New York state they have penalties --
5 Q. That's okay. They can't bother you while
6 you're up here.
7 A. They can't hear me. Right?
8 Q. It may catch up with you later.
9 A. I'm not sure I agree with this, but some
10 states have goals and then they have penalties. And I'm
11 sure you're aware of that. And whether they're effective or
12 not is conjecture on my part, so I don't know.
13 Q. Yeah. But that varies from state to state?
14 A. Very few states have that, but yes, it does
15 vary from state to state.
16 Q. Okay. In your example with New York City, do
17 you believe that the high reliability that exists there is
18 due to a higher degree of focus on reliability historically
19 in New York City or are other elements contributing to that?
20 A. It's -- it's due to a number of factors. One
21 is that the higher -- generally speaking, the higher the
22 density of population, the higher the reliability because
23 the lines are shorter. Okay?
24 The other thing -- and, of course, in New York
25 City is -- and in I guess St. Louis, it's a network system,

1 which inherently has an extremely high reliability, but it
2 has an extremely high cost.

3 And I -- to the best of my knowledge, when New
4 York expands its system, it doesn't expand it as a network
5 because it's too expensive. Is goes into what we call a
6 primary selective. Now, the reason for theirs is they have
7 a very large network system and it's just extremely --
8 extremely reliable. All network systems are reliable.

9 Q. Okay. Did you go through -- did someone go
10 through with you the Missouri regulation?

11 JUDGE THOMPSON: Yes indeed.

12 COMMISSIONER GAW: Then I'll catch up on that
13 with the transcript information.

14 JUDGE THOMPSON: Why don't you give the
15 Commissioner a quick summary of your opinion of the
16 applicability of this regulation?

17 THE WITNESS: Basically, I'm one of the five
18 representatives of the IEEE to the American National
19 Standard, which is called formally C 84.1, which is the
20 voltage standard.

21 That standard has three categories in it which
22 are very similar to the Missouri standard. They don't call
23 them by the same name and the limits are slightly different.
24 In that standard it specifically excludes momentary events
25 such as a sag. It -- that standard does not apply to

1 abnormal conditions. It specifically states that. It says
2 this is for sustained voltage levels, which are regulated
3 levels.

4 And as I explained a little bit earlier, that
5 means that if I walk out to your house and put a meter on
6 your house, it has to be in these levels. If there's
7 something going on in the system, a brownout or switching
8 operation or the generator's down, it doesn't apply. And
9 that's the whole purpose.

10 The international standard is -- is very
11 similar. It excludes that. So my assumption to the Court
12 was that I -- my personal opinion is that this standard that
13 everybody's talking about, this Missouri state standard
14 is -- it's not applicable to this case, it's not meant --
15 we're misusing it. That's an opinion.

16 BY COMMISSIONER GAW:

17 Q. And that is, again, based upon your belief
18 that the incidences that are involved in this case have to
19 do with events that would be accepted from the normal --

20 A. Oh, sure.

21 Q. -- view under a standard of this sort. Is
22 that what you're saying?

23 A. These are momentary abnormal events. It's
24 just not applicable. To the best of my knowledge, if you
25 tried to apply your standard to this, you'd be the first

1 person in the world. It's -- it's not that -- that voltage
2 standard is for steady state conditions, has nothing to do
3 with what we've been discussing for the last three days.

4 Q. Yes. Well, is there, in your opinion -- at
5 what point in time, in your opinion, in a hypothetical
6 situation should this Commission be concerned about the
7 reliability of service to a manufacturing customer?

8 A. Now, that's a tough question. Reliability by
9 the industry is defined by interruptions, not by sags. The
10 industry does not recognize -- no one in the industry
11 recognizes sags as a reliability parameter at this stage --
12 at this time. And as I mentioned before, I'm not sure you
13 were here, I don't think it will happen in my lifetime.

14 The industry's very concerned with sags and
15 the sag group that's -- the group in --

16 Q. That's not a challenge, is it?

17 A. Well, you know, I'm lucky to be alive right
18 now.

19 But the -- there is a -- there is an IEEE
20 group that is addressing sags and that group reports to me.
21 And all they're trying to do is figure out ways to measure
22 it, but they're not trying -- no one's trying to attempt
23 to -- because sags -- you have to understand that when you
24 get a fault on the system, at the point of fault, you get
25 zero volts. So if you have a plant right there, you got

1 zero.

2 Now, the fact that the Zoltek people got
3 82 percent, that means somebody saw zero and didn't
4 complain. I mean -- and a whole bunch of people saw
5 voltages lower than Zoltek's and they didn't complain. So
6 82 percent doesn't mean -- no one's picking on these people.
7 Okay? It's just a fact of life. You get faults, the
8 voltage goes to zero some place and it goes low some other
9 place.

10 Q. Did you review all of the exhibits that Zoltek
11 had provided with testimony of their witnesses in regard to
12 incidences that occurred --

13 A. Yeah.

14 Q. -- between '93 and 2000, I think or somewhere
15 in that area?

16 A. I believe so.

17 Q. Did you find those incidences to be in any way
18 unusual in your experience on a system that -- a system of
19 that type?

20 A. Not -- not in the least.

21 Q. Did you find it unusual in a system of any
22 type?

23 A. Not -- well, if you -- if Zoltek located
24 their -- their plant in New York City, it would be unusual,
25 it would be abnormal. But in a system that's an overhead

1 system, I -- it's not unusual at all.

2 Q. All right.

3 A. I see no way around it either. It's just the
4 nature of the beast.

5 Q. Yeah.

6 COMMISSIONER GAW: Thank you very much, sir.
7 I appreciate it. Thanks for your time. I apologize for
8 coming in in the middle of it.

9 JUDGE THOMPSON: I believe we are ready for
10 recross based on questions from the Bench.

11 And, Ms. Shemwell?

12 MS. SHEMWELL: No questions. Thank you, your
13 Honor.

14 JUDGE THOMPSON: Thank you.

15 Mr. May?

16 MR. MAY: Thank you, Judge.

17 RECROSS-EXAMINATION BY MR. MAY:

18 Q. Sir, you had explained to Commissioner Gaw
19 your feelings about the applicability of -- we call it
20 Exhibit 26, but this regulation in this instance. Do you
21 recall that?

22 A. Yes, sir, I do.

23 Q. Well, I guess I'm confused, but are you saying
24 that this should not apply?

25 A. Yes, sir, I am.

1 Q. And are you saying that because the national
2 standard wouldn't apply here?

3 A. I'm assuming -- I'm assuming that this -- this
4 document was created as a similar type document to the
5 national and international standards. It looks the same in
6 many ways. And it doesn't make any sense to have a -- a
7 standard that sets those limits, because it's impossible to
8 meet them.

9 Q. Okay. Now, you say you're assuming. Again,
10 we've been over this. And just for Commissioner Gaw's
11 benefit, I believe that you would agree that you have no
12 inside information as to how this was formulated, this
13 regulation?

14 A. That's true.

15 Q. Okay. So that's an assumption on your part
16 where this even came from. Right? The basis for this
17 regulation?

18 A. I believe it's an assumption on anybody's part
19 in the room where it came from.

20 Q. Well, with all due respect --

21 A. I don't know.

22 Q. -- I'm not saying it came from some--

23 A. Yes. I'm not a lawyer.

24 Q. You seem to be suggesting it came from some
25 national standard?

1 A. Well, I'm -- I'm assuming that the intent is
2 the same as the rest of the world.

3 Q. Okay. Now --

4 A. That's my assumption.

5 Q. Well, with respect to this national standard,
6 you said it almost seems the same. Did you not just say
7 that?

8 A. Yes, sir.

9 Q. Okay. You had also mentioned that -- am I
10 saying this right -- the national standard, is that a good
11 definition --

12 A. Yes.

13 Q. -- or description?

14 A. That's fine.

15 Q. The national standard, I believe it's in my
16 notes, you had said it had a sustained effect or some
17 language in it about sustained time; is that right?

18 A. It says -- it addresses only sustained
19 voltages.

20 Q. Okay. This here, and I'll be glad to give you
21 a copy, does not in 23-D talk about sustained voltages; is
22 that correct?

23 A. I don't -- I don't think it uses that
24 terminology, no, sir.

25 Q. Okay. So that would be a difference between

1 the national standard and this regulation?

2 A. Yes, sir, it is.

3 Q. Okay.

4 MR. VITALE: Your Honor, I think Mr. Burke
5 wasn't finished with his answer and Mr. May's moving on to
6 the next.

7 MR. MAY: I had asked him a yes or no
8 question, your Honor. He answered it.

9 THE WITNESS: Okay. Go ahead.

10 BY MR. MAY:

11 Q. Now, so I can get back to my original point.
12 The way I understood your comments to Commissioner Gaw was
13 that you do not think this should apply in this instance?

14 A. I think the one minute -- my personal opinion
15 is that the one-minute reference is in there because the
16 one-minute -- by using the one-minute reference, it takes
17 out momentary events.

18 If you have -- most of your abnormal
19 conditions, your momentaries, your switching, they take less
20 than a minute. The reason that the minute is in there is to
21 exclude that which would make it very similar to the
22 national and the international standards.

23 Q. Right.

24 A. So that's why I believe that way.

25 Q. Now, with respect to the one minute -- and

1 I'll be glad to show you a copy -- but it says, For lighting
2 service, comma, the variation in voltage for periods longer
3 than one minute, and it goes on.

4 A. I don't understand.

5 Q. I'll bring it to you.

6 A. No. I can remember it. I just don't
7 understand that terminology.

8 Q. Okay. It says that. And the previous expert
9 for Union Electric, you heard his testimony as well as the
10 expert for Zoltek, said that D, power service, is what
11 applies in this instance?

12 A. Well, I don't -- I personally don't -- I don't
13 understand that terminology --

14 Q. Did you hear that testimony?

15 A. -- and I don't understand how you can separate
16 lighting service from power service.

17 Q. Nonetheless, we're dealing with what we have
18 here; is that correct?

19 A. I'm not a lawyer. I don't think this is a
20 good line of questioning for me. I can't interpret that.

21 Q. Sir, it was a good line of questioning, with
22 all due respect, when you wanted to form an opinion you
23 shouldn't apply. I'm trying to walk through it with you so
24 I can understand the basis of why you believe it doesn't
25 apply.

1 A. I think I've told you that.

2 Q. Okay. And you believe it doesn't apply

3 because sustained voltage, and then you talked about the one

4 minute. And I'm asking you, does it not say for lighting

5 service and then it goes into the one minute? Does it say

6 that?

7 A. Yes, sir, it does.

8 Q. And does D talk about power service?

9 A. Yes, sir, it does.

10 Q. And does it say, At any time with respect to

11 power service?

12 A. Yes. But if you continue that -- that

13 paragraph, It also says you have to -- you have to fix it

14 immediately. And it's fixed immediately because in -- in

15 the -- if you want to be -- cut straws here, the protective

16 gear operates and it's fixed. So either way you interpret

17 it, in my opinion, there's no problem.

18 Q. Well, I want to get back to the one minute.

19 A. Okay.

20 Q. We were walking through this.

21 A. Okay.

22 Q. Again, it was yes or no question.

23 A. All right.

24 Q. For power service indeed does it say, At any

25 time?

1 A. Yes, sir.

2 Q. Now, you made another comment which leads to
3 another question. You talked about fixing it. Correct?
4 Did you hear the previous testimony? And I believe it was
5 by the expert for UE. I'm not sure about that, but --

6 A. Mr. Morgan.

7 Q. Mr. Morgan. He had said that the way it ended
8 up, in essence, was that there were two duties listed in D,
9 one of which was to make sure it did not dip into this
10 extreme zone and the second duty was to fix it if it did.
11 Did you hear that testimony?

12 A. Yes, sir, I heard that testimony.

13 MR. MAY: Okay. Nothing else. Thank you.

14 Thank you, Judge.

15 JUDGE THOMPSON: Thank you, Mr. May.

16 I have a follow-up question and this will
17 spark a whole new round of examining and redirecting and we
18 might have to have dinner sent in.

19 FURTHER QUESTIONS BY JUDGE THOMPSON:

20 Q. Would you look -- well, you don't have
21 Exhibit 26 and here we are questioning you exhaustively
22 about what it says and I think it's only fair that you have
23 a copy to look at.

24 A. Thank you. Thank you.

25 Q. You see that highlighted portion over there on

1 the right-hand column?

2 A. Yes, sir, I do.

3 Q. Okay. And there's sort of a -- I've
4 highlighted a sentence fragment there and then lower there's
5 a whole sentence highlighted. Do you see that?

6 A. Yes, sir.

7 Q. What I'm interested in is that sentence --
8 that second-to-last sentence which appears to exclude
9 conditions. Do you see that? It says something along the
10 lines of the utility will not be liable if it's conditions
11 outside its control --

12 A. Yes, sir.

13 Q. -- caused by the elements. Do you see that?

14 A. Yes.

15 Q. And I guess what I'm getting at is, is it your
16 opinion that that language is, in fact, intended to exclude
17 the application of this regulation to just such abnormal
18 events as you were talking about?

19 A. I'm not sure I understand this piece.

20 Q. In other words, you told me that you believed
21 that this regulation was intended for steady state periods
22 and not for application to sag, brownouts and interruptions;
23 isn't that correct?

24 A. Yes, sir.

25 Q. And I'm wondering if you might have the

1 opinion, having read that sentence that I directed you to,
2 that that language is, in fact, intended to exclude the
3 application of this regulation to those abnormal
4 circumstances?

5 A. I believe that the paragraph -- or the
6 sentence above it -- I agree with the previous witness that
7 it applies to internal stuff that we can't be held
8 responsible, as a utility, if you have a problem internally.

9 I think that -- the way I interpret the bottom
10 has nothing to do with this case in terms of you can waive
11 that -- you can waive these limitations.

12 Q. Right. I'm not talking about that sentence.

13 A. Okay.

14 Q. The one before it.

15 A. As long as -- this piece here (indicating)?

16 Q. The sentence above that.

17 A. This one here (indicating)?

18 Q. The one that starts off saying the utility
19 will not be held liable.

20 MR. VITALE: Responsible.

21 THE WITNESS: Let me see. Utility will not be
22 held responsible for -- yeah, but I believe that's
23 internally.

24 BY JUDGE THOMPSON:

25 Q. I need a copy of it too.

1 A. The sentence that's not highlighted? The
2 utility will not be held responsible for variation --

3 Q. The utilities will not be held responsible for
4 variations in service voltage at a customer's premises
5 caused by the operation of that customer's apparatus in
6 violation of the utility's rules.

7 That's talking about what you were calling
8 internal?

9 A. Right.

10 Q. But it goes on and it says that the utility's
11 also not going to be held liable for or held responsible for
12 variations caused by the action of the elements?

13 A. I believe -- yes, sir, I -- what I think that
14 they're looking at, this is a steady state document so that
15 if you -- let's say a substation blows up or lightning hits
16 a generator and it blows up. I think it's trying to exclude
17 that situation.

18 Now you have a steady state condition. You've
19 lost something for a long, long period of time, maybe days,
20 certainly hours. And it's trying to exclude that from the
21 one-minute situation. See? Most of your -- most of your
22 problems that you see faults are less -- well less than a
23 minute, usually less than a second.

24 I think the purpose of that is to exclude
25 something bigger like the line gets hit by a hurricane and

1 it goes down for five days and there's no -- the voltage --
2 or you have a brownout or --

3 Q. And it's your understanding of this regulation
4 that it also does not apply to events of less than one
5 minute in duration?

6 A. I believe -- yes, sir. I believe that is put
7 in for that reason, yes, sir.

8 JUDGE THOMPSON: Thank you. That's all I
9 wanted to get at.

10 And we will have to give you an opportunity
11 for some recross based on my further questions.

12 Ms. Shemwell?

13 MS. SHEMWELL: None. Thank you, your Honor.

14 JUDGE THOMPSON: Mr. May? And I apologize for
15 dragging this out.

16 MR. MAY: Just one minute.

17 FURTHER RECROSS-EXAMINATION BY MR. MAY:

18 Q. The section that the Judge was asking you
19 about, you had said that you think that would apply if --
20 you gave an example of a hurricane or transformer blowing up
21 or something like that?

22 A. Yeah. A major event that takes a long time to
23 repair.

24 Q. Then that provision would kick in?

25 A. I believe so. I'm no lawyer.

1 MR. MAY: Thank you.
2 Thank you, Judge.
3 JUDGE THOMPSON: Thank you, Mr. May.
4 Redirect?
5 MR. VITALE: No questions, your Honor.
6 JUDGE THOMPSON: Thank you, Mr. Vitale.
7 I think we're done with you, sir. Thank you
8 very much for traveling here and providing us with your
9 testimony. In the event that one of these absent
10 Commissioners have a question for you in the future, we'll
11 let Mr. Vitale know. You may step down.
12 THE WITNESS: Thank you.
13 JUDGE THOMPSON: It's 20 minutes to 5:00 and
14 it's my feeling that we're done for the day, but I'm
15 perfectly willing to entertain arguments to the contrary
16 from those of you who would like to get another six or seven
17 witnesses in before 5:00.
18 MR. VITALE: I think we're --
19 MR. MAY: In agreement on something.
20 MR. VITALE: We're in agreement on that point,
21 your Honor.
22 JUDGE THOMPSON: Very well. I have already
23 drafted an order and it will be issued tomorrow morning
24 resetting the continuation of this hearing for February 14th
25 and 15th. It's my understanding that everyone has agreed on

1 those dates.

2 MR. VITALE: I think that's correct.

3 JUDGE THOMPSON: I want to get an order out as
4 quickly as possible before somebody else snaps those days
5 up. So we will see you then at nine o'clock on the 14th.
6 You need not bring back any of the witnesses that we're
7 finished with unless you hear differently between now and
8 then or unless you need them to answer the question that
9 Commissioner Lumpe had me put to you.

10 Have a safe trip.

11 MR. MAY: Your Honor, you had asked us to
12 prepared I believe it was Exhibit 24. I think we --

13 JUDGE THOMPSON: Right. Late-filed exhibit.

14 MR. MAY: What was the timing of that? You
15 said we would talk about it at the briefing schedule. Is
16 that something we're going to do later or do you want --

17 JUDGE THOMPSON: Well, since we are coming
18 back, it would be most helpful to have it for the 14th.
19 That way it can be offered in open hearing and any
20 objections can be taken up at that time.

21 MR. VITALE: Just for further clarification,
22 your Honor, is it possible to suggest that it be available
23 at least a day or two before so we have an opportunity to
24 see it instead of for the first time --

25 JUDGE THOMPSON: Is that possible? How about

1 bring it on the 14th and you can offer it on the 15th.

2 MR. MAY: I'll do my best to get it to him
3 quickly.

4 JUDGE THOMPSON: Thank you. I appreciate
5 that. Thank you all very much. We'll be recessed.

6 WHEREUPON, the hearing of this case was
7 adjourned until 9:00 a.m., February 14, 2002.

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