

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE

MIDWEST ENERGY EMISSIONS CORP.
and MES INC.,

Plaintiffs,

v. CIV. No. 1:19-cv-01334-CJB
ARTHUR J. GALLAGHER & CO., ET AL.,
Defendants.

VIDEOTAPED DEPOSITION OF
PHILIP J. O'KEEFE, P.E.
VOLUME 1

DATE: March 2, 2023
TIME: 9:14 a.m.
PLACE: Express Suites
Riverport Conference and Event Center
900 Bruski Drive
Winona, MN 55987

JOB NO.: NY 5775855

REPORTED BY: Dawn Workman Bounds, CSR

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(Original exhibits attached to original transcript;
copies to counsel as requested. Previously marked
exhibits referenced not attached.)

REPORTER'S NOTE: All quotations from exhibits are
reflected in the manner in which they were read into the
record and do not necessarily indicate an exact quote
from the document.

P R O C E E D I N G S

THE VIDEOGRAPHER: Good morning. We're going on the record at 9:14 a.m. on March 2, 2023. Please note the microphones are sensitive and may pick up whispering and private conversation. Please mute your phones at this time. Audio and video recording will continue to take place unless all parties agree to go off the record.

This is media unit 1 of the video-recorded deposition of Philip O'Keefe taken by counsel for the defendants in the matter of Midwest Energy Emissions Corporation and MES, Incorporated versus Arthur Gallagher & Company, et al., filed in United States District Court for the District of Delaware, Case No. 119-01-334.

This deposition is located in Winona, Minnesota.

My name is Dave Young. I'm the videographer. Our court reporter is Dawn Bounds. We're both representing Veritext Legal Solutions. I am not related to any party in this action, nor am I financially interested in the outcome.

If there are any objections to this proceeding, please state them at the time of your appearance.

Will counsel now state their appearances

1 and affiliations for the record beginning with the
2 noticing attorney.

3 DR. GLANDORF: My name is David Glandorf,
4 and I'm here with my colleague Ina Kosova. And also on
5 the line is Joe Evall. We're with Gibson Dunn
6 representing the defendants -- the -- I'm sorry. We are
7 here representing the Gallagher and DTE defendants.

8 MR. DYESS: Jeff Dyess with the Bradley
9 Arant firm. Also on the line are Paul Sykes and Benn
10 Wilson, the same firm. We represent the parties that are
11 referred to as the CERT Defendants, C-E-R-T.

12 MR. NEMUNAITIS: And Justin Nemunaitis.
13 I'm with Caldwell Cassady & Curry representing the
14 plaintiffs.

15 THE VIDEOGRAPHER: And will the court
16 reporter please swear in the witness, and then we can
17 proceed.

18 PHILIP J. O'KEEFE, P.E.,
19 having been first duly sworn, testified as follows:

20 EXAMINATION

21 BY DR. GLANDORF:

22 Q. Good morning.

23 A. Good morning.

24 Q. Mr. O'Keefe, could you please state your full
25 name for the record.

1 A. My name is Philip J. O'Keefe.

2 Q. And what is your current address?

3 A. 2008 North Clinton Drive, and it's Winona,
4 Minnesota 55987.

5 Q. You were serving as an expert witness for the
6 plaintiffs in this case; is that correct?

7 A. Correct.

8 Q. Have you served as an expert witness in
9 previous cases?

10 A. Yes.

11 Q. Roughly how many cases?

12 A. I don't know.

13 Q. Do you know how many times you've been deposed
14 as an expert witness?

15 A. Over 25.

16 Q. Over 25. Okay.

17 Well, then I'll keep my instructions
18 brief.

19 As you know, I'll be asking you questions
20 today on behalf of my clients, and it's your job to be
21 here and answer my questions to the best of your ability.
22 Do you understand that?

23 A. Yes.

24 Q. Are you on any medications or is there any
25 reason why you won't be able to provide full, truthful

1 testimony today?

2 A. No.

3 Q. Because the court reporter is here recording
4 our words, I would ask that you let me ask my full
5 question. Your counsel will have an opportunity to
6 object, and then you can give me your full answer. Do
7 you understand that?

8 A. I understand.

9 Q. If you are unclear in any way about my
10 question, will you ask me to clarify?

11 A. Yes.

12 Q. And if at any point you realize one of your
13 previous answers was incomplete or incorrect, please just
14 let me know and I'll give you an opportunity to correct
15 that. Is that okay?

16 A. Sure.

17 Q. Are you currently employed?

18 A. I am self-employed.

19 Q. And can you please explain that
20 self-employment.

21 A. I work as a professional expert witness.

22 Q. And is that in connection with a company?

23 A. Yes.

24 Q. What is the name of that company?

25 A. EngineeringExpert.net, LLC.

1 Q. How long have you worked with
2 EngineeringExpert.net, LLC?

3 A. Over 20 years.

4 Q. Is it your own company?

5 A. Yes.

6 Q. Do you have any other employees currently?

7 A. No.

8 Q. Have you ever had any other employees?

9 A. No.

10 Q. What services do you offer through
11 EngineeringExpert?

12 A. Expert witness services, engineering. It's all
13 engineering. Also litigation support, and I also do
14 intellectual property research.

15 Q. What would you describe as your area of
16 expertise?

17 A. Mechanical and electrical engineering.

18 Q. Any other areas?

19 A. No.

20 Q. Within mechanical and electrical engineering,
21 do you have any focuses?

22 A. General. No focus.

23 Q. If I could, I'd like to walk through a little
24 bit of your education starting with post high school.

25 Where did you go to school after high

1 school?

2 A. I went to the Illinois Institute of Technology.

3 Q. And where is that located?

4 A. In Chicago.

5 Q. And what degree did you get from that
6 institute?

7 A. A bachelor of science in mechanical
8 engineering.

9 Q. Is that a four-year degree?

10 A. Yes.

11 Q. Did you have any particular -- did you have a
12 minor?

13 A. No.

14 Q. Did you have any particular area of focus,
15 again within mechanical engineering, that you studied
16 there?

17 A. No.

18 Q. Did that work involve a dissertation?

19 A. No.

20 Q. And we'll come back to that in a little bit.

21 And then, have you attended any other
22 schooling after the Illinois Institute of Technology?

23 A. Well, I was employed after I graduated from
24 engineering school by Commonwealth Edison and I attended
25 several training programs there.

1 Q. Okay. What year did you start with
2 Commonwealth Edison?

3 A. 1981.

4 Q. Is that the same year you graduated?

5 A. Yes.

6 Q. And what -- so if you could, could you explain
7 us to -- could you explain a little bit about what those
8 training programs were?

9 A. They were a wide variety of programs. Mainly
10 management training, to classes. I had to take a test
11 construction class on how to write exams and tests.
12 Also, from what I can remember, pollution control, all
13 that sort of thing, combustion control, anything that a
14 power plant engineer would have to know.

15 Q. Did they provide you with any written materials
16 at these training sessions?

17 A. I think so.

18 Q. Do you know if you have any of those written
19 materials still?

20 A. I don't think so.

21 Q. Were any of those training sessions focused on
22 chemistry?

23 A. Yes.

24 Q. Which ones?

25 A. Steam and mechanical fundamentals.

1 Q. And so what chemi -- what aspects did you learn
2 through steam and mechanical fundamentals?

3 A. Mainly water chemistry.

4 Q. What's the role of water at a power plant?

5 A. Well, it has to be purified. We -- the power
6 plant that I worked at drew water in from the lake, Lake
7 Michigan. And that water has a lot of dissolved solids
8 in it and contaminants, seaweed, that sort of thing. So
9 it has to be filtered with sand filters. And then it
10 goes through a -- what we call a demineralizer. And the
11 demineralizer -- the best analogy would be the water
12 softener in your house, except instead of using salt to
13 charge the elements inside, it uses acids and bases.

14 So you have a cation and anion in each.
15 The ionic charge is to attract the impurities out of the
16 water. And then the clean water is sent on to the boiler
17 and put in the boiler itself.

18 Q. Did you ever -- I'm sorry.

19 So at the power plant, did you ever have a
20 role in that water purification process?

21 A. Yes.

22 Q. So you operated the water purifying system; is
23 that correct?

24 A. Well, I had to take samples and analyze samples
25 from the boiler water and determine how well the

1 demineralizer and sand filters were working.

2 Q. Did you have any role in designing that water
3 purification system?

4 A. Some of it, yes.

5 Q. What aspect of it?

6 A. Some of the piping.

7 Q. Going back to those courses, were there any
8 other courses that you took there at Commonwealth Edison
9 that involved chemistry?

10 A. I can't remember.

11 Q. You mentioned, I believe, a pollution control
12 course; is that correct?

13 A. Yes.

14 Q. Can you tell me what was the subject of that
15 course?

16 A. Well, how electrostatic precipitators work.

17 Q. What pollutants would be encompassed in that
18 course?

19 A. Fly ash.

20 Q. Fly ash?

21 A. Yes.

22 Q. But let me ask it another way.

23 Are there chemical species that are
24 considered pollutants that you would be studying there?

25 A. We just focused on fly ash.

1 Q. Did you focus on the composition of fly ash?

2 A. No.

3 Q. Did you foc -- were you learning more then
4 about the ways to dispose of fly ash?

5 A. Well, the mechanisms of taking the fly ash out
6 of the flue gases.

7 Q. And that was done at your plant using an
8 electrostatic precipitator?

9 A. Correct.

10 Q. Is it okay if we call that an ESP?

11 A. Yes.

12 Q. And so it's the role of the ESP to take fly ash
13 particulates out of the gas stream; is that fair?

14 A. At the plant I worked at, yes.

15 Q. And what was your role with that ESP?

16 A. Well, I had to do -- we call them tech staff
17 procedures. They were tests that we had run on different
18 parts of the power plant, different pieces of equipment.
19 And one of them included the ESP. And we had to check
20 wrappers and vibrators that actually shake the particles
21 of fly ash off the internal components of the
22 precipitators. And it drops into ash hoppers where it's
23 disposed of.

24 Q. Sorry. You've mentioned something that, again,
25 I just want to make sure I understand. Tech stand

1 proced -- stand?

2 A. Tech staff.

3 Q. Okay. Staff.

4 A. Staff.

5 Q. Okay. Gotcha.

6 So these are procedures followed by the
7 power plant staff?

8 A. Yes, and they're based on ASME standards.

9 Q. When you were doing that work did you have an
10 understanding of the chemistry of the fly ash?

11 A. I can't recall.

12 Q. Sitting here today, do you have an
13 understanding of the chemistry of the fly ash?

14 A. Somewhat, yes.

15 Q. What is the fly ash composed of?

16 A. Well, it's composed of a lot of things. It's
17 composed of uncombustible material that's in coal and
18 fuel. It can have carbon in it that is not fully
19 combusted. It can have impurities like sulphur and
20 mercury and all kinds of other things.

21 Q. And do you -- your understanding of the
22 chemistry of the fly ash that you just told me, did you
23 learn that in context with this cases or did you have an
24 understanding of that prior to this case?

25 A. Well, I can't really remember details of long

1 ago when I started with ComEd.

2 Yes, I learned a lot on this case.

3 Q. Going back - I just want to make sure I
4 understand - were there any other courses that you took
5 at -- you call it -- I'm sorry. You call it ComEd; is
6 that --

7 A. Yes.

8 Q. Okay. Were there any other courses that you
9 took at ComEd that dealt with the chemistry involved with
10 a power plant?

11 A. No, not that I can remember.

12 Q. Okay. Have you taken any other academic
13 coursework after the Illinois Institute of Technology?

14 A. Yes, I was going to Iowa State University. I
15 was working on a masters in electrical engineering, and I
16 got halfway through the program. Then I quit.

17 Q. What year was that?

18 A. That was about five or six years ago.

19 Q. You started five or six years ago or you
20 stopped?

21 A. No, I started about 10 years ago.

22 Q. Okay. And you stopped about five or six years
23 ago?

24 A. Yeah.

25 Q. Okay. Was there a -- did you have a particular

1 subject matter of research during that time at Iowa
2 State?

3 A. General electrical engineering classes.

4 Q. Did you take any chemistry classes at Iowa
5 State?

6 A. No.

7 Q. Let's go back to your time at the Illinois
8 Institute of Technology. Did you take any chemistry
9 courses there?

10 A. Yeah.

11 Q. What chemistry courses did you take there?

12 A. I took organic chemistry and also atomic
13 chemistry classes. I took a year's worth of chemistry
14 classes total.

15 Q. So two semesters -- are those two different --
16 so one semester of organic and one semester of atomic
17 chemistry; is that correct?

18 A. Yes.

19 Q. What is the subject matter of atomic chemistry?

20 A. Well, you're looking at, you know, how
21 chemicals bond with each other - ionic bondings, the
22 van der Waals forces, that sort of thing.

23 Q. Is it a -- is that a -- would you call that a
24 general chemistry class?

25 A. Well, they were both general classes, the

1 organic and the atomic chemistry classes.

2 Q. Was atomic chemistry first; do you recall?

3 A. I think I took that first, yes.

4 Q. Would you call that the intro chemistry class?

5 A. No. They actually had me take an advanced
6 course first and then take the basic course in organic
7 chemistries afterwards.

8 Q. I see. So you took the atomic course first?

9 A. Yes. Don't ask me why --

10 Q. Okay.

11 A. -- they gave me the more difficult stuff first,
12 but that's what they did.

13 Q. And so to go back into it again, you said it
14 taught you aspects of chemical bonding and, you know,
15 different charge forces, ionic forces; is that correct?

16 A. Yes.

17 Q. Okay. What year -- did you take that in your
18 freshman year?

19 A. Yeah. I think that was 1976, '77.

20 Q. And then have you -- did you take any chemistry
21 courses after those two?

22 A. Like I said, just after I got a job as an
23 engineering test technician in Commonwealth Edison's
24 power plant.

25 Q. And those chemistry courses are the ones that

1 we spoke about earlier; is that correct?

2 A. Yes. Yes.

3 Q. Is there any other schooling that you've had
4 aside from what we've talked about here today?

5 A. Not that I can recall.

6 Q. No other courses you took in conjunction with
7 any of your employments; is that correct?

8 A. I'm sorry. I didn't understand.

9 Q. Yeah, let me ask that again.

10 Were there any other courses that you took
11 in connection with any other employment that you had?

12 A. You mean courses in general or --

13 Q. Yeah, training courses that you had for
14 different -- you know, let's go through. I want to go
15 through a little bit of your job history, and maybe that
16 will help answer the questions.

17 A. Okay.

18 Q. Let's do that.

19 How long did you work at ComEd?

20 A. Almost 14 years.

21 Q. So starting in '86; is that correct?

22 A. '81.

23 Q. Thank you.

24 Starting in '81?

25 A. Yes.

1 Q. And then ending in?

2 A. '95.

3 Q. '95. So you left there in '95.

4 And were you -- during that time were you
5 at -- located at a particular power plant?

6 A. Well, part of the time. The first three
7 years I believe I was at State Line station, which is in
8 Hammond, Indiana.

9 Q. What part of the state is that in?

10 A. It's right across the border from Chicago.
11 It's in northwest Indiana.

12 Q. Okay. Where did you go after the three years
13 you had in Hammond?

14 A. I was asked to go to the production training
15 center, which is in Braidwood, Illinois. And there I was
16 technical training coordinator for all the power plants
17 throughout the ComEd system.

18 Q. Is there a power plant located there?

19 A. No. Well, there was. It's a nuclear plant.
20 I didn't have anything to do with that. I was just
21 involved in the fossil plants, coal fire plants and oil
22 fire.

23 Q. And what subject matters were you the technical
24 training coordinator for?

25 A. Anything that had to do with running tests in a

1 power plant.

2 Q. Can you give me an example of the type of tests
3 that would be?

4 A. Well, like I mentioned the tech staff
5 procedures, I had trained engineers on that. You know, I
6 had subject matter experts come in, present training
7 seminars on boiler control and that sort of thing, you
8 know, nice -- nice-to-know subject matter, not
9 necessarily involved in testing. And then I also had to
10 work on a fossil training simulator. I had to model the
11 combustion process in a coal fire power plant, and both
12 pulverized coal and cyclone furnaces. And I had to model
13 steam turbine on all the equipment that went with both
14 the turbine and boiler and the generator. So it was a
15 simulator that basically emulated what we had in fossil
16 plants.

17 Q. Let's go back a little bit. You said that on
18 the training seminars there were some that you brought in
19 someone else to teach; is that correct?

20 A. Yes.

21 Q. And are there some that you taught yourself?

22 A. Yes.

23 Q. Let's start with the ones you taught yourself.
24 So, again, what are all the subjects that you would have
25 taught?

1 A. I can't remember.

2 Q. Can you give me an example?

3 A. It had to do with tech staff procedures,
4 testing equipment in the plants. I had to teach a class
5 on steam and mechanical fundamentals, how the power
6 plants operate. And that's all I can remember at this
7 point.

8 I think I had to teach a class on
9 transformers too.

10 Q. Okay.

11 A. Electrical transformers.

12 Q. So there were some electrical engineering
13 involved in this; is that correct?

14 A. Yes.

15 Q. Would you say the majority was electrical or
16 mechanical?

17 A. Mechanical.

18 Q. Mostly mechanical?

19 A. Yes.

20 Q. Okay. And how long would these classes
21 typically take? Is this a --

22 A. A day or two.

23 Q. And who were the students?

24 A. The tech staff engineers in the different power
25 plants.

1 Q. And did any of those seminars that you taught
2 deal with measuring the concentration or the level of
3 different pollutants?

4 A. No.

5 THE WITNESS: You know, it's really hot in
6 here. The temperature hasn't come down.

7 DR. GLANDORF: Let's take a moment and see
8 what we can do with that.

9 THE VIDEOGRAPHER: We are going off the
10 record. The time now is 9:36.

11 (Recess 9:36-9:46.)

12 THE VIDEOGRAPHER: We are back on the
13 record. The time now is 9:46.

14 BY DR. GLANDORF:

15 Q. So going back to these courses that we were
16 discussing before the break. Did any of these courses
17 that you taught have to do with emission control?

18 A. No.

19 Q. Did any of the courses that any of the
20 instructors you brought in have to do with emission
21 control?

22 A. Yes.

23 Q. What courses were those?

24 A. Audit course on electrostatic precipitators.

25 THE REPORTER: Can you repeat what you

1 just said.

2 A. Electrostatic precipitators, ESPs.

3 Q. Did any of the courses taught by you or others
4 have to do with control of the amount of mercury emitted
5 from the plant?

6 A. No.

7 Q. Did any aspect of your time at ComEd have to do
8 with the control of the amount of mercury emitted from
9 the plant?

10 A. No.

11 Q. Did -- so to go back. There was only one
12 particular power plant that you physically worked at; is
13 that correct?

14 A. It's not correct. We didn't get that far into
15 my work history. So I can talk more about that.

16 Q. Okay. Great. Well, let's do that.

17 So at some point, then, were you employed
18 at another plant?

19 A. No. Well, sort of. I had different projects.
20 I worked -- from the production training center I was
21 transferred to the engineering department downtown. They
22 had a general office building downtown. And I used to
23 work on projects at all of the power plants.

24 Q. I see. So you --

25 A. All the fossil plants, the coal-fired plants.

1 Q. So you were stationed, for lack of a better
2 term, you said downtown -- I'm sorry, what -- downtown
3 Chicago?

4 A. Yes.

5 Q. But then you were sent to various power plants
6 to work there?

7 A. Yes.

8 Q. How long would you typically spend in a power
9 plant when you visited.

10 A. Anywhere from a couple of days to a couple of
11 months.

12 Q. Were you ever at a power plant for longer than
13 a couple months?

14 A. Not that I can recall.

15 Q. And what type of projects would you work on
16 at -- when you were sent to the power plants?

17 A. Well, mainly I worked on flame scanners, which
18 look at the fireball when you burn coal, pulverized coal
19 or cyclone furnace. You produce a fireball, and a flame
20 scanner would analyze the frequency of the combustion and
21 also the color of the flame to determine if the operators
22 were firing correctly.

23 Q. Is the goal there to ensure that the combustion
24 is going efficiently?

25 A. Yes.

1 Q. And by efficiently, does that mean burning as
2 much of the carbon as possible?

3 A. Yes.

4 Q. Did that work on the flame scanners ever
5 involve analyzing the components in that fireball, for
6 lack of a better term?

7 A. What do you mean by that?

8 Q. Did the flame scanner ever involve determining
9 the level of different chemical species present?

10 A. No.

11 Q. Were any of your visits to these other power
12 plants for the purposes of working on the emission
13 control systems?

14 A. No.

15 But I'm not finished yet talking about my
16 projects that I work on.

17 Q. Okay. Well, let's take it one at a time here.

18 So none of your visits -- you didn't visit
19 any power plants for the purposes of working on emission
20 control; do I --

21 A. No.

22 Q. -- have that correct?

23 A. That's correct.

24 Q. Okay. So roughly what time period were you
25 stationed in Chicago and working with these other power

1 plants?

2 A. From about 1986 until 1994.

3 Q. Okay. And then where did you go in 1994?

4 A. Well, I'm not done talking about all the
5 projects I worked on.

6 Q. That's fine. I'll go back to that. But I just
7 want to cabin this.

8 Where did you go in 1994?

9 A. I worked in the combustion turbine division.
10 So I was put in charge of overhauling two combustion
11 turbines.

12 Q. Okay. And -- again, that was -- what company
13 was that for?

14 A. Commonwealth Edison.

15 Q. Okay. Well, let's go back into that 1986 to
16 '94 aspect.

17 So what were some of the other projects
18 you worked on?

19 Combustion control systems that were based
20 on Westinghouse WDPF and Bailey Infi 90 distributed
21 control systems. So these were basically mainframe
22 computers that were installed to automate the old
23 pneumatic and electropneumatic controls in the power
24 plants to deal with combustion control. So I had to
25 design the integrated combustion control and burner

1 management systems in the power plants. And that was
2 both on cyclone and pulverized coal furnaces.

3 Q. Would you describe that as electrical
4 engineering work?

5 A. Some of it was, but some of it was mechanical.

6 Q. And when you say combustion control, do you
7 mean again -- is the focus there on, again, the
8 efficiency of the combustion?

9 A. Well, the air and the fuel mixtures to burn
10 properly, efficiently.

11 Q. Is any portion of that combustion control
12 focused on what happens to the combustion products?

13 A. Well, I had to ensure that the operators
14 weren't burning the coal dangerously; in other words,
15 that they weren't working on producing a boiler
16 explosion.

17 Q. When you say dangerously, you're not talking
18 about pollution there? You mean --

19 A. I'm talking about explosion of fuel.

20 Q. Right. Is any portion of that combustion
21 control work focused on pollution?

22 A. I think opacity factored in, which was the
23 measure of the particulate matter going up the stack.
24 But that was the extent of it.

25 Q. Were there any other projects in this window,

1 yeah, where you were headquartered in Chicago?

2 A. Well, I had to work on some smaller industrial
3 control projects using programmable logic controllers,
4 PLCs, and, you know, controlling things like water
5 treatment, you know, auxiliary equipment.

6 Q. And when -- was this -- when you say working on
7 programmable logic controllers, do you mean you were
8 doing computer programming?

9 A. Some programming, yes.

10 Q. What language were you using programming it?

11 A. Well, they had ladder logic that was used, you
12 know, to simulate hardwired relay logic. But it was on a
13 computer, so you used symbols to represent contacts for
14 relays and coils for relays and that sort of thing.

15 Q. Were you also doing design of, you know, the
16 physical instrumentation?

17 A. Yes.

18 Q. What would be an example of that?

19 A. Like meters to, you know, indicate the amperage
20 draw of equipment, and that sort of thing.

21 Q. And again, none of this work was related to
22 emission control?

23 A. No.

24 Q. I'm sorry. I asked a bad question. Let me
25 just ask it again just to make sure we're clear.

1 Was any of that work related to emission
2 control?

3 A. No.

4 Q. To go back to your time, then, from '94 to '95,
5 where were you located at that time?

6 A. I worked in the combustion turbine group.

7 Q. And where physically was that?

8 A. It was in the general offices.

9 Q. In Chicago?

10 A. Yeah, I moved like a floor down from where I
11 was at.

12 Q. And was that work directed toward a particular
13 power plant?

14 A. Well, a generating site which had combustion
15 turbines in it. So I guess it could be called a power
16 plant. It produced power.

17 Q. Where was that site?

18 A. It was in Bloom near Chicago Heights.

19 Q. Did that site have any emission control
20 systems?

21 A. Not that I can remember.

22 I basically had to take two combustion
23 turbines, which are basically Jetta engines. They're
24 affixed to the ground. But instead of propelling an
25 airplane forward, they turn a generator. And they had

1 not been used for about 30 years, so I had to recondition
2 them and get them operating again.

3 Q. Going back to the first plant you started at
4 when you started your career. Did that plant have an
5 emission control system?

6 A. Yes.

7 Q. What system did it have?

8 A. It had electrostatic precipitators, ESPs.

9 Q. Anything else?

10 A. Well, that -- on the water we had a wastewater
11 system. In other words, we would sluice ash and slag out
12 of the furnaces; and it had to be treated -- like the
13 water had to be removed from it and treated before it was
14 discharged back into Lake Michigan.

15 Q. Any -- were there any other systems involved in
16 removing pollutants from the flue gas, other than the
17 ESP?

18 A. No.

19 Q. Now, the other plants that you visited, did
20 those --

21 A. Well, let me go back.

22 Q. Okay.

23 A. Some of the pollutants of fly ash would be
24 removed upstream of the ESPs by centrifugal force by
25 changing direction of the flue gas or by draining slag

1 off from where the combustion was taking place into slag
2 tanks underneath the boiler.

3 Q. They would be removed into the slag; is that
4 right?

5 A. Yes.

6 Q. Thinking about the other plants that you worked
7 with now over your career with ComEd, did any of those
8 have any emission control systems other than ESPs?

9 A. No.

10 Q. Did any of the plants you've worked at in your
11 career with ComEd have any mercury control systems?

12 A. No.

13 Q. All right. Well, let's move along then.

14 So after -- in 1995, you left ComEd; is
15 that correct?

16 A. Correct.

17 Q. At that point you left the coal-fired power
18 plant industry; is that fair?

19 A. Sort of.

20 Q. Was there other work that you did after that
21 for --

22 A. Yes.

23 Q. -- related to the coal-fire --

24 And what work was that?

25 A. I did training seminars. I taught training

1 seminars on fossil power plant operations.

2 Q. What years did you do that?

3 A. That was after the turn of the century. It
4 was -- I think it was around 2008, 2012, something like
5 that. I did it for a number of years.

6 Q. You did it between 2008 and 2012?

7 A. Yeah. Yes.

8 Q. Okay. Well, we'll come back to those I think.
9 But let's -- in the meantime, where did you go in 1995?

10 A. I went to a company called CARPS, Incorporated,
11 which is a food manufacturing company.

12 Q. And was your work there mechanical engineering?

13 A. Yes, and some electrical.

14 Q. What products did that food manufacturer make?

15 A. Primarily confectionery products, like sweet
16 rolls and Danish and ready-to-bake products. Products
17 that you couldn't just serve in and of themselves. They
18 had to be heated up in an oven by a bakery, you know,
19 either in your supermarket or your corner bakery.

20 Q. And how long were you there at that company?

21 A. I think I was just there for a little over a
22 year, like -- I don't know, like about 18 months.

23 Q. Where did you go after that?

24 A. I went to work for a company called Echo,
25 Incorporated.

1 Q. And what products, if any, does Echo make?

2 A. Echo made two-cycle, gas-driven products like
3 string trimmers and chainsaws and leaf blowers and that
4 sort of thing. They also made some electrical products
5 too, so electrically-driven products like leaf blowers
6 and that sort of thing. So I worked there after CARPS,
7 and I was in charge of development and testing.

8 Q. So new products?

9 A. Yes.

10 Q. What types of products were you involved in
11 developing and testing?

12 A. Well, expanding the product line. I worked on
13 two-cycle gas products, electrical products,
14 battery-operated products, plug-in products.

15 I was also in charge of regulatory
16 compliance. So we had to hook the engines up to
17 dynamometers and take emission sampling. And we had to
18 meet certain standards from the EPA -- the federal EPA
19 and also the California Resources Board, which is like
20 their form of the EPA.

21 Q. What -- what species were they looking for from
22 these emissions?

23 A. Well, carbon monoxide, that sort of thing.
24 Pollutants that you would get, you know, running a
25 gasoline engine.

1 Q. What are those pollutants?

2 A. I can't remember offhand.

3 Q. Carbon monoxide is one?

4 A. Carbon monoxide is one.

5 Q. Do you remember any others?

6 A. No.

7 Q. Were you focused, then, also on the efficiency
8 of the combustion in those?

9 A. Well, efficiency was tied to the emissions that
10 the engine was producing. If the engine was not running
11 efficiently, well, the emissions would go out through the
12 roof. So everything had to be just right.

13 Q. If the engine was not running efficiently, you
14 would have a high level of carbon monoxide, correct?

15 A. Correct, one pollutant.

16 Q. Yeah.

17 A. And we had to report all of the emissions that
18 we tested off the production line to the regulatory
19 agencies.

20 Q. How long were you there at Echo?

21 A. I'm going to say two year -- or -- three years.

22 Q. So you left there in roughly what year?

23 A. Well, I was there -- I was there almost four
24 years, that's right. I went to work there in 2000, I
25 think. Or wait. '90 -- '96, and I left in 2000.

1 Q. Where did you go in 2000?

2 A. I went to go work for a medical device
3 manufacturer called Fisher Industries. And I was
4 director of engineering with that company.

5 Q. And what were your responsibilities as director
6 of engineering?

7 A. New product development, regulatory compliance,
8 quality control. I wore a lot of different hats. I even
9 did product service calls, like the girls would hand me
10 the real nasty product service calls like irate customers
11 and...

12 Q. So what types of products are we talking about?

13 A. Well, we primarily manufactured X-ray film
14 processing machines, which are -- you know, are now
15 pretty much obsolete. Now that we have diagnostic
16 imaging, everything's done with computers. And, you
17 know, analog film has kind of gone the way of the
18 dinosaur. But our machine would process analog films.
19 In other words, if you broke a bone and you went to, you
20 know, your radiographer in a hospital, you know, they
21 took some X-rays, the radiographer would put the X-rays
22 in -- the exposed X-rays in the film processing machine,
23 and the machine would automatically dip into the
24 developing fluid and then into fixer fluid and into water
25 and then it would dry the film so that he could look at

1 it on the light box and diagnose your problems.

2 Q. So the result would be the physical, what we
3 call X-ray -- some kind of physical form of the X-ray?

4 A. Right. What, you know, you would see on the
5 light box, you know, when they're trying to figure out
6 what's wrong with you.

7 Q. Got it. Got it.

8 Do you recall any of the new products that
9 you worked on developing there?

10 A. Yeah. I got a patent on one of them; it was
11 called the auto tank. And that was an X-ray film
12 processing machine that did not use any kind of heat for
13 the chemical. And also did not use air blowers for the
14 drier for drying the film before it goes out of the
15 machine. So -- everybody said it couldn't be done, but I
16 did it. And I got a patent on it.

17 Q. How many patents do you have?

18 A. Just one.

19 Q. Do you know if it ever got turned into a
20 product?

21 A. Oh, yeah. Yeah, we sold the -- we sold the
22 auto tanks. That was one of the big sellers for the
23 company.

24 Q. Did you personally get any royalties?

25 A. I was supposed to get -- I was supposed to turn

1 over my patent rights to the owner of the company, and in
2 exchange he was supposed to pay me a dollar, and he never
3 paid me. And then I lost my job shortly after that.

4 Q. Do you have those patent rights still or does
5 he have those patent rights?

6 A. No, he owns everything.

7 Q. Well, he never -- oh, okay. Well, we'll set
8 that aside.

9 A. Yeah, the guy had a JD from Harvard and -- you
10 know, he was a pretty slick guy. JD in engineering, you
11 know, gypped me out of my dollar.

12 Q. Have you ever been involved in any other patent
13 filings?

14 A. Yes.

15 Q. But those never, I guess, resulted in patents;
16 is that correct?

17 A. Correct. That was with another company.

18 Q. What company was that?

19 A. That was Echo -- or, I'm sorry -- Omni
20 Engineering.

21 Q. We haven't gotten to that?

22 A. We haven't gotten there yet.

23 Q. Okay. Great.

24 What year did you leave Fisher?

25 A. That was -- I believe it was 2004.

1 Q. And where did you go in 2004?

2 A. Well, I decided to move to Minnesota and try
3 running my business -- expert witness business full time,
4 and it didn't quite work out the way I planned. And I
5 ended up taking a job at Omni Engineering, which is an
6 engineering firm here in Winona.

7 And they did contract engineering work for
8 different companies, designing their products, doing
9 industrial control system design, that sort of thing.

10 Q. How long were you at Omni?

11 A. Almost four years.

12 Q. Roughly 2004 to 2008?

13 A. Yes.

14 Q. What were some of the products that you worked
15 on there?

16 A. A wide range of things. We did a lot of air
17 conditioning testing design for Trane, Incorporated.
18 It's a big air conditioner manufacturer in La Crosse.
19 And we also did industrial control design for other
20 companies like Bay State Milling here in Winona, the big
21 milling company downtown on the river. And I also worked
22 for a lot of medical device manufacturers designing
23 medical devices. A lot of work involved doing the
24 testing equipment for testing the products when they
25 would come off the production line.

1 Q. Would you describe your work as electrical
2 engineering and mechanical engineering?

3 A. It was primarily electrical engineering.

4 Q. Was any of that work related to chemistry?

5 A. No.

6 Q. Any of that work related to chemical
7 engineering?

8 A. No.

9 Q. Then again, going back to electrical
10 engineering, was a lot of that work again, you know, for
11 computer programming control systems?

12 A. Some of it was, but some of it was circuit
13 design, wiring design.

14 Q. Was it -- did Omni ever do any projects for
15 coal-fired power plants?

16 A. No.

17 And while I was at Omni, we invented a new
18 product for Mayo Clinic. It was a -- it was called a
19 light bar, and I was one of the inventors. So we tried
20 to get a patent on that. And about as far as we got was
21 a patent application. And the owners of the company,
22 Omni Engineering, looked at how much it would cost to
23 actually prosecute the patent and pay all the fees and
24 everything else. They got cold feet and dropped the --
25 abandoned the application.

1 Q. So what was -- what is a light bar?

2 A. Well, it tells the status of the room like to
3 people out in the hallway, like whether a doctor's in
4 there or a patient's waiting. It depends on the color
5 that's displayed in the bar. The bar had multiple tiers
6 of LEDs in it. And depending on the color of each tier,
7 you know, it meant different things to the staff at Mayo.

8 Q. And then from -- at what point did you leave
9 Omni?

10 A. I'm trying to remember. I think it was 2008.

11 Q. From 2008 on, has your work primarily been with
12 your own engineering firm?

13 A. Yes.

14 Q. Your own engineering consulting firm?

15 A. Consulting firm, yes.

16 And part of that work involved putting on
17 training seminars.

18 Q. Going back to your time at ComEd - and again,
19 let's start with the first plant you were at - did it
20 have a system for injecting activated carbon?

21 A. No.

22 Q. Do you know if any of the plants you worked at
23 in your entire career with ComEd had activated carbon
24 injections?

25 A. No.

1 Q. They did not?

2 A. No.

3 Q. Have you ever worked at a plant that has
4 activated carbon injections?

5 A. No.

6 Q. Have you ever taught a seminar relating to
7 activated carbon injection systems?

8 A. No.

9 Q. Have you ever attended a seminar about
10 activated carbon injection systems?

11 A. No, I haven't.

12 Q. Sitting here today do you have an understanding
13 of activating carbon injection systems?

14 A. Yes.

15 Q. And is that understanding a result of your work
16 on this particular case?

17 A. Yes.

18 Q. Entirely so?

19 A. Yes.

20 Q. And sitting here today do you have an
21 understanding of mercury control?

22 A. Yes.

23 Q. And is that understanding entirely a result of
24 your work on this particular case?

25 A. Yes.

1 Q. Let's talk a little bit about -- you said
2 you've been deposed roughly 25 times?

3 A. At least.

4 Q. At least.

5 A. I lost track. I've been doing this for 20
6 years.

7 Q. That's a lot of depositions, yes.

8 A. Yes.

9 Q. Have you been deposed in any capacity outside
10 of the work for your engineering firm?

11 A. Yeah. I had a lawsuit against Echo,
12 Incorporated, my former -- my former employer.

13 Q. Was that patent related?

14 A. No. no.

15 Q. Okay.

16 A. No, it was a wrongful discharge lawsuit.

17 Q. All your other depositions have been in the
18 context of your work as an expert consultant; is that
19 correct?

20 A. Yes.

21 Q. Okay. You've been deposed 25 times.

22 Is it fair to assume that you've had a
23 larger number of consultancies?

24 A. You mean that where I wasn't deposed?

25 Q. Yeah.

1 A. Yeah, sure.

2 Q. Let me ask a cleaner question.

3 Roughly how many different consulting
4 projects have you worked on in your time at expert
5 consulting?

6 A. I can't even imagine. Like at least 40.

7 Q. Okay. Were all of those consulting projects
8 relating to patents?

9 A. That's the majority of my cases. They involved
10 intellectual property, trade secrets, and the rest were,
11 like, patent cases.

12 Q. Did you have any copyright cases?

13 A. Not that I can recall.

14 Q. No trademark cases?

15 A. Not that I can recall.

16 Q. Have you consulted on any product liability
17 cases?

18 A. Oh, yes.

19 Q. Would you say that you've had less product
20 liability cases than you've had patent cases?

21 A. Yes.

22 Q. Roughly how many product liability cases have
23 you had?

24 A. Oh, I don't know. At least 25.

25 Q. So a significant number but less than you've

1 had of patent cases?

2 A. Yes.

3 Q. Okay. Can you give me an example of a product
4 liability case that you worked on?

5 A. Well, one, for example, last year in a case
6 involving Segways. I was asked to inspect a fire scene,
7 and I determined that the cause of the fire was they were
8 recharging the batteries on two Segways and the batteries
9 burst into flames and burned the house down. So I
10 haven't heard anything since I did the inspection, but I
11 would assume that it led to a product liability case.

12 Q. I would assume so too.

13 A. Yeah.

14 Q. Have you had any product liability cases
15 relating to medical devices?

16 A. Yes.

17 Q. And have you done it -- had any product
18 liability cases for food?

19 A. Yes.

20 Q. Have you had any product liability cases for
21 pharmaceuticals?

22 A. No.

23 Q. Have you had any other product liability cases
24 for consumer electronics?

25 A. Yes.

1 Q. What would be an example of that?

2 A. Well, I worked for a company that was being
3 sued because they -- they made a product -- they sold a
4 product that burst into flames and it had rechargeable
5 batteries in it.

6 Q. Not the Segway case?

7 A. No. It's a real common problem.

8 Q. Okay. Have any of your other consultancy cases
9 had to -- related to coal combustion?

10 A. I don't -- I can't remember. Might have.

11 Q. You might have had other cases relating to coal
12 combustion?

13 A. I might have, yes.

14 Like the combustion control systems, I
15 think I worked on a case about 15 years ago out of
16 Phoenix. There was a company that was making Honeywell
17 Legacy distribute control systems. Those were being used
18 for combustion control projects.

19 Q. I see. And you were working on the control
20 system; is that right?

21 A. Well, I was working on -- it was a patent
22 infringement case, and Honeywell held the patents. And
23 they were suing this company for using their designs that
24 were in the patents to make these legacy products.

25 Q. And were those -- is that electrical

1 engineering work, would you describe it?

2 A. Well, some of it was, yes. Some of it was
3 industrial control.

4 Q. Did any of the work for that case involve
5 chemistry?

6 A. No.

7 Q. Did any of the work for any of your consultancy
8 cases outside of this one involve chemistry?

9 A. I don't think so, no.

10 Q. Did you represent Honeywell in that case?

11 A. Yes. Or, no, I represented the company that
12 they were suing.

13 Q. You represented the defendants --

14 A. The defendants --

15 Q. -- in that case?

16 A. -- yes.

17 Q. Were you arguing that the patents were invalid
18 in that case?

19 A. I think so.

20 Q. Were you arguing that the patents were not
21 infringed in that case?

22 A. No.

23 Q. Okay. When did you get hired for this case?

24 A. I'm going to say last summer.

25 Q. Have you done any other work for any of the

1 defendants in this case outside of this -- this work?

2 A. No.

3 Q. I'm sorry. Let me reask that question.

4 Well, let me ask a different question.

5 Scratch that. Start again.

6 Have you done any work for the plaintiffs
7 in this case outside of this work?

8 A. No.

9 THE WITNESS: Can we take a little break?

10 DR. GLANDORF: Sure, sure.

11 THE WITNESS: Would this be a good time?

12 DR. GLANDORF: Yeah.

13 THE VIDEOGRAPHER: We are going off the
14 record. The time now is 10:19.

15 (Recess 10:19-10:33.)

16 THE VIDEOGRAPHER: We are back on the
17 record. This is the start to media number 2. The time
18 is 10:33.

19 BY DR. GLANDORF:

20 Q. Mr. O'Keefe, during the break did you discuss
21 the substance of your testimony with your counsel at all?

22 A. No.

23 Q. Before the break, I believe you had mentioned
24 that you had went back during your time working at
25 ExpertEngineering and did some kind of a training with

1 power plants. Do I have that correct?

2 A. Though it's EngineeringExpert.

3 Q. EngineeringExpert. Thank you.

4 A. Okay.

5 Yes, I did power plant trainings.

6 Basically it was a seminar that I put on I think about
7 five times. And it was for employees of power-related
8 companies, so, you know, they could get a better job of,
9 you know, how their products are being used in, you know,
10 the power plant environment, you know, because none of
11 them ever worked in a power plant before.

12 Q. Was it one seminar that you gave multiple
13 times?

14 A. Yes. It was a two-day seminar.

15 Q. Okay. And it was for employees of
16 power-related companies?

17 A. Yes.

18 Q. What do you mean by power-related companies?

19 A. Well, companies that manufactured the equipment
20 used in power plants, manufactured and sold equipment,
21 so...

22 Q. What types of equipment would that be?

23 A. Oh, like pulverizers, pumps, feeders, that sort
24 of thing.

25 Q. So these weren't workers at the power plant,

1 correct?

2 A. Correct. They worked for vendors of the power
3 plants.

4 Q. And what would be an example of that type of
5 company?

6 A. Well, if the -- like I said, a company that
7 would manufacture, for example, coal pulverizers.

8 Q. Can you share with me the name of a company
9 that would be?

10 A. I can't remember.

11 Q. Okay.

12 A. I had probably about 20 or 30 students in each
13 class.

14 Q. And were these generally new employees?

15 A. No.

16 Q. So were they some of the senior employees in
17 these companies?

18 A. Yeah, it was a pretty even mix, young people,
19 old people, middle aged.

20 Q. Typically engineers?

21 A. No, no.

22 Q. What type of background would these people
23 have?

24 A. A lot of them were like in sales and marketing.

25 Q. Were any of them that was not involved in the

1 design of the --

2 A. No.

3 Q. -- the products?

4 A. No. Or not that I can remember. All I
5 remember is sales and marketing.

6 THE REPORTER: Excuse me. Can you move
7 your mic up.

8 THE WITNESS: Oh, I'm sorry.

9 THE REPORTER: Thank you.

10 DR. GLANDORF: Can we take a pause here.
11 Let's just make sure. I think there might be some
12 question of whether or not there's -- does there -- is
13 it --

14 THE REPORTER: No, it's --

15 THE VIDEOGRAPHER: We're going off the
16 record. The time now is 10:36.

17 (Off the record 10:36-10:38.)

18 THE VIDEOGRAPHER: We are back on the
19 record. The time now is 10:38.

20 BY DR. GLANDORF:

21 Q. I think you indicated that the -- the people at
22 these seminars were involved in sales and marketing for
23 these power-related companies; is that right?

24 A. That's what I seem to remember.

25 Q. Do you remember any other areas that people

1 were involved in?

2 A. No.

3 Q. Did any of these companies provide activated
4 carbon injection systems?

5 A. I don't think so. One -- one time I presented
6 the sem -- I forgot to mention -- I provided the seminar
7 to power plant employees. So it was at one electric
8 utility in Maryland. I can't remember the name of the
9 company. But it was like operating and maintenance
10 people that were in the seminar. So, yes, I taught not
11 only vendors but also power plant employees.

12 Q. Did that electric utility have an activated
13 carbon injection system?

14 A. I don't know.

15 Q. Did you -- you didn't see one?

16 A. I briefly went out in the plant, but I don't
17 remember seeing that.

18 Q. Do you recall what mercury control systems that
19 electrical utility had, if any?

20 A. I don't know. All I know is they burned
21 Colombian coal from Colombia. So they actually had to
22 bring it in by ship and offload it into railcars and dump
23 it and then they burned it. So I don't know what the
24 standards were for mercury emissions of Colombian coal,
25 but that's what they were burning, so I -- that's all I

1 know.

2 Q. Did you spend any time there learning about
3 their emission control systems?

4 A. No. I didn't learn anything. You know, I
5 basically presented a seminar based on training materials
6 that I developed.

7 Q. You were there to teach?

8 A. Right. Right.

9 Q. Did you prepare a set of slides that you would
10 use at these?

11 A. It was a PowerPoint presentation.

12 Q. Do you still have that PowerPoint presentation?

13 A. I think so.

14 Q. Do you know if it was produced in this case?

15 A. I don't think so.

16 No, it wasn't.

17 Q. Did that -- did those seminars involve
18 chemistry in any way?

19 A. Talked about water chemistry.

20 Q. And this is what we -- similar to what we
21 talked about earlier, the purity level of the water to --

22 A. Yes. And how the demineralizer worked and the
23 sand filters.

24 Q. And I'll just remind you. I know you've done a
25 lot of depositions. But I think let's make sure we kind

1 of separate our question and answer there. You could see
2 where my question was going, I get it. But this is just
3 for the court reporter.

4 A. Okay.

5 Q. Did those seminars involve any chemistry other
6 than water chemistry?

7 A. Not that I can remember, no.

8 Q. You testified that you were hired for this
9 matter last summer; is that correct?

10 A. Correct.

11 Q. Approximately how many hours have you billed
12 for your work in this case?

13 A. Oh, I can't remember offhand.

14 Q. Do you have an approximation for how much
15 you've been paid so far in this case?

16 A. Tens of thousands of dollars.

17 Q. Over a hundred thousand?

18 A. No. I wish.

19 Q. What is your billing rate in this case?

20 A. \$300 an hour.

21 Q. And do you have a separate billing rate for
22 testifying versus research or anything like that?

23 A. No.

24 Q. In connection with this case, have you visited
25 any coal-fired power plants?

1 A. No.

2 Q. Does your compensation in this case depend on
3 the outcome of this case?

4 A. No.

5 Q. And your compensation is purely in dollars per
6 hour, correct?

7 A. Right. I have a billable rate and it's \$300
8 an hour.

9 Q. There's no equity involved or any --

10 A. No.

11 Q. -- anything like that?

12 A. No.

13 Q. And your compensation does not depend on any
14 outcome in any way?

15 A. No.

16 Q. To your knowledge, have you ever visited a
17 power plant with an activated carbon injection system?

18 A. No.

19 Q. Have you ever done any study on the activated
20 carbon injection system of any particular plant?

21 A. Well, in -- with regard to this case, or
22 outside of this case?

23 Q. Well, let's start with outside of this case.

24 A. No.

25 Q. Okay. Inside of this case, though, you have

1 studied the activated carbon injection systems of the
2 plants in this case; is that correct?

3 A. Yes.

4 Q. And did you study the activated carbon
5 injection systems of any plants that are not in this
6 case?

7 A. No.

8 Q. Did you consider the activated carbon use at
9 the plants in this case?

10 A. I'm sorry. Could you --

11 Q. Oh, sure. I'll repeat it?

12 Did you consider the activated carbon use
13 at the plants in this case?

14 A. The use?

15 Q. Yes.

16 A. I thought I answered that.

17 Q. You did perhaps. I just am trying to get a --
18 I'm trying to get a clean record here.

19 A. I'm just confused.

20 Q. That's fine. Let's just -- you know,
21 occasionally I'm going to have to ask questions in
22 different ways. So I just -- you know, I want you to
23 listen to the question I ask. And so if it's unclear
24 here, let me know. Let me ask it again and see if it
25 makes sense.

1 In the context of your work on this case,
2 did you consider the activated carbon use at the plants
3 in this case?

4 A. Yes.

5 Q. Okay. In the context of your work on this
6 case, did you consider the activated carbon use at plants
7 that are not in this case?

8 A. I don't think so.

9 Q. In the context of your work on this case, did
10 you consider the use of refined coal at the plants that
11 are in this case?

12 A. Yes.

13 Q. In the context of your work on this case, did
14 you consider the use of refined coal at plants that are
15 not in this case?

16 A. No.

17 Q. Did you speak with any employee at any of the
18 plants in this case?

19 A. No.

20 Q. Did you speak with any representatives of any
21 of the plants accused in this case?

22 A. No, I didn't speak recently. But I used to
23 have projects at Powerton Station which is involved in
24 this case, but that was years ago, decades ago.

25 Q. When was the last time you had a project at

1 Powerton Station?

2 A. I think it was about 1990.

3 Q. And going back then, do you recall if any of
4 those conversations concerned activated carbon or mercury
5 control?

6 A. No.

7 Q. They would not have concerned that, correct?

8 A. No.

9 Q. Did you visit any of the power plants that are
10 accused of infringement in this case?

11 A. Well -- no, I didn't. No.

12 Q. And to be clear, the power -- you understand
13 that the power plants themselves are not accused
14 defendants in this case?

15 A. Right. They infringed the patents but they're
16 not being accused.

17 Q. And so when I talk about the power plants in
18 this case, I'm referring to the power plants that are
19 accused of infringement in this case.

20 A. Right.

21 Q. You understand that?

22 A. Right, they -- they're not the defendants in
23 this case, but they are involved.

24 Q. Thank you. Yeah, I just want to make sure
25 we're on the same page.

1 Did you have any correspondence with the
2 power plants that are accused of infringement in this
3 case?

4 A. No.

5 Q. Whom did you meet with in analyzing this case?

6 A. Well, I -- I didn't meet with anybody until the
7 other day. My primary contact is Mr. Nemunaitis right
8 over here. And I also had Zoom calls with the inventor
9 of the patents in suit -- the inventors. One of them was
10 John Pavlish; and the other, I forget his name.

11 Q. Because the other two listed inventors are a
12 man named Ed Olson and one named Michael Holmes.

13 Does that help refresh which one it was?

14 A. I think so.

15 I don't know which one.

16 Q. One of those two?

17 A. I just talked with Pavlish. That's it.

18 Q. You didn't talk to either of the other
19 inventors?

20 A. No, no.

21 Q. How many times did you talk with John Pavlish?

22 A. I think twice.

23 Q. Roughly how many hours total did you talk with
24 Mr. Pavlish?

25 A. Less than an hour total.

1 Q. Did you speak with anyone else at ME2C?

2 A. No, I don't think so.

3 Q. Did you speak with anyone else in preparing
4 your opinions in this report other than your counsel and
5 Mr. Pavlish?

6 A. Did I speak with anyone else? I don't think
7 so.

8 Q. You didn't have anyone else -- you don't have
9 an assistant?

10 A. No.

11 Q. You don't have anyone else working with you?

12 A. No.

13 Q. You didn't speak with anyone else in the -- in
14 the industry to help you with this report?

15 A. No.

16 Q. As far as you can recall, you spoke only with
17 your counsel and with Mr. Pavlish; is that fair?

18 A. I think so. And some damages experts, I was
19 talking with them a little bit, but they're not -- I'm
20 working on the case but in a different area.

21 Q. Would that be a Mr. Green?

22 A. Yes.

23 Q. Phillip Green?

24 A. Yeah, I think so, yes.

25 Q. You spoke with him as well?

1 A. Yes.

2 Q. For about how many hours have you spoken with
3 Mr. Green?

4 A. Less than an hour.

5 Q. Okay. Did you -- is there anyone else that you
6 can recall speaking with in connection with this case
7 about the subject matter of this case?

8 A. No.

9 Q. Did Mr. Green ask you to provide opinions on
10 any particular matter?

11 A. He just had some questions, but I can't even
12 remember them.

13 Q. Were they technical questions about the
14 patents?

15 A. Yes.

16 Or about the process that's disclosed in
17 the patents.

18 Q. Was he asking you about the methods used by the
19 defendants?

20 A. I can't remember specifics.

21 Q. Was he asking you about the methods used at
22 the -- the power plants that are accused of infringement?

23 A. I think so, yes.

24 Q. Do you have any expertise in economics
25 yourself?

1 A. No. I did take an engineering economics class
2 when I was at IAT. I don't know if that means anything.

3 Q. Did you use any of that economics knowledge for
4 this matter?

5 A. No.

6 Q. Could you just tell me anything you recall
7 about your conversation with Mr. Green?

8 A. I don't remember anything.

9 Q. You mentioned that you have, in the course of
10 your career, visited the Powerton plant; is that correct?

11 A. Correct.

12 Q. Have you visited any of the other plants
13 accused in this case?

14 A. No.

15 Well -- no. I -- I did visit like some
16 Wisconsin power plants, but I don't think there were any
17 that I visited that are in this lawsuit.

18 Q. Did Mr. Green give you any data or info that
19 you relied on for your opinions?

20 A. No.

21 Q. You were providing information to him; is that
22 fair?

23 A. Correct.

24 Q. There was nothing that he provided to you that
25 you relied on for your opinions?

1 A. No.

2 Q. What did you discuss with Mr. Pavlish?

3 A. Just the process of coming up with the
4 invention that's disclosed in the patents in suit.

5 Q. He told you some of the history of their work;
6 is that fair?

7 A. Yeah.

8 Q. Did he help you to understand any of the terms
9 in any of the claims of the patents?

10 A. I don't think so.

11 Q. Did he help you understand any of the
12 specification of the patents?

13 A. A little bit, yes.

14 Q. What aspects?

15 A. I can't remember offhand. I talked to him
16 months ago. I don't remember.

17 Q. Did Mr. Pavlish tell you about any
18 conversations that he had had with defendants?

19 A. No.

20 Q. Did Mr. Pavlish tell you about any
21 conversations he had with the power plants accused of
22 infringement?

23 A. No.

24 Q. Did you talk to Mr. Pavlish before or after he
25 was disclosed?

1 I'm sorry. Restate that.

2 Did you talk to Mr. Pavlish before or
3 after he was deposed?

4 A. I have no idea when he was deposed.

5 Q. Have you read his deposition transcript?

6 A. I might have. I can't remember.

7 Q. Did you read the deposition transcript of
8 Dr. Olson?

9 A. I might have.

10 Q. Did you read the deposition transcript of
11 Mr. Holmes?

12 A. I might have.

13 Q. Do you recall if you relied on those deposition
14 transcripts for your opinions?

15 A. I might have. I don't know.

16 Q. Do you have an understanding of what a refined
17 coal facility is?

18 A. Yes.

19 Q. What happens at a refined coal facility?

20 A. They take coal off of the coal pile at a power
21 plant and they run it into a -- I believe a building, and
22 they -- in the building, they buy the coal from the power
23 plant, okay, and they treat it with a chemical, calcium
24 bromide, and spray it onto the coal. And then the coal
25 is sold back at a loss to the power plant. And then the

1 power plant runs it through pulverizers or, you know,
2 right to the -- just pulverizes, I'll talk about now,
3 and it's burned, and then they use activated carbon
4 injection in the flue gas to aid in mercury removal of
5 the particulate matter like in a bag house or
6 electrostatic precipitator.

7 Q. I'm sure we're going to come back to a lot of
8 what you just said there. But just to clarify, when I
9 asked what happens at a refined coal facility, they sell
10 back to the power plant, correct?

11 A. Correct, at a loss.

12 Q. And then the power plant is responsible for
13 everything you said after that, right? It's responsible
14 for the combustion of it?

15 A. Right.

16 Q. And the power plant is responsible for the
17 emission control systems that are applied.

18 A. And meeting the emission standards.

19 Q. That's the power plant, correct?

20 A. Yes.

21 Q. Have you visited any refined coal facilities
22 ever?

23 A. No.

24 Q. Have you ever observed this provision of the
25 refined coal from the refined coal facility to the power

1 plant?

2 A. What do you mean by that?

3 Q. Have you ever -- well, maybe I'll just make it
4 more general.

5 You've never visited a power plant that --
6 have you ever visited a power plant that uses refined
7 coal?

8 A. No.

9 Q. You've never observed in any way a power plant
10 that uses refined coal?

11 A. No.

12 Q. Do you have an understanding of what products
13 ME2C offers?

14 A. I believe they offer the chemicals used in the
15 refining process, coal refining process, and I think they
16 also activate carbon powder.

17 Q. Have you ever visited a power plant that uses
18 ME2C products?

19 A. No.

20 Q. Have you ever observed the production of coal
21 using ME2C products?

22 A. No.

23 Q. Have you ever observed in any way the
24 production of refined coal?

25 A. No.

1 Q. Have you ever visited a power plant that uses
2 brominated activated carbon?

3 A. No.

4 Q. And when you visited the Wisconsin power plant,
5 was it in conjunction with this case?

6 A. No.

7 Q. Do you recall roughly when that was?

8 A. It was over 30 years ago.

9 Q. Okay.

10 A. It involved soot blowers and the controlled
11 soot blowers. A soot blower removes fly ash deposits
12 from tube bundles and tube banks and water walls.

13 Q. A soot blower is blowing the soot out of the
14 flue gas?

15 A. Yeah. It's a confusing name. Soot blowers
16 that we used used steam that would be directed in -- the
17 steam was directed through a lance - what they call a
18 lance - and that's a pipe that moves into the furnace,
19 and has a nozzle on the end of it. And the nozzle would
20 be directed at tubes that have fly ash deposits coating.
21 So it would remove the fly ash to improve the heat
22 transfer from the fireball or the flue gas to the tubes
23 with the water or steam in them.

24 Q. I see.

25 A. So the fly ash would go up into the flue gas

1 and be removed by the ESPs downstream.

2 Q. Let's take a minute now and introduce some
3 exhibits. And so what I'm going to start with is your
4 first three reports.

5 A. Okay.

6 Q. I'm going to make those Exhibits 1, 2, and 3.

7 A. Okay.

8 Q. I think that will make things straightforward
9 as we go through the day.

10 A. Okay.

11 Q. So they are in, I believe, the Exhibit Share
12 room.

13 A. Well, I have --

14 Q. I see you have a binder with you today.

15 A. Yeah, I have like a paper copy of my reports --

16 Q. Okay.

17 A. -- and some of the other exhibits. So...

18 Q. Okay.

19 DR. GLANDORF: Well, let's -- yeah, so
20 let's -- anything else that we need to do as far as
21 marking those exhibits?

22 THE REPORTER: No.

23 DR. GLANDORF: Okay. Then they're all
24 done --

25 THE REPORTER: You're marking them as you

1 put them in, right?

2 MS. KOSOVA: Yes.

3 DR. GLANDORF: Okay.

4 (Exhibit Nos. 1, 2, 3 marked.)

5 BY DR. GLANDORF:

6 Q. Let's now mark as an exhibit -- we'll make it
7 Exhibit 4, be kind of the table of contents that you
8 brought today.

9 A. Okay.

10 DR. GLANDORF: So I don't know what the
11 best way to do that from your point of view is. Should
12 we provide a PDF? Because everything's going to be on
13 Exhibit Share.

14 THE REPORTER: I have access.

15 DR. GLANDORF: You have access?

16 THE REPORTER: Yeah.

17 DR. GLANDORF: Okay. And you have a --
18 I'll paper copy you.

19 THE REPORTER: I'm not going to have a
20 paper copy.

21 DR. GLANDORF: I can e-mail you a copy.

22 MS. KOSOVA: Okay. I'm not going to
23 order.

24 THE REPORTER: I don't need any paper
25 copies, right? I'm going to use what's there.

1 DR. GLANDORF: That's right. I just want
2 to make sure -- because we have that paper and not
3 electronic, I just want to make sure it doesn't get lost.
4 Okay.

5 So that will be Exhibit 4.

6 (Exhibit No. 4 marked.)

7 BY DR. GLANDORF:

8 Q. Let me ask you then, I'd like to know what's in
9 your binder, if we could. So it looks like I can see --
10 the first thing is a copy of this table of contents that
11 we're calling Exhibit 4; is that correct?

12 A. Correct.

13 Q. And then you have a copy of all three of your
14 reports in there; is that right?

15 A. Yes.

16 Q. And are they annotated in any way?

17 A. Well, they're just marked off with tabs.

18 Q. Fair enough. But there's no markings or notes
19 that you have left in --

20 A. No, I didn't mark them up or anything, no.

21 Q. And so then Exhibit 4, 1, 2, and 3. And then
22 what else do you have in that binder?

23 A. Well, I have the '114 patent, the '225 patent,
24 the '517 patent, '430 patent, '147 patent; and I have
25 Pavlish Exhibit 11. And that's it.

1 MR. NEMUNAITIS: And that's the
2 provisional application?

3 DR. GLANDORF: That is the provisional
4 application.

5 MR. NEMUNAITIS: It has the Pavlish -- I
6 pulled it from his deposition, so it has his exhibit
7 sticker on it, but it's the --

8 DR. GLANDORF: Could I have a look at it
9 real quick.

10 MR. NEMUNAITIS: Yeah, sure.

11 BY DR. GLANDORF:

12 Q. And as far as you know, there's -- you have no
13 other notations in here other than the --

14 A. No.

15 Q. -- the binder tabs?

16 A. No.

17 Q. Okay. So referring to Exhibit 1 --

18 A. What's that?

19 Q. -- which is your first report.

20 A. Okay. The opening report?

21 Q. Yes, the opening report.

22 And I -- you know, normally how this would
23 be is that I would have a paper exhibit pre-pandemic and
24 show it to you and just confirm it is your report. It's
25 a little difficult here.

1 Can we call up his first report on here
2 just so you can look at it and confirm, to the extent you
3 can, that it is your report.

4 So that will be on the computer. So if we
5 have something electronically, that'll be the computer
6 he'll use; is that correct?

7 A. Uh-huh.

8 Q. And we -- I may have a mouse actually, but
9 that's -- if that's useful.

10 Let's wait, I think.

11 Well, let us know though if you have any
12 trouble, like, accessing or viewing any of the exhibits.

13 But let me just ask you: Exhibit 1, does
14 this appear to you to be a copy of your opening expert
15 report?

16 A. Yes.

17 Q. And what was the date that you signed your
18 opening expert report?

19 A. Let's see. I don't remember. I've got to look
20 that up.

21 10-25-22.

22 Q. Do you recall when you started working on this
23 report?

24 A. No.

25 Q. Who wrote your opening expert report?

1 A. It was a collaborative effort between lawyers
2 that I work for and myself.

3 Q. Is it fair to say that your lawyers directed
4 you as to what opinions to include in your opening expert
5 report?

6 A. No.

7 MR. NEMUNAITIS: And...

8 BY DR. GLANDORF:

9 Q. In what way is that inaccurate?

10 A. Well, we just corresponded during the writing
11 process.

12 MR. NEMUNAITIS: And I'll caution the
13 witness not to get into the details of any communications
14 with attorneys. But you can answer that at a high level.

15 BY DR. GLANDORF:

16 Q. Yes, I don't want to know any specific
17 communications.

18 A. That's what we do, you know. I would write
19 some. They would e-mail me back with their comments and
20 input, and I'd write some more. So it was a
21 collaborative effort.

22 Q. Were there portions that your attorneys wrote
23 and sent to you?

24 A. Portions, yes.

25 Q. Approximately how many hours did you spend on

1 your opening report?

2 A. I can't remember.

3 Q. And do you recall if you spoke to Mr. Green
4 before or after?

5 A. I don't remember.

6 Q. You don't know if it was before or after?

7 A. It was after. I think I wrote all three
8 reports already. It was a few weeks ago.

9 Q. Did you speak with Mr. Pavlish before your
10 opening expert report?

11 A. I think it was during.

12 Q. During your work on it?

13 A. Yes.

14 Q. Did you speak to Mr. Pavlish again after your
15 first expert visit?

16 A. I don't think so.

17 Q. Okay. Let's move actually and introduce a new
18 exhibit.

19 Well, before that, I'm sorry, let's go
20 through the rest here.

21 Let's pull up Exhibit 2, if we could, on
22 the computer and confirm what that is.

23 Exhibit 2 is the second expert report you
24 submitted in this case; is that -- is that correct?

25 A. That appears to be so, yes.

1 Q. It's what you've titled your Rebuttal Expert
2 Report, right?

3 A. Yes.

4 Q. This rebuttal expert report is responding to
5 the opening expert report of Dr. Steven Niksa, correct?

6 A. Correct.

7 Q. Does it contain all of your opinions about that
8 opening expert report of Dr. Niksa?

9 A. I believe so, yes.

10 Q. And what is the date on this report?

11 A. 12-20-22.

12 Q. Let's go now to Exhibit 3, if we could.

13 And do you recognize Exhibit 3?

14 A. Yes.

15 Q. What is Exhibit 3?

16 A. Expert report of myself in reply to Defendant's
17 rebuttal reports.

18 Q. This is the third expert report you did in this
19 case, correct?

20 A. Yes.

21 Q. And between Exhibit 1, 2, and 3, these are all
22 the opinions that you've offered in this case?

23 A. Correct.

24 Q. And in your third report, you are replying to
25 the expert reports of Dr. Niksa and Dr. Connie Senior,

1 correct?

2 A. Correct.

3 Q. Does that third report include all of your
4 opinions about the expert reports of Dr. Niksa and
5 Dr. Connie Senior?

6 A. Yes.

7 THE WITNESS: You know, can I take a
8 break? I have to use the men's room.

9 DR. GLANDORF: Sure.

10 THE VIDEOGRAPHER: We are going off the
11 record. The time now is 11:09.

12 (Recess 11:09-11:18.)

13 THE VIDEOGRAPHER: We are back on the
14 record. The time now is 11:18.

15 BY DR. GLANDORF:

16 Q. Did you review the reply expert report of Dr.
17 Niksa?

18 A. Yes, I believe so, yes.

19 Q. His third report?

20 A. Oh, yeah. I think I did, yes.

21 Q. I'll represent to you --

22 A. I didn't respond to it.

23 Q. Correct. You haven't offered a written
24 response to it?

25 A. No.

1 Q. It was filed -- I'll represent to you it was
2 filed -- or served at about the same time as your third
3 report. Do you understand that?

4 A. Yeah. Yeah.

5 Q. But you have reviewed that report --

6 A. Yes.

7 Q. -- correct?

8 A. I believe so, yes.

9 Q. Sitting here today, do you recall if there's
10 anything you disagree with in that third report?

11 A. I don't remember.

12 Q. Let's go, if we could now, to Exhibit 4.

13 A. Which is that?

14 Q. I don't know if we can click on the next one
15 there.

16 MR. NEMUNAITIS: Oh, are there new
17 exhibits in there?

18 DR. GLANDORF: It's a different tab.

19 A. Okay.

20 BY DR. GLANDORF:

21 Q. Do you recognize Exhibit 4?

22 A. Yes.

23 Q. What is this exhibit?

24 A. It's the table of contents.

25 Q. A table of contents of what?

1 A. My opening report and my rebuttal expert
2 report.

3 Q. I see. And there's not one here of your reply
4 report; is that correct?

5 A. No.

6 Q. Did you write your rebuttal expert report?

7 A. Yes.

8 Q. And was the process for your rebuttal expert
9 report the same as your opening report?

10 A. Yes.

11 Q. And is that true for your reply expert report
12 as well?

13 A. Yes.

14 Q. Do you intend to offer testimony at trial if
15 there should be a trial in this case?

16 A. Yes.

17 Q. And is the testimony that you intend to offer
18 at trial contained in your expert reports that you have
19 in front of you today?

20 A. Some of it, yes.

21 Q. What additional testimony would -- do you
22 intend to offer, if any?

23 A. I don't know.

24 If any opinions of Dr. Niksa and Dr.
25 Senior come forward, then I will address that in court.

1 Q. Do you -- have you ever met Dr. Niksa?

2 A. No.

3 Q. Have you ever met Dr. Senior?

4 A. No.

5 Q. To your knowledge, have you ever met any of the
6 authors of the prior art references in this case?

7 A. No.

8 Q. Then you have not met, for example, Sid Nelson,
9 Jr.?

10 A. No.

11 Q. You have not met, for example, Dr. Vosteen?

12 A. No.

13 Q. Have you met Dr. Sjostrom?

14 A. No.

15 Q. Have you ever attended any conference related
16 to mercury control?

17 A. No.

18 Q. Have you ever attended any conferences relating
19 to gas phase emissions from power plants?

20 A. No.

21 Q. I'm sorry. I want to go back to something I'd
22 asked you earlier, which is you said you may have to
23 offer some additional opinions at trial.

24 Do you mean additional opinions to
25 opinions from Dr. Niksa or Dr. Senior that you have not

1 yet heard?

2 A. Yes.

3 Q. There aren't any opinions from -- that you are
4 holding from what you've read from them so far that you
5 have not yet disclosed; is that correct?

6 A. Correct.

7 Q. Let's go back to your opening expert report, if
8 we could, which is Exhibit 1.

9 And I'm going to direct you to page 39.
10 Let me know when you have that.

11 A. Okay. I'm there.

12 Q. And if you could review paragraph 76 and, you
13 know, the references cited -- the footnotes cited there.
14 Let me know when you've done that.

15 A. Paragraph 76 begins on page 38?

16 Q. Yes. Correct.

17 A. Okay.

18 Okay.

19 Q. And I would just direct you to footnote 50.
20 Did you read footnote 50?

21 A. The paragraph that begins with "Conversation
22 with Jim Trettel"?

23 Q. Correct.

24 A. Okay.

25 Q. You've read that?

1 A. I -- yeah.

2 Q. Did you have a conversation with Jim Trettel in
3 connection with this case?

4 A. I seem to remember that. That was like a long
5 time ago.

6 Q. It would have been before this opening expert
7 report, correct?

8 A. It might have been during the writing of it.

9 Q. What did you discuss with Mr. Trettel?

10 A. I can't remember.

11 Q. Do you know who Mr. Trettel is?

12 A. Not offhand.

13 Q. Did you discuss the application rates of ME2C
14 products with Mr. Trettel?

15 A. I don't know. I can't remember.

16 Q. Did you discuss the application rates of
17 calcium bromide for any refined coal with Mr. Trettel?

18 A. I can't remember.

19 Q. You don't remember anything about your
20 conversation --

21 A. No.

22 Q. -- with him?

23 Let's look, if you could, now to paragraph
24 77 and to the footnotes that are cited within. Let me
25 know when you've had a chance to review.

1 A. Okay.

2 Q. Do you see you've cited for paragraph 77 a
3 conversation with John Pavlish?

4 A. Yes.

5 Q. Does that refresh your recollection of what you
6 spoke about with Mr. Pavlish?

7 A. Yeah, it seems so.

8 Q. So with regards to this paragraph, what did you
9 discuss with Mr. Pavlish?

10 A. Just ME2C's use of calcium bromide injected
11 activated carbon.

12 Q. Is it your opinion that ME2C's process is
13 covered by any of the claims asserted in this lawsuit?

14 A. Well, it would seem so, yes.

15 Q. Is that opinion based on your conversation with
16 Mr. Pavlish?

17 A. Well, review of the patents and a conversation.

18 Q. You reached that opinion based on your review
19 of the patents and your conversation with the inventor
20 Mr. Pavlish --

21 A. Yes.

22 Q. -- is that correct?

23 A. Yes.

24 Q. I'm sorry. And I know -- I'm a slow question
25 asker, I know, but do try to pause just so we can get

1 your answer nice and clearly.

2 Did you ever speak with -- let me
3 rephrase.

4 Have you ever spoken with Richard
5 MacPherson?

6 A. I don't remember speaking with him.

7 Q. Rick MacPherson, that doesn't ring a bell?

8 A. I don't remember.

9 Q. As far as you can remember, you've never spoken
10 with this individual?

11 A. I don't remember.

12 Q. Okay. And then one more just clean-up question
13 before we go on.

14 You mentioned holding one of your seminars
15 at a power plant in Maryland, correct?

16 A. Yes.

17 Q. What year was that?

18 A. It was around 2012.

19 Q. Okay. And you don't recall the name of that
20 power plant?

21 A. No.

22 DR. GLANDORF: Let's introduce as Exhibit,
23 I think, 5, the '147 patent.

24 (Exhibit No. 5 marked.)

25 MR. NEMUNAITIS: That's not in the folder

1 here. Do you just want him to refer to the --

2 DR. GLANDORF: He can refer to that. But
3 let's go ahead and pull it up in the folder just so we
4 can -- he can confirm for us that we're all looking at
5 the same thing.

6 MR. NEMUNAITIS: Yeah. It didn't --

7 DR. GLANDORF: It'd take a minute, yeah.

8 MR. NEMUNAITIS: Oh, okay. Okay.

9 A. Okay.

10 BY DR. GLANDORF:

11 Q. Do you see Exhibit 5 on the Exhibit Share?

12 A. Yes.

13 Q. And do you recognize Exhibit 5?

14 A. Yes.

15 Q. What is Exhibit 5?

16 A. The '147 patent.

17 Q. And could you, just for the record, read the
18 entire patent number for us.

19 A. U.S. Patent Number 8,168,147 B2.

20 Q. And do you have a copy of this patent in paper
21 form with you?

22 A. Yes.

23 Q. Could you turn to the claims of the '147
24 patent.

25 A. Okay.

1 Q. And what column numbers are the claims in?

2 A. Claims are in column 23 and column 24.

3 Q. Okay. And do you understand that at issue in
4 this case are claims 17 through 20 of the '147 patent?

5 A. 17 through 20?

6 Q. Correct.

7 A. Okay.

8 Q. I'll represent to you that the claims at issue
9 in this case are the claims 17 through 20.

10 A. Okay.

11 Q. Now, we're going to talk through some of these
12 claims but -- and I know some are long. But let me first
13 just ask you to read through to refresh yourself claim 1
14 and claim 17.

15 A. Claim 1...

16 Okay.

17 Q. You've had a moment to refresh your
18 recollection with regard to claim 17 and claim 1?

19 A. Yes.

20 Q. And claim 17 depends from claim 1, correct?

21 A. Correct.

22 Q. And so to infringe claim 17, you understand
23 that a person has to perform, for this method, all the
24 steps in claim 17 and all the steps in claim 1?

25 A. Well, in theory, yes. But it's my

1 understanding that claim 1 was found to be invalid in a
2 previous ruling by the IPR.

3 Q. Yeah, I don't want to say correct or not. I
4 mean, there was a -- there's a nuance there.

5 But let me just say, you're correct that
6 claim 1 on its own is not asserted in this case.

7 A. Right.

8 Q. So we only are considering claim 1 to the
9 extent it is part of claim 17. You understand that?

10 A. Yes, I do.

11 Q. That's what you're saying?

12 A. In other words, claim 17 is now an independent
13 claim.

14 Q. And so claim 17, again, includes all of the
15 elements listed in claim 17 and all of the elements
16 listed in claim 1?

17 A. Well, as the patent is written, that's true.

18 Q. And generally you understand that when a --
19 there is a dependent claim, that dependent claim requires
20 all the elements listed in the dependent claim as well as
21 the --

22 A. Yes.

23 Q. -- elements in the independent claim?

24 A. Yes.

25 Q. If I refer to claim 1 now, do you see that

1 there is a phrase in here a "bromine-containing
2 promoter"?

3 A. Yes.

4 Q. Do you have an understanding in the context of
5 this case what a bromine-containing promoter is?

6 A. Yes.

7 Q. And do you have an understanding of what a
8 person of skill in the art would understand the term
9 "bromine-containing promoter" to mean?

10 A. Yes.

11 Q. And just to -- let's just make a couple of
12 abbreviations. But again, if you don't want to use them,
13 that's fine. When you talk about the person with skill
14 in the art, have you heard people use the abbreviation
15 POSA or POSITA?

16 A. Yes.

17 Q. And do you have a preference?

18 A. I don't care one way or the other.

19 Q. Okay. I'll generally talk about POSA today,
20 P-O-S-A, to refer to a person of ordinary skill in the
21 art. That's okay with you?

22 A. Fine.

23 Q. And for bromine-containing promoter, is it okay
24 if I use an abbreviation BCP?

25 A. Yeah, sure.

1 Q. Okay. What is your understanding of the
2 definition a POSA would give to a bromine-containing
3 promoter?

4 A. Some sort of a bromine-containing compound like
5 calcium bromide.

6 Q. And that understanding is based on reading the
7 '147 patent; is that correct?

8 A. And other documents besides that.

9 Q. What other documents?

10 A. Well, some of the exhibits, and my talk with
11 John Pavlish.

12 Q. What other exhibits?

13 A. Well, I think I listed them, you know, in my
14 opening report. You know, I have -- I have 238 different
15 things that I looked at.

16 Q. So sitting here at the moment, do you recall
17 any exhibits in particular that helped you understand how
18 a POSA would see the term BCP?

19 A. No, I can't.

20 Q. Okay. That's fair.

21 Did you have an understanding of the term
22 "bromine-containing promoter" before you were hired for
23 this case?

24 A. No.

25 Q. It's not a term that you've used before this

1 case?

2 A. No.

3 Q. Now you see the term a bromine-containing
4 promoter. It's in roughly the fourth line of 1A; is that
5 correct?

6 A. Yeah.

7 Q. Maybe it would be easier to use a row or column
8 number so we're clear here. So if I refer to column 23
9 at row 38, roughly, is that where you see a
10 bromine-containing promoter?

11 A. Yes.

12 Q. Okay. Do you see now going down to row 40 of
13 column 23 another reference to the bromine-containing
14 promoter?

15 A. Yes.

16 Q. And that refers to "the" bromine-containing
17 promoter, correct?

18 A. Yes.

19 Q. And you understand that that is a reference to
20 the same bromine-containing promoter that was introduced
21 in line 38, correct?

22 A. Yes.

23 Q. In general, when a patent introduces a term
24 with "a" and then uses that same term later with "the,"
25 you understand that that is referring to the same thing

1 in the claim language?

2 A. Yes.

3 Q. And so if I refer now to line 49 -- I'm
4 sorry -- 44, you see it appears there again?

5 A. Yes.

6 Q. Column 23, line 44 you see bromine-containing
7 promoter?

8 A. Yes.

9 Q. This, again, is the same bromine-containing
10 promoter?

11 A. Yes.

12 Q. It's the same bromine compound that would be
13 referred to throughout this claim, correct?

14 A. Right.

15 Q. And then if we are going to go now to claim 17
16 -- and I believe the first time bromine-containing
17 promoter appears is in line 36 of column 24 where it
18 again says "the" bromine-containing promoter.

19 A. It says "the" brominated sorbent.

20 Q. Okay. And that's -- so I'm looking at -- above
21 that, I think. So line 36 - I'm sorry - of column 24.

22 A. Yep.

23 Q. There you see the bromine-containing promoter?

24 A. Yes.

25 Q. And again, that would be the same

1 bromine-containing promoter that would be -- that is
2 being discussed in claim 1, correct?

3 A. Correct.

4 Q. That claim is referring to the -- would be
5 referring to the same bromine compound as it would be in
6 claim 1, correct?

7 A. That's what it says.

8 Q. That's how you -- that's how --

9 A. The method of claim 1, so...

10 Q. That's how patents are read?

11 A. Yeah.

12 Q. And then when it says -- if we look at line 38
13 of column 24, it just refers to wherein "the" promoter is
14 reacted. Do you see that?

15 A. I'm sorry. Can you say it again.

16 Q. It's the end of line 38. It says: "Wherein
17 the promoter is reacted in the gas phase."

18 A. In the gas strain?

19 Q. No. It's lower than that maybe. Line -- do
20 you see there's a "wherein" clause that says: "Wherein
21 the promoter is reacted in the gas phase."

22 A. I see "whereby."

23 Q. Yep. Keep going lower.

24 A. Oh, yeah. Wherein the promoter is reacted in
25 the gas phase --

1 Q. Yes.

2 A. -- or as a vapor.

3 Q. Correct. So the reference there to "the"
4 promoter, do you understand that to be a reference to the
5 same bromine-containing promoter that we've been
6 discussing?

7 A. Yes.

8 Q. And I believe there's been one more reference
9 here, which is just after where you stopped where it
10 says, "Wherein the promoter is added."

11 Do you see that?

12 A. Yes.

13 Q. That, again, is referring to -- I'm sorry.
14 Scratch that. Let me rephrase.

15 The promoter in that phrase in column 24
16 at line 40 is referring to the same bromine-containing
17 promoter, correct?

18 A. That's what it looks like.

19 Q. Do you agree?

20 A. Yeah.

21 THE WITNESS: Can we take a lunch break.

22 DR. GLANDORF: I'm okay with taking a
23 break. My only con -- maybe we should go off the record
24 here. But my only concern is whether the lunch has
25 arrived. But --

1 MR. NEMUNAITIS: What, did you guys order
2 lunch?

3 DR. GLANDORF: We did order lunch, yeah.

4 THE WITNESS: Oh, you did?

5 DR. GLANDORF: But if -- let's go off the
6 record, if that's okay.

7 THE VIDEOGRAPHER: We are going off the
8 record. The time now is 11:45.

9 (Off the record 11:45-11:48.)

10 THE VIDEOGRAPHER: We are back on the
11 record. The time now is 11:48.

12 BY DR. GLANDORF:

13 Q. So going back to this phrase
14 "bromine-containing promoter," is it your opinion that
15 the bromine-containing promoter refers to the same
16 bromine compound throughout claim 1 and claim 17?

17 A. Okay. Early it talks about promoter bromated
18 sorbent. So I'm not sure if that's different than
19 bromated-containing promoter.

20 Q. Yes. Well, I won't -- I won't confirm that one
21 way or the other. But I'm not asking right now about the
22 bromine-promoted sorbent. So I'm not asking about
23 anything with the word "sorbent" in it at this point.

24 A. Okay.

25 Q. So I want to focus on the term that we were

1 just discussing that we looked at which is the
2 bromine-containing promoter.

3 A. Okay. Just bear with me a second.

4 Q. Sure.

5 A. Okay. Can you ask me again.

6 Q. Sure. Is it your opinion that the term
7 "bromine-containing promoter" needs to refer to the same
8 bromine compound every time the phrase
9 "bromine-containing promoter" is used in claim 1 and
10 claim 17?

11 A. I'm not sure they're the same.

12 Q. Well, let me make sure I understand. Because
13 it first refers to "a" bromine-containing promoter and
14 then every time after that it refers to "the"
15 bromine-containing promoter, correct?

16 A. Well, yeah.

17 Q. So is it your opinion then that it's referring
18 to the same thing in claim 1 and claim 17 every time it
19 refers to "the" bromine-containing promoter?

20 A. Yes, but what I -- what concerns me is the
21 promoted bromate -- brominated sorbent; and I'm not sure
22 that's the same as the bromine-containing promoter.

23 Q. And I'm not asking anything about the promoted
24 brominated sorbent. We -- well, that's a different term
25 that we will get to later.

1 I'm just asking about this one specific
2 term which is the bromine-containing promoter.

3 A. Well, yeah, it's the same, "a"
4 bromine-containing promoter and "the" bromine-containing
5 promoter are the same thing.

6 Q. And so it would -- to meet this claim it has to
7 be the same bromine compound that is "the"
8 bromine-containing promoter throughout claim 1 and claim
9 17, correct?

10 A. Yeah.

11 Q. I'm not asking about the sorbent at this point.
12 Is that okay with you? There is a different term here
13 that's the "bromated sorbent." But that's a different
14 term, correct? I'm just asking about the
15 "bromine-containing promoter" term.

16 A. Well, they're the same in claim 1. But when we
17 get to claim 17, that's where the confusion results.

18 Q. And are you -- when you say confusion, do you
19 mean confusing the term "bromine-containing promoter" and
20 the term "promoted brominated sorbent"?

21 A. Yes.

22 Q. I see. Okay.

23 So let's just go back -- let's go back to
24 claim 17, if we could, just to make sure we're on the
25 same page.

1 A. Okay.

2 Q. And so in claim 17, in line 36, there is a
3 reference where it says, "Separately the
4 bromine-containing promoter."

5 Do you see that?

6 A. Yes.

7 Q. So, again, I'm not referring to any phrase that
8 has the word "sor bent" in it. This is -- this -- I'm
9 looking at that specific phrase, "the bromine-containing
10 promoter."

11 A. Right.

12 Q. And that phrase also appears in claim 1. And I
13 think we are just concluding here that the phrase
14 "bromine-containing promoter" refers to the same bromine
15 compound throughout claim 1 and claim 17.

16 A. Yes.

17 Q. Okay. Thank you.

18 There is also a phrase here, and let's
19 look -- I'll show you where it first appears, which is in
20 claim 1 at line 39.

21 A. Okay.

22 Q. Where it says "a promoted brominated sor bent."

23 Do you see that?

24 A. Yes.

25 Q. And that is the phrase that you brought up a

1 little bit ago, I think; is that correct?

2 A. Yes.

3 Q. Do you have an understanding of how a POSA
4 would understand the phrase "a promoted brominated
5 sorbent"?

6 A. Well, the sorbent would be activated carbon,
7 and the promoter would be a brominated compound. But it
8 looks like we're brominating the activated carbon.

9 Q. Is that how you read it?

10 A. That is my understanding at this point.

11 Q. And is it your opinion that that's how a POSA
12 would understand it?

13 A. Well, yes.

14 Q. And was that opinion informed by your
15 conversation with Mr. Pavlish at all?

16 A. I don't think so.

17 Q. You're just reading the plain language of the
18 claim and understanding it --

19 A. Yes.

20 Q. -- is that fair?

21 And in terms of the timing, is that -- is
22 it your opinion that that's how a person of skill in the
23 art would understand that term as of 2003?

24 A. I believe so.

25 Q. And is that how a person skilled in the art

1 would understand that term today?

2 A. I believe so.

3 Q. Do you have any opinions that the meaning of
4 that term to a person skilled in the art would have
5 changed any time between 2003 and now?

6 A. No.

7 Q. And with regard to the previous term we
8 discussed, the bromine-containing promoter, do you have
9 an opinion that the meaning of that term has changed for
10 a person of skill in the art from 2003 to the present?

11 A. No.

12 Q. You applied your understanding of how a POSA
13 would see the term "bromine-containing promoter" when you
14 offered your opinions in this case, correct?

15 A. Correct.

16 Q. And that's true also for a bromine -- I'm
17 sorry. That's true also for the term "promoted
18 brominated sorbent"; is that correct?

19 A. Yes.

20 THE WITNESS: I really got to stop. I
21 have to go to the men's room.

22 DR. GLANDORF: That's fine. Yeah, and in
23 fact, I am going to transition to something else later,
24 so that is a fine time to stop.

25 THE VIDEOGRAPHER: We are going off the

1 record. The time now is 11:57.

2 (Recess 11:57-12:46.)

3 THE VIDEOGRAPHER: We are back on the
4 record. This is the start to media number 3. The time
5 is 12:46.

6 BY DR. GLANDORF:

7 Q. Welcome back, Mr. O'Keefe.

8 A. Thank you.

9 Q. Did you discuss the substance of your testimony
10 with counsel during your lunch break?

11 A. No.

12 Q. Let's go back, if we could, to the 147 patent
13 and its claims.

14 Do you have that in front of you?

15 A. Yes.

16 Q. And we were looking at claim 17, if you recall.

17 A. Yes.

18 Q. And I want to direct you to claim 17. There's
19 a couple of terms that use the word -- a couple of
20 elements that use the word "injecting" in claim 17.

21 Do you see that there is a phrase that
22 says "injecting the particulate sorbent material"?

23 A. Is that on line 35?

24 Q. Yes.

25 A. Yes.

1 Q. And what is your understanding of what the
2 particulate sorbent material is?

3 A. Activated carbon.

4 DR. GLANDORF: Are we okay?

5 BY DR. GLANDORF:

6 Q. And so that phrase refers to the injection of
7 activated carbon sorbent; is that fair?

8 A. Correct.

9 Q. And is it your understanding that the parties
10 in this case have agreed that that term refers to the
11 injection of activated carbon sorbent from outside of the
12 system into the flue gas?

13 A. Yes.

14 Q. And there's also a reference to, if we go to
15 line -- the next line, line 36, injecting separately the
16 bromine-containing promoter into a gas stream.

17 Do you see that?

18 A. Yes.

19 Q. And so, is it your understanding that in order
20 for a method to be covered by claim 17, there has to be
21 an injection of an activated carbon sorbent and there has
22 to separately be an injection of a bromine-containing
23 promoter into a gas stream?

24 A. Yes.

25 Q. So for an accused power plant to be infringing

1 this method, the accused power plant would have to be,
2 again, injecting the activated carbon sorbent and also
3 injecting the bromine-containing promoter, correct?

4 A. Yes.

5 Q. Is it your opinion that power plants that burn
6 refined coal are injecting separately a
7 bromine-containing promoter into a gas stream?

8 A. No, that's not my understanding.

9 Q. Is it your opinion that the accused power
10 plants in this case, as part of their mercury control
11 system, inject separately a bromine-containing promoter
12 into a gas stream?

13 A. Separa -- I don't understand.

14 Q. Let me just reask it and we'll -- I may have
15 stumbled.

16 Is it your opinion that the power plants
17 accused of infringement in this case inject a
18 bromine-containing promoter into a gas stream separately
19 from an injection of activated carbon into the gas
20 stream?

21 A. I think one of them does.

22 Q. Do you recall which one that is?

23 A. The Powerton Station has cyclones and I believe
24 that they inject the brominated compound just above the
25 reentrant through the cyclone.

1 Q. Do you know what bromine compound they are
2 injecting?

3 A. Not offhand.

4 Q. That's Powerton Station; is that correct?

5 A. I believe so, yes.

6 Q. And so, outside of the Powerton Station, the
7 other power plants are not injecting a bromine-containing
8 promoter into a gas stream?

9 A. Correct.

10 Q. Are the other power plants injecting activated
11 carbon into a gas stream?

12 A. Yes.

13 Q. You agree that if a power plant was burning
14 refined coal without injecting activated carbon, that it
15 would not be infringing claim 17 of the 147?

16 A. Can you run that by me again?

17 Q. Sure. If a power plant is burning refined coal
18 but is not injecting activated carbon, then it would not
19 be infringing claim 17 of the 147 patent?

20 A. Always not injecting activated carbon or just
21 sometimes not injecting it?

22 Q. Well, let's just take a specific point in time.

23 At a particular point in time, if the
24 power plant is burning refined coal but not injecting
25 activated carbon, then it would not be infringing claim

1 17?

2 A. Well, it would not be infringing; but as soon
3 as it injects activated carbon into the flue gas, it
4 would be infringing.

5 Q. So when it is injecting activated carbon, it is
6 your opinion that it is infringing?

7 A. Yes.

8 Q. But if it is not injecting activated carbon,
9 you agree it would not be infringing at that moment?

10 A. True.

11 Q. And is that true for all of the claims asserted
12 in this case?

13 A. In the 147 patent?

14 Q. Let's start there. Is that true for the claims
15 asserted in the 147 patent?

16 A. Well, the 147 patent, it looks like it deals
17 with injecting the brominate compound in the flue gas
18 separately from the activated carbon.

19 Q. Okay. Well, let's just focus on the injecting
20 activated carbon point, if we can.

21 A. Okay.

22 Q. If a power plant is -- at a particular moment
23 is not injecting activated carbon, then it is not
24 infringing claim 17 of the 147 patent, correct?

25 A. That's true.

1 Q. Okay. Is it -- and perhaps it would be best to
2 go through them one by one if you're not comfortable
3 answering. But I'll ask you the general question first,
4 which is: For the other patents -- patent claims
5 asserted in this case, is it also true that when they are
6 not injecting activated carbon, then that -- that they
7 are not infringing the asserted claims of those other
8 patents?

9 A. Yes.

10 Q. The asserted claims of the patents in this case
11 are only infringed when activated carbon is being
12 inserted?

13 A. Correct.

14 Q. Let's go back to claim 1 and, in particular,
15 paragraph 1A. Let me give you a moment to just read
16 paragraph 1A. And let me know when you've done that.

17 A. Okay.

18 Q. And do you see that there's a reference there
19 to a chemical reaction?

20 A. Yes.

21 Q. And what are the reactants in that reaction?

22 A. The bromine and carbon.

23 Q. And when you say carbon, do you mean the
24 reactants are the activated carbon?

25 A. Yes.

1 Q. And the other -- sorry, let me rephrase that.

2 Just to clarify your answer, one of the
3 reactants is the activated carbon sorbent; is that
4 correct?

5 A. Correct.

6 Q. And the other reactant is the
7 bromine-containing promoter, correct?

8 A. Right, with mercury -- that contains mercury.

9 Q. Well, let me just -- I don't want to -- I don't
10 want to confuse things here.

11 If you look at step 1B, step 1B is when
12 the mercury becomes part of the reaction.

13 Do you see that?

14 A. Yeah.

15 Q. So I believe - and you'll correct me if I'm
16 wrong - the step 1A is when you're reacting with the --
17 bromine-containing promoter with the activated carbon
18 sorbent?

19 A. Well, that's kind of what it says, yes.

20 Q. Okay. So again, one of the reactants is the
21 activated carbon sorbent, correct?

22 A. Right.

23 Q. The other reactant is the bromine-containing
24 promoter?

25 A. Right.

1 Q. And that's whatever bromine compound that
2 contains bromine, correct?

3 A. Right, of calcium bromide.

4 Q. And there's further language, then, about --
5 details about that reaction.

6 Do you see where it talks about the
7 reaction happening at the carbene species edge sites?

8 Do you see that?

9 A. Yes.

10 Q. If you would turn back in the patent to figure
11 2. Let me know when you've had that -- when you have
12 that.

13 A. Okay.

14 Q. Do you understand this figure to be a
15 representation of the reaction described in claim 1?

16 A. Yes, that's what it looks like.

17 Q. Have you previously reviewed this -- this
18 reaction?

19 A. In the patent?

20 Q. Yes.

21 A. Yes.

22 Q. You had not -- you'd never seen this reaction
23 before working on this case, correct?

24 A. No. no.

25 Q. I'm sorry. Just one -- one moment, please.

1 You know, I'm going to give you a new
2 exhibit here, if I can access my e-mail.

3 DR. GLANDORF: We're having trouble
4 starting Outlook.

5 BY DR. GLANDORF:

6 Q. Okay. Let me ask you a few other questions.
7 We'll come back to this exhibit.

8 DR. GLANDORF: Do you want to see if you
9 can get on to Exhibit Share on here, and then maybe we
10 can load it.

11 BY DR. GLANDORF:

12 Q. So going back, we -- let's go back to the
13 discussion we were just having. And maybe we should turn
14 back to claim 1 if you could.

15 The reaction in claim 1A is between the
16 bromine-containing promoter and the activated carbon
17 sorbent, correct?

18 A. Correct.

19 Q. Is it your opinion that that reaction happens
20 at the accused power plants?

21 A. Yes.

22 Q. And what is the basis for your opinion that
23 that reaction is happening at the accused power plants?

24 A. Well, that's why they produce refined coal.
25 It's a bro -- refined coal is sprayed with a brominated

1 compound and that reacts after combustion with the
2 activated carbon injected into flue gas.

3 Q. Have you considered whether there are any other
4 reaction pathways other than the one described in 1A
5 whereby the bromine could enhance the capture of mercury
6 by the activated carbon sorbent?

7 A. I think that's what it says.

8 Q. That's what happens with this reaction pathway,
9 correct?

10 A. Yes.

11 Q. Have you considered whether there are any other
12 reaction pathways other than the one described here by
13 which the capture of mercury can be enhanced?

14 A. Not that I know of.

15 Q. Sorry. So to go back.

16 In your opinion, when this reaction
17 happens at the accused power plants, what is the
18 bromine-containing promoter that is serving as the
19 reactant?

20 A. What is it? I don't understand.

21 Q. What chemical species is it?

22 A. What chemical species is it? Calcium bromide.

23 Q. Calcium bromide is the bromine-containing
24 promoter that's taking part in the reaction, right,
25 described here in element 1A?

1 A. Right.

2 Q. Is there any other bromine-containing promoter
3 that you are saying reacts according to the reaction in
4 claim 1A in the accused power plants?

5 A. I don't know.

6 Q. You don't know of any others?

7 A. No.

8 Q. Sitting here today, your opinion is only
9 that it's calcium bromide that is serving as the
10 bromine-containing promoter that is taking part in this
11 reaction in the accused power plants?

12 A. Well, it's not what it says in the claim. It
13 just says it's a bromide -- bromate compound --
14 brominated compound.

15 Q. It just says bromine-containing promoter --

16 A. Yeah.

17 Q. -- right?

18 And so my question is: In your
19 infringement opinions - because you're, again, you know,
20 accusing these power plants of infringing - I'm asking
21 you what various bromine compounds you are asserting
22 serve as that bromine-containing promoter for this
23 reaction?

24 A. None other.

25 Q. None other than calcium bromide?

1 A. Yep.

2 Q. Okay. We do have now a new exhibit for you to
3 see. We don't have this in paper, unfortunately. It's
4 only one page.

5 DR. GLANDORF: So we'll take a moment and
6 pull it up.

7 (Exhibit No. 6 marked.)

8 BY DR. GLANDORF:

9 Q. Do you see Exhibit 6 --

10 A. Yes.

11 Q. -- Mr. O'Keefe?

12 And do you recognize Exhibit 6 to be a --
13 the figure 2 from the 147 patent with some additional red
14 annotations?

15 A. Looks like it, yes.

16 Q. And I will admit to you that I am the one who
17 put these on here. And what I've done is I've just
18 numbered some of the steps of this reaction 1 through 5.

19 Do you see that?

20 A. Yes.

21 Q. And I'm just doing that so that we are on the
22 same page in referring to what's going on here.

23 A. Right.

24 Q. Okay. And so I'm going to ask you some
25 questions about this figure and also in reference to the

1 claim language in element 1A. So you may have to go back
2 and forth between the two, if that's okay.

3 A. Sure.

4 Q. And if we go back to claim 1A, we see that
5 the -- there is a chemical reaction between the sorbent
6 material and a bromine-containing promoter.

7 Do you see where I'm reading that?

8 A. Yes.

9 Q. And so if we go back here to the figure, could
10 you identify for me here in the figure what the
11 bromine-containing promoter is?

12 A. That would be number 3.

13 Q. Number 3 is the bromine-containing promoter; is
14 that your testimony?

15 A. Yes.

16 Q. Okay. I'm not sure about that. Let's walk it
17 back.

18 The -- well, let's look at it this way.

19 You see the hexagon rings that are
20 displayed in a number of these figures?

21 A. Yes.

22 Q. What are those hexagon rings?

23 A. Carbon bonding.

24 Q. Those are carbon bonding. Okay.

25 And do you understand those hexagon rings

1 to be the activated carbon sorbent?

2 A. I think that's number 2.

3 Q. Okay. And number 2 is the activated carbon
4 sorbent?

5 A. Yes.

6 Q. And it has -- in number 2 it has no bromine,
7 correct?

8 A. No. no.

9 Q. And then if we go to step number 3, do you see
10 that there is a Br- associated there?

11 Do you see that?

12 A. Yes.

13 Q. Okay. Do you -- okay. Do you understand
14 number 3 to be the promoted brominated sorbent?

15 A. I believe so, yes.

16 Q. And so, let me ask you again. Do you -- can
17 you identify in this figure what species is the
18 bromine-containing promoter?

19 A. That would be number 3.

20 Q. Okay. Well, let's go back to the claim
21 language again, if we could. And I'm going to read it to
22 you. And it says, "Chemically reacting the sorbent
23 material with a bromine-containing promoter to form a
24 promoted brominated sorbent."

25 So the product of the reaction -- scratch

1 that.

2 You're familiar with the terms "reactants"
3 and "products" when it comes to chemistry?

4 A. Yes.

5 Q. What is a reactant?

6 A. The reactant is the elements that are forming
7 the chemical reaction, and the products are after the
8 reaction. It's what you result after -- result with
9 after the reaction.

10 Q. And so what are the reactants in this reaction
11 that's being described in 1A?

12 A. Carbon, So₄, hydrogen bromide, NO_x.

13 Q. Right. Let's go back to the claim language
14 where it says, "Chemically reacting" -- if you look at
15 1A. "Chemically reacting the sorbent material with a
16 bromine-containing promoter to form a promoted brominated
17 sorbent."

18 So that's describing a chemical reaction,
19 correct?

20 A. When you're forming something, yes, I would say
21 so.

22 Q. Okay. And so in that reaction being described
23 there the reactants - I think we already established
24 this - the reactants are the activated carbon sorbent and
25 the bromine-containing promoter, correct?

1 A. Correct.

2 Q. And one of the products is the promoted
3 brominated sorbent?

4 A. Right.

5 Q. So again, going back to figure 2, can you
6 identify here what is the bromine-containing promoter?

7 A. That would be number 3.

8 Q. Okay. Going back to the claim language here,
9 it says -- there's a "wherein" clause that starts on line
10 41. Do you see that?

11 "Wherein, the activated carbon contains
12 graphene sheets having carbene species edge sites."

13 A. It's actually on line 42.

14 Q. Yes. Thank you. Thank you.

15 Did I read that correctly, though?

16 A. "Wherein, the activated carbon contains
17 graphene sheets..."

18 Q. Yes, "...having carbene species edge sites."

19 Do you see that?

20 A. Yeah.

21 Q. What is a graphene sheet?

22 A. It's a sheet that contains carbon.

23 Q. Is there a particular type of carbon that is
24 referred to as graphene sheets?

25 A. Activated carbon.

1 Q. So activated carbon includes graphene sheets --

2 A. Yes.

3 Q. -- is that right?

4 Do you know the bonding configurations of
5 the carbon in the graphene sheets?

6 A. No.

7 Q. You understand that a diamond is also made of
8 carbon?

9 A. Yeah. It burns too.

10 Q. It does? Okay.

11 A. Yeah, it's like coal.

12 Q. Okay. How would you explain the difference
13 between carbon that's made out of -- I'm sorry. Let me
14 scratch that.

15 How would you describe to someone the
16 difference between graphene and carbon?

17 A. I don't know.

18 Q. If we go back to the figure and -- is there an
19 indication here of the graphene sheets?

20 A. That would be number 2.

21 Q. And which part are you looking at there, number
22 2?

23 A. Figure 2.

24 Q. Okay. How do you know that those are graphene
25 sheets?

1 A. Well, it's the carbon site that accepts the
2 hydrogen bromide.

3 Q. Okay. And do you know what graphite is?

4 A. It's a carbon compound.

5 Q. And do you know how the term "graphene" relates
6 to graphite?

7 A. No.

8 Q. Going back to figure 2.

9 Is there an indication here of the carbene
10 species edge site?

11 A. Number 2.

12 Q. It's part of number 2?

13 A. Yes.

14 Q. What part of that?

15 A. Number 2. What can I say?

16 Q. But is there a particular carbon atom on number
17 2 that has the carbene species?

18 A. No, I can't point to that in number 2, figure
19 2.

20 Q. It's somewhere there in figure 2?

21 A. Yes.

22 Q. Do you know -- do you know the orbital
23 configuration for a carbene species carbon?

24 A. No.

25 Q. Do you know the oxidation state of a carbene

1 species carbon?

2 A. No.

3 Q. You know what a -- do you know what oxidation
4 state is?

5 A. Yeah.

6 Q. Could you explain to me in your own words what
7 oxidation state is?

8 A. Well, let's see. I've got to look back here.

9 Reaction of mercury with a gas, that is a
10 homogeneous oxidation. Is that what you're asking me
11 or...

12 Q. No. That's a little bit different. That is
13 referring to oxidation as a process.

14 A. Okay.

15 Q. In terms of the oxidation state -- and I don't
16 want to confuse you. They are related. But in terms of
17 the oxidation state of an atom in a molecule, do you
18 understand what that means?

19 A. No.

20 Q. Okay. Let's go back then to the use of the
21 oxidation that you just had there.

22 When it's referring to the oxidation of
23 mercury, what is meant by the oxidation of mercury?

24 A. In a gaseous state. That's the products of
25 combustion.

1 Q. So the products are combustion -- I'm not
2 understanding.

3 Let me go back and reask my question.

4 Again, what is meant -- I guess let's
5 refocus on mercury in particular.

6 What is the meaning of the term "oxidation
7 of mercury"?

8 A. You're pulling the mercury and oxidizing it in
9 a chemical reaction in the combustion gas.

10 Q. And --

11 A. -- flue gas.

12 Q. And so what chemical -- what is the chemical
13 reaction that would be happening?

14 A. I don't know offhand.

15 Q. Can you give me an example I guess of a
16 chemical reaction that is the oxidation of mercury?

17 A. Well, just when you put calcium bromide on coal
18 and you burn it and it attracts the mercury atoms to it,
19 that's like an oxidation of mercury in the gaseous form.

20 Q. And so how does the mercury change in that
21 chemical reaction?

22 A. It doesn't.

23 Q. Do you know if the oxidation state of that
24 mercury changes in that chemical reaction?

25 A. I don't know.

1 Q. Do you see any mercury here in this figure 2?

2 A. Yes.

3 Q. And like if we look, for example, at -- there
4 is a -- what's the chemical symbol for mercury?

5 A. Hg.

6 Q. And do you see there's an HgBr₂ in the lower
7 left corner?

8 A. Yeah. By number 3?

9 Q. Yes.

10 I'm actually -- it's not really by number
11 3. It's more by number 5.

12 A. Right. Sorry, yeah. My vision is a little
13 blurry.

14 Number 5.

15 Q. Okay. And is the mercury in that compound
16 oxidized or not?

17 A. Yes.

18 Q. And what would be an example of mercury that's
19 not oxidized?

20 A. Just free mercury in the coal prior to
21 combustion.

22 Q. Is mercury oxidized in the combustion process?

23 A. Well, if you have brominated compound in the --
24 on the coal -- refined coal, it's oxidized when the coal
25 is burned.

1 Q. And what mercury species results from that
2 oxidation that happens when the coal is burned?

3 A. Well, it combines with the brominated compound
4 with the bromine and then it's further enhanced by
5 activated carbon injection in the flue gas.

6 Q. So does it react -- does the mercury react with
7 the bromine before it interacts with the activated
8 carbon?

9 A. Yes, in the combustion process. And the
10 activated carbon enhances the attraction of mercury. It
11 attracts mercury to the carbon graphene sheets in the
12 activated carbon.

13 Q. And at that point it's attracting mercury
14 bromide to the activated carbon?

15 A. Well, the mercury is attracted -- yes, the
16 mercury bromide is attracted to the graphite.

17 Q. Did you say graphite?

18 A. Yes.

19 Q. Is graphite part of activated carbon?

20 A. Well, yes, it is. It's a form of carbon.

21 Q. Do you understand the difference between a
22 homogeneous and heterogeneous reaction?

23 A. Yes.

24 Q. What is the difference?

25 A. I think heterogeneous is direct contact between

1 elements, the reactants. And heterogeneous -- let me
2 look that up.

3 Homogeneous is the reaction of like, for
4 example, mercury with gas. Okay. And heterogeneous is
5 the reaction of mercury and gas with activated carbon.

6 Q. And where are you looking for that definition,
7 if I could --

8 A. Well, it's in my report, my preliminary report.

9 Q. Are you looking at any particular page in your
10 report?

11 A. Well, I'm looking at this page. And you can
12 have a copy of it if you like.

13 Q. This is a -- that is a page from your report?

14 Okay --

15 A. It's out of my report.

16 Q. I see. This is like a glossary? I mean, is --
17 is this --

18 A. Well, I condensed some of the terms in my
19 reports down into a single sheet so I don't have to hunt
20 for it.

21 Q. Smart idea. Okay.

22 Is this condensed sheet, was it part of
23 your original report?

24 A. No.

25 Q. Okay. Let's go ahead and make this just an

1 exhibit if that's okay. We'll go ahead -- and I think
2 the best way to do it is just through Ina's phone.

3 MS. KOSOVA: Yeah, I'm going to.

4 DR. GLANDORF: Is that okay?

5 BY DR. GLANDORF:

6 Q. Can I take this out?

7 A. It's fine with me.

8 DR. GLANDORF: Did you get them both?

9 MS. KOSOVA: Yeah.

10 BY DR. GLANDORF:

11 Q. I'm going to return this to you.

12 Thank you.

13 And so to go back to my questioning here.

14 So what makes it a heterogeneous reaction
15 versus a homogeneous reaction?

16 A. Homogeneous is a reaction of mercury with a
17 gas. And homogeneous is reaction of mercury in the gas
18 of activated carbon.

19 Q. I think you may have misspoken there. Could
20 we -- I think you may have said homogeneous when you
21 meant heterogeneous.

22 Can I -- let me just ask the question
23 again. I'm sorry. I don't mean to -- I'm going to keep
24 asking you about this for a little bit, so you may want
25 to stay on that page.

1 Again, what makes it a heterogeneous
2 reaction versus a homogeneous reaction?

3 A. Homogeneous is the reaction of mercury with
4 gas -- with a gas. And heterogeneous is a reaction of
5 mercury in gas with activated carbon.

6 Q. And so you understand those terms, homogeneous
7 reaction and heterogeneous reaction, are general terms as
8 in chemistry, not specific to this case, correct?

9 A. Yes.

10 Q. And so general -- what is a high-level, general
11 definition of the difference between a homogeneous and
12 heterogeneous reaction?

13 A. I can't give you that.

14 Q. Okay.

15 Sorry. We're just going to try to get
16 this exhibit here.

17 So just to confirm, you can't give me a
18 definition of a homogeneous versus heterogeneous reaction
19 without a reference to mercury?

20 A. Correct.

21 Q. Okay. There is a -- now go back to claim 1.
22 And I apologize, I'm switching you back and forth here.
23 And if it's easier for you to take any piece out, feel
24 free to do that.

25 If we look down to line 46, do you see

1 that?

2 A. In which column?

3 Q. Column 23.

4 A. Okay.

5 Q. It says to form a carbo cation paired with a
6 bromine anion.

7 Do you see that?

8 A. Okay. I'm confused as far as the lines go.

9 Q. Sure, sure, sure. So --

10 A. It looks like you're referring to line 43.

11 Q. 44, I guess.

12 A. 43.

13 Q. I think it's 44, to form a carbo cation, the
14 last half over the line on 44.

15 A. Oh, okay. Yes.

16 Q. So it says, "To form a carbo cation paired with
17 a bromide ani" -- "bromide anion."

18 Do you see that?

19 A. Yes.

20 Q. Let's go back to the exhibit that's in front of
21 you.

22 Is there a carbo cation shown here?

23 A. Well, cation would mean a positive charge; and
24 there's one shown on carbon in number 3 and there's one
25 shown in number 5.

1 Q. Okay. So number 3 and number 5 have carbo
2 cations; is that correct?

3 A. There's a positive charge on the carbon atoms
4 in those two parts of the figure.

5 Q. What is your understanding of what a carbo
6 cation is?

7 A. A positive charge.

8 Q. How many valence electrons does a carbo cation
9 have?

10 A. I don't know. I took atomic chemistry like 40
11 years ago, so I don't remember.

12 Q. Okay. Is there a bromide anion shown here?

13 A. Yes.

14 Q. Where is that at?

15 A. That's in number 3. That's a bromide with the
16 negative charge.

17 Q. Do you know what a valence electron is?

18 A. No. Well, we're talking about electron
19 orbitals?

20 Q. Correct.

21 A. Yeah, I mean, there's different orbital levels;
22 and I can't really talk about that offhand.

23 Q. But now having thought about that, do you know
24 what a valence electron is?

25 A. Well, it has to do with electron orbitals,

1 right?

2 Q. It does, yeah. But do you know, I guess,
3 specifically --

4 A. Well, I don't know specifically what orbital
5 we're talking about.

6 Q. Do you know, for example, how many valence
7 electrons Br- has?

8 A. No.

9 Q. Going back. Let's look now -- I think we have
10 an open exhibit of your glossary, if it's okay if I call
11 it that.

12 A. Call it whatever you like.

13 Q. What would you call it?

14 A. I call it list of acronyms.

15 Q. Okay. List of acronyms. Okay. Let's look at
16 your list of acronyms. That's fine.

17 Do you see that up there as Exhibit 7?

18 A. No.

19 Q. Okay. Just a moment.

20 (Exhibit No. 7 marked.)

21 MR. NEMUNAITIS: It's in your sheet there.

22 THE WITNESS: Okay.

23 BY DR. GLANDORF:

24 Q. Okay. And so I'm looking at this. This is
25 what you refer to -- this exhibit is what you refer to as

1 your list of acronyms; is that correct?

2 A. Correct.

3 Q. Who prepared this list of acronyms?

4 A. I did.

5 Q. And did you have input from your counsel in
6 preparing this list of acronyms?

7 A. No.

8 Q. And was this list prepared for this deposition
9 today?

10 A. Yes.

11 Q. Okay. When you see -- I see that you have the
12 definitions here for homogeneous and heterogeneous
13 oxidation.

14 A. Yes.

15 Q. What determines in a system whether the
16 reaction of mercury happens homogeneously or
17 heterogeneously?

18 A. Whether it's in a gas alone or whether it's a
19 reaction in a gas with activated carbon.

20 Q. Is it your opinion that there is no homogeneous
21 oxidation of mercury in gas streams where there is no
22 activated carbon?

23 A. That's correct.

24 Q. And what is your basis for that opinion?

25 A. Just the sheet that you have in front of you,

1 Exhibit 7. It's out of my report.

2 Q. Now, you testified earlier, I believe, that the
3 bromine-containing promoter that you are asserting that
4 the accused power plants are reacting is calcium bromide;
5 is that correct?

6 A. I think it's different for the cyclone unit at
7 Powerton.

8 Q. Okay. So aside from the Powerton unit, you are
9 asserting that the bromine-containing promoter that the
10 accused power plants are reacting with activated carbon
11 is calcium bromide; is that correct?

12 A. That's correct. That's the chemical
13 composition of MERSORB.

14 Q. I see. And so it is the calcium bromide from
15 MERSORB that is directly reacting with the activated
16 carbon. Is that your theory?

17 A. Well, yeah, once it accepts mercury in the
18 homogeneous oxidation, it reacts with the carbon in the
19 flue gas as a heterogeneous oxidation.

20 Q. Does any of the calcium bromide react with the
21 activated carbon before it encounters mercury?

22 A. No.

23 Q. Does the calcium bromide transform into another
24 bromide compound before it encounters mercury? I'm
25 sorry. Before it -- let me scratch that. Let me ask

1 that again.

2 Does the calcium bromide convert into
3 another bromide compound before it reacts with the
4 activated carbon?

5 A. I don't think so.

6 THE WITNESS: You know, can we take a
7 break?

8 DR. GLANDORF: Sure.

9 THE VIDEOGRAPHER: We are going off the
10 record. The time now is 1:30.

11 (Recess 1:30-1:48.)

12 THE VIDEOGRAPHER: We are back on the
13 record. This is the start to media number 4. The time
14 is 1:48.

15 BY DR. GLANDORF:

16 Q. Mr. O'Keefe, welcome back.

17 A. Thank you.

18 Q. During the break did you talk about the
19 substance of your deposition with your counsel?

20 A. No.

21 Q. Let's go back to the claim language of the
22 '147. And again, I may be -- I'm going to be referring
23 to some of those acronyms. I don't want to tell you how
24 to do things, but if you want to take out the acronym
25 sheet, it might be easier given how far apart those

1 exhibits are.

2 A. Okay.

3 Q. Let's look back at claim 1A, if we could.

4 A. Okay.

5 Q. And I'm going to direct you to line 40 where it
6 starts: "Wherein..." Do you see: "Wherein, the
7 bromine-containing promoter..."?

8 A. Yes.

9 Q. And that says, "Wherein, the bromine-containing
10 promoter is in gaseous form, vapor form, or nonaqueous
11 liquid form."

12 Do you see that?

13 A. Yes.

14 Q. And I believe your testimony earlier was that
15 the bromine-containing promoter that you are accusing the
16 accused power plants of using in this case is calcium
17 bromide; is that correct?

18 A. Yes.

19 Q. And is it your opinion that in the accused
20 power plants the calcium bromide is in gaseous form,
21 vapor form or nonaqueous liquid form?

22 A. Yes.

23 Q. Which of those three things?

24 A. Nonaqueous liquid form.

25 Q. The calcium bromide in the accused power plants

1 system is in nonaqueous liquid form?

2 A. That's my understanding.

3 Q. And what is the meaning of an aqueous liquid?

4 A. It contains water.

5 Q. And so what is the nonaqueous liquid that the
6 calcium bromide is?

7 A. It doesn't contain water.

8 Q. What doesn't contain -- is it only -- is it
9 purely calcium bromide?

10 A. I believe so.

11 Q. Is your understanding that MERSORB is a
12 nonaqueous liquid?

13 A. Yes.

14 Q. Do you have an understanding of what happens
15 when calcium bromide is added onto pulverized coal?

16 A. What happens?

17 Q. Yeah, what form -- does it still remain calcium
18 bromide when it's added, sprayed onto the pulverized
19 coal?

20 A. Yes.

21 Q. Is the -- calcium bromide just adsorbs to the
22 outside of the coal?

23 A. Let's call it the outside of coal.

24 Q. And your understanding is that pure calcium
25 bromide is a liquid?

1 A. Yes.

2 Q. A nonaqueous liquid?

3 A. Yes.

4 Q. Now, that refined coal is then combusted in
5 a -- in these accused power plants, correct?

6 A. It's pulverized and it's combusted.

7 Q. And does that calcium bromide undergo -- well,
8 scratch that. Let me go back.

9 Do you know if the calcium bromide is
10 added before or after pulverization?

11 A. Before.

12 Q. Does that calcium bromide undergo any changes
13 as a result of that pulverizing?

14 A. No.

15 Q. So when the pulverized refined coal is
16 combusted in these accused systems, what happens to the
17 calcium bromide at that point?

18 A. It bonds with mercury, and it forms a gaseous
19 compound.

20 Q. The calcium bromide directly result -- I'm
21 sorry. The calcium bromide itself reacts with mercury;
22 is that your understanding?

23 A. Correct.

24 Q. And what form is that mercury in at that point?

25 A. Gaseous form.

1 Q. And is the calcium bromide in gaseous form when
2 it reacts with the mercury?

3 A. Yes.

4 Q. And is that form -- and is that form gaseous
5 calcium bromide?

6 A. Well, it's turned into a gas in a combustion
7 process.

8 Q. What gas has it turned into?

9 A. Flue gas.

10 Q. I'm sorry. But is it still calcium bromide?

11 A. Well, the bromine is not destroyed. It remains
12 in there bonded with mercury.

13 Q. But before it reacts with mercury, is the
14 bromine still in a bond with the calcium?

15 A. I'm not sure.

16 Q. You don't know if the calcium -- well, let me
17 just reask.

18 Does the calcium bromide convert to some
19 other species before it reacts with the bromine?

20 A. I don't know.

21 Q. You don't know, for example, if the calcium
22 bromide are still together or if those have separated?

23 A. I don't know.

24 Q. I -- I made a mistake in one of my questions.
25 I just want to go back and reask it.

1 Does the calcium bromide convert to some
2 other species before it reacts with the mercury?

3 A. I don't know.

4 Q. Is there gaseous calcium bromide in the
5 combustion zone?

6 A. I don't know.

7 Q. What bromine species -- well, let me -- let me
8 step back.

9 When I say bromine species, do you
10 understand me to be referring to whatever bromine
11 compounds are present?

12 A. Yes.

13 Q. Whether it's bromine with other atoms or just
14 bromine by itself?

15 A. Yes.

16 Q. What bromine species are present in the
17 combustion zone?

18 A. I don't know.

19 Q. Can you name any?

20 A. No.

21 Q. What bromine species are present in the flue
22 gas?

23 A. Well, the bromine reacts with the mercury and
24 it further reacts with the carbon in the activated carbon
25 that's injected in flue gas and it's removed as

1 particulate matter.

2 Q. Okay. So there is some product of the bromine
3 reacting with the mercury, correct?

4 A. Yes.

5 Q. And what is that product?

6 A. I don't know.

7 Q. It's some compound with bromine and mercury; is
8 that correct?

9 A. Yes.

10 Q. And then that reacts with the activated carbon;
11 is that your understanding?

12 A. Correct. And it forms particulate matter.
13 It's easily removed in a bag house or an ESP.

14 Q. And ESP we talked about earlier, that's an
15 electrostatic precipitator; is that correct?

16 A. Correct.

17 Q. Does any of the bromine react with activated
18 carbon before it reacts with the mercury?

19 A. It's already reacted with the mercury during
20 the combustion process. The activated carbon is injected
21 in the flue gas which is downstream from the combustion
22 process.

23 Q. So none of the bromine reacts with the
24 activated carbon before it reacts with the mercury?

25 A. Well, if there's no activated carbon present,

1 how would it react?

2 Q. When you say that the bromine reacts with the
3 activated carbon in these systems, just to confirm, in
4 the accused plants -- I'm sorry. I'll jump back. Let me
5 start it again.

6 In the accused plants, when you say that
7 the bromine reacts with the activated carbon, do you mean
8 that the calcium bromide reacts with the activated
9 carbon?

10 A. What I'm talking about is the mercury combines
11 with the bromide in calcium bromide, and that reacts with
12 the activated carbon.

13 Q. Ahh. Thank you for correcting me.

14 So in these accused plants, when you say
15 that the bromine reacts with the mercury, do you mean the
16 calcium bromide reacts with the mercury?

17 A. Yes.

18 Q. Thank you.

19 So in the accused plants, the bromine is
20 not reacting directly with the activated carbon?

21 A. No, it contains -- it's bonded with the
22 mercury.

23 Q. Do you know if there's any bromine radicals in
24 the flue gas?

25 A. I don't know.

1 Q. Do you know what a bromine radical is?

2 A. No.

3 Q. Do you know what charge a bromine radical has?

4 A. No.

5 Q. Do you know if there's any bromide ions in the
6 flue gas?

7 A. Yeah.

8 Q. And what is your opinion?

9 That there is or there are not? I'm
10 sorry.

11 A. We already talked about that.

12 Q. I'm sorry. Well, let -- I know we're going
13 back a little bit, but just let me confirm.

14 Is it your opin -- what is your opinion on
15 whether or not there are bromede -- bromide ions in the
16 flew gas?

17 A. Yes, there are.

18 Q. And those bromide ions are in the gas phase in
19 the flue gas?

20 A. Yes.

21 Q. And are those bromide ions in the gas phase in
22 the flue gas bonded to anything else or are they free?

23 A. To mercury.

24 Q. Are there any bromide ions in the flue gas that
25 are not bound to anything?

1 A. I don't know.

2 Q. Let's go to the 147 patent if we could here.

3 And I'm going to look at some of the
4 examples. Do you recall there being examples in the 147
5 patent?

6 A. I think so.

7 Q. And I will direct you to column 14.

8 A. Example 1?

9 Q. Yes.

10 Let me -- do you recall reviewing example
11 1?

12 A. Well, I looked at it a long time ago. I don't
13 remember it.

14 Q. Okay. Yeah, sure. I don't want to give you a
15 memorization quiz on it, so...

16 But I'm going to ask you some questions
17 about it and you refer to it, please, as much as you need
18 to.

19 Do you see that there's a reference in
20 the -- at the beginning of example 1 to finely powdered
21 activated carbon?

22 Do you see that?

23 A. Yes.

24 Q. And it says, "Such as NORIT Darco FGD."

25 Do you see that?

1 A. Yes.

2 Q. And there's some -- there's information there
3 listed about the company NORIT Americas in Marshall,
4 Texas.

5 Do you see that?

6 A. Yes.

7 Q. Are you familiar with NORIT Darco FGD?

8 A. No.

9 Q. Have you heard of NORIT Darco FGD before your
10 work on this case?

11 A. No.

12 Q. Well, are you familiar with it now having
13 worked on this case?

14 A. Yes.

15 Q. What is NORIT Darco FGD?

16 A. It's a company that makes --

17 Q. Well, let me ask about -- let me interrupt you
18 just for a moment, and just --

19 A. -- company that makes activated carbon powder.

20 Q. Thank you. Okay.

21 THE REPORTER: I'm sorry. I didn't --

22 DR. GLANDORF: We were speaking over each
23 other.

24 A. It's a company that makes activated carbon
25 powder.

1 BY DR. GLANDORF:

2 Q. And the company is NORIT Americas, Inc.; is
3 that correct?

4 A. That's what it says, yes.

5 Q. And NORIT Darco FGD is the product, correct?

6 A. Yes.

7 Q. And I think you said this, but we were speaking
8 over each other.

9 What is NORIT Darco FGD?

10 A. It's a product made by NORIT America.

11 Q. And what is it?

12 A. It's activated carbon powder.

13 Q. And what does FGD stand for here?

14 A. Fluidized gas desulphurization is the only
15 thing I'm familiar with.

16 Q. And are you referring there to your table of
17 acronyms?

18 A. Yes.

19 Q. Okay. And what is the meaning of fluid --
20 of -- I'm sorry. Could you say it again.

21 So what does FGD stand for here?

22 A. Fluidized gas desulphurization.

23 Q. And what is -- what does that refer to?

24 A. Sulphur control.

25 Q. Sulphur control from the flue gas; is that

1 correct?

2 A. Well, yes, the emissions.

3 Q. Does activated carbon play a role in
4 desulphurization?

5 A. Well, it looks like it does, according to
6 example 1.

7 Q. Example 1 has to do with desulphurization?

8 A. Well, that -- if that's what FGD stands for in
9 this case. I don't know what NORIT Darco determined FGD
10 stands for, but it's what I know it stands for in the
11 industry.

12 Q. And is NORIT Darco FGD an example of the
13 activated carbon that can be used in conjunction with the
14 claims of this patent?

15 A. Yes.

16 Q. What sulphur species are removed through the
17 desulphurization process?

18 A. I don't know.

19 Q. If you refer down to line 46 or so - but I'll
20 let you read it - what is your understanding of how
21 bromine is generated in this example?

22 A. How it's generated?

23 Q. That's the word that's used here, so -- but
24 just confirm with me that there is bromine being
25 generated here.

1 A. Gas phase bromine was generated. That's what
2 it says.

3 Q. And what is -- gas phase bromine, what is the
4 chemical formula for bromine?

5 A. Well, it's Br, bromine. It's an element.

6 Q. Do you know if it is monatomic or diatomic?

7 A. I -- I can't tell you.

8 Q. I guess my question is: Does it -- when
9 bromine is by itself, is it just one atom of bromine or
10 two atoms of bromine or more atoms of bromine; do you
11 know?

12 A. Well, in the case of MERSORB, it's calcium
13 bromide, which is Br₂, so it's two atoms of bromine.

14 Q. That's in calcium bromide, right. Is --

15 A. In MERSORB.

16 Q. Yes, in MERSORB. I see.

17 So my question is, for the liquid bromine
18 that's being referred to here, do you know what that
19 chemical formula is?

20 A. No.

21 Q. Okay. Do you know what -- if pure bromine at
22 room temperature is a solid, a liquid, or a gas?

23 A. I don't know.

24 Q. Okay. Now, here there's a reference to -- if
25 we go maybe to line 43 or so -- a rotating plastic

1 barrel.

2 Do you see that?

3 A. Yes.

4 Q. And do you understand this example to be
5 describing a rotating plastic barrel that -- where the
6 activated carbon is within it?

7 A. It says that the activated carbon was placed in
8 a rotating plastic barrel with side blades.

9 Q. And then if we go down to page -- I'm sorry, to
10 line 50, there's an indication there that the outlet from
11 the gaseous bromine generator is connected into the
12 barrel. Is that -- is that a fair summary?

13 A. That's what it says.

14 Q. And, you know, reading through -- and again, I
15 encourage you to read through this entire paragraph as
16 needed. But is the -- what is the -- what is the product
17 of introducing, you know, the outlet of the bromine
18 generator into the barrel with the activated carbon?

19 A. I'm sorry. Can you ask that again.

20 Q. Sure. What is the product of the process
21 they're doing here where they are introducing the outlet
22 of the bromine generator into the barrel with the
23 activated carbon?

24 A. It looks like they're trying to create a
25 brominated activated carbon.

1 Q. And you agree that they are creating this
2 brominated activated carbon outside of the flue gas?

3 A. Well, it looks like it, yes.

4 Q. But this -- you understand this brominated
5 activated carbon could then be introduced into the flue
6 gas?

7 A. It could be, yeah.

8 Q. Would that be what you would expect the use of
9 it to be?

10 A. I suppose it could be, yes.

11 Q. Is there any other use that you can think of
12 for that brominated activated carbon?

13 A. No.

14 Q. Let's go to claim 17, if we could.

15 And we're going to come back to this page,
16 and I anticipate you'll want to mark it.

17 I'm going to read a portion of claim 17
18 just into the record just so we're on the same page. And
19 I'll do it slowly.

20 The claim 17 says, "A method, according to
21 claim 1, further comprising injecting the particulate
22 sorbent material at a sorbent material injection rate and
23 injecting separately the bromine-containing promoter into
24 a gas stream whereby in-flight reaction produces the
25 promoted brominated sorbent wherein the promoter is

1 reacted in a gas phase as a vapor."

2 Now, did I read the claim right up until
3 there?

4 A. It looks like you did.

5 Q. And there's an extra part after that about the
6 ratio of material; is that right?

7 A. Yes.

8 Q. But focusing on what I read, do you see the
9 phrase in there that says "in-flight reaction"?

10 A. Yes.

11 Q. What is your understanding of how a POSITA --
12 I'm sorry, a POSA would understand in-flight reaction?

13 A. Well, I think they're referring to the flue
14 gas, and it's the compounds in-flight in the flue gas.

15 Q. If the reaction happened in a gas stream other
16 than the flue gas, would that be in-flight reaction?

17 A. Well, if it's flowing.

18 Q. Okay. So in-flight reaction, as it's referred
19 to here in claim 17, refers to the reaction happening in
20 a flowing gas stream; is that correct?

21 A. Right, flue gas.

22 Q. Well, that's my question.

23 Does it have to be flue gas, or can it
24 just be a different flowing gas?

25 So let me reask my question.

1 In-flight reaction, as it's referred to
2 here in claim 17, refers to the reaction happening in a
3 flowing gas stream; is that correct?

4 A. In flue gas.

5 Q. It has to be in flue gas?

6 A. Well, that's what the claim is talking about,
7 flue gas.

8 Q. The claim itself has no reference to the flue
9 gas, correct?

10 A. Yeah, but that's what a person of ordinary
11 skill in the art would interpret it to be referencing to.

12 Q. Is there anything in claim 1 or claim 17 that
13 indicates that the gas stream we're talking about here is
14 the flue gas?

15 A. No.

16 Q. But that is your understanding of how a person
17 of skill in the art would read it?

18 A. Yes.

19 Q. A person of skill in the art would read claim
20 17 to be limited to in-flight reaction in flue gas?

21 A. Right.

22 Q. Let's go back now to example 1.

23 By the way, when you say flue gas,
24 according to your understanding, where in the system does
25 it start being flue gas?

1 A. As soon as it's burned and the flue gas passes
2 from the fireball into the furnace and into the ductwork.

3 Q. And at what point does it stop being flue gas?

4 A. It's flue gas all the way up to the stack.

5 Q. And just so I understand, is it flue gas
6 when it's -- when the gas is being -- I'm sorry. Scratch
7 that. Let me start again.

8 Combustion happens in the combustion zone,
9 correct?

10 A. In the furnace, yes.

11 Q. In the furnace. And so in the furnace it is
12 creating flue gas as a -- as a result of combustion?

13 A. Product of combustion.

14 Q. And so would you call -- is it flue gas, then,
15 in the furnace once it's created?

16 A. Well, flue gas can be in the furnace upstream
17 of the fireball in a pulverized coal furnace.

18 Q. And do you consider flue gas to be, you know,
19 present throughout the furnace?

20 A. Well, in the back end of the furnace and also
21 in the ductwork leading from the furnace.

22 Q. Yes, it certainly is in the ductwork leading
23 from the furnace. Is it also in the furnace itself
24 where it's created?

25 A. Oh, yes.

1 Q. And I think you said upstream of the fireball.

2 Did you mean downstream of the fireball?

3 A. I'm sorry. Downstream. Yes. I misspoke.

4 Q. So flue gas starts in the combustion zone, in
5 your opinion?

6 A. Right, where the coal is burned.

7 Q. Now, you were describing to me what you
8 understood the phrase "in-flight promotion" to be as that
9 phrase is used in claim 17.

10 My example to you is -- well, scratch
11 that. Let me ask it again.

12 Does -- is example 1 an example of
13 in-flight promotion as that term is used in claim 17?

14 A. I didn't get that far.

15 Q. Okay. Well, please take your time and review
16 the example.

17 A. Okay. What was your question again?

18 Q. Sure. Is example 1 an example of in-flight
19 promotion as that term is used in claim 17?

20 A. I think so.

21 Q. Now, here in example 1 the bromine and the
22 activated carbon are combined in a barrel, correct?

23 A. Well, they brominate activated carbon in the
24 barrel.

25 Q. And so is that preparation of the brominated

1 activated carbon in the flue gas?

2 A. No, if it's injected downstream of the
3 fireball.

4 Q. But it is your opinion that example 1 is an
5 example of in-flight promotion?

6 A. Yes.

7 Q. Even though the brominated activated carbon is
8 prepared outside the flue gas?

9 A. Yeah.

10 Q. Okay. Can you identify for me the
11 bromine-containing promoter in example 1?

12 A. I don't think it's mentioned.

13 Q. You can't tell if there's a bromine-containing
14 promoter --

15 A. I don't remember seeing that.

16 Q. Well, I will represent to you that that term is
17 not used in -- you know, in like the first paragraph here
18 in example 1.

19 But my question is, you as a -- reading
20 this, can you identify what would be the
21 bromine-containing promoter here, to the extent there is
22 one?

23 A. Yes. Like in the third paragraph, it talks
24 about -- oh, I'm sorry. My mistake.

25 I don't think it talks about upstream of

1 the fireball.

2 Q. So can you identify a bromine-containing
3 promoter that's being used here in example 1?

4 A. No.

5 Q. Does example 1 provide a description of a
6 process that's covered by claim 17?

7 A. Partially.

8 Q. What's missing?

9 A. The bromine-containing promoter.

10 Q. Okay.

11 THE WITNESS: You know what. I've got to
12 take a break. I've got to go to the men's room.

13 DR. GLANDORF: Okay.

14 THE VIDEOGRAPHER: We are going off the
15 record. The time now is 2:23.

16 (Recess 2:23-2:36.)

17 THE VIDEOGRAPHER: We are back on the
18 record. The time now is 2:36.

19 BY DR. GLANDORF:

20 Q. Mr. O'Keefe, welcome back.

21 A. Thank you.

22 Q. I'd like to go back to Exhibit 6 briefly if we
23 could. I think that's one that you only have on your
24 screen.

25 A. Well, yeah, that's the list of acronyms.

1 Q. No, I believe it's the annotated figure.
2 That's what I'm looking for.

3 A. Oh.

4 Q. Do you have that?

5 A. Yes.

6 Q. And before I ask questions about that, let me
7 ask you, did you speak with your counsel about the
8 substance of your testimony during the break?

9 A. No.

10 Q. Earlier in the deposition you identified
11 location 3 on this diagram as the bromine-containing
12 promoter; is that correct?

13 A. Correct.

14 Q. And just to clarify, when you say that number 3
15 is the bromine-containing promoter, do you mean that
16 entire molecule there represented by 3?

17 A. I think so.

18 Q. Do you mean the carbon ring, the hydrogen, and
19 the bromine?

20 A. Yes.

21 Q. The whole thing?

22 A. Yes.

23 Q. Okay. Let's go back now to the examples in the
24 patent. And I think -- and I'll help you find where
25 those started.

1 I think -- we're actually going to go to
2 example 9, and I see that's -- that's farther down. So
3 that is in --

4 A. Column 19.

5 Q. Yes. Thank you.

6 Go ahead and -- it's a short example.
7 Well, you go ahead and read that to yourself, and let me
8 know when you're done.

9 A. Okay.

10 Q. And there's a reference here to a fluidized
11 bed.

12 Do you see that?

13 A. Yes.

14 Q. Do you have an understanding of what a
15 fluidized bed is?

16 A. Yeah. I have heard of it.

17 Q. What is your understanding of what a fluidized
18 bed is?

19 A. I can't remember.

20 Q. Can you tell me anything about what a fluidized
21 bed would look like?

22 A. No.

23 Q. Do you understand this is a fluidized bed of
24 the activated carbon sorbent, correct?

25 A. That's what it looks like.

1 Q. And then the -- there is molecular bromine that
2 is being introduced into the fluidized bed of activated
3 carbon, correct?

4 A. I'm sorry. Can you say that again.

5 Q. Sure. There is molecular bromine that's being
6 introduced into the activated -- sorry. I messed it up.

7 There is molecular bromine that's being
8 introduced into the fluidized bed of activated carbon,
9 correct?

10 A. That looks like what it says, yes.

11 Q. And do you understand this to be creating a
12 promoted activated carbon?

13 A. Well, it says that the activated carbon is
14 impregnated with molecular bromine.

15 Q. And would activated carbon impregnated with
16 molecular bromine be a promoted activated carbon?

17 A. Well, it's a type of activated carbon. It's
18 brominated.

19 Q. Well, let's go to the -- we have a term. If we
20 go to claim 1, there is a -- and we go to line 39,
21 there's a term we have discussed previously, a promoted
22 brominated sorbent.

23 Do you see that?

24 A. Yes.

25 Q. And so is the fluidized bed example that we

1 were just looking at, example 9, a way to create a
2 promoted brominated sorbent?

3 A. Looks like it.

4 Q. And is that creation through an in-flight
5 reaction, as that term is used in the patent?

6 MR. NEMUNAITIS: I'm going to object,
7 outside the scope.

8 A. Well, we're talking about flowing gas, so I
9 guess that would be in-flight.

10 BY DR. GLANDORF:

11 Q. And there's a reference there to molecular
12 bromine. Do you know the chemical formula for molecular
13 bromine?

14 A. No.

15 Br₂. I don't know.

16 Q. Do you think it might be Br₂?

17 A. Yes.

18 Q. Going back to example 1. Example 1 -- I'll
19 wait until you get there.

20 Example 1 does not disclose introducing
21 the bromine directly into the flue gas separate from the
22 activated carbon, correct?

23 A. I don't think it does.

24 Q. Are there any examples here in the patent that
25 disclose introducing the bromine into the flue gas

1 separate from the activated carbon?

2 A. I don't know. I'd have to look through all the
3 examples.

4 Q. Well, I think we will do that --

5 A. Can I do that?

6 Q. -- if you don't recall. But that is -- that
7 is, I think, something we'll have to do here.

8 A. Okay.

9 Q. We've looked at example 1. Let's go ahead and
10 look at example 2.

11 And let me -- let me direct you a little
12 bit, and let's just take them one at a time just so the
13 record is clear.

14 So go ahead and review example 2, and let
15 me know when you're ready.

16 A. Okay.

17 Q. Does example 2 involve an in-flight reaction to
18 make a promoted brominated sorbent?

19 A. The bromine was added in-flight, so yes.

20 Q. Does example 2 disclose the introduction of
21 bromine -- of any bromine species -- let me start it
22 again.

23 Does example 2 disclose the introduction
24 of any bromine species directly into the flue gas --
25 nope. Let me start again.

1 Does example 2 disclose the introduction
2 of any bromine species into the flue gas separate from
3 the activated carbon?

4 A. No.

5 Q. Does example 2 disclose the addition of any
6 bromine species to coal?

7 A. No.

8 Q. And just to go back with that last question to
9 example 1. Does example 1 disclose the addition of any
10 bromine species to coal?

11 A. No.

12 Q. Okay. Well, let's go to example 3 now. Go
13 ahead and review that, and let me know when you're ready.

14 A. Okay.

15 Q. Now, example 3 is combining bromine and
16 activated carbon in the liquid phase, correct?

17 A. Correct.

18 Q. Would you agree that this is not an in-flight
19 reaction?

20 A. Doesn't look like it.

21 Q. You don't have any -- do you have any reason to
22 think this is an in-flight reaction?

23 A. No.

24 Q. Example 3 does not disclose adding any bromine
25 species to coal, correct?

1 A. Correct.

2 Q. Let's go on to example 4.

3 Now, I believe example 4 is an additional
4 step to example 3, but go ahead and review that and let
5 me know when you're ready.

6 A. Okay.

7 Q. Do you agree that example 4 is just talking
8 about an additional step to example 3?

9 A. I think it -- it does, yes.

10 Q. So example 4, likewise, does not disclose
11 making brominated carbon through an in-flight reaction?

12 A. Correct.

13 Q. And example 4 does not disclose adding bromine
14 to coal?

15 A. No.

16 Q. Okay. Let's go on to example 5, and let me
17 know when you've had a chance to review that.

18 A. Okay.

19 Q. This is another example of preparing the
20 brominated activated carbon in the liquid phase, correct?

21 A. Correct.

22 Q. Example 5 is not an in-flight reaction,
23 correct?

24 A. No.

25 Q. Example 5 does not disclose the addition of any

1 bromine species to coal, correct?

2 A. Correct.

3 Q. Okay. The next example is a long one. So I
4 want to give you time read to it, but -- go ahead and
5 please do so.

6 And I think I can also -- can I give you
7 one more instruction, Mr. O'Keefe? Which is, the first
8 paragraph on -- I know this is a long example.

9 The first paragraph on column 17 is, I
10 believe, where they're talking about the creation of the
11 brominated activated carbon, so you may want to focus
12 there. But again, sorry, I'll let you read the whole
13 thing.

14 A. Okay.

15 Q. Okay. That was a long one. My apologies.

16 So let's go back to the first paragraph in
17 column 17. It starts at line 5.

18 Do you see that?

19 A. Yes.

20 Q. And so is this preparation of brominated
21 activated carbon being done by in-flight reaction?

22 A. It looks like it.

23 Q. And there is no disclosure here of adding
24 bromine directly to the flue gas apart from the activated
25 carbon sorbent, correct?

1 A. Right.

2 Q. There's no disclosure here of adding any
3 bromine species to coal; is that correct?

4 A. Correct.

5 Q. Now, the rest of this example, then, is a test
6 where the previously prepared brominated activated carbon
7 is injected into a flue; is that fair?

8 A. Correct.

9 Q. So in this example they've prepared the
10 brominated activated carbon outside of the flue, and then
11 they are injecting it into the flue, correct?

12 A. Right.

13 Q. Okay. Let's go to example 7. It's much
14 shorter. Let me know when you've had a chance to review
15 it.

16 A. Okay.

17 Q. Does example 7 disclose a prepara -- a
18 preparation of brominated activated carbon made through
19 in-flight reaction?

20 A. Doesn't look like it.

21 Q. Because this preparation is in a solution,
22 correct?

23 A. Right.

24 Q. There's no disclosure in example 7 of adding
25 bromine into flue gas apart from activated carbon,

1 correct?

2 A. Right.

3 Q. And there's no disclosure in example 7 of
4 adding a bromine species to coal, correct?

5 A. Correct.

6 Q. Let's go to example 8. Now, example 8, I
7 believe the first paragraph talks about the creation of
8 the brominated activated carbon, and there are a few
9 different methods involved; but please review example 8.

10 A. Okay.

11 Q. You agree that example 8 is disclosing a few
12 different ways to create the brominated activated carbon?

13 A. Yes.

14 Q. And again, the brominated activated carbon
15 is -- it's a promoted sorbent, correct?

16 A. Well, it is activated carbon. It's combined
17 with bromine. So...

18 Q. And the activated carbon is a sorbent?

19 A. Yes.

20 Q. And the purpose of the bromine is to promote
21 the activated carbon, right?

22 A. Right.

23 Q. And so the -- again, the brominated activated
24 carbon another way that this patent refers to that as a
25 promoted sorbent?

1 A. Yes.

2 Q. And the examples here in example 8 include some
3 preparation of the promoted sorbent using in-flight
4 reaction, correct?

5 A. I don't think so.

6 Q. Well, I would refer to you to maybe the
7 second-to-last sentence.

8 A. Where it says -- what paragraph?

9 Q. We are at line -- line 28, column 19.

10 A. It says, "The brominated treated carbons are
11 prepared by impregnation of the powdered activated carbon
12 precursors in a stirred solution of bromine in carbon
13 tetrachloride or methyl chloride."

14 Q. And that's not in-flight reaction, correct?

15 A. Correct.

16 Q. So I want to go down to the next sentence that
17 is on 28, which starts "Bromine treated carbons were also
18 prepared."

19 A. Yes.

20 Q. And so this example does disclose some examples
21 that are in-flight reaction; is that right?

22 A. I guess so, yes.

23 Q. And then it discloses some that are prepared in
24 a liquid phase, correct?

25 A. Yes.

1 Q. But regardless, in -- none of the examples here
2 involve the injection of bromine into the flue gas
3 separate from activated carbon, correct?

4 A. Correct.

5 Q. None of these are making a promoted sorbent in
6 the flue gas, correct?

7 A. Correct.

8 Q. And, in fact, none of the examples we've seen
9 so far have been making the -- making a promoted sorbent
10 in the flue gas?

11 A. Correct.

12 Q. And, in fact, let's go take a moment and go to
13 the very first page of this patent and look at the title
14 of it, if we could.

15 Could you read the title of this patent.

16 A. "Sorbents for the Oxidation and Removal of
17 Mercury."

18 Q. And so do you understand this patent to be
19 about inventions of sorbents for the oxidation removal of
20 mercury?

21 A. Yes.

22 Q. And the sorbents that they are allegedly
23 inventing here is not plain, activated carbon, correct?

24 A. It would seem to be not plain, activated
25 carbon.

1 Q. Would you agree that the sorbents that are
2 being invented here are a brominated activated carbon?

3 A. Well, up until the last example I read, yes.

4 Q. Did the last example change your mind?

5 A. I don't know.

6 Q. Oh, I see what you mean. Up through what we
7 read so far?

8 A. Right.

9 Q. Up through what we've read so far, the
10 inventive sorbents are brominated activated carbon?

11 A. Right.

12 Q. Not plain, activated carbon?

13 A. Right.

14 Q. Okay. Thank you.

15 Let's go back now to our -- run through
16 the examples here. And there are 12, so we're getting
17 there. So let's go -- I think we are on example 9, which
18 is -- and starts in column 19.

19 Oh, and we've already reviewed this one.
20 Just -- I'm sorry. Sorry to interrupt.

21 Go ahead and let me know when you've read
22 example 9.

23 A. Well, yeah, we already looked at that.

24 Q. And I believe you testified that this is an
25 example of in-flight reaction, correct?

1 A. Well, that's what it looks like, yes.

2 Q. There is no disclosure in example 9 of adding
3 bromine to the flue gas apart from activated carbon,
4 correct?

5 A. Right, right.

6 Q. And there's no disclosure in example 9 of
7 adding any bromine species to coal, correct?

8 A. Right.

9 Q. Okay. Let's go on then to example 10.

10 A. You mean example --

11 Q. Example 10.

12 A. -- 10. Okay.

13 Q. I'm sorry.

14 A. Okay.

15 Q. Now, does example 10 disclose the creation of
16 the promoted carbon sorbent through in-flight reaction?

17 A. I don't think it talks about, like, creation of
18 the -- of promoted carbon sorbent, the brominated carbon
19 sorbent.

20 Q. It doesn't -- this example doesn't actually
21 tell you how it was created, correct?

22 A. Right. It was just injected in the flue gas.

23 Q. This example 10 discloses the injection of the
24 previously created promoted sorbent into the flue gas,
25 correct?

1 A. Right. It says that it could be injected
2 before, after, or within the boiler.

3 Q. And when it says it can be injected before,
4 after, or within the boiler, it's referring to injection
5 of the previously created brominated activated carbon,
6 correct?

7 A. Yes.

8 Q. It's referring to the previously created,
9 promoted sorbent, correct?

10 A. Yes.

11 Q. Is there any disclosure in example 10 of
12 introducing bromine into the flue gas apart from
13 activated carbon?

14 A. No.

15 Q. And is there any disclosure in example 10 of
16 adding bromine in any form to coal?

17 A. No.

18 Q. Okay. Let's go on to example 11, and let me
19 know when you've reviewed that.

20 A. 11A?

21 Q. Yes, 11A. Thank you.

22 A. Okay.

23 Q. So example A is -- and you see the title is
24 "Addition of an Optional Alkaline Component - Bench
25 Scale"?

1 A. Right.

2 Q. Example 11A doesn't disclose how the brominated
3 activated carbon was made, correct?

4 A. No.

5 Q. You can't actually tell in example 11A whether
6 the brominated activated carbon was made in-flight?

7 A. No.

8 Q. Is there any disclosure in example 11A of
9 introducing the bromine into the flue gas separate from
10 the activated carbon?

11 A. No.

12 Q. And is there any disclosure in example 11A of
13 adding any bromine species to coal?

14 A. No.

15 Q. Do you have an understanding of the word --
16 what the word "alkaline" means?

17 A. Yes.

18 Q. What does the alkaline mean?

19 A. Alkaline is, I believe, group 2 of the Periodic
20 Table. So it's -- it can be like calcium, that sort of
21 thing. Those are alkali compounds.

22 Q. Okay. Well, let's go on to 11B, which is
23 also, I believe, a test of adding this optional alkaline
24 component. If you'd go ahead and -- it's a long example,
25 but if you could go ahead and read through that, that

1 would be great.

2 A. Okay.

3 Q. Does example 11B disclose the creation of
4 activated carbon through an in-flight -- I'm sorry. I'm
5 going to restart.

6 Does example 11B disclose the creation of
7 a promoted activated carbon through an in-flight
8 reaction?

9 A. I don't think so.

10 Q. It doesn't disclose how the act -- brominated
11 activated carbon is made, correct?

12 A. Correct.

13 Q. Does example B disclose the introduction of a
14 bromine into the flue gas separate from activated carbon?

15 A. No.

16 Q. Does example B disclose the addition of any
17 bromine species to coal?

18 A. No.

19 Q. Okay.

20 THE WITNESS: You know what. I have to go
21 to the men's room.

22 DR. GLANDORF: Okay.

23 THE VIDEOGRAPHER: We are going off the
24 record. The time now is 3:17.

25 (Recess 3:17-3:25.)

1 THE VIDEOGRAPHER: We are back on the
2 record. This is the start to media number 5. The time
3 is 3:25.

4 BY DR. GLANDORF:

5 Q. Now, I believe we are on to example 12.

6 A. Yes.

7 Q. Now, example 12, just to give you my preview -
8 and which you are free to disagree with - but it refers
9 back to example 3 and example 7, which I believe are both
10 liquid preparations.

11 But go ahead and read example 12. And I
12 think you know I'm -- I'm going to ask you the same
13 questions I've been asking.

14 A. Okay.

15 Q. Does example 12 disclose the preparation of a
16 brominated activated carbon through in-flight reaction?

17 A. No.

18 Q. The brominated activated carbon that's being
19 prepared in example 12 is done in the liquid phase,
20 correct?

21 A. Correct.

22 Q. And again, we've been going back and forth
23 between different terms. But you understand brominated
24 activated carbon to refer to a promoted carbon sorbent in
25 this context?

1 A. Right.

2 Q. Does example 12 disclose the introduction of
3 bromine into the flue gas apart from activated carbon?

4 A. No.

5 Q. And does example 12 disclose the addition of
6 any bromine species to coal?

7 A. No.

8 Q. So just -- and this -- I'll represent to you
9 this is the last example.

10 Do you understand that?

11 A. Yeah.

12 Q. Okay. So just to review, in these examples
13 there are some examples where the promoted sorbent is
14 created through in-flight reactions and there are some
15 examples where it is created not through in-flight
16 reactions; is that fair?

17 A. I think so, yes.

18 Q. There are no examples here where bromine is
19 introduced into the flue gas apart from activated carbon,
20 correct?

21 A. No. no.

22 Q. You agree with my statement?

23 A. Yes.

24 Q. There is no example here where the brominated
25 activated carbon sorbent is being prepared in flue gas,

1 correct?

2 A. It looks like it, yes.

3 Q. And there's no example here where there is
4 bromine in a form being added to coal, correct?

5 A. No.

6 Q. Okay. Now, do you have an understanding of
7 where in the system activated carbon sorbent is typically
8 injected?

9 A. In the flue gas.

10 Q. And where -- where in the system? Now, we
11 talked about the flue gas being -- going quite a ways,
12 right, from starting in the combustion zone all the way
13 into the stack, I believe.

14 So where within that system would it be --
15 would the activated carbon be injected?

16 A. Somewhere downstream of the economizer.

17 Q. Certainly the activated carbon would be
18 injected after the furnace.

19 Do you agree with that?

20 A. Yes. That's what I said.

21 Q. And you agree that it would be injected before
22 any particle collection system?

23 A. Yes.

24 Q. And your answer is -- I just need to -- I just
25 need to phrase this question slightly differently just to

1 make sure we're on the same page.

2 Is it your opinion that a POSA would
3 inject activated carbon somewhere after the economizer
4 but before the particulate collection system?

5 A. Yes.

6 Q. And is that answer the same if it is a promoted
7 activated carbon?

8 A. Yes.

9 Q. Is there a reason why a POSA would not inject
10 activated carbon into the furnace?

11 A. I don't know.

12 Q. Is it your understanding that activated carbon
13 is combustible?

14 A. Yes.

15 Q. What is your opinion?

16 A. Well, it can burn.

17 Q. Is that one reason why a POSA would not inject
18 activated carbon into the furnace?

19 A. I think so.

20 Q. And that answer is the same for a promoted
21 activated carbon, correct?

22 A. I think so, yes.

23 Q. Now, you understand here in this case that --
24 scratch that. Let me ask it again.

25 Is it your opinion in this case that the

1 accused power plants are creating a promoted activated
2 carbon in the flue gas?

3 A. No.

4 Q. Is it your opinion in this case that the
5 accused power plants are creating a promoted activated
6 carbon sorbent anywhere?

7 A. No.

8 Q. Is it your opinion that the accused power
9 plants are introducing bromine into the system through
10 their use of calcium bromide on coal?

11 A. Yes.

12 And that's for a pulverized coal unit --
13 units. Now, the cyclone unit, it's my understanding that
14 the bromide compound is introduced above the reentrant
15 throat on the cyclone.

16 Q. Are you aware of any power plants that
17 introduce bromine into the system by introducing
18 brominated activated carbon into the furnace?

19 A. I'm sorry. Can you ask that again.

20 Q. Are you aware of any power plants that
21 introduce bromine into their system by introducing
22 brominated activated carbon into the furnace?

23 A. No.

24 Q. If a power plant was to introduce brominated
25 activated carbon into the furnace, the concern would be

1 that it would combust, correct?

2 A. Into the furnace?

3 I would imagine it would, yes.

4 Q. And so that would not be a reasonable way to
5 add bromine into the system?

6 A. The optimal way is to add bromine to the coal
7 before it's combusted. Now, the activated carbon is
8 injected into the flue gas stream.

9 Q. Is it your understanding that activated carbon
10 is expensive?

11 A. I don't know. I have no idea.

12 Q. Well, you understand there is a cost to the
13 activated carbon?

14 A. Oh, yeah, it's not for free.

15 Q. And so, introducing the bromine to the coal by
16 adding brominated activated carbon to the furnace would
17 not be a reasonable way to add bromine to the system,
18 correct?

19 A. I don't know.

20 Q. But you agree it would be wasting the activated
21 carbon in that case?

22 A. I don't know.

23 Q. Have you considered whether adding brominated
24 activated carbon to the furnace would be a reasonable way
25 for a POSA to add -- let me even reask that.

1 Have you considered whether a POSA would
2 find that adding brominated activated carbon to the
3 furnace is a reasonable way to add bromine into the
4 system?

5 A. To the furnace, no.

6 Q. You haven't considered that, or you think that
7 it would not be a --

8 A. I wouldn't consider that, no.

9 Q. You wouldn't consider that to be a reasonable
10 way?

11 A. Well, no. I -- as far as the patents and suit
12 go, the bromi -- the activated carbon is injected into
13 the flue gas; and with pulverized coal units, it's
14 inject -- it's sprayed onto the coal, the bromine
15 compound. And with the cyclones, it's injected above the
16 reentrant throat to the cyclones.

17 Q. I see. So that's two different ways to
18 introduce a bromine species into the system, correct?

19 A. Yes.

20 Q. Would a POSA consider it to be a reasonable
21 approach to add bromine to the system to add brominated
22 activated carbon into the furnace?

23 A. No.

24 Q. Okay. Do you consider yourself to be a POSA in
25 this matter?

1 A. Yes.

2 Q. And you understand that there are -- that Dr.
3 Niksa has offered in this case a -- a different -- a
4 slightly different POSA standard than he -- than you have
5 offered?

6 A. In this case, yes.

7 But when the case became -- was looked at
8 by IPR, he said a person of ordinary skill in the art
9 would have a mechanical engineering degree, which I
10 have.

11 Q. Do you consider yourself a POSA if the Court
12 concluded that Dr. Niksa's POSA standard that he offered
13 in his opening report was correct?

14 A. Well, I have to do what the Court says.

15 Q. And if the Court decides that the POSA standard
16 is -- in his opening report is correct, would you
17 consider yourself a POSA?

18 A. In this case?

19 Q. Yes.

20 A. I guess I would be eliminated.

21 Q. Now, we talked about how the examples do not
22 disclose injecting bromine species into the flue gas
23 apart from the activated carbon; is that right?

24 A. Correct.

25 Q. Are you aware of any other teaching outside of

1 the examples in the patent -- let me rephrase. Sorry.

2 Are you aware of any teaching in the
3 patent outside of the examples that teaches the
4 introduction of bromine species into flue gas apart from
5 the activated carbon?

6 A. Well, I haven't looked at the entire
7 specification, but we talk about it in the claim
8 language.

9 Q. In the claim language, it -- you're looking at
10 claim 17; is that correct?

11 A. Yes.

12 Q. In the claim 17 they are talking about separate
13 injections of bromine --

14 A. Yes.

15 Q. -- and activated carbon, correct?

16 A. Right. Right.

17 Q. When you say you haven't looked at the entire
18 specification, have you not read through the entire
19 specification?

20 A. Well, I did a long time ago, but I don't
21 remember it.

22 Q. I see. You just mean that you haven't read it
23 recently; is that correct?

24 A. Yeah, in front of you, like we did the
25 examples.

1 Q. When was the last time you read the entire
2 specification?

3 A. It was months ago.

4 THE WITNESS: Just so you're aware of it,
5 I'm getting very hungry right now.

6 DR. GLANDORF: Okay.

7 THE WITNESS: I don't know how much longer
8 that you got today.

9 Can we continue tomorrow or --

10 DR. GLANDORF: What is the time on the
11 record here today?

12 THE VIDEOGRAPHER: You want to go off?

13 DR. GLANDORF: Yes, please. Let's go
14 ahead and go off.

15 THE VIDEOGRAPHER: We're going off the
16 record. The time now is 3:43.

17 (Recess 3:43-4:03.)

18 THE VIDEOGRAPHER: We are back on the
19 record. The time now is 4:03.

20 DR. GLANDORF: I just had a discussion
21 here with counsel and discussing -- and the witness --
22 continuing today to 5:30 local time. And the witness has
23 indicated that would be okay. Is that --

24 THE WITNESS: I'll try.

25 DR. GLANDORF: -- that he'll try.

1 We discussed if there's any food or get
2 anything -- again, is there any food that we can get you
3 or will help --

4 THE WITNESS: No.

5 DR. GLANDORF: Okay. So we will go
6 another hour and a half here. We'll take a short break
7 in the middle so you can be refreshed. But again, if
8 there's anything you can think of in terms of snack-wise,
9 if we have any bars here, vending machines, just let us
10 know.

11 THE WITNESS: Okay.

12 BY DR. GLANDORF:

13 Q. Mr. O'Keefe, during the last break did you
14 discuss the substance of your testimony with counsel?

15 A. No.

16 Q. During any of the breaks today have you
17 discussed the substance of your testimony with counsel?

18 A. No.

19 Q. Let's go, if we could, to the Nelson reference.

20 So, you know, Ina will bring that out. I
21 don't think it's in your binder, I believe. So --

22 A. It's not.

23 Q. -- just give us a moment and we'll pop it up
24 here on the screen.

25 THE WITNESS: Can you find that exhibit?

1 DR. GLANDORF: It will probably take a few
2 seconds here.

3 THE REPORTER: Is this 8?

4 MS. KOSOVA: Yes.

5 (Exhibit No. 8 marked.)

6 THE WITNESS: Okay. Thanks.

7 BY DR. GLANDORF:

8 Q. Take a moment and familiarize yourself with the
9 Exhibit 8, if you could.

10 THE WITNESS: How do you scroll on this
11 thing?

12 MR. NEMUNAITIS: These two fingers.
13 Right here.

14 THE WITNESS: Let's go along with two
15 fingers.

16 DR. GLANDORF: Do you want a mouse?

17 THE WITNESS: That would be helpful.

18 A. Okay.

19 BY DR. GLANDORF:

20 Q. Are you familiar with Exhibit 8?

21 A. I've seen it before, yes.

22 Q. And what is Exhibit 8?

23 A. The Nelson patent.

24 Oh, I'm sorry.

25 Q. And do you have an understanding of what the

1 alleged mention is in the Nelson patent?

2 A. Well, it looks like injecting sorbent into the
3 flue gas stream downstream of the combustion process.

4 Q. And do you understand that the disclosure here
5 is relating to the injection of activated carbon sorbent
6 that has been treated with bromine?

7 A. Yes.

8 Q. Is it your opinion that the invention disclosed
9 in Nelson is different from the invention claimed in the
10 '147 patent?

11 A. The '147 patent is different. The disputed
12 claims are different.

13 Q. Than what's disclosed here in the Nelson?

14 A. Yes.

15 Q. How so?

16 A. Because it talks about injecting a bromine
17 separate from activated carbon.

18 Q. Now, in all the examples we looked at, of
19 course there was no separate injection of bromine into
20 the flue gas, correct?

21 A. Right.

22 Q. But you're referring to the claim which refers
23 to a separate injection of bromine; is that right?

24 A. Like claim 17.

25 Q. Let's look, if we could, at column 8 of the

1 Nelson reference, toward the bottom.

2 A. Towards the bottom?

3 Q. The bottom. I'm going to start with the
4 paragraph on about line 57 of paragraph 8.

5 A. Note that the bromine, step 4?

6 Q. Yes. Do you see that?

7 A. Yes.

8 Q. And do you see in that paragraph there is a
9 reference to the bromination step occurring in a
10 fluidized bed unit?

11 A. Yeah.

12 Q. And the bromination step here is a reference to
13 creating brominated activated carbon, correct?

14 A. I believe so, yes.

15 Q. And I believe you testified earlier about the
16 fluidized bed example in the '147 patent that creating
17 the brominated activated carbon in a fluidized bed unit
18 is an example of in-flight promotion, correct?

19 A. Well, creation of the brominated compound is --
20 is done in-flight and that was external to the flue gas
21 injection.

22 Q. In the example in the patent using a fluidized
23 bed, that was external to the flue gas, correct?

24 A. Yes.

25 Q. And here in this example, is this external to

1 the flue gas?

2 A. No.

3 Q. This is being done in the flue gas?

4 A. Yes.

5 Q. Your testimony is that Nelson is creating its
6 brominated activated carbon in the flue gas?

7 A. Well, the brominated activated carbon exists in
8 the flue gas in a bed, for example. It has other
9 examples listed in the specification too.

10 Q. Your testimony is that the fluidized bed
11 example described in Nelson refers to the creation of
12 brominated activated carbon in the flue gas?

13 A. It's but one example of how you can use
14 brominated activated carbon in the process of combustion
15 inside a furnace.

16 Q. I understand it's just one example. I just
17 wanted to make sure I understand your characterization of
18 it.

19 Your testimony is that the fluidized bed
20 example described in Nelson refers to the creation of
21 brominated activated carbon in the flue gas?

22 A. I haven't read all the specification at all
23 in -- recently. I can't remember.

24 Q. So can you --

25 A. I don't know how the brominated activated

1 carbon was created.

2 Q. So you can't answer my question?

3 A. No.

4 Q. Okay. If we can now go to column 11, example 1
5 of the Nelson reference.

6 A. Okay.

7 Q. Do you see at the last sentence of the first
8 paragraph of example 1 where it refers to NORIT's Darco
9 FGD?

10 A. Yes.

11 Q. Would you read that sentence for me.

12 A. "NORIT's Darco FGD is a common pack frequently
13 used by other researchers as a comparative yardstick."

14 THE REPORTER: As a -- I'm sorry. As a
15 what?

16 THE WITNESS: As a comparative yardstick.

17 BY DR. GLANDORF:

18 Q. Do you believe that statement to be true?

19 A. Well, that's what it says.

20 Q. I think you testified earlier today that you
21 were unfamiliar with this FGD product before this
22 litigation, correct?

23 A. Correct.

24 Q. Now, this NORIT's Darco FGD is the same product
25 that we read about in the '147 patent, correct?

1 A. Correct.

2 Q. Is it your understanding that as of 2004, a
3 POSA would understand Darco FGD to be an activated carbon
4 sorbent having graphene sheets with carbene edge sites?

5 A. I think so.

6 Q. Is it your understanding that a POSA would
7 understand that as of 2011?

8 A. Yes.

9 Q. Is it your opinion that that understanding
10 would have changed any time between 2003 and now?

11 A. No.

12 Q. Do you have an understanding of whether the
13 invention claimed in the '147 patent has any advantages
14 over the Nelson reference?

15 A. Yes.

16 Q. What are those advantages?

17 A. Well, you inject the brominated compound
18 before -- you inject a brominated compound separately
19 from the activated carbon. And it just talks about
20 activated carbon.

21 Q. Well, is there an advantage -- any advantage
22 that comes from the difference that you just opined on?

23 A. I don't know. I can't opine on that.

24 Q. You don't have any opinion as to whether there
25 are any advantages to the '147 compared to the Nelson?

1 A. No.

2 Q. You have no such opinions?

3 A. No.

4 Q. That's not something you considered?

5 A. No.

6 Q. Okay. Going back to the graphene sheets.

7 One moment here.

8 Is it your opinion that the Nelson Junior
9 reference discloses -- I'm sorry, let me rephrase that
10 question.

11 In your opinion, does the Nelson Junior
12 reference disclose activated carbon containing graphene
13 sheets having carbene species edge sites?

14 A. What?

15 Q. That's a long question. I'll ask it again.

16 In your opinion, does the Nelson Junior
17 reference disclose activated carbon with graphene sheets
18 having carbene species edge sites?

19 A. I think so.

20 Q. And is that because it's your opinion that a
21 POSA would understand that the activated carbon that
22 Nelson Junior is discussing has graphene sheets with
23 carbene edge sites?

24 A. Yes.

25 Q. Let's go to the Vosteen reference.

1 THE REPORTER: What was the name?

2 DR. GLANDORF: Vosteen, V-O-S-T-E-E-N.

3 A. Okay.

4 BY DR. GLANDORF:

5 Q. I'm sorry. And before we go to that reference,
6 I do have just a couple follow-up questions that I want
7 to ask on the Nelson Junior reference.

8 You just said that a POSA would understand
9 that the activated carbon disclosed by Nelson would have
10 graphene sheets with carbon edge sites; is that correct?

11 A. Correct.

12 Q. And it's your opinion that a POSA would
13 understand that, correct?

14 A. Yes.

15 Q. Is it your -- in your opinion, would Ed Olson,
16 the inventor of the patent, have understood that?

17 A. I would assume so, yes.

18 Q. In your opinion, would the other two inventors
19 have understood that as well?

20 A. Yes.

21 Q. They would have understood that in 2003,
22 correct?

23 A. I think so, yes.

24 Q. And that understanding would not have changed
25 up until today, correct?

1 A. No.

2 Q. Do you have --

3 DR. GLANDORF: What are we on? Exhibit
4 9?

5 (Exhibit No. 9 marked.)

6 BY DR. GLANDORF:

7 Q. Do you have Exhibit 9 in front of you?

8 A. Yes.

9 Q. If you wouldn't mind reviewing that.

10 A. It's the Vosteen patent?

11 Q. That's the Vosteen patent.

12 A. Okay.

13 Q. Are you familiar with this exhibit,
14 Mr. O'Keefe?

15 A. I've seen it before.

16 Q. Would you mind reading just for the record what
17 the patent number is of this exhibit.

18 A. U.S. Patent Number 6,878,358 B2.

19 Q. And if we go down to column 4 of the patent.

20 Let me know when you've found that.

21 A. Okay.

22 Q. Do you see the sentence starting halfway
23 through line 4 of column 4 with "the bromine compound"?

24 A. "The bromine compound, for example"?

25 Q. Sure. Could you go ahead and read that into

1 the record.

2 A. "The bromine compound, for example, sodium
3 bromide, can be added in solid form, for example, as salt
4 or in liquid form, for example, as aqueous solution to
5 the waste mixture coal or the like to be burned..."

6 Q. I think there's just a few more words there.

7 A. "...upstream of the furnace."

8 Q. Great. Thank you.

9 So Vosteen is disclosing here as one
10 option adding the bromine compound to the coal, correct?

11 A. That's what it looks like.

12 Q. And as their example, they give sodium bromide.

13 Do you see that?

14 A. Yes.

15 Q. Sodium bromide is a bromide salt, correct?

16 A. Correct.

17 Q. Calcium bromide is another bromide salt,
18 correct?

19 A. It's an alkali earth element.

20 Q. It's a salt with an alkali earth element --

21 A. Right.

22 Q. -- is that correct?

23 And you agree -- would you agree that the
24 inventors of the patents at issue here did not invent the
25 addition of bromine compounds to coal upstream of the

1 furnace, correct?

2 A. I'm sorry. Can you ask that again?

3 Q. Sure. The inventors of the patents at issue in
4 our case here were not the first to invent the addition
5 of bromine compounds to the coal upstream of the furnace?

6 A. I can't say that.

7 Q. But you agree that this sentence does disclose
8 the addition of bromine compounds to the coal upstream of
9 the furnace, correct?

10 A. Yeah.

11 Q. And so if this invention came before the
12 invention in the asserted patents, would you then agree
13 that the inventors of the patent at issue were not the
14 first to invent adding bromine compounds to the coal?

15 A. No.

16 Q. Why not?

17 A. Because I'm not sure that Vosteen invented this
18 first. I'd have to go back and check.

19 Q. It would depend on the date; is that fair?

20 A. Yes.

21 Q. In your opinion, is the invention disclosed in
22 the Vosteen reference different than the inventions in
23 the asserted patents?

24 A. I don't know.

25 Q. Do you recall if you offered testimony on

1 whether or not the patents are invalid in light of the
2 Vosteen reference?

3 A. No.

4 Q. You don't recall if you offered that?

5 A. I don't recall that.

6 THE WITNESS: I'm very tired right now.

7 MR. NEMUNAITIS: Why don't we take a break
8 right here.

9 DR. GLANDORF: Okay.

10 MR. NEMUNAITIS: Is that okay?

11 DR. GLANDORF: Yeah.

12 THE VIDEOGRAPHER: We're going off the
13 record. The time now is 4:27.

14 (Recess 4:27-4:40.)

15 THE VIDEOGRAPHER: We are back on the
16 record. The time now is 4:40.

17 DR. GLANDORF: We're back on the record
18 here. And the counsel had a discussion. With regards to
19 the deposition today, we've agreed at opposing counsel's
20 request to pause the deposition for the day today to
21 continue on tomorrow.

22 You know, we are doing this, of course --
23 we are agreeing to do this without any prejudice to our
24 right to get the full, agreed-to deposition time.

25 I believe we're going to continue at

1 9 a.m. tomorrow morning local time.

2 At this point, I do want to remind the
3 witness that the deposition is to be considered to be
4 ongoing between today and tomorrow.

5 THE WITNESS: Yes.

6 DR. GLANDORF: So just as in today, I
7 believe you answered every time that you had not
8 discussed the substance of your testimony with counsel or
9 anyone else; is that correct?

10 THE WITNESS: Right.

11 DR. GLANDORF: And I would offer you that
12 same instruction should be in place now, continue on to
13 the deposition tomorrow morning.

14 THE WITNESS: Okay.

15 DR. GLANDORF: Do you understand that?

16 THE WITNESS: Yes.

17 DR. GLANDORF: With that in place, we do
18 agree to stop the deposition here for the day, and we'll
19 continue to confer with counsel about how we will
20 continue, but in the near future we'll continue it at
21 9 a.m. tomorrow morning.

22 THE WITNESS: Good. Thank you.

23 THE VIDEOGRAPHER: This concludes today's
24 deposition. The time now is 4:42 p.m.

25 (Proceedings adjourned at 4:42 p.m.)

REPORTER'S CERTIFICATE

STATE OF MINNESOTA)

) ss.

COUNTY OF HENNEPIN)

I hereby certify that I reported the deposition of PHILIP J. O'KEEFE, P.E., on the 2nd day of March, 2023, in Winona, Minnesota, and that the witness was by me first duly sworn to tell the whole truth;

That the testimony was transcribed by me and is a true record of the testimony of the witness;

That the cost of the original has been charged to the party who noticed the deposition, and that all parties who ordered copies have been charged at the same rate for such copies;

That I am not a relative or employee or attorney or counsel of any of the parties, or a relative or employee of such attorney or counsel;

That I am not financially interested in the action and have no contract with the parties, attorneys, or persons with an interest in the action that affects or has a substantial tendency to affect my impartiality;

That the right to read and sign the deposition by the witness was not waived.

WITNESS MY HAND AND SEAL THIS 6th day of March, 2023.



Dawn Workman Bounds, CSR 6129

Notary Public, Hennepin County, Minnesota

My commission expires January 31, 2024

JUSTIN T. NEMUNAITIS, ESQ.

jnemunaitis@caldwellcc.com

March 6, 2023

Midwest Energy & MES v Arthur J. Gallagher & Co, Et Al

3/2/2023, Philip J. O'Keefe , P.E. (#5775855)

The above-referenced transcript is available for
review.

Within the applicable timeframe, the witness should
read the testimony to verify its accuracy. If there are
any changes, the witness should note those with the
reason, on the attached Errata Sheet.

The witness should sign the Acknowledgment of
Deponent and Errata and return to the deposing attorney.
Copies should be sent to all counsel, and to Veritext at
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Return completed errata within 30 days from
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If the witness fails to do so within the time
allotted, the transcript may be used as if signed.

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Midwest Energy & MES v Arthur J. Gallagher & Co, Et Al
Philip J. O'Keefe , P.E. (#5775855)

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Philip J. O'Keefe , P.E. Date

Midwest Energy & MES v Arthur J. Gallagher & Co, Et Al
Philip J. O'Keefe , P.E. (#5775855)

ACKNOWLEDGEMENT OF DEPONENT

I, Philip J. O'Keefe , P.E., do hereby declare that I
have read the foregoing transcript, I have made any
corrections, additions, or changes I deemed necessary as
noted above to be appended hereto, and that the same is
a true, correct and complete transcript of the testimony
given by me.

Philip J. O'Keefe , P.E.

Date

*If notary is required

SUBSCRIBED AND SWORN TO BEFORE ME THIS

_____ DAY OF _____, 20____.

NOTARY PUBLIC

Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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VERITEXT LEGAL SOLUTIONS
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