

1 this point it's in, it speaks for itself, but I don't think
2 the witness gets to read it in. The Court can read through
3 the facts.

4 JUDGE EILER: Counsel?

5 MR. STEIN: Your Honor, it's a lengthy document.
6 It's a document that I can go back and lay additional
7 foundation for, but this is the portion of the document that
8 defines traceability. It is NIST's definition of
9 traceability.

10 MR. SCHWARTZ: Objection. Counsel is now
11 testifying as to what the document is.

12 MR. STEIN: It's an offer of proof.

13 JUDGE EILER: I don't think that you get to testify
14 here, and you've gone beyond what admitting the document and
15 the objection is: he shouldn't testify to it because the
16 document speaks for itself. So just answer to that.

17 MR. STEIN: Previously, as I was moving to admit
18 the previous exhibit, I indicated to the Court that my
19 understanding of the rules allowed me to ask the specific
20 questions, and then, once admitted, that it then spoke for
21 itself, and the Court said that I would then be allowed,
22 once it was admitted, to ask specific questions. So one is
23 the ground rules that we're working on.

24 Two is -- and I'm only trying to make an offer of
25 proof to the Court as to what it will say so that it can

1 clarify for Your Honors' ruling whether it is something
2 that's specific and purposeful here. It is misdefinition of
3 traceability in the Frequently Asked Questions section of
4 the Traceability section of the NIST publication. So I
5 would ask that we can have Dr. Emery indicate basis of
6 belief, basis of opinion, and foundation for his opinion
7 that NIST has this definition of --

8 JUDGE EILER: You can ask all those questions, but
9 what you've asked him, what the objection is about --

10 MR. STEIN: Yes?

11 JUDGE EILER: -- is whether or not he can read it.
12 So make your objection as to whether or not he can read that
13 into the record and then stop.

14 MR. STEIN: It's helpful to the finder of facts,
15 Your Honor.

16 JUDGE EILER: Counsel, I think that he can read it
17 in just limited portions or at least highlight them for the
18 Court to look at because, quite frankly, I don't have any
19 intention of reading the entire treatise. So I think that
20 he can at least get our attention to some portion. Now, if
21 he's going to read a lot of it or we're going to go over
22 this with a fine tooth comb, you can use renew your
23 objection.

24 MR. STEIN: Thank you, Your Honor.

25 JUDGE EILER: Read the section that Counsel has

1 asked you to read.

2 A. "I want my measurement results to be traceable to
3 NIST. What do I have to do?

4 "To achieve traceability of measurement results to
5 standards maintained by NIST, you need to reference your
6 measurement results through an unbroken chain of
7 comparisons, including determining the uncertainties at each
8 step, to NIST standards as the stated references."

9 Do you want me to continue?

10 Q. No, that's all right. Thank you very much.

11 MR. SCHWARTZ: I'm sorry. If I can take a look at
12 the document, the page number is different than the one that
13 I've got.

14 JUDGE EILER: Is this the page that you're
15 referring to, Counsel?

16 Counsel, I'm asking you a question?

17 MR. STEIN: Yes, Your Honor. I'm just trying to
18 get another exhibit.

19 Do you want that copy as well?

20 MR. SCHWARTZ: Let me see if I can find it.

21 THE CLERK: Defendant's Exhibit R marked for
22 identification.

23 MR. SCHWARTZ: No. I've got it.

24 MR. STEIN: All right. Then may I use that one?

25 Thank you.

1 Q. Dr. Emery, may I ask you to review what's been
2 marked as Defense Exhibit R, please.

3 A. Yes, and I've read this.

4 Q. Are you familiar with that document?

5 A. Yes, I am

6 Q. What is it, sir?

7 A. "Guidelines for Evaluating and Expressing the
8 Uncertainty of NIST Measurement Results."

9 Q. Who published it?

10 A. This is a NIST Technical Note, No. 1297.

11 Q. And what is a Technical Note, please?

12 A. A Technical Note is an official publication of
13 NIST, usually published by the Government Printing Office.

14 Q. Is this type of document generally relied on by
15 experts in the four fields of science that we've been
16 previously discussing in forming their expert opinions?

17 A. Yes, it is.

18 Q. Is it also the type of document that you rely upon
19 in forming your opinions?

20 A. Yes.

21 MR. STEIN: Move to admit R, Your Honor.

22 MR. SCHWARTZ: One question on voir dire.

23

24

V-O-I-R D-I-R-E

25

BY MR. SCHWARTZ:

1 Q. Doctor, did you specifically rely on this document
2 in forming your testimony today?

3 A. This is general knowledge.

4 JUDGE EILER: The question was, did you rely on it?

5 A. No. I relied on the ISO document.

6 MR. SCHWARTZ: Objection.

7 MR. STEIN: Your Honor, he's testified that it is
8 generally relied on experts in the fields. It can be either
9 illustrative or --

10 JUDGE EILER: Well, you asked to admit it as part
11 of the information that he's basing his expert testimony on.
12 He says he didn't base it on this particular piece.

13 MR. STEIN: Move to admit it as a learned treatise.

14 JUDGE EILER: Objection, Counsel?

15 MR. SCHWARTZ: Same objection, Your Honor.

16 According to Tegland -- I'm looking at the 2003 volume of
17 Washington Practice, Courtroom Handbook on Washington
18 Evidence under Learned Treatises, Evidence Rule 803A18, "If
19 the treatise is to be mentioned during the witness' direct
20 examination, the proponent must also list the foundation
21 testimony that the witness actually relied upon the
22 publication in question."

23 JUDGE EILER: Sustain the objection. It's not
24 admitted.

25 MR. STEIN: All right. Thank you, Your Honor.

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D-I-R-E-C-T E-X-A-M-I-N-A-T-I-O-N (cont'd)

BY MR. STEIN:

Q. Dr. Emery, have you reviewed this Guidelines for Evaluating and Expressing the Uncertainties of NIST Measurement Results?

A. Yes.

Q. All right. And you indicated that previously you relied on ISO. What is ISO?

A. American words are International Standards Organization. The correct title is International Organization for Standardization.

Q. All right. Is there anything different between the ISO standards and technical -- and NIST Technical Note 1297?

A. No, there is not.

Q. Could you have just as easily relied upon this Technical Note 1297 in forming your opinion?

A. Yes.

Q. And would your opinion be any different if you relied on this Technical Note 1297?

A. No, it would not.

Q. Do you have the ISO document here?

A. No, I do not.

Q. All right. Would you please review Exhibit R, and let me know when you've had an opportunity to review it.

A. Yes.

1 Q. All right. I'm going to ask you -- maybe you can
2 come up -- please reform your opinions based upon Technical
3 Note 1297.

4 MR. SCHWARTZ: Objection.

5 JUDGE EILER: It would be?

6 MR. SCHWARTZ: Well, it's -- now we're preparing
7 for testimony while on the stand to get around and to get
8 this in, whereas, previously, he's testified that he didn't
9 form his opinion based on this. Notwithstanding his answer
10 that this is the same as ISO, which he did use, his opinion
11 has already been formed. We're now asking -- Counsel has
12 now asked him to reform his opinion based on the article
13 that he does have.

14 His opinion is his opinion. He's already said that
15 it wouldn't change from this document to the other. He
16 apparently is familiar with this document but didn't use it
17 to form his opinion.

18 MR. STEIN: Well, he will have used it to form any
19 opinion that he gives to the Court today. This is a federal
20 publication. It is the same -- it expresses the same
21 opinions as the ISO he originally used, and I don't see
22 anything improper with him reformulating his opinion based
23 on the Technical Note 1297 for Your Honors today so that you
24 may have the underlying material before you.

25 JUDGE EILER: That doesn't change his testimony

1 that he didn't rely on this in forming his opinion, and now
2 you're saying that he hasn't changed it. So he hasn't used
3 this, in my opinion, at all. So we're -- it's going to
4 remain unadmitted at this point.

5 MR. STEIN: The witness has never said -- all
6 right. Thank you, Your Honor.

7 Q. Sir, in your opinion, does NIST, The National
8 Institute of Standards and Technology, have guidelines for
9 evaluating and expressing the uncertainty of measurement
10 results?

11 A. Yes, they do.

12 Q. And are you familiar with those?

13 A. Yes, I am.

14 Q. Is there anything that might help you refresh your
15 memory as to the specific details of NIST Guidelines for
16 Evaluating and Expressing the Uncertainty --

17 MR. SCHWARTZ: Objection. The witness has not
18 indicated that he has any lack of memory as to what those
19 are.

20 MR. STEIN: I asked him with regard to the
21 specifics. And so --

22 JUDGE EILER: He hasn't admitted that he needs some
23 recollection recalled. So we're not going to go there yet.

24 MR. STEIN: Okay.

25 Q. Dr. Emery, would it be helpful to you to have any

1 particular document in front of you so that you could and
2 know the exact expression of the words and the material of
3 Guidelines for Evaluating and Expressing Uncertainty by
4 NIST?

5 MR. SCHWARTZ: Same objection, Your Honor.

6 JUDGE EILER: Until he expresses some concern,
7 don't go there.

8 Sustained.

9 Ask the question.

10 MR. STEIN: Thank you, Your Honor.

11 Q. Does NIST have a policy with regard to measurements
12 and statements of uncertainty?

13 A. Yes, they do.

14 Q. All right. And is it a policy that is generally
15 relied on by experts in the four fields of science that
16 we've been discussing?

17 A. Yes, it is.

18 Q. Is it relied upon by you, sir?

19 A. Yes, it is.

20 Q. And in your opinion, is -- do you recall the exact
21 verbiage of that policy, the exact words with which NIST has
22 stated its policy regarding the statements of uncertainty?

23 A. Uncertainty? The exact words? No, I do not.

24 Q. Is there anything that might help you in recalling
25 the exact words of the NIST policy with regard to statements

1 of uncertainty?

2 A. If I want to know the NIST policy, I would look at
3 1297.

4 Q. All right. May I ask you, then, to look at what's
5 been marked as Exhibit R.

6 A. Yes.

7 Q. And perhaps page 11 of Exhibit R.

8 A. There are no page numbers on mine. Okay. I can
9 see them at the bottom. Yes. Thirteen -- okay.

10 Q. Can you describe what this document is?

11 A. It describes what --

12 JUDGE EILER: He doesn't get to describe the
13 document. He just gets to use it to refresh his memory.

14 MR. STEIN: All right.

15 JUDGE EILER: Ask him a question about the
16 document. He can take some time, if he would like, to look
17 at it, but then he gets to testify from his own knowledge.

18 MR. STEIN: All Right.

19 Q. May I ask you to review Exhibit R.

20 A. Yes.

21 MR. SCHWARTZ: Objection. There isn't a question
22 thus far. The last question that was asked and answered was
23 did he know the exact words used to describe uncertainty, or
24 something along those lines. And the answer was, no. Would
25 there be anything helpful? The answer was basically

1 Defense R.

2 JUDGE EILER: And he gets to refresh his memory if
3 it helps --

4 MR. SCHWARTZ: If it helps, but there hasn't been
5 any -- the next question was, please read the document.

6 JUDGE EILER: Well, he's allowed to refresh his
7 memory. Counsel, he gets to do that; then he gets to speak
8 from his own knowledge.

9 MR. STEIN: Thank you.

10 Q. Has review of that document refreshed your
11 recollection as to the verbiage of NIST --

12 A. Their specific definition, yes.

13 Q. And what is NIST policy with regard to statements
14 of uncertainty?

15 A. They require that you state standard uncertainty --

16 MR. STEIN: I'm sorry. I can't hear you, and I
17 don't believe the record will pick you up.

18 JUDGE EILER: I think they're done. Okay. Now
19 answer your question.

20 MR. SCHWARTZ: And, Your Honor, just for my
21 benefit, if the witness could turn over Exhibit R so that
22 we're sure that he is remembering this from his own
23 recollection having been refreshed already.

24 MR. STEIN: I think that's just abusive, Your
25 Honor. The witness can look at it so that he can say from

1 his own knowledge, and if he needs to remind himself in mid
2 sentence, then he should be allowed to review it in mid
3 sentence.

4 JUDGE EILER: If he needs to review it, please let
5 us know. You can review it, but this is your testimony.

6 Answer the question, please.

7 A. It defines terms such as uncertainty, standard
8 uncertainty, combined uncertainty, and expanded uncertainty,
9 and coverage factors.

10 Q. All right. And does it state NIST policy with
11 regard to whether uncertainty must be stated in every
12 measurement?

13 A. Yes, it does.

14 Q. And what does it say?

15 A. It says in the back of the document --

16 THE WITNESS: If I may refer to the document to
17 remind myself, please.

18 JUDGE EILER: You may.

19 A. It gives -- it says, for instance -- it describes
20 how the laboratories are to define uncertainty and how they
21 are to report uncertainty. And it says that you're supposed
22 to use a coverage factor. And if it isn't stated, the
23 coverage factor must be two. If you use other than two, you
24 have to state it.

25 Q. And what is a coverage factor, sir?

1 A. Coverage factor is a number which allows you to
2 make a statement of the following form: I am 95 percent
3 confident that the result falls within this range or am
4 99 percent confident.

5 Q. Does NIST or does NIST not have a policy that
6 indicates a measurement result is complete only when
7 accompanied by a quantitative statement of its uncertainty?

8 A. Yes, they do.

9 Q. Is that a policy that NIST publishes?

10 A. Yes, it is.

11 Q. Do you know where it's published?

12 A. 1297.

13 Q. Anywhere else?

14 A. It's published all over the place, I'm sorry, to
15 say, but it is -- appears in 1297.

16 Q. To your knowledge, do you know whether it appears
17 in the NIST Administrative Manual?

18 A. It appears in their check-off sheet for people
19 writing papers. I know that. I don't know --

20 MR. SCHWARTZ: Objection; nonresponsive.

21 A. I don't know if --

22 JUDGE EILER: Sustained.

23 Ask a new question.

24 MR. STEIN: All right.

25 Q. Might 1297 assist you in recalling whether it

1 appears in the NIST Administrative Manual?

2 A. It might.

3 Q. May I ask you to look at the bottom of page 11,
4 please.

5 A. The bottom of page 11?

6 Q. Yes.

7 A. It describes -- it defines combined standard
8 uncertainty.

9 MR. STEIN: May I approach the witness?

10 JUDGE EILER: You may.

11 Q. I'm assuming we have the same pagination, sir.
12 Here's what I'm asking you to look at. There is Appendix C
13 here and Appendix B here.

14 A. Right.

15 Q. Does that refresh your memory as to whether this
16 policy appears in the NIST Administrative Manual?

17 A. Yes, it does.

18 Q. And now that your memory has been refreshed, does
19 this policy appear in the NIST Administrative Manual?

20 A. Yes, it does.

21 Q. What is the NIST Administrative Manual?

22 A. It says, "No measurement is complete without
23 accompanied statement of uncertainty."

24 Q. Thank you. But what is the manual itself? What is
25 the NIST Administrative Manual? Is it a particular document

1 or a policy?

2 A. It's 1297.

3 Q. And does NIST publish the formula for calculating
4 uncertainty that it uses?

5 A. Yes, it does.

6 Q. Can you give us perhaps a lay description of what
7 uncertainty is and how it is calculated?

8 A. If you want to measure somebody's height, your
9 grandchildren's height, you stand them up against the wall,
10 put a yardstick on top of their head and make a mark on the
11 wall. If you were to do that a number of times, you would
12 find out that the mark would be at different spots, slightly
13 different, because the yardstick isn't exactly level; they
14 got more hair on one side of their head than on the other
15 side of their head. If you did that five or six times, when
16 you got through, you'd see this little range of marks right
17 there, and that would be the uncertainty of your
18 measurement. That would be an indication of the uncertainty
19 of your measurement.

20 Q. By definition, does it require multiple
21 measurements, then?

22 A. Yes.

23 Q. Now, you've read the NIST policy, but can you tell
24 us, in your opinion, what is the importance of including the
25 statement of uncertainty with a temperature measurement?

1 A. Same as with any other measurement: Without a
2 statement of uncertainty, the measurement is worthless.

3 Q. Why is it worthless?

4 A. It means nothing to me.

5 Q. Why does it mean nothing to you?

6 A. Because I have no idea the precision with which you
7 made the measurement. I have no confidence in a
8 single-point measurement.

9 Q. Why?

10 A. For one thing, I cannot establish confidence limits
11 statistically with only one degree of reading. I must have
12 at least two readings.

13 Q. And with regard to temperatures, is there anything
14 specific about that field?

15 A. It's no different than any other field.

16 Q. Do you believe that that opinion is the generally
17 accepted opinion amongst scientists in the four fields of
18 science that we have been discussing?

19 A. Yes, I do.

20 Q. Are there common ways of expressing uncertainty in
21 those four fields of science?

22 A. Upper and lower limits, standard deviation,
23 confidence limits, or what are now called expanded
24 uncertainty.

25 Q. And are those methods of expressing uncertainty

1 generally accepted in the four scientific communities we've
2 been discussing?

3 A. Yes, they are.

4 JUDGE EILER: This would be exhibit?

5 MR. STEIN: This is already admitted, Your Honor.

6 JUDGE EILER: Oh, okay.

7 Q. Dr. Emery, can I have you look at Exhibit J,
8 please.

9 A. Yes.

10 Q. Have you seen that document before?

11 A. Yes, I have.

12 Q. What is it, if you know?

13 A. What?

14 Q. Do you know what is?

15 A. Yes. It's a report of calibration and
16 verification.

17 Q. Can you see who it's attributed to?

18 A. It's attributed to Bostec, Incorporated.

19 Q. Have you seen that prior to today?

20 A. I believe I have.

21 Q. This document, does it have a statement of
22 uncertainty anywhere on it?

23 A. No, it does not.

24 Q. In your opinion, would this document satisfy the
25 NIST requirement?

1 A. No, it would not.

2 Q. In your opinion, is this, in fact, a report of
3 calibration?

4 A. No, it is not.

5 Q. And why not?

6 A. It does not state the conditions under which the
7 testing was done. It doesn't give ambient temperature,
8 relative humidity, et cetera. It does not list the
9 uncertainties associated with any of the readings. Those
10 are my primary reasons.

11 Q. Okay. Is there any way to calculate uncertainty
12 from the data provided here?

13 A. None.

14 Q. In your opinion, would this document be considered
15 an acceptable report of calibration -- would it be
16 considered a report of calibration by experts in the four
17 fields of science that we've been discussing?

18 A. No, it would not.

19 Q. In your opinion, may this document be relied upon
20 by the end user to establish a chain of traceability to the
21 standards maintained by NIST?

22 A. No, it is not.

23 Q. To standards maintained by anyone?

24 A. No.

25 Q. And do you believe that it would also be the

1 generally accepted opinion among scientists in the four
2 fields of science that we've been discussing?

3 A. I believe that they would have the same opinion.

4 Q. Generally?

5 A. Yes.

6 Q. A majority of them?

7 A. All of them.

8 Q. Thank you.

9 Now, hypothetically, if an attempt of calibration
10 was based upon a single recorded reading, could that
11 attempted calibration ever be the basis of a report of
12 calibration that meets your definition previously stated?

13 A. No, it could not.

14 Q. And if an attempt to calibrate was based on a
15 single recorded reading, would it meet the generally
16 accepted scientific definition of -- would it be sufficient
17 to create a report of calibration under the generally
18 accepted scientific definition of reported calibration
19 amongst the scientists in the four fields that we've been
20 discussing?

21 A. No, it would not.

22 Q. Would it meet the NIST standards?

23 A. No.

24 Q. Would this document, J, meet the NIST standards, in
25 your opinion?

1 A. No, it would not.

2 JUDGE EILER: We're going to see exhibit?

3 MR. STEIN: L as in Lucy, Your Honor.

4 Q. Dr. Emery, I'm handing you Exhibit L. Would you
5 take a moment to review it, please.

6 A. I've seen it before.

7 Q. And what does that document appear to be?

8 A. It's entitled "Report of Calibration."

9 Q. And who is it attributed to, if you know?

10 A. Guth Laboratories.

11 Q. In your opinion, would this report of -- is this a
12 report of calibration that meets the NIST requirements?

13 A. No, it does not.

14 Q. Why not?

15 A. It, again, does not state anything about the
16 ambient conditions. It does not state the uncertainty
17 associated with readings.

18 Q. Does it provide any data from which uncertainty can
19 be determined?

20 A. No, it does not.

21 Q. In your personal opinion, is this a document that
22 can be relied upon to establish traceability to NIST?

23 A. No, it cannot.

24 Q. Do you believe also that that -- does this document
25 meet the NIST definition?

1 A. No, it does not.

2 Q. And in your opinion, would this document be
3 considered or relied upon as a report of calibration by the
4 scientists in the four fields of science that we have been
5 discussing generally?

6 A. It could not be relied upon by them.

7 MR. STEIN: This is the Wise article. If you want
8 a copy of that, that's the copy I'm just going to ask --

9 MR. SCHWARTZ: Could I just see the front?

10 MR. STEIN: It's NIST Technical Note 5341.

11 JUDGE EILER: This would be Exhibit?

12 MR. STEIN: S, Your Honor.

13 THE CLERK: Exhibit S marked.

14 MR. STEIN: Thank you.

15 JUDGE EILER: Counsel, are you ready?

16 MR. STEIN: When my witness indicates he's had an
17 opportunity to review it, Your Honor.

18 A. Yes, I've seen it before.

19 Q. All right. What is this document?

20 A. Assessment of Uncertainties of Liquid-in-Glass
21 Thermometer Calibrations at the National Institute of
22 Standards and Technology.

23 Q. Okay. Is it a journal article or some other kind
24 of article?

25 A. No. It's a technical report.

1 Q. All right. Are you familiar with the technical
2 report?

3 A. Yes, I am familiar with this.

4 Q. Is it the type of document generally relied upon by
5 experts in the four fields of science that we have been
6 discussing in forming their opinions?

7 A. Yes, it is.

8 Q. Is it one of the things that you relied upon in
9 forming the opinions that you come into court with today?

10 A. Yes, it is.

11 Q. All right. In your opinion, does this publication
12 establish a proper method to calibrate a thermometer to
13 establish traceability?

14 A. Yes, it does.

15 Q. Okay. Does it describe that method somewhere?

16 A. It describes the actual process by which the
17 thermometer is to be calibrated; specifies that it is to be
18 used under -- examined under a microscope.

19 MR. SCHWARTZ: Objection; nonresponsive.

20 JUDGE EILER: Well, I think the question was does
21 it, and then he went on to explain what it does. So I think
22 that the answer exceeds the question.

23 Sustained.

24 Ask your question again.

25 Q. Does the document lay out the standards and

1 policies --

2 A. Yes, it does.

3 Q. -- for the calibration of a thermometer?

4 A. It does.

5 Q. And can you tell us what those are, generally?

6 A. It describes the process, details how you are to
7 place a thermometer in the bath, how long the thermometer
8 must be allowed to equilibrate, how many readings must be
9 taken, and how to compute the uncertainty. It also
10 specifies that you are to use a microscope in looking -- in
11 taking your readings. It gives full details.

12 Q. All right. Let's talk about some of those. What
13 is equilibration?

14 A. What is calibration?

15 Q. Equilibration.

16 A. Equilibration is allowing the thermometer to reach
17 a steady state.

18 Q. How long does the NIST policy require that a
19 thermometer equilibrate before one can calibrate it?

20 A. Seventy-two hours.

21 Q. In your opinion, is that an essential element of
22 the proper calibration?

23 A. Yes.

24 Q. Do you believe that it is an essential element of
25 calibration amongst the generally accepted -- is it

1 generally accepted amongst scientists in the four fields
2 that we have been discussing as an essential element of
3 calibration?

4 A. Yes.

5 Q. Is it in NIST policy for calibration?

6 A. It's there stated.

7 Q. How many readings must one take of the various
8 thermometers employed in the calibration process, please?

9 A. You must take three readings.

10 Q. Three readings of which?

11 A. You must read the master, the thermometer under
12 question, the master again, the thermometer under question,
13 and then the master again, and you must repeat this process
14 three times.

15 Q. So the total number of readings, because my math
16 isn't very good?

17 A. It would be nine reading of the master and six
18 readings of the instrument being calibrated.

19 Q. In your opinion, is that necessary to establish a
20 calibration of a thermometer?

21 A. Yes.

22 Q. And do you believe it is the generally accepted
23 opinion of scientists in the four fields of science that we
24 have been discussing?

25 A. Yes.

1 Q. And is it in NIST policy?

2 A. Yes.

3 JUDGE EILER: Counsel, we're going to stop you
4 right there. We have a court stenographer who's going to
5 need a morning break. So we're going to give her her
6 morning break at this point.

7 We're going to recess.

8 (Brief Recess)

9 JUDGE EILER: Counsel, we have some concerns as to
10 how long this is going to take. This is to end today.
11 We're not trying to set a Guinness record for the longest
12 continuing motion. So those concerns being conveyed to
13 counsel, how long do you think you're going to be with this
14 witness?

15 MR. STEIN: I'm hoping to finish within 30 minutes.

16 JUDGE EILER: All right. How long with your next
17 witness?

18 MR. STEIN: I need to address that to the Court
19 after we're done with --

20 JUDGE EILER: No, no, no. You don't need to
21 address it with the Court; we're asking already.

22 MR. STEIN: I don't anticipate calling another
23 witness.

24 JUDGE EILER: No telephonic witness?

25 MR. STEIN: No. I need a ruling from the Court

1 before I make my final decision.

2 JUDGE EILER: All right. Counsel, do you
3 anticipate rebuttal witnesses?

4 MR. SCHWARTZ: If I could just have one moment?

5 Currently, no, Your Honor, borrowing what comes out
6 in the rest of direct and the rest of cross.

7 JUDGE EILER: Okay. This was an anticipatory
8 question.

9 MR. SCHWARTZ: Currently, no.

10 JUDGE EILER: Okay.

11 MR. STEIN: And if they have no rebuttal, of
12 course, I --

13 JUDGE EILER: You don't get rebuttal. That's his
14 line of job.

15 MR. STEIN: Dang.

16 JUDGE EILER: All right. So let's move on with
17 this witness' questioning. Let's cut to the chase here.
18 The Court is getting the drift, all right?

19 MR. STEIN: I apologize, Your Honor. Those of us
20 whose minds work slowly have to work slowly even though
21 other people work much quicker. I apologize.

22 JUDGE EILER: Well, think about those that are
23 quick.

24 MR. STEIN: I try, Your Honor, but it's beyond my
25 ability sometimes.

1 Q. Dr. Emery --

2 JUDGE EILER: The witness remains under oath.

3 THE WITNESS: Yes, Your Honor.

4 Q. -- I'm handing you Exhibit O. Do you recognize
5 that document?

6 A. Yes, I do.

7 Q. All right. What is it?

8 A. It's a calibration report from ICL.

9 Q. What's ICL?

10 A. It's a commercial laboratory.

11 Q. And have you reviewed Exhibit O previously?

12 A. Yes, I have.

13 Q. Do you have an opinion as to whether this document
14 appears to be a proper certification of calibration?

15 A. It's an exemplary document, yes. It's a proper --

16 Q. Why does that one work?

17 A. It contains everything that I would expect to see.
18 It describes the conditions under which the test was
19 operated; it defines the expanded uncertainty; also tells me
20 what the coverage factor is. It describes the master or
21 reference equipment that was used; gives me their -- how
22 they were compared to the NIST standards; what the
23 uncertainty of those master instruments were; it contains
24 the date in which it was done; and contains the recommended
25 recalibration date.

1 Q. Okay. And what was the date that that particular
2 calibration referenced in O was done?

3 A. This was March 11th of 2003 the report was issued.

4 Q. Very good. I'm going to just get that back to the
5 bailiff here, because I don't think I'll be referring to it
6 again.

7 A. Yeah.

8 Q. Are you familiar with the reference thermometer
9 used by the Washington State Patrol in its breath testing
10 program?

11 A. I have seen it.

12 Q. Is a reference thermometer somehow different from
13 other thermometers used in the field?

14 A. In principle, no, but it's desirable that it be
15 more precise.

16 Q. Does reference thermometer have a generally
17 accepted meaning amongst scientists in the four fields that
18 we've been discussing?

19 A. It will be the one that you compare your
20 instruments to.

21 Q. So it's the next level up from the base instruments
22 used to employ in a lab or --

23 A. Yes, it is.

24 Q. Okay. And as such -- oh. The reference
25 thermometer used by the Washington State Patrol -- you've

1 been to the Washington State Patrol breath test?

2 A. Yes.

3 Q. Have you talked to Sergeant Goldberg?

4 A. Yes, I have.

5 Q. And you've seen their equipment?

6 JUDGE EILER: That will be a yes?

7 A. Yes, I did.

8 JUDGE EILER: Okay. If you nod your head, the
9 person typing it doesn't have an answer. So you need to say
10 something.

11 Q. Do you recall what type of thermometer they use as
12 a reference thermometer?

13 A. Eurotronic or something -- I do not know the name.

14 Q. Very good.

15 With regard to recalibration, you indicated that
16 Exhibit O talked about a recalibration date. Do reference
17 thermometers have a -- in your opinion, do reference
18 thermometers need to be recalibrated?

19 A. Yes.

20 Q. At what frequency?

21 A. There's a NIST policy on that. Most thermometers
22 are every six months; reference thermometers, if I recall
23 right, every year.

24 Q. I'm sorry. Reference thermometers less frequently
25 than regular thermometers?

1 A. I do not recall.

2 Q. Okay. Let me get you a couple of documents. But
3 there is a -- to your knowledge, there is a policy and
4 procedure for recalibration; is that right?

5 A. There is.

6 THE CLERK: Exhibit T marked for identification.

7 MR. STEIN: I apologize, Your Honor. It's taking
8 me a minute. That's RF.

9 I'm sorry. Did I gave you the Raspberry article?

10 MR. SCHWARTZ: Which is the second one?

11 MR. STEIN: This is GMP 11.

12 MR. SCHWARTZ: Thank you.

13 THE CLERK: Exhibit U marked for ID.

14 MR. SCHWARTZ: I'm sorry. U as in Ulysses, and
15 that's GMP 11.

16 Q. Okay. I'm going to hand you two exhibits at once
17 in an effort to be quick here: T and U. Would you review
18 those, please.

19 A. Yes. I've seen these before.

20 Q. What is T, please?

21 A. T is an article from the Journal of Research of
22 NIST, entitled "Metrological Timelines in Traceability."

23 Q. The one that you have reviewed to form their
24 opinions here today?

25 A. Yes, it is.

1 Q. And is it generally relied upon by experts in the
2 four fields of science that we have been discussing --

3 A. Yes, it is.

4 Q. -- to form your opinions?

5 And what is U?

6 A. U is -- GMP 11 is Good Measurement Practice for
7 Assignment and Adjustment of Calibration Intervals for
8 Standards.

9 Q. Who publishes that?

10 A. It's published by NIST.

11 Q. And is it the type of document generally relied
12 upon by experts in the four fields of science that we have
13 been discussing in forming their opinions?

14 A. Yes, it is.

15 Q. And have you relied upon it?

16 A. Yes, I have.

17 MR. STEIN: Move to admit U.

18 MR. SCHWARTZ: May I have voir dire on this, Your
19 Honor?

20 JUDGE EILER: You may.

21

22 V-O-I-R D-I-R-E

23 BY MR. SCHWARTZ:

24 Q. Dr. Emery, first, what's the -- well, where on U is
25 there any indication that this is a NIST publication?

1 A. There is no indication indicated here.

2 Q. And where on U does it indicate that this was ever
3 adopted as a policy by NIST?

4 A. It does not.

5 Q. And, in fact, doesn't U indicate that this is a
6 draft dated August 18, 2001?

7 A. Yes, it is.

8 MR. SCHWARTZ: The State would object to its
9 admission. There's no foundation.

10 JUDGE EILER: Counsel?

11 MR. STEIN: Let me, if I may, return to the
12 witness.

13

14 D-I-R-E-C-T E-X-A-M-I-N-A-T-I-O-N (cont'd)

15 BY MR. STEIN:

16 Q. Dr. Emery, are Good Measurement Practices, GMP 11,
17 in your opinion, have they now been adopted by NIST?

18 A. I have not been able to determine if they have been
19 formally adopted. They are used by ICL.

20 Q. All right. And in your opinion --

21 MR. SCHWARTZ: Objection. Move to strike.

22 Nonresponsive.

23 JUDGE EILER: Sustained.

24 Q. All right. In your opinion, is GMP 11 -- has
25 that -- does that state a standard that is generally

1 accepted in the four fields of science that we've been
2 discussing as confident practice for experts in the field?

3 A. Yes, it does.

4 Q And in your opinion, does it state the basic
5 confidence requirements for these purposes in the four
6 fields of science that we've been discussing?

7 A. GMP 11 is only intervals for recalibration.

8 Q. Okay. But in that area, do you believe that it is
9 your opinion that that is the reasonable standard of care --

10 A. Yes.

11 Q. -- amongst scientists in the four fields of science
12 that we've been discussing?

13 A. It is.

14 MR. STEIN: Then, now we can move to admit it.

15 MR. SCHWARTZ: Same objection. It's still hearsay.
16 It's still unauthenticated as to who wrote it. That's not a
17 learned treatise. It may, in fact, outline good procedure,
18 but the witness can testify what he believes good procedure
19 is without admitting this document.

20 MR. STEIN: I'll withdraw the motion. Thank you,
21 Your Honor.

22 Q. All right. Dr. Emery, I would like you to review
23 Exhibit T and Exhibit U, and then after you have done
24 that -- you indicated previously you could not recall
25 frequencies for -- interval frequencies that you believe are

1 the standards of care in the four fields of science that
2 we've been discussing. After reviewing these, let me know
3 if your memory has refreshed.

4 A. My memory has been refreshed.

5 Q. All right. Now, after refreshing your memory, sir,
6 do you have an opinion as to the frequency of recalibration
7 as required amongst -- as generally accepted amongst
8 scientists in the four fields of science that we've been
9 discussing?

10 A. I have an opinion, yes.

11 Q. And what is that opinion?

12 A. It's somewhat vague, Your Honor. The
13 calibration -- the essence of calibration is to develop a
14 history of the behavior of an instrument. So when I first
15 get an instrument, I calibrate it with great frequency.
16 Once I become confident that the instrument is stable, then
17 I lengthen the frequency period up. So, normally, I would
18 start with six months, and once I had shown that it was
19 stable, I would move that to a year.

20 Q. All right. Now, when you talk about calibration at
21 the outset, are you talking about a calibration that is part
22 of the chain of unbroken comparisons, each stating
23 uncertainty back to the NIST standard?

24 A. Yes.

25 Q. Now, with regard to that, if you have a calibration

1 on date one, let's use March 11, 2003, if the calibration is
2 done on that date that establishes a traceability of the
3 instrument to standards maintained by NIST, can you use that
4 instrument -- if that instrument was used prior to that
5 date, was that instrument traceable to standards maintained
6 by NIST prior to the date of the first calibration that you
7 see that constitutes that unbroken chain?

8 A. I do not believe so.

9 Q. And do you believe that NIST has a policy with
10 regards to that?

11 A. NIST is very specific in that you need to establish
12 a history of calibration. And in Exhibit T --

13 MR. SCHWARTZ: Objection. The witness can't
14 testify as to what Exhibit T says.

15 JUDGE EILER: Sustained.

16 Q. All right. What is Exhibit T?

17 A. Exhibit T was a Metrological Timelines in
18 Traceability.

19 Q. And is it a document generally relied on by experts
20 in the four fields of science that we've been discussing to
21 determine their opinions?

22 A. Yes.

23 Q. And have you used it and relied upon it to form
24 your opinion here today?

25 A. Yes, I have.

1 MR. STEIN: Move to admit T.

2 MR. SCHWARTZ: No objection.

3 JUDGE EILER: Admitted.

4 MR. STEIN: Thank you.

5 (Exhibit T admitted into evidence.)

6 Q. Now, Dr. Emery, can you tell us whether this has
7 stated a policy or a procedure with regard to calibration?
8 I'm sorry. Not with regard to calibration, with regard to
9 when one can claim traceability.

10 A. You can claim it subsequent to calibration, not
11 prior to calibration.

12 Q. And when you talk about subsequent to calibration,
13 do you mean subsequent to a calibration that is part of an
14 unbroken chain of comparison, each stating uncertainty from
15 the end user to the NIST?

16 MR. SCHWARTZ: Objection; leading.

17 JUDGE EILER: Sustained. Rephrase.

18 Q. When you refer to calibration or a calibration, do
19 you or do you not mean, when you say calibration in that
20 context, a calibration that is part of an unbroken chain of
21 comparison, each stating uncertainty from the end user back
22 to NIST?

23 A. Yes.

24 Q. So unless and until you have that chain --

25 MR. SCHWARTZ: Actually, I'll object. The response

1 was none-responsive. It wasn't a yes or no question. The
2 question was do you mean or do you not mean, then the
3 definition.

4 MR. STEIN: It's less than clear.

5 JUDGE EILER: Sustained.

6 So reask the question. Maybe a shorter phraseology
7 would give us a better answer.

8 MR. STEIN: I should hope so.

9 JUDGE EILER: So try again.

10 Q. When you have referred just previously in your
11 testimony to calibration, are you or are you not referring
12 to a calibration which is part of an unbroken chain of
13 comparisons, each stating uncertainty from the end user to
14 NIST?

15 A. When I refer to a calibration, I refer to one that
16 satisfies traceability as an unbroken chain of comparisons
17 with uncertainties stated at every step.

18 Q. Now, we have seen in Exhibit O a calibration which
19 you have indicated appears to be an adequate calibration, in
20 your opinion, the opinions of the scientists in the fields
21 that we've been discussing and according to NIST. That
22 calibration was done on March 11, 2003, correct?

23 A. Yes.

24 Q. And I guess what I'm asking you is, if that
25 instrument that was calibrated on March 11, 2003, was used

1 to do something on March 10th of 2003, and there had been no
2 prior adequate, unbroken chain of comparisons of that
3 instrument from the end user to NIST prior to March 11, '03,
4 could that instrument on March 10th be said to be traceable
5 to standards maintained by NIST?

6 A. Strictly speaking? No.

7 Q. Very good.

8 Is that your opinion, sir?

9 A. Yes, it is.

10 Q. Do you believe that is the opinion of experts
11 amongst the four fields of science that we have been
12 discussing?

13 A. Yes.

14 Q. And do you believe that is the policy stated by
15 NIST?

16 A. Yes.

17 Q. Now, we're talking about the most close
18 association, March 10th compared to March 11th. As you go
19 back -- well, I don't think it's relevant.

20 In this case, we're talking about a measurement
21 that was done on September 22, 2001, with an instrument --
22 assume this as facts. We're talking about a measurement
23 that was done on September 22, 2001, with an instrument that
24 was first calibrated in an unbroken chain of comparisons,
25 each stating uncertainty from the end user to NIST, on

1 March 11, 2003.

2 A. Yes, you are speaking about it.

3 Q. In your opinion, is there any way to claim that the
4 instrument that did the reading on September 22, 2001, was
5 traceable to standards maintained by NIST as a result of the
6 March 11, 2003, calibration?

7 A. I do not believe it is traceable.

8 Q. Thank you.

9 Do you also believe that that is the generally
10 accepted opinion of scientists in the four fields of science
11 that we've discussed?

12 A. Yes.

13 Q. And the policy of NIST?

14 A. Yes, I do.

15 Q. Have you seen the mercury glass thermometer
16 employed with the simulator solutions that are used by the
17 Washington State Patrol?

18 A. Yes, I have.

19 Q. Are you familiar with that type of thermometer?

20 A. Mercury-in-glass, yes.

21 Q. Can you describe what type of thermometer it is?

22 A. It's a mercury encapsulated in glass. It's --

23 MR. SCHWARTZ: I'm going to object. Relevance.

24 MR. STEIN: This is actually in response to

25 testimony that --

1 JUDGE EILER: This is the thermometer that we're
2 talking about, so how can that not be relevant?

3 MR. SCHWARTZ: It isn't the one we're talking
4 about. We're talking about -- the motion has to do with the
5 digital reference thermometer, not the mercury-in-glass
6 thermometer.

7 JUDGE EILER: Except that the mercury-in-glass
8 thermometer was the one that -- was in the machine when the
9 defendant actually blew. So I'm going to find it relevant.

10 MR. SCHWARTZ: Okay.

11 JUDGE EILER: Ask your question.

12 Q. Could you describe the thermometer to us?

13 A. It's an immersion thermometer designed to be
14 submerged to a certain depth. It has a limited range, and
15 just mercury-in-glass. A typical household thermometer.
16 That's what it looks like.

17 Q. About the same size of a household thermometer?

18 A. About four or five inches tall, something like
19 that.

20 Q. When you say it's an immersion thermometer, is it a
21 particular kind of immersion thermometer?

22 A. It has a line on it indicating that it is accurate
23 when it is immersed to that line.

24 Q. In your experience in observing that partial
25 immersion thermometer employed by the Washington State

1 Patrol, did you have occasion to see more than one of them
2 in various simulators?

3 A. Yes, I did.

4 Q. Were they immersed to the immersion line when you
5 observed them?

6 MR. SCHWARTZ: Objection; relevance. What does the
7 immersion line have to do with any of this to NIST or
8 otherwise?

9 MR. STEIN: Your Honor, I'm just going at one point
10 that I believe it was Dr. Logan or Sergeant Goldberg
11 testified to with regard to this being a specialty
12 thermometer.

13 JUDGE EILER: Well, then, why don't you ask about
14 that? Asking about if all of them that he saw were immersed
15 up to the line doesn't get us there. So figure out what
16 your end result is and ask that question.

17 Sustained.

18 Ask a new question.

19 Q. Is there any reason that the mercury-in-glass
20 thermometer employed by the Washington State Patrol cannot
21 be calibrated to standards maintained by NIST?

22 A. No.

23 Q. Is that your personal opinion?

24 A. Anything can be calibrated, and anything can be
25 traceable.

1 MR. STEIN: I'm done, Your Honor. Thank you.

2 JUDGE EILER: Counsel, do you -- I believe you have
3 some questions.

4 MR. SCHWARTZ: One or two, Your Honor.

5

6 C-R-O-S-S E-X-A-M-I-N-A-T-I-O-N

7 BY MR. SCHWARTZ:

8 Q. Dr. Emery, good afternoon.

9 JUDGE EILER: Well, you're jumping the gun.

10 Q. I'm sorry. Good morning, rather.

11 A. Thank you.

12 Q. Initially, I want to ask you some questions,
13 Dr. Emery, about your background.

14 A. Yes.

15 Q. Now, you are -- by training and by what you
16 actually do as a vocation, you are a mechanical engineer?

17 A. Yes, I am.

18 Q. Are you -- would you consider yourself to be a
19 chemist?

20 A. No.

21 Q. You are a doctor, that is, you have obtained a
22 Ph.D., correct?

23 A. That is correct.

24 Q. You're not a physician?

25 A. That is correct.

1 Q. Do you have any formal medical training beyond the
2 testimony in terms of the bioengineering?

3 A. No.

4 Q. And you've previously stated you are not a
5 toxicologist.

6 A. That is correct.

7 Q. You have no formal training in that specialty
8 science, as well.

9 A. That's correct.

10 Q. Would you agree that all three of those general
11 subject areas are subjects that are under the heading of
12 metrology?

13 A. Metrology is a science of measurement.

14 Q. Right. Let me rephrase the question. I apologize.
15 Would you agree that all three of those sciences
16 use metrology?

17 A. Yes.

18 Q. But you can't testify to this Court that you know
19 what the general opinion on any issue is --

20 MR. STEIN: Objection. Calls for a legal opinion.

21 JUDGE EILER: I don't think we got there. You're a
22 little premature. Wait till he gets to the end of the
23 question and see if it calls for a legal opinion.

24 Q. Can you testify to this Court with regard -- you
25 testified at great length about certain definitions used in

1 the four subject areas: metrology, thermometry, mechanical
2 engineering and bioengineering, I think was the fourth one.

3 A. Yes.

4 Q. You can't say -- your answers would not necessarily
5 be the same for, for example, chemistry, toxicology and
6 medicine.

7 MR. STEIN: Objection. It's beyond the --
8 objection. Not competent to testify as to whether it is to
9 be the same or not, by the Court's own ruling.

10 JUDGE EILER: Well, I think that if he isn't
11 competent, he could, in fact, answer the question by saying
12 no.

13 So overruled.

14 MR. STEIN: Well, it also calls for a legal
15 opinion. It's --

16 JUDGE EILER: Well, I don't think that chemistry,
17 medical education and toxicology calls for a legal question.

18 MR. STEIN: You're asking him whether he can form
19 an opinion in those areas, and the formation of the opinion
20 is --

21 I'll withdraw the objection, Your Honor.

22 JUDGE EILER: Answer the question.

23 A. Are you asking me if I can form an accurate and
24 precise opinion or can I form an opinion? I can form an
25 opinion, yes.

1 Q. Fair enough.

2 Would you have the same bases that you form your
3 opinions with regard to the other four areas?

4 A. In the sense that they use standard techniques for
5 measurements, I would believe that my opinion would be valid
6 regarding them.

7 Q. But you have had no contact with people in those
8 fields to discuss your opinions.

9 A. Oh, I have contacted and talked to chemists about
10 the measurements that they make, yes.

11 Q. Now, you have indicated that there is one
12 definition accepted universally, at least within the four
13 sciences that you have discussed with Mr. Stein, with regard
14 to traceable, in general, and traceability to NIST as an
15 extended portion of that word; is that true?

16 A. That's true.

17 THE CLERK: State Exhibit V as in Victor marked for
18 ID.

19 MR. STEIN: I'm sorry. This is what you gave us
20 this morning?

21 MR. SCHWARTZ: Correct.

22 Q. Dr. Emery, I'm showing you what has been marked as
23 State's Exhibit V for identification purposes.

24 MR. STEIN: I'm sorry, Michael. You gave me two
25 things. I don't know which you're referring to. Okay.

1 Q. Dr. Emery, can you identify what this item is?

2 A. Yes, I can.

3 Q. And what is this item?

4 A. It's an article entitled "Quality Assurance for
5 Environmental Analysis."

6 Q. And does -- can you tell from the title page from
7 what text this comes from?

8 A. This comes from a journal entitled Techniques and
9 Instrumentation in Analytical Chemistry.

10 Q. And can you tell just by looking at the stapled
11 portion whether or not this is the entire section of the
12 article, or does it appear to be -- or does it appear to be
13 the whole article?

14 A. No, it does not.

15 Q. Okay. Looking at page 3, which is the second page
16 of the staple, in Section 1.14, what is that section?

17 A. It's entitled "Use of Certified Reference
18 Materials."

19 Q. And doesn't it say that, "By definition,
20 traceability of a measurement is achieved by an unbroken
21 chain of calibrations connecting the measurement process to
22 the fundamental units"?

23 MR. STEIN: Objection; relevance, foundation,
24 hearsay, improper cross-examination. There is no --

25 JUDGE EILER: Counsel, we're talking about an

1 unadmitted document. So I don't think he can testify to
2 what's in it. He can testify as to foundational materials,
3 but you've just asked him essentially a core question about
4 the document that's at this point not admitted.

5 JUDGE SCHWARTZ: I'll rephrase the question. Thank
6 you, Your Honor.

7 Q. Dr. Emery, is it fair to say that there are other
8 definitions of traceability, more limited than the one that
9 you say is universally accepted?

10 MR. STEIN: Objection; relevance.

11 JUDGE EILER: Counsel?

12 MR. SCHWARTZ: Well, Your Honor, I'm not sure how
13 more relevant it can be. Mr. Stein spent multiple hours
14 talking about the ultimate, only definition of traceability.
15 I think I'm entitled on cross-examination to examine several
16 other definitions of traceability.

17 MR. STEIN: Your Honor, there's a definition of
18 traceability within the law of real property title. There's
19 a definition of traceability that my son uses when he does a
20 maze on a piece of paper. It's completely irrelevant,
21 unless counsel is prepared to establish that there is some
22 scientific relevance within the fields that we're dealing
23 here.

24 JUDGE EILER: I think the core issue before us is
25 what is traceability. So I think a proper question on

1 cross-examination is to ask about other possible
2 definitions. And I think that's the only place that this
3 question has gone. So if he gets into the traceability of a
4 maze for your son, you'll be raising the objection and we'll
5 be sustaining it. But at this point, you're premature.

6 MR. STEIN: Then I'm going to object as it calls
7 for speculation.

8 JUDGE EILER: Ask your question.

9 Q. Are there other definitions of traceability?

10 MR. STEIN: Your Honor, it's not a relevant
11 question unless we're talking about traceability to a
12 standard. Traceability, as Mr. Schwartz has asked the
13 question, is much too broad. Clearly the witness is
14 dumfounded by the breadth of the question, and it's not
15 relevant to our inquiry unless we're talking about some sort
16 of traceability.

17 MR. SCHWARTZ: I'll rephrase the question. I'll
18 rephrase the question.

19 Q. In science, Dr. Emery, are there other definitions
20 of traceability?

21 A. In that part of science referring to measurements,
22 no.

23 Q. Well, didn't we already satisfy -- you testified
24 that chemistry, for example, uses measurements.

25 A. For the purpose of measuring, yes, traceability

1 means what I previously defined it. But --

2 Q. But you're not a chemist.

3 A. I'm not a chemist.

4 Q. So you couldn't testify as to what a chemist
5 believes is traceable.

6 MR. STEIN: Asked and answered.

7 JUDGE EILER: I don't think he's asked this
8 question.

9 Overruled.

10 A. I could testify as to what I believe a chemists
11 believes when we talk about making a measurement of
12 temperature, length or so. I could not testify as to what
13 he means in other aspects of his work, if he's talking about
14 titration or so.

15 Q. But, in fact, Doctor, are you saying that you would
16 know -- you know what the accepted view of a science that
17 you are not qualified in --

18 MR. STEIN: Objection as to form.

19 JUDGE EILER: I'm going to sustain it.

20 MR. SCHWARTZ: I'll rephrase it. I'll rephrase it.

21 Q. Would you disagree with the following statement:
22 In chemistry, they may use the following definition of
23 traceability.

24 MR. STEIN: Objection; calls for speculation.

25 MR. SCHWARTZ: I asked him if he disagrees with

1 this statement, that they may use.

2 JUDGE EILER: I think he gets to ask his question.

3 Overruled.

4 Q. -- that traceability of a measurement is achieved
5 be unbroken chain of calibrations connecting the measurement
6 process to the fundamental units.

7 A. I would have to ask what you mean by calibrations.

8 Q. Okay. Fair enough.

9 That definition that I've given you, does it say
10 anything about uncertainties?

11 A. That definition you've given me does not say
12 anything about uncertainty.

13 THE CLERK: Plaintiff's Exhibit W marked for ID.

14 Q. Dr. Emery, I'm showing you what's been marked as
15 Plaintiff's Exhibit W. Do you recognize that? Well, can
16 you identify that item?

17 A. Yes, I can.

18 Q. And what is that item?

19 A. It's Chapter 2, Calibration, Traceability, and
20 Standards.

21 MR. STEIN: May I voir dire?

22 JUDGE EILER: You may.

23

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V-O-I-R D-I-R-E

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BY MR. STEIN:

Q. Dr. Emery, does it have an author?

A. It has an author: David R. Workman.

Q. Does it state the author's credentials?

A. Simply that he's a consultant.

MR. STEIN: Thank you. No further voir dire.

C-R-O-S-S E-X-A-M-I-N-A-T-I-O-N (cont'd)

BY MR. SCHWARTZ:

Q. Dr. Emery, another hypothetical, and you can follow along in this document if you'd like. Is it possible that another definition of traceability within the scientific community could be that "traceability is the ability to relate individual measurement results through an unbroken chain of calibrations to one or more of the following: U.S. Technical -- I'm sorry -- U.S. National Standards that are maintained by the National Institute of Standards and Technology "NIST and the U.S. Naval Observatory"? Is that a possible definition of --

MR. STEIN: Objection. Calls for speculation, irrelevant, improper cross-examination and assumes facts not in evidence, relying on hearsay.

JUDGE EILER: Well, this is a hypothetical.

MR. STEIN: It is.