BEFORE THE ILLINOIS POLLUTION CONTROL BOARD

JOSEPH BOGACZ,	)	
	)	
Petitioner,	)	
	)	
vs.	)	No. PCB-96-47
	)	
COMMONWEALTH EDISON COMPANY,	)	
	)	
Respondent.	)	

The following is a transcript of a hearing held in the above-entitled matter taken stenographically by MICHELLE M. DOSE, C.S.R., a Notary Public within and for the County of Cook and State of Illinois, before JUNE C. EDVENSON, ESQ., Hearing Officer, at the Lake Zurich Village Hall, 70 East Main Street, Lake Zurich, Illinois, commencing at 10:00 a.m. on the 21st day of November, 1996.

HEARING TAKEN BEFORE:

ILLINOIS POLLUTION CONTROL BOARD, by
MS. JUNE C. EDVENSON, ESQ., Hearing Officer
James R. Thompson Center
100 West Randolph Street, Suite 11-500
Chicago, Illinois 60601
(312) 814-6930

APPEARANCES:

MR. JOSEPH BOGACZ, Petitioner
30432 North Highway 12
Round Lake, Illinois 60073
(815) 385-3264

Appearing Pro Se;

HOPKINS & SUTTER, by
MR. CHRISTOPHER W. ZIBART
MR. E. GLENN RIPPIE
Three First National Plaza
Chicago, Illinois 60602
(312) 558-4214

Appearing on behalf of the Respondent.

I N D E X

COMPLAINANT'S CASE-IN-CHIEF

OPENING STATEMENTS

WITNESS
JOSEPH BOGACZ

WITNESS
LINDA S. MANNING

WITNESS
GARY B. JOHNSON, Ph.D.

E X H I B I T S

(Complainant's Exhibits marked for identification.)

E X H I B I T S
(Continuing.)

(Complainant's Exhibits marked for identification.)

(Complainant's Exhibits admitted into evidence.)

(Respondent's Exhibits marked for identification.)

(Respondent's Exhibits admitted into evidence.)

THE HEARING OFFICER: Okay. Good morning and welcome. This is a contested case hearing conducted by the Illinois Pollution Control Board, Case No. PCB-96-47 entitled Joseph Bogacz, the Plaintiff, versus Commonwealth Edison Company, the Respondent.

The proceeding is in the nature of an enforcement action. My name is June Edvenson. I'm the Board's Hearing Officer for this case.

I will now request that the Complainant party and counsel for the Respondent party identify themselves for the record.

Would you state your name, please?

MR. BOGACZ: Joseph Bogacz. I'm the -- pro se.

THE HEARING OFFICER: Thank you very much.

MR. ZIBART: Christopher Zibart, Z-i-b-a-r-t, of Hopkins & Sutter for the Respondent, Commonwealth Edison Company.

MR. RIPPIE: And Glenn Rippie, also of Hopkins & Sutter for the Respondent, Commonwealth Edison.

THE HEARING OFFICER: All right. Thank you.

Let the record reflect that a number of additional persons are here in attendance at our hearing. And for those that are not witnesses, I would like to request that they sign in on a pad of paper, which I will pass around.

All right. I believe we have some preliminary activities to discuss, and the first one is a request that we received this morning from Mr. Bogacz related to the use of his personal tape recorder.

Mr. Bogacz, would you like to state your request for the record?

MR. BOGACZ: Yes. Pursuant to Rules 101 -- I lost it here -- oh, pursuant to the -- a rule within the Rules and Regulations of the Illinois Pollution Control Board, there is an allowance for tape recording of the hearing providing it does not disrupt the hearing itself and that it not be broadcast in any way to the news media and so forth. I, therefore, request to be allowed to tape

record the hearing.

THE HEARING OFFICER: All right. And --

MR. BOGACZ: Can I get a glass of water or something? I've got a dry throat or something.

THE HEARING OFFICER: Off the record.

(A short recess was taken.)

THE HEARING OFFICER: Back on the record.

All right. Is there a response from the Respondent related to the request?

MR. RIPPIE: The Respondent has no objection to the request with two provisos.

First of all, it's our understanding that the request is to tape those portions of the proceedings which are the official proceedings, that is, the portions that are on the record.

Secondly, under state statute and pursuant to the purposes of the Board's rule, the company believes that it is inappropriate to tape record, to audio tape record, portions of the testimony of a witness that personally objects to being taped. I have not instructed

our witnesses to object, I have not advised them to object; however, I think it's appropriate that each witness be asked whether they are personally objecting to having their testimony being taped at the time they take the stand.

THE HEARING OFFICER: Thank you, Mr. Rippie. I agree. I would like to permit the taping to occur; however, if a witness who is coming onto the stand objects to that, then we will go off the record to discuss whether the witness should be in a position to be forced to have themselves taped.

I have asked the witnesses preliminarily when we discussed this subject off the record if they wouldn't make themselves available for taping in this manner under the conditions set forth, and so let the record reflect that.

The second matter we have preliminary to starting the hearing has to do with a motion which is being filed by the Complainant, and the motion is entitled Motion to Include Evidence from Absent Subpoenaed Witness. I received a fax copy of this motion yesterday

afternoon -- excuse me -- two afternoons prior to the hearing, and the motion has been mailed to the clerk of the Board for filing at the Board.

I believe Respondent has also received a copy of the motion and have prepared for our receipt today a response to the motion. That response will be filed by me with the clerk of the Board when I return to the Board offices.

The Respondent opposes the motion to include evidence from the absent witness. The Complainant requests that the hearing officer rule on this motion today at the hearing.

The motion proposed by the Complainant requests that information that he will be receiving as the result of a FOIA request to the U.S. EPA be included with other evidence that he is presenting in this case. It appears that the evidence would be what he calls documentary evidence in the nature of documents which he has not yet obtained. The evidence is related to a FOIA request which is being processed by U.S. EPA as the result of a

subpoena request that Mr. Bogacz served on U.S. EPA.

The Respondent opposes the motion on the grounds that the evidence that would be received would not give the Respondent an opportunity to respond, which would be a violation of the hearing process, and would not give them the opportunity to cross examine any witness for whom the evidence was admitted. The Respondent makes other arguments.

Now, what I would like to propose is a case schedule which would permit the documents that Mr. Bogacz would be receiving from U.S. EPA to be entertained for inclusion in the record of this case as he would like and would also give the Respondent an opportunity to respond to those documents in writing by filing with the Board.

I also would like to suggest that the granting of the motion by Mr. Bogacz be limited in certain ways. Mr. Bogacz requests that, quote, any documentary evidence obtained in accordance with a FOIA request to the U.S.

EPA, end quote, be included with the other evidence that he presents in the case.

I must be assured that that evidence is material that is relevant to the subject of this proceeding, and, therefore, I would need to review it to identify its relevancy to this specific proceeding before I would be interested in including it in the record of the case.

If the evidence appears to be relevant to this proceeding and to the subject matter of this proceeding, I would be interested in having that be a part of the record of the proceeding for consideration by the Board. This evidence would be in the form of documents. I would not be interested in entertaining witnesses' testimony that are off the record of a hearing, in other words. Therefore, I am considering permitting documents that you received from U.S. EPA be entered into evidence in this proceeding, but not statements by witnesses that did not appear at the hearing.

Various forms of documents are admissible

as evidence in technical proceedings and in enforcement proceedings, and the Board appreciates the ability to review these in their consideration of the cases. Therefore, I will permit such documents to be entered into evidence if they are received by Mr. Bogacz with respect to his FOIA request from U.S. EPA.

Now, because we do not know when these items will be received, it will be difficult for us to develop a case schedule that will identify the date when the record is closed until we have further information on this. However, at the time that we finish receiving documents from U.S. EPA related to the FOIA request, I would like to give counsel for Commonwealth Edison an opportunity to respond to those documents in writing. Therefore, any briefing schedule we develop would have to be developed around the conclusion of the receipt of documents that the Complainant wishes to propose as admissible evidence in the case.

I believe this answer is Respondent's chief concern as noted in the response, and

that it also accommodates the Complainant's interest in submitting documents that have not yet been received at this point in time.

All right. Thank you. At this point, let's proceed with the order of the hearing.

MR. ZIBART: Madam Hearing Officer, can I ask a question about the ruling or ask for a clarification?

THE HEARING OFFICER: Yes.

MR. ZIBART: First, could it be clear that there would be no more FOIA requests to EPA; that the documents that are covered by the Hearing Officer's ruling would cover the FOIA request that's already been filed?

THE HEARING OFFICER: Yes, that can be a condition of the ruling.

MR. ZIBART: And my other clarification would be Commonwealth Edison Company would like to take a look at the documents that are received by Mr. Bogacz, all of the documents. And in the interest of completeness, we would ask that we too be allowed to submit some of those same documents into the record; in other words, we would be allowed to see the

documents that U.S. EPA produces to Mr. Bogacz and make sure that all of the ones that we are interested in are also submitted into the record as well.

THE HEARING OFFICER: I believe it would be appropriate for you to be permitted to submit responsive documents as well as submit copies of those other documents in your filing.

MR. BOGACZ: I see no problem with that.

THE HEARING OFFICER: All right. Then at this point in time, we will, I hope, be able to accomplish today the aspects of the case that need to be heard in a hearing situation, and we are gathered for that purpose today.

In the order of the hearing, we will first hear from the Complainant who proposes to testify himself in this case.

And will the Complainant be sworn.

(Complainant sworn.)

THE HEARING OFFICER: Mr. Bogacz, if you would like to sit at the table there with your documents, that would be fine.

MR. BOGACZ: Okay. Thank you.

(Whereupon the following is the Complainant's Case-in-Chief, pro se.)

MR. BOGACZ: I appreciate the time that you are providing a citizen to present his case regarding pollution.

My case concerns air pollution caused by ozone being produced by high voltage transmission lines from the Respondent.

Currently, there are no permits or regulations and so forth covering the Respondent's high voltage lines as they relate to the Clean Air Act or the Illinois Pollution Control Board or the U.S. EPA or the Illinois EPA.

I'll show a need for controlling the ozone from these high voltage lines, and that the ozone is an air pollutant, and that the Respondent has caused or contributed to or sustained the air pollution at its immediate locations and/or the ambient air in the surrounding area of Chicago.

The Respondent should stop polluting the atmosphere just like everybody else is being controlled in one way or another by permits

and regulations. It appears that the Respondent is operating without any -- or the Respondent is operating arbitrarily in all its operations as far as they apply to the high voltage lines. And they are being uncontrolled at the moment, and the Board should initiate, consider, and adapt the appropriate regulations applicable to the Respondent; and along with that because of their causing air pollution in the atmosphere, penalties should be assessed against the Respondent for polluting the air during the period that the high voltage lines have been in operation and at least until -- or from the point of inception of the Clean Air Act.

That basically is my case. That's my preliminary statement.

THE HEARING OFFICER: All right. I did not propose opening statements.

MR. BOGACZ: Oh, I'm sorry.

THE HEARING OFFICER: Perhaps at this point I would ask if Commonwealth Edison has an opening statement.

MR. ZIBART: We can make an opening

statement now or perhaps as Mr. Bogacz's case is narrative in nature, perhaps we should defer the opening statement to the beginning of our case-in-chief.

THE HEARING OFFICER: All right. That's fine.

All right, then, Mr. Bogacz, you may proceed. We would be interested in seeing any documents that you have that propose evidence of this, and we would also be interested in any evidentuary testimony that you have to give of a factual or scientific nature.

MR. BOGACZ: Okay. I'll start off basically with documents I have submitted in response to the interrogatories from the Respondent and also my Answers to Interrogatories from the Respondent.

Basically, I'd start off with establishing that ozone is an air pollutant.

THE HEARING OFFICER: Can you refer us to documents in the record as you proceed?

MR. BOGACZ: Yes. I'm going to try. I don't know how -- I think there's a list that I provided to the Respondent of all the

documents that I had supplied them.

Well, let me start off with newspaper articles, this large ad that I provided the Respondent that was in reply to something in the nature of documents describing whether ozone was an air pollutant or something to that effect. This article is --

THE HEARING OFFICER: Can you give the title and the date of the article?

MR. BOGACZ: Yes. This is an article published in the Northwest Herald in McHenry County, and it's titled "Ozone Poses New Challenge."

THE HEARING OFFICER: Let the record reflect that this is a document that was in response to Respondent's document request No. 1.

MR. BOGACZ: It's dated July 23, 1995. I'll read certain excerpts from the article rather than going through all the -- Some of the material in here is really not relevant, but --

MR. RIPPIE: Madam Hearing Examiner, if it is the Complainant's intention to read this

article into the record and/or to offer this newspaper article into evidence, the Company does have an objection to it. I don't know exactly what the Complainant's intention is, whether he just intends to read it as reference or as the basis of something else or whether it's his intention to offer this as substantive evidence.

MR. BOGACZ: My intention is to offer it as substantive evidence, and --

MR. RIPPIE: We obviously don't have any objection to the Complainant or any other party submitting written materials of a scientific or technical nature, studies, reports and the like of scientific and technical nature. This falls far short of that criteria. And I might add that much of what the Complainant did provide to us was material that may qualify under that standard.

This, however, is a newspaper article by an individual named Karen Rivedal. We don't know what Ms. Rivedal's qualifications are. She's not available to be cross-examined nor are any of the other individuals named or

unnamed which are referred to in the articles available for cross-examination. She is certainly -- The author is certainly not an air pollution expert. She has no qualifications stated in the article nor has the Complainant attempted to offer any qualifications for it nor has the Complainant attempted to offer any evidence that this type of material is authoritative, peer reviewed, scientific, technical or is the kind of material that policy makers and others rely on in examining the appropriate courses of action to take in regulating ozone.

THE HEARING OFFICER: Thank you, Counsel.

MR. BOGACZ: May I respond?

THE HEARING OFFICER: I would like to ask the Complainant not to read from the article, and I will accept the article into evidence. The Board will determine the voracity and reliability of newspaper articles. The Board members are frequently reading articles on topics of interest to their areas of concern.

Mr. Bogacz, you are welcome to make observations about the article --

MR. BOGACZ: Right.

THE HEARING OFFICER: -- without reading the article.

MR. ZIBART: Will that -- Excuse me. Will that exhibit be marked or numbered in some way for reference?

THE HEARING OFFICER: We can identify that as Complainant's Exhibit 1.

(Complainant's Exhibit No. 1 marked for identification.)

THE HEARING OFFICER: You may continue, Mr. Bogacz.

MR. BOGACZ: This particular article explains how ozone is an air pollutant. It is technical in nature in that it quotes authorities from the EPA and other individuals within governmental units in the Chicago area and McHenry County specifically that they are working on programs to resolve the ozone air pollution problem because of the nonattainment mandate provided to various governments and companies and individuals by the U.S. EPA.

And, essentially, it states that -- or the article covers air pollutant -- or ozone

as an air pollutant in that it's harmful, it affects people with lung problems and asthma, and that there are certain ozone alert days designated when ozone is at a very high level in the Chicago area. And it is information given to the general public through a newspaper, and the quotes within the article are made by individuals who are technical specialists in their agency or company who handle air pollution problems and know about ozone being a very bad air pollutant.

The next document I'd like to submit for evidence is a brochure entitled, "Is There Anything I Can Do To Protect Myself From Harmful -- Harmful Effects of Air Pollution." This is distributed by the Lake County Health Department, and it's published by the Lake County Lung Association, Lake County, Illinois.

THE HEARING OFFICER: And we will number this as Exhibit No. 2.

(Complainant's Exhibit No. 2 marked for identification.)

THE HEARING OFFICER: Are there any

observations you would like to make about this document?

MR. BOGACZ: Within the document, it describes certain pollution standards index charts showing various levels of index values which affect the health of persons in the Chicago area.

It states that the Illinois Environmental Protection Agency uses the highest air level to -- or measured by monitors in each -- in certain sectors of the Chicago area to publish to the public and the news media to alert them of harmful levels of air pollution; in other words, ozone.

The article states that the air pollutants measured in Illinois are -- one of them is ozone. And the highest reading for ozone is at a certain very high level. It describes how they determine the index value as described in this brochure.

Also within the brochure, it describes people who should -- who are affected by this pollution as described by these index values of pollution; the elderly, infants and

children, asthmatics, people with lung problems, heart problems, persons with their cardiovascular diseases and so forth. And then there is certain characteristics that are described in here that are the symptoms of high pollution levels, eye and ear, throat irritation and headaches, coughing, wheezing. In fact, there may be air pollution in here right now. I don't know.

But, anyway, that basically describes this particular brochure.

The next --

THE HEARING OFFICER: Mr. Bogacz, I would like to ask you not to describe the items. The items are themselves in the record. I asked you if you had any comments about them. I would like to ask you not to describe them for the record.

MR. BOGACZ: Any comments?

THE HEARING OFFICER: Yes. Did you have any testimony of your own that you wish to add to the introduction of the document?

MR. BOGACZ: Well, I am basically adding my own testimony.

THE HEARING OFFICER: Proceed.

MR. BOGACZ: There is another document entitled, "What's in the Air" published by the Chicago Area Transportation Study in Chicago, Illinois.

THE HEARING OFFICER: Do I have a copy of that?

MR. BOGACZ: You should have. The subtitle of the document is, "The Ozone Problem in Northeastern, Illinois."

MR. RIPPIE: Madam Hearing Officer, we don't see that document in the materials we have either.

THE HEARING OFFICER: Okay.

MR. RIPPIE: If we could just perhaps go off the record for just a second and take a look at it.

THE HEARING OFFICER: All right. We'll go off the record so we can share the document with the Respondent.

(Discussion off the record.)

THE HEARING OFFICER: Let the record reflect that neither Respondent nor Hearing Officer have received the brochure item which

Mr. Bogacz identified.

Mr. Bogacz, you are welcome to discuss that if copies of it are made available to the parties prior so that they can look at it.

MR. BOGACZ: Okay.

THE HEARING OFFICER: Since that has not been done, are you going to forego entering that document?

MR. BOGACZ: Am I going to what?

THE HEARING OFFICER: Forego entering that document?

MR. BOGACZ: Yes.

THE HEARING OFFICER: Okay.

MR. BOGACZ: The next document I have is a brochure entitled, "Ozone Action Days: A Special Alert for People with Asthma and Other Respiratory Problems."

THE HEARING OFFICER: This will be numbered Exhibit 3.

(Complainant's Exhibit No. 3 marked for identification.)

MR. BOGACZ: This is a document published by the U.S. EPA in Chicago, Illinois. It basically describes the ozone pollution in the

area of Chicago and the difference in stratospheric ozone and ground level ozone. And it describes how ozone is a problem and particular -- and of particular concern to people of -- who have certain illnesses and the general public, also people that have asthma problems and lung problems, and describes also how people can protect themself or what they should do to protect themselves from this pollution.

The next document I have is "What You Can Do To Reduce Air Pollution."

Maybe to move things along, could the Respondent indicate whether that is something that was on the list? I don't have my list right here. If you object to it --

MR. RIPPIE: Yes. We have that one.

MR. BOGACZ: Okay.

THE HEARING OFFICER: That will be Exhibit 4.

(Complainant's Exhibit No. 4 marked for identification.)

MR. BOGACZ: This is an Internet document which I obtained, and it's from the United

States Environmental Protection Agency. It's -- Let's see. The document number is EPA450-K-92-002.

On the front page, the first page, it lists what you will learn about by reading this document, and one of them is the health effects of air pollution. It lists six pollutants that the U.S. EPA considers their responsibility, and one of them is ozone.

And it states basically that there are health problems associated with breathing in of ozone via the atmosphere. It basically describes various characteristics and symptoms people may obtain from breathing in the ozone which involve coughing and hard breathing, headaches and so forth.

This document also describes how the plant life on earth is of harm by ozone. And it also says that ozone is the most harmful pollutant to plant life.

MR. RIPPIE: Madam Hearing Officer, if I may, I would just like to note two things.

First of all, the portion of the document which is being offered states on its face that

it is the first four pages of twenty. The Respondent doesn't object to admission of these four pages as opposed to the complete twenty, but we do want to make it clear on the record that this is not the complete document that the Complainant is offering.

THE HEARING OFFICER: Thank you, Counsel.

MR. BOGACZ: The next document I have is a document -- or pages from a book titled, The Green Encyclopedia. The authors are Irene Frank and David Brownstone, 1992.

THE HEARING OFFICER: This will be numbered Exhibit 4 -- 5. Excuse me.

(Complainant's Exhibit No. 5 marked for identification.)

THE HEARING OFFICER: Do you have any observations to make about this document without describing it?

MR. BOGACZ: The document basically describes ozone as an air pollutant and that it is very injurious -- injurious to human beings and plant life on earth.

Respiratory problems are prevalent by breathing in the ozone, and it also describes

various bad effects on lung tissue which ozone apparently affects.

THE HEARING OFFICER: I show a three-page document; is that correct?

MR. BOGACZ: Well, yeah. The document -- or the book in one of the pages describes how ozone is a very virulent gas.

THE HEARING OFFICER: Are you discussing a page that is here in this document?

MR. BOGACZ: Yes.

THE HEARING OFFICER: Okay. Thank you.

Do you have any observations about this document?

MR. BOGACZ: Yes. This particular document describes how ozone is a very poisonous or virulent gas and is --

THE HEARING OFFICER: Mr. Bogacz, do you have any comments about the document itself?

MR. BOGACZ: Do I have any -- the comments -- As far as describing the pollution, air pollution, and the fact that ozone is an air pollutant, it is a very good document.

THE HEARING OFFICER: And do you know

anything about the authors of the document?

MR. BOGACZ: Not really, no.

THE HEARING OFFICER: Okay.

MR. BOGACZ: And the -- one of the -- some of the information within this document describes how ozone is more poisonous than mustard gas, which was used in World War I as a combat -- during combat.

THE HEARING OFFICER: Mr. Bogacz, I have to ask you not to make statements about what the document says without referring to the specific piece of the document that says that.

MR. BOGACZ: Oh, you want the page number?

THE HEARING OFFICER: Otherwise, we are in a position where we cannot verify that what you are saying is correct.

MR. BOGACZ: Okay. You want me to refer to the page number then?

THE HEARING OFFICER: For instance, you made a statement about mustard gas. Where is that statement in this document?

MR. BOGACZ: It's listed on page 8 or sheet 8. I don't know if it's the third sheet

or --

THE HEARING OFFICER: I have three pages here, and none of them are numbered page 8. All right. The first page appears to have an eight in the upper corner.

MR. BOGACZ: 231. I'm sorry.

THE HEARING OFFICER: Okay. Where on page 231?

MR. BOGACZ: At the very top.

THE HEARING OFFICER: All right. Thank you.

MR. RIPPIE: I would also note for the record, again, that this appears to be not even a complete excerpt. As Mr. Bogacz just noted, the first page of his submission appears to terminate with an eight, and then it proceeds to page 231 --

MR. BOGACZ: Right.

MR. RIPPIE: -- and an unnumbered page.

Also, the text on the first page does not flow over to the text on the second page.

THE HEARING OFFICER: Okay. Thank you, Counsel.

MR. BOGACZ: The next document is a

technical publication from the United States Environmental Protection Agency. This was obtained on the Internet. The title of it is "Ozone, Good Up, High Bad, Nearby."

THE HEARING OFFICER: That would be Exhibit 6.

MR. BOGACZ: What?

THE HEARING OFFICER: That will be Exhibit 6.

(Complainant's Exhibit No. 6 marked for identification.)

MR. BOGACZ: Oh, okay.

This is a very good document in that it describes the health and environmental effects of ground level ozone. It basically describes the same information that was described previously in the documents about ozone being an air pollutant and that it's very harmful to the environment and to human beings.

The next document I'd like to present is another technical publication from NASA, National Aeronautical Space Administration. The title of it is "Ozone, What Is It and Why Do We Care About It."

THE HEARING OFFICER: That will be numbered item 7.

(Complainant's Exhibit No. 7 marked for identification.)

MR. BOGACZ: This is another Internet document. It too is a very good document in that it alerts the public to ozone as being a very big problem on earth and the various health effects such as affecting the lungs and asthma and the heart are one of the -- is one of the byproducts of breathing in ozone, and ozone is a bad type of gas to have in the atmosphere and that it is an air pollutant.

The next document I have is a document titled "Target Summary Air Quality Health and Risk Assessment." This is a document from the Electric Power Research Institute, EPRI. It was obtained on the Internet.

MR. RIPPIE: Madam Hearing Examiner, I think we have -- if we could go off the record again to see if we can locate a copy of this document. I cannot find it on the schedule.

THE HEARING OFFICER: Off the record to find the document.

(Discussion off the record.)

THE HEARING OFFICER: Let the record show that we have looked at this document which was not previously shared with the Hearing Officer and Respondent.

Could you give the title of the document again, Mr. Bogacz?

MR. BOGACZ: This is a document from the EPRI, Electric Power Research Institute. It's titled "Target Summary Air Quality Health and Risk Assessment." This was obtained on the Internet.

THE HEARING OFFICER: That will be Exhibit 8.

(Complainant's Exhibit No. 8 marked for identification.)

MR. RIPPIE: Mr. Bogacz, because we don't have a copy of that document, could you provide us with the Internet address so that we could look at the full document?

I also, as long as we are noting this, just want to note that the last two Internet documents that have been marked as Exhibits 6 and 7 have been incomplete collections of

pages.

THE HEARING OFFICER: That is correct.

I will also have to take the copy that you have here today with me.

MR. BOGACZ: Okay.

I don't know. For some reason, this one does not have the Internet address on here, but I'll -- It might be.

THE HEARING OFFICER: We can make sure that Respondent receives a copy of this.

MR. BOGACZ: Somewhere on the EPRI.

THE HEARING OFFICER: You may proceed.

MR. BOGACZ: Okay. This document is published by a Research Institute, the EPRI, which provides advice as to environmental and other factors to the electric power industry which includes the Respondent. It's a very good document in that it describes various criteria of established air pollutants, and one of them is ozone, and that the industry should be concerned about it and do everything in their --

THE HEARING OFFICER: If you would not repeat what the document states.

MR. BOGACZ: No, no. I mean, not word by word, no.

THE HEARING OFFICER: Mr. Bogacz, do you have any comments about the document?

MR. BOGACZ: Well, the document is an apparent advisement to the electric power industry, and it's very good and it describes the responsibilities of the electric power industry to minimize or eliminate air pollution in their operations.

The next document I have is a few pages from what is called -- the title of the document is entitled "Air Quality Criteria for Ozone and Related Photochemical Oxidants." This is a United States EPA document.

THE HEARING OFFICER: Has that document been given to the Respondent and the Officer?

MR. BOGACZ: I believe so, yes.

MR. RIPPIE: There is an additional matter which I should bring to your attention, Madam Hearing Officer.

This is a -- This is not from the actual document. It is from a preliminary draft. And if you will look on the face of the

document --

THE HEARING OFFICER: I don't have the document.

MR. RIPPIE: There isn't -- There isn't a title, ma'am. And it's -- I think it was attached to the copy --

MR. BOGACZ: I think I wrote in there, you know, the title on it on the second page.

MR. RIPPIE: Right.

MR. BOGACZ: Some notes on, yeah, that it's a draft.

THE HEARING OFFICER: Oh, okay. This is the document which on its face simply identifies itself by a series of alphabet letters, AQCFOARPOII.

MR. RIPPIE: The Agency has, as you will see, on both the pages marked 2-5 and 3-127, which the Complainant has included. I believe it's the second and third pages of these documents. It makes it clear that what the Complainant is offering are pages from a preliminary review draft under the Agency's designation. This draft is not for quotation or citation, and I on that basis object to

it's admission. If he cares to admit the final report, I wouldn't have any objection.

THE HEARING OFFICER: Do you have any response?

MR. BOGACZ: Well, it is a document being considered or ultimately adopted, in essence, by U.S. EPA. I have no evidence that it's not going to be -- it wasn't adopted or it's not going to be adopted, but I'm offering it as a -- as evidence that the subject of ozone is being considered by the U.S. EPA.

MR. RIPPIE: Would -- I'm sorry.

MR. BOGACZ: Okay.

MR. RIPPIE: I would have -- Well, the purpose of offering this exhibit is for more than just proving that the subject of ozone is under consideration by U.S. EPA. We all know that to be true.

Administrative agencies charged with enforcement of pollution regulations and indeed agencies charged with all manner of technical and scientific issues regularly release preliminary drafts of documents for review by other agencies and by the scientific

community. Those documents are customarily designated as this one is and not for citation or quotation, and the reason for that is apparent.

If they could be cited and quoted as much as the Complainant is doing here, the agency's positions would be attributed to the agency that were not its final position, and that's why the agencies designate these drafts not for quotation and citation; and on that basis, we object to its use.

THE HEARING OFFICER: Thank you, Counsel.

The Board regularly sees drafts of documents from the IEPA and the U.S. EPA, and the Board can also determine the voracity and the reliability of the information provided in those documents.

I am going to permit the introduction of this document into evidence, but I am going to forbid its photocopying by the public. This will be Exhibit 9.

(Complainant's Exhibit No. 9 marked for identification.)

THE HEARING OFFICER: Do you have any comments you wish to make about this document, Mr. Bogacz, without repeating what is in the document?

MR. BOGACZ: Well, it basically --

THE HEARING OFFICER: I'm sorry, sir. I am going to have to stop you if you are going to try to tell me what the document says.

MR. BOGACZ: The document is a very good document in describing ozone and the concern of the U.S. EPA in controlling it, and that's all I can say about it right now.

THE HEARING OFFICER: Thanks, sir.

MR. BOGACZ: The next document I'd like to present is a document copy from the Encyclopedia of Britannica, Volume 16, Copyright 1967, specifically, the subject of ozone.

THE HEARING OFFICER: And that would be Exhibit 10.

(Complainant's Exhibit No. 10 marked for identification.)

MR. BOGACZ: This document is, well, basically a dictionary definition of ozone and

then all its characteristics and as to whether it's harmful to human beings or the environment. It's just one of many definitions available to the public, and that finishes that.

The next portion of my presentation, I'd like to offer evidence of Commonwealth Edison producing ozone, the air pollutant, and I'd like to offer all these -- all the documents that I received from the Respondent in response to my interrogatory. I'd like to have that entered as evidence.

THE HEARING OFFICER: Is there any objection to the introduction of those documents into evidence?

MR. RIPPIE: There are supplemental responses to those as well.

MR. BOGACZ: Right.

MR. RIPPIE: Is it your intention, Mr. Bogacz, to offer both the original and supplemental responses?

MR. BOGACZ: Yes.

MR. RIPPIE: Then we have no objection.

THE HEARING OFFICER: Okay. I believe

the filings that we are referring to were identified by the following titles; and if you will assist me in identifying whether I inadvertently fail to mention one, I will appreciate it.

The first one being Commonwealth Edison's Answers to Complainant's Interrogatories, comma, Requests for Admissions of Fact and Documents. I received that on April 2nd.

The second being Respondent's Supplemental Answers to Complainant's Interrogatory No. 2. I received that on August 13th.

The third being Respondent's Supplemental Answers to Complainant's Interrogatory No. 20. I received that on October 15th.

And I forgot to mention one I received earlier, Respondent's Supplemental Answers to Complainant's Interrogatories Nos. 24 and 25, which I received April 9th.

Are there any others I have not mentioned?

MR. RIPPIE: That's a complete identification.

THE HEARING OFFICER: All right. Thank you, very much.

Those will be entered into evidence as Complainant's Exhibit 11.

(Complainant's Exhibit No. 11 marked for identification.)

MR. BOGACZ: Now, all those documents not only show that Commonwealth Edison produces ozone by their generating electricity through their high voltage transmission lines, but it causes air pollution and sustains air pollution and contributes to air pollution.

That essentially is my particular case-in-chief right now.

THE HEARING OFFICER: All right. At this point in time then, Mr. Bogacz, you are subject to cross-examination by Respondent's counsel.

MR. BOGACZ: I didn't quite hear you. I'm sorry.

THE HEARING OFFICER: I said at this point in time, Mr. Bogacz, you would be subject to cross-examination by Respondent's counsel --

MR. BOGACZ: Okay.

THE HEARING OFFICER: -- on statements that you have been made as part of your testimony.

Before we do that, why don't we take about five minutes, and then we'll come back and do that.

And then it appears that our schedule today will mean that we will take a lunch break and we will come back after the lunch break and have Respondent's case-in-chief.

And I do appreciate the fact that you have a number of individuals with you today. The Board is very interested in this topical area, and thank you.

We'll come back on the record in five minutes.

(A short recess was taken.)

THE HEARING OFFICER: All right. Back on the record.

We will proceed now with the cross-examination of Mr. Bogacz on his testimony by counsel for the Respondent. And if I have the need to ask any clarifying

questions after that, then I will take that opportunity for the Board.

So, Counsel, you may proceed.

MR. RIPPIE: Mr. Bogacz, my name is Glenn Rippie. We've met before several years ago. I'll be asking you a few questions about your case on behalf of my client.

CROSS-EXAMINATION

BY MR. RIPPIE:

Q. It's correct, is it not, that prior to filing your complaint before the Pollution Control Board, you sought the advice of some other agencies on the question of transmission lines and ozone?

A. Yes, I did.

Q. One of those agencies was the United States Environmental Protection Agency?

A. I believe so. I don't know if I really sought advice. I don't -- I don't understand what you mean by advice.

Q. Well --

THE HEARING OFFICER: Could you clarify your question?

MR. RIPPIE: Certainly.

BY MR. RIPPIE:

Q. Mr. Bogacz, am I correct that you wrote to the administrator of the U.S. EPA informing her of your concerns and asking U.S. EPA to provide you with information and/or measurements of ozone levels that you contend that were related to the transmission lines?

A. I believe I did, yes.

Q. And you also contacted the Illinois Environmental Protection Agency?

A. Yes.

Q. And you contacted those agencies because you believe that they were authoritative?

A. Yes.

Q. Now, U.S. EPA didn't respond to your letter within 19 days, after which time you wrote a letter to U.S. Senator Paul Simon; am I correct?

THE HEARING OFFICER: Can we be more specific about the dates of the letters in question?

MR. RIPPIE: Sure.

BY MR. RIPPIE:

Q. Mr. Bogacz, you contacted Administrator Browner in writing on July 28, 1995; is that correct?

A. I believe so, yeah.

Q. And on August 17, 1995, not having heard back from Administrator Browner, you wrote to Senator Paul Simon requesting, quote, his assistance, unquote, in obtaining a response from the Agency?

A. I believe so, yes.

Q. And the Agency provided you a response to your inquiry through the offices of Mr. -- Senator Simon?

A. Yes.

Q. I'm going to show you a document which I will ask to be marked Commonwealth Edison Exhibit No. 1. It's a document that you have previously produced to the Company. I will also provide a copy to the Hearing Officer.

(Respondent's Exhibit No. 1 marked for identification.)

BY MR. RIPPIE:

Q. Mr. Bogacz, is that a copy of the document which the U.S. EPA forwarded to Senator Simon for delivery to you in response to your inquiries?

A. It appears to be, yes.

Q. Attached to that letter are materials that the EPA presented along with its letter to Senator Simon in response to your inquiry?

A. Yes.

Q. And that is page 68 of a larger document?
A. Right, yes.
THE HEARING OFFICER: Counsel, what is the relation of this avenue of inquiry to Mr. Bogacz's case-in-chief testimony or isn't this part of your own case-in-chief?
MR. RIPPIE: Well, Mr. Bogacz, I believe, expressed the testimony and would be required to express the testimony that ozone was produced in material quantities by the activities of the Respondent of which he is complaining, and this goes to that question. It also goes to -- Well, it goes to that element of the Respondent's case.
THE HEARING OFFICER: All right. I'll let you proceed then.
BY MR. RIPPIE:
Q. Mr. Bogacz, have you had an opportunity to review the study that the U.S. EPA referred to in its September 15, 1995 letter to Mr. Simon, to Senator Simon, that was forwarded on to you in response to your inquiry?
A. I don't quite understand. Are you asking if I have reviewed all these studies that are listed on this page or just this particular page?

Q. Okay. You had an opportunity to review the study of which this was a part, of which the third page is a part?

A. The study. That they list? No.

Q. Let me try to be even clearer.

The third page of their response is page 68 of a study, of a report. Have you reviewed that report?

THE HEARING OFFICER: I believe the report is referred to in the letter on the previous page; am I correct?

MR. RIPPIE: Yes.

THE HEARING OFFICER: The report you're referring to is entitled "Electrical and Biological Effects of Transmission Lines, A Review."

MR. RIPPIE: That's the study I am referring to.

MR. BOGACZ: Wait a minute.

THE HEARING OFFICER: Mr. Bogacz, have you reviewed the study entitled --

MR. BOGACZ: No, I haven't reviewed that other than this page, which is part of that report apparently.

BY MR. RIPPIE:

Q. Mr. Bogacz, I'm going to show you a document which I'm going to mark Commonwealth Edison Exhibit No. 2.

(Respondent's Exhibit No. 2 marked for identification.)

BY MR. RIPPIE:

Q. Can you tell the Hearing Officer and the Board whether that is the study that's referred to in U.S. EPA's response in your inquiry?

A. It appears to be.

Q. Now, you -- I'm sorry.

A. Let me check the page here.

Yes. It appears to be the study they refer to.

Q. And it is fair to say that the conclusion in the portion of the U.S. EPA study that the Agency referred to in responding to your inquiry concluded that ozone concentrations produced by transmission lines appear to be too low to have any significant effects on humans, animals or plants. That was the --

THE HEARING OFFICER: Can you identify the page you are reading from, Mr. Rippie?

MR. RIPPIE: Certainly. That is the last

sentence on page 68. That was the excerpt that the Agency sent.

THE HEARING OFFICER: Thank you.

BY MR. BOGACZ:

A. Yes. That's what it appears to say, yes.

Q. Mr. Bogacz, there were also some studies that U.S. EPA's document referred to. I'm, again, referring to the second to the last paragraph on that page 68 that was sent to you by the Agency -- the third to the last paragraph. I'm sorry.

Do you see the paragraph I'm referring to?

A. Which one is that, in the joint study?

Q. It's the paragraph that begins -- It's the third to the last paragraph of the page that the Agency sent to you in response to your inquiry. It begins when this review was first prepared in 1975. And then it identifies some studies that were prepared in response to questions about this subject.

A. Oh, okay. I was looking at the letter. Yes.

Q. Have you reviewed those studies at any time?

A. Other than knowing about them by this document, I haven't really studied it, no.

Q. You were made aware of them, though, because they were referred to by the U.S. EPA's response?

A. Yeah.

Q. I will show you a copy of a document I'm going to mark Commonwealth Edison Company Exhibit No. 3. It's a study of the principal author of which is Barry Scott-Walton, United States Department of Energy.

(Respondent's Exhibit No. 3 marked for identification.)

BY MR. RIPPIE:

Q. I ask you, Mr. Bogacz, if that is one of the studies that the United States Environmental Protection Agency referred to in response to your inquiry?

A. The United States Department -- or United States Environmental Protection Agency did not refer to this document. The Department of Energy did.

Q. Let me be clearer then.

U.S. EPA sent you a page of a report that references this as one of the studies on the subject?

THE HEARING OFFICER: Are you referring again to the page you were referring to previously --

MR. RIPPIE: Yes.

THE HEARING OFFICER: -- Mr. Rippie?

MR. RIPPIE: The third to the last paragraph that I've referred Mr. Bogacz to

that identifies studies on this subject.
BY THE WITNESS:
A. Would you repeat that last question again?
Q. Sure. Is this one of the studies that are referred to --
THE HEARING OFFICER: Let the record reflect that this appears to be one of the studies that is referred to on page 68, slash, 69 of the document.
BY MR. RIPPIE:
Q. Mr. Bogacz, I'm going to show you a second document -- or a third document, which I will mark Commonwealth Edison Company Exhibit No. 4.
(Respondent's Exhibit No. 4 marked for identification.)
BY MR. RIPPIE:
Q. And I ask you, is this also one of the studies identified in the paragraph of U.S. EPA's response that we have been discussing?
A. I don't see any of these, other than the names -- there's a name on there. Potential environmental effects -- You're referring to this paragraph, right, when this review was prepared?
Q. Uh-huh. And one of the studies identified in

there is Janes' from 1980.

A. Yeah.

Q. It says the study prepared by David E. Janes in June of 1980 on ozone production -- well, on a variety of environmental effects, if any, on transmission lines.

A. Well, I presume that they are referring to Mr. David -- or David E. Janes, but I really can't confirm whether those are the documents. I mean, there's nothing really identifying -- I mean, there's no number or anything.

Q. Well, Mr. Bogacz --

A. Other than the name on the one document and another name on another document.

Q. Okay. Can we at least agree that it's the same name and same date?

A. Yes. The same dates are there.

Q. Okay.

A. Whether they are the same documents or refer to the same documents, I'm not quite sure.

Q. It's the same name, the same date, and it's also the same subject; right?

A. Well, the title's not listed on -- for either one of these documents in this page 68 paragraph, so I can't say that those -- these documents are listed in

this -- on page 68.

Q. Okay. Mr. Bogacz, please, I'm trying to do this as quickly as I can. It's a very precise question. It's the same --

A. And I'm asking for a precise description.

Q. It's the same author, the same date, and the same subject matter, namely, environmental effects, if any, of high voltage transmission lines; correct?

A. No.

Q. Can you --

A. There is nothing in this paragraph that says that whatsoever.

Q. Well, EPA was responding to your inquiry about environmental effects of high voltage transmission lines; am I correct?

A. Yes.

Q. And Com Ed Exhibit 4 is a study by Mr. David Janes published in 1980 on environmental effects of high voltage transmission lines, right?

A. I believe so, yes.

Q. And the EPA's response to you identifies a 1980 study by Mr. Janes on this subject in their response to your inquiry?

A. I, again, must correct you. U.S. EPA did not

identify. The Department of Energy has identified these documents.

Q. The page attached to that response identifies it?

A. The page obtained from the Department of Energy and given to the United States Environmental Protection Agency describes those documents.

Q. Okay. Thank you.

I'm going to show you a document that's been marked Com Ed Exhibit No. 5.

THE HEARING OFFICER: I will be happy to label the exhibits, Counsel.

MR. RIPPIE: Oh, I'm -- Whatever is simplest. I'm sorry.

(Respondent's Exhibit No. 5 marked for identification.)

BY MR. RIPPIE:

Q. Mr. Bogacz, would you agree that Com Ed Exhibit 5 is a study conducted in 1991 by Drs. Bracken and Gabriel, and that such a study is referred to in the U.S. EPA response to your inquiry?

A. It appears that that's the document that is referred in the Department of Energy document which was provided to the U.S. EPA.

Q. Mr. Bogacz, is there any doubt in your mind that these four studies, Com Ed Exhibits 2 through 5, are scientific or technical reports on the effects, if any, of high voltage transmission lines?

A. It appears that they are some sort of technical research and/or engineering studies.

Q. Mr. Bogacz, it's true, is it not, that the United States Environmental Protection Agency has never sent you a document that states that high voltage transmission lines produce material quantities of ozone?

A. Well, what do you mean by material?

Q. The word material or significant appears in their statement.

THE HEARING OFFICER: You can answer that to the best of your ability, Mr. Bogacz.

MR. BOGACZ: Yeah. I'm just reading something.

THE HEARING OFFICER: You need to be responsive to the question.

BY MR. BOGACZ:

A. As to material production, no.

Q. In fact, everything that U.S. EPA has ever sent you is consistent with the conclusion on the last sentence of Com Ed Exhibit 1, namely, that ozone

concentrations produced by transmission lines appear to be too low to have any significant effects on an animals, plant, or humans?

A. I would have to object to -- I'm not -- That's a conclusion at this point.

THE HEARING OFFICER: Would you please state that as a question?

MR. RIPPIE: Sure.

BY MR. RIPPIE:

Q. Isn't it true that U.S. EPA has never sent you any materials that are inconsistent with the statement made on the last sentence of their response, namely, that ozone concentrations produced by transmission lines appear to be too low to have any effect on humans, plants or animals?

A. That they haven't sent me? I don't -- I didn't quite get that again.

Q. I'll try to make it simpler.

U.S. EPA has never sent you any document -- I will phrase it as a question.

Has U.S. EPA ever sent you any document that states that ozone produced by transmission lines has any significant effect on humans, plants or animals?

A. That's correct.

Q. They have not?
A. They have not specifically, no.
Q. Now, you also asked the Illinois EPA to come out and make some measurements of ozone around your property; correct?
A. Yes.
Q. And two environmental protection specialists from the Air Monitoring Section of the IEPA Bureau of Air came out and visited your property; am I correct?
A. Yes.
Q. And they conducted ozone measurements on your property?
A. Yes. It appears that they did.
Q. And the IEPA environmental protection specialists were unable to find any elevated levels of ozone on your property or near the transmission lines whatsoever?
A. I have no information to indicate that they didn't or did.
Q. They did not -- Mr. Bogacz, you met those two individuals; am I correct?
A. Yes.
Q. And you spoke with them?
A. Yes.

THE HEARING OFFICER: Would you please make your statements questions, Counsel?

BY MR. RIPPIE:

Q. And did you speak with them?

A. Yes.

Q. Did you speak with them both before and after they completed their measurements?

A. To a certain extent.

Q. Did those individuals tell you that they were able to measure any elevated concentrations of ozone on your property or near the transmission lines?

A. They indicated to me indefinite results and that they'd probably have to come back again to verify and make some other studies to come up with a final report.

Q. Mr. Bogacz, isn't it a fact that they told you that when they were out measuring on your property, they were unable to detect any elevated levels of ozone?

A. No.

THE HEARING OFFICER: Let's pursue this line of inquiry by best evidence, if you wish to do that at a later time. I think we are talking about the statements of individuals that are not before us, and we are talking about an event that Mr. Bogacz did not refer

to in his case-in-chief.

MR. BOGACZ: I know. That's -- I'll object to his line of questioning because I didn't mention anything at all about testing or anything, so -- I thought his questions were to ask me questions referring to what I presented thus far. I haven't heard anything yet.

MR. RIPPIE: Well, Mr. Bogacz made allegations in his complaint to the Board about levels of ozone produced by transmission lines, and I am certainly entitled to question him on that subject. I appreciate --

THE HEARING OFFICER: And you are entitled to call him during your case-in-chief.

MR. RIPPIE: If that's your preference, I will consider pursuing this line of questioning further on our case.

THE HEARING OFFICER: That would be more proper from the standpoint of the order of hearing.

MR. BOGACZ: I mean, this line of questioning is -- has nothing to do anything with anything I presented specifically. Each

document -- You're supposed to have a question, you know, that I can respond to that refers to the document.

THE HEARING OFFICER: Mr. Bogacz --

MR. BOGACZ: I'm going off onto completely different subjects here.

THE HEARING OFFICER: Mr. Bogacz, your objection has already been noted.

MR. BOGACZ: Thank you.

BY MR. RIPPIE:

Q. Mr. Bogacz, you admitted into evidence a packet of brochures and other Web page materials as Exhibits 1 through 10; am I correct?

A. Yes.

Q. Do any of those materials mention high voltage transmission lines as a source of ozone?

A. No.

Q. Do any of them mention high voltage transmission lines at all?

A. Not specifically.

Q. I take it then your answer is that they do not mention high voltage transmission lines?

A. My answer --

THE HEARING OFFICER: To the best of your

knowledge.

BY MR. BOGACZ:

A. To the best of my knowledge from the information that I have seen in here, they indicate that the phenomena of ozone being produced by electrical discharge is within some of these documents.

MR. RIPPIE: It's very -- Madam Hearing Officer, I'll try to pose the question again.

BY MR. RIPPIE:

Q. I'm not asking you about sparking, Mr. Bogacz. I'm asking you whether any of the documents that you submitted as Exhibits 1 through 10 mention transmission lines at all?

A. Not that I can recall.

Q. Now, Mr. Bogacz, you also provided some additional materials to us in discovery which you didn't admit into evidence or didn't offer into evidence; am I correct?

A. Could you be a little more specific?

Q. Sure. You provided us with some other Internet pages that identify some other --

A. It's quite possible.

Q. -- sources of ozone?

A. Right.

MR. RIPPIE: Let me ask the Hearing Officer whether you would prefer that we, for procedural purposes, pursued this as part of the Company's case? It's -- I think it's probably within the limits of what the Complainant's burden of proof is in testing the appropriateness of the relief the Complainant requests; but if the Board is going to have any procedural discomfort with this at all, I am happy to do this as part of the Company's case.

THE HEARING OFFICER: Well, what do you propose to inquire about at this time, Mr. Rippie?

MR. RIPPIE: Well, I intend to inquire of the witness about the emission of ozone by other sources and how the allegations of his complaint that he is in some way injured by what he terms to be pollution caused by transmission lines relates to those other sources.

THE HEARING OFFICER: Well, I'll let you proceed.

BY MR. RIPPIE:

Q. Mr. Bogacz, you are aware that ozone can be produced both directly and by the action of sunlight on other chemicals in the air?

A. Yes.

Q. And amongst the direct sources of ozone are, for example, the use of ozone gas as a means of purifying drinking water?

A. Yes.

Q. And that, in fact, was a document that you produced to Commonwealth Edison in discovery. There was a document that referred to the use of ozone as a water purification agent?

A. If could you show me that.

Q. Sure. I'll be happy to. It's a document entitled "Bommersbach Marketing International, Ozone Point of Entry Water Purification Systems."

A. Yeah.

Q. And you are aware that ozone is also produced by photocopying machines, laser printers, and other electrostatic devices?

A. Yes.

Q. Is ozone also produced by arc welding?

A. I believe so.

Q. And is ozone produced in the manufacture of white paper in the bleaching process?

A. I'm not quite familiar with that one.

Q. Okay. Putting aside white paper, are you also familiar with some of the indirect sources of ozone, namely, the sources of chemicals that when exposed to sunlight can produce ozone in the atmosphere?

A. Are you speaking of the photochemical process?

Q. Sure, sources of --

A. Yeah.

Q. -- common --

A. Yes.

Q. Okay. And those would include -- do those include both household products such as automotive cleaners, waxes, polishes, hair spray, and health and beauty products? If you don't know, you --

A. I'm not quite sure whether I'm familiar with that part of it.

Q. Are you familiar with the fact that fireplaces and wood burning stoves produce ozone precursors?

A. It quite possibly might.

Q. How about barbecue pits?

A. Possible.

Q. Small --

A. You mean the burning of barbecue charcoal and so forth?
Q. Yes.
THE HEARING OFFICER: Mr. Bogacz, just answer the question directly whether you are or are not familiar with that.
MR. BOGACZ: Okay.
BY MR. RIPPIE:
Q. How about lawn mowers and other small gasoline engines?
A. Oh, yes.
Q. Now, Mr. Bogacz, do you propose that Commonwealth Edison as a result of your complaint in this case be directed to -- and I believe I'm using your words -- underground or otherwise keep their transmission lines from having contact with air?
A. Am I proposing that essentially?
Q. Is that the relief you're asking of the Board?
A. It's a possible request, although there might be others that they might -- the Board may think of or somebody else.
Q. I'm just asking you, Mr. Bogacz, whether that is the relief that you request from the Board?
A. Well, it's the most obvious relief at the

moment.

Q. And, in fact, that was the relief that you identified in response to interrogatory No. 7 of Commonwealth Edison which inquired what you asked the Board to do. If I'm correct, your answer was burial of lines or other methods to prevent direct exposure to air. Is that your answer?

A. I believe so, yes.

Q. Now, do you propose -- Let me ask the question this way, Mr. Bogacz.

Do you believe that the use of ozone as a water purification device should be prevented by the Pollution Control Board?

A. I think I'm going to have to object to that question. I mean, it has nothing to do with --

MR. RIPPIE: If I can respond.

THE HEARING OFFICER: Please.

MR. RIPPIE: Mr. Bogacz has asked the Board to take specific remedial action both in his complaint and his responses. It is the Company's contention that there exists, and we will demonstrate this in our case-in-chief, studies on the subject of ozone plans and how it should best be controlled and that those

plans for the cost effective control of ozone do not include transmission lines.

I am entitled to inquire of the Complainant as to whether or not it is his position that any source of ozone, no matter how beneficial and no matter what the costs of control are, should be regulated, and that's all I'm trying to do.

THE HEARING OFFICER: Do you have a response, Mr. Bogacz?

MR. BOGACZ: What?

THE HEARING OFFICER: Do you have a response to counsel's argument?

MR. BOGACZ: Well, I don't see how that relates to the -- my complaint in that I'm -- I have nothing in my complaint about other sources of ozone. I specifically mention high voltage transmission lines as the polluter of the atmosphere and -- by producing ozone and other sources of possible ozone creation. Whether it be a precursor or direct or otherwise, I really can't answer anything to that.

THE HEARING OFFICER: The objection is

sustained.

MR. RIPPIE: May I inquire of the Hearing Officer whether that ruling is a function of the fact that Mr. Bogacz's -- Mr. Bogacz is on cross-examination?

THE HEARING OFFICER: Yes, it is.

In other words, Counsel, you are welcome to bring evidence of this nature up in your case-in-chief.

MR. RIPPIE: Madam Hearing Officer, at this point then, I would like to terminate my cross-examination of Mr. Bogacz.

Just so no one is surprised, it's my intention then to also call him as a witness in the Company's case-in-chief to inquire briefly on the regulatory policy issues.

THE HEARING OFFICER: Did you intend to do that today?

MR. RIPPIE: Yes.

THE HEARING OFFICER: Okay. Mr. Bogacz, would you mind being asked questions again today by counsel for Commonwealth Edison?

MR. BOGACZ: No. If that's the way it works out, fine.

THE HEARING OFFICER: Procedurally, that would be more correct for us to do that.

MR. BOGACZ: Right. I mean, let's see. Well, I don't know what's next there.

THE HEARING OFFICER: What is next is any further witnesses that you might have here today, which -- Do you have any further witnesses here today?

MR. BOGACZ: Not at this time.

THE HEARING OFFICER: Okay. Then we have discussed your inquiry about receipt of documents related to your FOIA request with U.S. EPA, and we ruled on that this morning.

So, at this time, I think we will take a recess for lunch, and we'll assume at this time that Complainant's case-in-chief is concluded. Is that correct?

MR. BOGACZ: Is it possible to introduce more evidence -- or documents rather --

THE HEARING OFFICER: The documents that we discussed, yes.

MR. BOGACZ: -- I may think of or --

THE HEARING OFFICER: The documents that we discussed, yes.

MR. BOGACZ: I don't recall -- Let's see. I entered in all the documents and information regarding interrogatories from me; all the Respondent's answers, in other words.

THE HEARING OFFICER: Those are now part of the record.

MR. BOGACZ: Huh?

THE HEARING OFFICER: Those are now part of the record.

MR. BOGACZ: Okay. Now, all the documents that I provided in response to the Respondent I wish to enter as evidence.

MR. RIPPIE: I'm not sure which documents Mr. Bogacz is referring.

THE HEARING OFFICER: He's referring to his responses to your interrogatories.

MR. RIPPIE: There is material in those interrogatories which is calculated to lead to the revelation of relevant and admissible evidence, but which is not in and of itself relevant.

MR. BOGACZ: Well, some of those document I've -- I have been -- I presented earlier this morning.

MR. RIPPIE: And we had no objection to the admission of relevant documents.

THE HEARING OFFICER: Excuse me. Some of the documents you presented earlier this morning were not the documents that you are talking about right now, Mr. Bogacz.

What you just asked about was the documents that you gave to the Company in response to their questions of you.

MR. BOGACZ: Right.

THE HEARING OFFICER: The documents that were entered as Exhibit 11 were the Company's responses to your questions, not your responses to their questions. Those are two separate sets of documents.

MR. BOGACZ: Right.

THE HEARING OFFICER: What are you now asking?

MR. BOGACZ: Well, the -- Essentially, that's what I've been using, some of the documents that I presented to the Respondent in answer to their interrogatory.

THE HEARING OFFICER: We have not had those documents referred to in the hearing

until now.

Would you like to have those documents entered into the record of the hearing as an exhibit number?

MR. BOGACZ: I don't know exactly how many there are, but is there a way of generalizing, you know, from one number to another or all of the documents that were submitted?

THE HEARING OFFICER: Could you answer the question? Would you like to have those documents entered into the record --

MR. BOGACZ: Yes.

THE HEARING OFFICER: -- at the hearing as an exhibit number?

MR. BOGACZ: Yes.

THE HEARING OFFICER: All right. Counsel, would you have an objection to entering these into the evidence of the hearing?

And I am referring to several documents which I will try to identify here on the record.

First, Complainant's Answers to

Respondent's Interrogatories. I received that on April 4th. It appears that I received with that a group of documents covered by a sheet that says Documents in Response to Respondent's Document Request No. 4, and in addition a document entitled Complainant's Response to Respondent's Request for Documents, which I received July 1, 1996.

MR. RIPPIE: Madam Hearing Officer, there are a few -- Well, the problem with admitting these documents in bulk is the Respondent -- or the Complainant has provided documents which are relevant to his case along with a number of documents which aren't and along with some documents which I do not believe under the Board's rules are admissible, for example, pages out of IICLE law books on environmental law.

There are also Web pages that do not appear to be from any established environmental source. They are not even identified what the source of those documents are. And there are certain calculation sheets that have been prepared by the Complainant

that the Complainant has not testified to nor has he attempted to establish any qualifications to prepare.

I am concerned and object to the inclusion of those documents in the record as substantive evidence. If there are specific documents, if there are any specific documents that the Complainant feels he has not already included in the list of 10 or 11 documents that he has offered, we would be happy to have him identify them and we will in all likelihood not have any objection.

I do, though, believe that the Rules of Evidence as applied by the Board have to at a minimum provide for the admission of only evidence which is relevant material and in the case of these calculations and law books have to have some authority.

THE HEARING OFFICER: Mr. Bogacz, do you have a response?

MR. BOGACZ: Well, all those documents were submitted as -- in response to interrogatories from the Respondent. So I don't see any difference in doing that again

as evidence at the hearing here. I mean, there was -- other than some of the documents possibly being unacceptable in some way, but I don't know if you can make a ruling on that right now or --

MR. RIPPIE: I'm sorry. That's the problem with doing them in bulk.

I suggest seriously that the way to resolve this issue is perhaps even over lunch to -- if Mr. Bogacz feels that there is any document in here that's relevant and material that he wants to have admitted into evidence, to offer that document individually.

We must remember that our responses were admissible -- our responses to his requests were admissible on his offer because we provided that information. But admitting his responses to our request in bulk means that anything he chose to send in a discovery response, regardless of its actual propriety or relevance, would come into the record.

Any legitimate document that he wishes to have admitted he can offer.

THE HEARING OFFICER: Thank you,

Counsel.

I am going to permit the Complainant's Answers to the Respondent's Interrogatories to be entered into evidence as Complainant's Exhibit 12. I do that based on the Board's general practice which is to permit the parties to make the case they seek to make and to judge for themselves the voracity, reliability, and materiality of the documents that are put before them.

(Complainant's Exhibit No. 12 marked for identification.)

The Hearing Officer is also encouraged when there is an arguable interpretation as to the admissible of evidence in Board proceedings to admit that evidence.

Now, the documents I referred to previously will be admitted into evidence as Complainant's Exhibit 12; and if there is any question as to what those documents are, they are the documents that I now hold in my hand. Respondent may check to see that the documents we are discussing are, in fact, the same documents Respondent did receive from

Complainant.

MR. BOGACZ: Okay.

THE HEARING OFFICER: At this time, the Complainant's case-in-chief at hearing has been concluded in oral testimony, and we are at a point where we have several exhibits identified that we have not entertained a motion for admission into evidence of, I don't believe. I would like to do that at this time for Complainant's Exhibits 1 through 12.

Is there any objection to the admissibility of these exhibits into evidence? These have previously been identified. We have heard some objections on the content of some of these documents from Respondent; however, I am entertaining a formal admission of these documents into evidence at this time.

MR. RIPPIE: Madam Hearing Officer, if I may, we have no objections other than those which have already been addressed and memorialized for the record at the time the documents were first marked for identification.

THE HEARING OFFICER: All right. Thank you.

Then Complainant's Exhibits Nos. 1 through 12 will be entered into evidence, and the objections of Respondent's counsel pertaining to those are preserved for the record.

(Complainant's Exhibit Nos. 1-12 admitted into evidence.)

THE HEARING OFFICER: At this time, then we will go off the record for lunch, and we will return for Respondent's case-in-chief.

Off the record.

(A lunch recess was taken.)

THE HEARING OFFICER: On the record.

We are back from our lunch recess, and we will proceed now with the Respondent's case-in-chief.

MR. ZIBART: If it would please the Hearing Officer, I would like to offer a brief opening statement at this time.

THE HEARING OFFICER: Please.

OPENING STATEMENT

By Mr. Zibart

Mr. Bogacz has filed an enforcement complaint claiming that Com Ed's transmission lines cause air pollution because trace amounts of ozone in the form of oxygen may be formed during certain weather conditions along the energized lines. Our evidence will demonstrate that Mr. Bogacz's complaint is without merit.

Ozone is a naturally occurring gas and can be formed when energy is released into the air. The major causes of ozone are sunlight, lightening, automobiles, and certain manufacturing operations. The evidence will show that transmission lines are not a meaningful cause of ozone.

After a few brief questions we will direct to Mr. Bogacz as part of our case, we will present the testimony first of Ms. Linda Manning, Com Ed's transmission system vice-president who will give the Board an overview of Com Ed's transmission system and explain the important role that it plays in delivering electric power to the people of Northern Illinois.

We will then present the testimony of Dr. Gary Johnson, an engineer and scientist who has studied the phenomenon of ozone caused by transmission lines.

Dr. Johnson will report to the Board on his calculations of how much ozone is created by Com Ed's transmission system. Because ozone decays almost as fast as it is created, Dr. Johnson has also calculated the total amount of ozone present in the atmosphere due to Com Ed's transmission lines.

We will also present the testimony of Dr. Jaroslav Vostal, a medical doctor and specialist in public health issues, who has spent many years investigating the health effects of ozone on people. Dr. Vostal has reached the conclusion that the amount of ozone created by transmission lines is not a danger to public health.

We will present the testimony of Mr. Mark Lorenz, Com Ed's siting and estimating engineer, who will discuss the feasibility and cost of attempting to bury Com Ed's entire transmission system underground as the Complainant has requested. Mr. Lorenz will demonstrate that it is neither technically nor economically feasible to do so.

Finally, we will put into the record for the Board's reference copies of the studies mentioned earlier that the U.S. EPA referred Mr. Bogacz to when he made his inquiries.

Upon considering the evidence, we believe the Board will agree that transmission lines are not a source of air pollution. Thank you.

THE HEARING OFFICER: Thank you very much.

Would the Respondent's counsel like to call their first witness?

MR. RIPPIE: The Respondent's first witness will be the Complainant, Mr. Joseph Bogacz.

THE HEARING OFFICER: Okay. Mr. Bogacz, at this time, the Respondent's counsel would like to ask you a few questions relating to their case-in-chief.

And can we have the witness sworn?

(Witness sworn.)

JOSEPH BOGACZ,

called as a witness herein, having been first duly sworn, was examined upon oral interrogatories and testified as follows:

DIRECT EXAMINATION

BY MR. RIPPIE:

Q. Mr. Bogacz, do you recall some of the questions that I posed to you during your

cross-examination; and in particular, do you recall that I asked you whether a variety of other industrial activities and household activities produced ozone?

A. Yes, I do.

Q. Okay. And I don't want to go over the same ground again, but let me briefly summarize.

We agreed, did we not, that ozone is produced by drinking water purification, Xerox and photocopying machines, laser printers, and arc welding?

A. I believe it is true.

Q. And we also agreed, I believe, did we not, that precursors of atmospheric ozone are produced by such things as barbecue pits, fireplaces, wood burning stoves, and small gasoline engines?

A. I believe so, yes.

Q. I am going to show you a document, which I'm going to also present a copy to the Hearing Officer.

MR. RIPPIE: It's a Department of Commerce National Technical Information Service Study.

I believe we are on Exhibit 6.

THE HEARING OFFICER: Correct.

(Respondent's Exhibit No. 6 marked for identification.)

BY MR. RIPPIE:

Q. Now, Mr. Bogacz, this is actually an excerpt from the study which I'm going to ask you to, first of all, just take a look at the front cover.

Can we agree that this is a portion of a United States Department of Commerce National Technical Information Service Report on identification and characterization of missing or unaccounted for area source categories?

A. Yes.

Q. Mr. Bogacz, I ask you whether we can also agree that this report categorizes and identifies some of the sources of atmospheric ozone? And probably the easiest way to do this would be to refer you to the table of contents that summarizes what the purpose of the studies are, what the sources are.

THE HEARING OFFICER: What is your question, Counsel?

MR. RIPPIE: I'm just trying to establish with the witness that we can agree that this study, in fact, identifies and characterizes a variety of other sources of ozone. That will be the last foundation question I have for the witness.

BY THE WITNESS:

A. It appears it does.

Q. Now, Mr. Bogacz, you have asked the Pollution Control Board to direct that certain things be done to Com Ed's existing transmission system based on your allegations that that transmission system produces ozone; am I correct?

A. Partially, I agree to that. There may be other methods of accomplishing that request.

Q. The methods that you identified, however, in response to our interrogatories was to bury the lines or to remove them from having any contact with air?

A. Yes.

Q. Now, Mr. Bogacz, do you believe that -- is it your -- Strike that.

Is it your contention that the Pollution Control Board must direct Commonwealth Edison to either bury or remove its lines from air or take other action to eliminate the production of ozone from its transmission lines?

A. Is it my contention that they do that?

Q. That's correct.

A. If it's within their authority, I guess I am asking them to do that.

Q. Do you -- Should the Pollution Control Board also prevent the production of atmospheric ozone by water purification, Xerox machines, laser printers, arc welding, barbecue pits, fireplaces, wood burning stoves, lawn mowers, and the like?

A. What was the first part?

Q. Should the Pollution Control Board also prevent the production of ozone by purification drinking water, Xerox machines, laser printers, arc welding, barbecue pits, fireplaces, wood burning stoves, lawn mowers, and the like?

A. I'm not sure that this line of questions really applies to the Illinois Pollution Control Board. It may apply to the U.S. EPA primarily.

Q. Okay. Well, then let me ask you whether or not you think that the U.S. EPA and/or the Pollution Control Board should require the elimination of the production of ozone from that list of sources?

A. If it's given the authority by the environmental -- the relative or respective Environmental Protection Acts, yes, I do.

Q. Is it your contention that the Pollution Control Board or the U.S. or Illinois EPA should also look at the benefits of those activities and the costs of

eliminating that ozone?

A. I guess it's within their prerogative to do that.

Q. Is it your contention that they should?

A. Oh, they should. If it's specified within their authority, I guess they should.

Q. Okay. Thank you very much. That's all the questions I have for you.

THE HEARING OFFICER: Okay.

MR. RIPPIE: At this point, Madam Hearing Officer, I would offer into evidence Company Exhibits -- Com Ed -- Respondent Com Ed's Exhibits 1 through, I believe, 6.

THE HEARING OFFICER: Is there any objection to the introduction of these exhibits into evidence?

MR. BOGACZ: The exhibits that -- You mean the questions or -- that he was just presented?

THE HEARING OFFICER: No, the exhibits identified as Respondent's Exhibits 1 through 6.

MR. BOGACZ: Oh, the ones that -- The exhibits that were presented earlier; is that

what you're talking about?

MR. RIPPIE: Yes, sir.

THE HEARING OFFICER: Exhibit 6 was just presented.

MR. BOGACZ: Okay.

THE HEARING OFFICER: Exhibits 1 through 5 were presented before lunch.

MR. BOGACZ: No. I have no problem.

THE HEARING OFFICER: Exhibits 1 through 6 of Respondent's will be entered into evidence.

(Respondent's Exhibit Nos. 1-6 admitted into evidence.)

MR. RIPPIE: Madam Hearing Officer, Respondent's next witness is Ms. Linda Manning.

THE HEARING OFFICER: Will Ms. Manning come forward?

Okay. You can arrange the witness chair appropriately. Perhaps you would like to put it on this side.

Will the witness be sworn?

(Witness sworn.)

LINDA S. MANNING,

called as a witness herein, having been first duly sworn, was examined upon oral interrogatories and testified as follows:

DIRECT EXAMINATION

BY MR. RIPPIE:

Q. Could you please state and spell your full legal name for the court reporter?

A. Yes. My name is Linda, S is the middle initial, Manning, M-a-n-n-i-n-g.

Q. Ms. Manning, can you tell me who your employer is?

A. My employer is Commonwealth Edison Company.

Q. And what is your position with Com Ed?

A. I am the transmission system vice-president for our company.

Q. And what in general is Commonwealth Edison Company's business?

A. Commonwealth Edison is in the business of producing and transmitting, distributing energy to approximately 3 million residential, commercial, and industrial customers in the northern one-third of Illinois.

Q. And what, Ms. Manning, are your duties and responsibilities as Com Ed's transmission system vice-president?

A. I am responsible for the design, construction, maintenance, and operation of all of our transmission lines overhead and underground as well as our substations and our system protection activities.

Q. Could you summarize for the Hearing Officer, please, what your educational background is?

A. Yes. I'm an electrical engineer since 19 -- I graduated as an electrical engineering degree BSEE in 1972, and I am a licensed professional engineer in the State of Illinois since 1976.

Q. Could you briefly summarize your background and experience in electric utility engineering and particularly in transmission engineering and operations?

A. Yes, I can.

I began with the company in 1971 and held positions as an electrical project engineer in our fossil generating stations. After that, I had a number of positions in engineering and operations.

I was an equipment specialist for several years with product line responsibility for large power transformers, inductors, resters, bushings, and ancillary

apparatus to large power transformers.

I had a number of positions in supervision and in engineering departments.

I was the operations manager of our western division, which included the responsibility of construction forces as well as engineering and relay testing and commissioning.

I was a commercial manager in one of our city divisions.

I was the manager of our system electrical engineering department. That department had the responsibility for the design of substation and transmission lines.

I was the division vice-president for one of our city divisions. And just -- That was my most previous position. And in 1993, I became the transmission system vice-president for the company.

Q. Could you identify, please, any special experience or participation in these special engineering activities relating to the design or construction of high voltage transmission lines?

A. Yes, I can.

I have been an advisor representing Commonwealth Edison to the Electric Power Research

Institute. Beginning in 1995, I served on the transmission business unit, business council, if you will. And I also served as the vice-chairman of the underground working group for that industry committee.

Q. Have you arranged for the preparation of a CV or resume that identifies in more detail your educational and professional background and experience?

A. Yes, I have.

THE HEARING OFFICER: We would identify this as Respondent's Exhibit 7.

MR. RIPPIE: Thank you.

(Respondent's Exhibit No. 7 marked for identification.)

BY MR. RIPPIE:

Q. Ms. Manning, is Respondent's Exhibit No. 7 a copy of your curriculum vitae?

A. Yes, it is.

Q. Ms. Manning, can you explain for the Hearing Officer and the Board what the major components are for a modern electric utility system?

A. Yes, I can.

It is primarily for fully integrated utility. There are generating stations or production equipment, if you will. There are substations. There are transmission

elements, transmission lines. There are part of the system referred to as the distribution system. And then there are the service and meter equipment that is closest, if you will, to the ultimate consumer of the electric energy.

Q. Have you arranged for the preparation of a chart or a diagram that would help you explain in greater detail the role of the transmission system on delivery of electric power?

A. Yes, I have.

THE HEARING OFFICER: Thank you. This will be identified as Respondent's Exhibit 8.

(Respondent's Exhibit No. 8 marked for identification.)

BY MR. RIPPIE:

Q. Ms. Manning, is Respondent's Exhibit 8 the chart to which I have just referred to?

A. Yes, it is.

Q. Referring to the chart as necessary, could you explain in greater detail what the function and role of the transmission system is in the operation of the utilities you just described?

A. Yes, I can.

I had sort of -- I had started my discussion a

little earlier about the generation aspects of a utility system, and it's represented as a power station on this particular chart.

As a matter of fact, Commonwealth Edison has 15 power stations. They are really remotely located for the most part away from heavy population centers. There are a few of those stations that are in the Metropolitan Chicago area, but primarily they are located in more distant counties from the City of Chicago.

So as we go up this chart, you'll see a typical voltage that the electricity is generated at. It is at 13.8 kV. And what that really represents is one is one thousand -- excuse me -- it's 13,800 volts. That's what the K stands for is for a thousand. So at 13,800 volts, the electricity is generated.

It goes then usually to a substation that is right outside the generating station where the voltage is increased. And in our example here, the substation transformer in this case, the main power transformer, would increase the voltage from 13,800 to 138,000 or 345 kV or 765 kV. It raises the voltage because there are certain economics for transmitting the electric energy at a higher voltage.

In a way, I think the overhead transmission

system you can kind of think of as the interstate highway system. It is bringing the power from long distance. It's bringing it in bulk. It brings it to -- from a distance remote from population centers. It brings it closer to those population centers to be distributed.

So as we go along past the transmission line portion of the chart, you'll see voltage reduced at distribution substation. This is another substation. It would contain substation transformers. It reduces the voltage now.

Our typical distribution voltage is 12,500 volts. We do have a 4,000 volt system in the City of Chicago. There are some variations of that voltage level.

But then it brings it closer. It is -- I would like in that distribution substation to -- perhaps a distribution warehouse, if you will, because it now -- it takes and breaks up the electricity into parcels that get moved closer to the ultimate consumers.

So the electricity now moves along the distribution system, and it will take -- it will have one more transformation of voltage to a usable voltage for the intended purpose.

And on our chart, we see it made to -- we see

it changed to 480 to 277 volts for industrial plants, and we see it at 12208 for commercial customers; 12240 residential.

So that's -- There's a number of different variations the way the product can be consumed, a number of different variations of the voltage. So, essentially, those are the elements with respect to this chart.

Q. Would it be possible for a utility like Com Ed or any other electric utility to provide electric power to its customers without the use of a transmission system?

A. Generally, no.

Q. Now, the transmission lines that you have described that Com Ed maintains at 765 kV, 345 kV, and 138 kV, are transmission lines of that same type maintained by other utilities around the United States and around the world?

A. Yes, they are.

Q. Does Commonwealth Edison also maintain transmission interconnections between its own transmission system and the systems of neighboring utilities?

A. Yes, we do.

Q. Why do you do that?

A. We really do that for several reasons. I would say three distinct reasons.

First of all, it's for reliability of the Edison system. If we should have some unplanned outage of one of the elements, whether it's a power station or another transmission line, it provides some redundancy and paths to bring electricity into our service territory. So from a reliability standpoint, it's very handy to be connected with one's neighbors.

The second reason would be one of economic dispatch, and I can give you an example of that. For instance, if one of our stations is generating at a higher cost than a neighboring -- a neighboring utility station, we can, in fact, elect not to dispatch our own unit, but, in fact, buy from a neighboring utility. So we need those interconnections to transport the purchase.

And then finally, the third major reason that you would need a transmission system, is to engage in interstate -- interstate transport, if you will, electricity across our system from one -- from a buyer to a -- excuse me -- from a seller to a buyer.

So those would really be the three main reasons.

Q. Are the systems of the utilities that neighbor Com Ed in turn interconnected with the systems of other utilities around the country?

A. Yes, they are.

Q. Is it -- How would you sort of describe or sum up in a couple sentences the interconnected system throughout the country?

A. Well, it is -- I guess for a layman, it looks -- it probably looks like a spider's web, if you could depict it on a diagram. There are really three major system connections. There's the western system. And we actually have a natural barrier of the Rocky Mountains that really prevent too many interconnections across the mountains. And then we have the eastern interconnections which Edison is a part of. And Texas, as in many cases, are sort of stand alone. They have their own interconnections.

So there are really three major interconnected systems in the United States.

Q. I want to now show you some diagrams, if I can, which I hope will clarify that a little further.

THE HEARING OFFICER: Would you like to enter this into evidence?

MR. RIPPIE: I thought I would enter them all at the end of the witness' testimony. Whatever your preference.

THE HEARING OFFICER: All right. We'll

identify this as Respondent's Exhibit 9.

(Respondent's Exhibit No. 9 marked for identification.)

BY MR. RIPPIE:

Q. Ms. Manning, can you tell us what Respondent's Exhibit 9 is?

A. Yes. This is a map that depicts all of the transmission lines that are -- the interconnections, the utilities, that comprise the Mid-America Interconnected Network or MAIN as it's well-known, MAIN.

Q. And is MAIN a formal regional association of utilities that engage in joint transmission planning and operations?

A. Yes, they are.

Q. And can you explain, just so we are clear, does MAIN also then maintain interconnections to other similar organizations on its borders?

A. Yes, they do. I can spend a little time -- If you can see in Illinois and Wisconsin, the portion in yellow is really -- is really the portion that is MAIN. Some of these others as it spills into other states are part of other interconnection associations, if you will.

It's interesting -- the reason the -- there is such -- there is such a good reason or good reasons to be

a part of one of these mutual planning associations, if you will, is it allows the -- a much greater piece of -- a much greater portion of electric systems to be planned as a whole as opposed to individuals.

For instance, the part in yellow, the MAIN interconnected network, Mid-America Interconnected Network, plans for reserved margin in both generation and in transmission of 17 -- excuse me -- 18 percent, and they recently have changed that downward to 17 percent.

But if, for instance -- if Edison -- if the Commonwealth Edison Company planned for generation of transmission contingencies, if you will, by itself, it would have to plan in excess of 40 percent of reserved margin in generation and transmission. So there's an enormous -- there's an enormous economic incentive as well as reliability for planning a larger system as opposed to a smaller system.

Q. And I'll come back to that in more detail in a main.

Does Com Ed also maintain maps of its own of the transmission system?

A. Yes, it does.

THE HEARING OFFICER: This will be Respondent's Exhibit 10.

(Respondent's Exhibit No. 10 marked for identification.)

BY MR. RIPPIE:

Q. Ms. Manning, is Respondent's Exhibit 10 a true and correct diagram of Commonwealth Edison's own transmission system as well as indications of its interconnections with its neighbors?

A. Yes, it is.

Q. Now, I'm going to refer to a state agency called the Illinois Commerce Commission. Are you familiar with that agency?

A. Yes, I am.

Q. What in a sentence does the Illinois Commerce Commission do with respect to Commonwealth Edison?

A. The Illinois Commerce Commission is the regulating -- regulating body for the utility operations of Commonwealth Edison. So we have many opportunities to appear before the Illinois Commerce Commission in the course of our utility business.

Q. Now, I'm going to show you the last map I'm going to show you today.

Before I do that, let me ask you, does the Illinois Commerce Commission also maintain similar transmission maps of the facilities that it regulates

within the State of Illinois?

A. Yes, it does.

MR. RIPPIE: Madam Hearing Officer, I have to apologize to you. I only have one copy of this map. The Commerce Commission printed these a number of months ago, actually a number of years ago, and they are somewhat stingy about the number they will hand out, so I only have one copy. Let me first show it to Mr. Bogacz, and then I'll ...

MR. BOGACZ: Okay.

THE HEARING OFFICER: Did you want to add that into evidence?

MR. RIPPIE: Yes, I will. I tried to have copies made, but because it's so large, it's difficult to copy.

THE HEARING OFFICER: All right. Did you want to enter a copy into evidence?

MR. RIPPIE: The copies might not come out well. I will give you my original.

THE HEARING OFFICER: All right. This will be Respondent's Exhibit No. 11.

(Respondent's Exhibit No. 11 marked for identification.)

BY MR. RIPPIE:

Q. Ms. Manning, is Respondent's Exhibit No. 11 the most recent Illinois Commerce Commission map of the transmission systems in the State of Illinois?

A. Yes, it is.

Q. Ms. Manning, could you summarize for the Hearing Officer and for the Board, please, how the Illinois Commerce Commission regulates the construction and operation of its electric transmission lines?

A. Yes, I will.

In order to build a transmission line in the State of Illinois, the utility must file an application for a certificate of convenience and necessity with the Illinois Commerce Commission, at which time the Commission will hold a series of public hearings; they will accumulate the evidence; there actually will be a whole formal administrative process where members of the public and interested parties can involve themselves in the case.

The Commission looks at all aspects of the proposed project. They really need to determine several things. They need to determine that it's in the public interest of the State of Illinois' residents to build that facility, and they also need to determine that it is --

it is going to be the least cost proposal, the least cost alternative, in which to build a transmission line.

Q. Ms. Manning, is it unlawful for Commonwealth Edison Company to construct a new transmission line without a certificate from the Commission?

A. That would be unlawful, that's correct.

Q. What types of things about the transmission line does the Commerce Commission specify in the certificate?

A. As far as the physical things, as I mentioned earlier, they are looking at the question -- really the questions of is it in the public's interest to build it, No. 1; is there a need for it. That is really one of the major items.

But from a physical standpoint, they look at the routing of the line; they are looking at the siting of where the -- where the line is actually going to go; and primarily it looks at the physical construction details of the line, it is overhead, is it underground, what type of structures we are using, is it double circuit, is it single circuit.

So they really look at all aspects of the siting and the physical construction of the line.

Q. Let me ask you specifically for one more item

on that list.

Does the Commerce Commission also consider the voltage law?

A. Absolutely. That is one of the design elements of the project, yes.

Q. Is Commonwealth Edison Company's transmission system also regulated by any federal agencies?

A. It is. It is regulated by the Federal Energy Regulatory Commission because, as I mentioned earlier, it is an element of interstate commerce as you conduct interstate sales of electricity.

Q. Could you please describe to the Hearing Officer and to the Board what the benefits are in the State of Illinois of Commonwealth Edison's operation of its existing transmission system and the provisional electric service through it?

A. Well, we have done some interesting market research and some interesting research in the public opinion area. And believe it or not, electricity has been heightened to the same level of air and water in view of most of our customers. It has become so a part of modern life that you take for granted that you could flip on a light switch and you could light your home, you can heat your home.

So it has -- Having a transmission system where we could actually bring the power from its source and bring it near the ultimate consumer where they can use it in their homes, their schools, their places of employment is absolutely essential to modern living as we know it.

Q. Is the operation of an adequate, reliable, and efficient electric transmission system essential of Commonwealth Edison to continue to provide this electric service?

A. Absolutely.

Q. Can you tell us what the effect would be of an order requiring Commonwealth Edison Company to place underground all of its transmission system?

A. Yes. And there would be several reasons. Actually, the effect of the order would be one that it might not even be able to be carried out from a technical standpoint.

Q. Can you tell us why it would be impossible to underground the entire system?

A. Well, there are some of the elements of our system at -- that are 765 kV transmission lines. There really is some question as to whether there's an adequate technology to do that in an underground fashion.

But even beyond that, there's a more fundamental issue, and it's -- I'm afraid I'm going to have to take a minute and just talk about several physical properties of operating an AC, alternating current, system. There is a physical property known as capacitance. And really what that is is if you have two conductors that are insulated, and they could even be insulated by air or they can be insulated by some insulating material or even an insulating fluid, you actually can generate a charge that -- between those two conductors. And, typically -- So it is a phenomena referred to as capacitance.

And when you look at the elements of a transmission system, underground transmission lines have a much higher level of capacity of -- of capacity of reactance -- excuse me -- capacity of effect on the operation of the system than overhead transmission lines. And by the nature of that, you have to take some mitigating steps. You have to introduce a corresponding inductance in order to operate the system.

I'm not convinced that we would really be able to regulate the power flow of our system and get power in an underground transmission system to the ultimate consumers if we had to underground the entire transmission

system. I know it would be extremely expensive, and I think another witness is going to talk about that a little bit later. It would be a very expensive proposition to do as well.

Q. Now, Ms. Manning, would it be possible if -- given the discussion of capacitance that you have just given, would it be possible to regulate Commonwealth Edison's system's role in the regional transmission grid if its system was underground and the remainder of the systems were designed as they are now?

A. It would pose tremendous challenges. I'm fairly convinced it would not be possible. If you could think of it this way; the Edison system would almost become a giant sink hole, and we'd be trying to suck all of the energy and the electricity from all of our surrounding neighbors into that giant sink hole because of the high capacitance effect, and I'm fairly certain that our neighbors would not stand still for it.

Q. If Commonwealth Edison had to drop its interconnections as a result of it not being feasible to maintain an underground system on its own, what would be the effect on the state of Com Ed?

A. Any -- There would be an economic effect because we would now have to plan for our own reserve

capacity. It would affect reliability if we had any unplanned or unscheduled outage of system elements. In fact, we may have blackouts of our own customers as a result of that. So it would be a very significant effect.

We have as a company 31 transmission lines at 138,000 volts and above connected to neighbors around us. So we are -- We enjoy the very best reliability because we can count on those neighbors in an unplanned situation.

Q. Two very brief questions to follow-up.

When you talked about needing to build more capacity, what we're talking about, to make it simple, is building a bunch of more generating stations; right?

A. Yes. I'm talking about building more generating stations, but also building more transmission lines to bring -- to connect those elements to our transmission system. So we could easily be building both generation as well as transmission elements.

Q. Given the number of generating stations that we have now, would Com Ed have an adequate reliable transmission system if its interconnections had to be terminated?

A. I think not.

Q. Now, you've talked about interconnections,

you've talked about cost, and you've talked about reliability.

Is there any other reason why it would be difficult or impossible for Com Ed to underground its transmission system?

A. Well, as we had discussed before, before we could do that, we would have to obtain regulatory approval to do it. We could not alter our overhead transmission line to an underground transmission line to take its place without obtaining authorization from the Illinois Commerce Commission.

Q. Does Commonwealth Edison have the real estate rights necessary to underground its transmission system?

A. Probably not in all cases; probably not even in most cases. All of those issues would have to be revisited on a transmission line by transmission line basis.

Q. Are you aware, Ms. Manning, in your experience on other committees, other industry committees, of any utility transmission grid anywhere in the world that has been constructed all or a substantial part underground because of air pollution?

A. No.

Q. Are you aware of any single transmission line

anywhere in the world that's been constructed underground because of air pollution concerns?

A. No, I'm not.

Q. Are you aware of any utility that's constructed its transmission grid underground for any reason when it passes through rural and suburban areas such as we have in Northern Illinois where land for an overhead system is available?

A. Not my knowledge, no.

MR. RIPPIE: That's all the questions I have for Ms. Manning.

At this time, the Company would offer into evidence Exhibits 7 through 11.

THE HEARING OFFICER: Is there any objection to the introduction of Respondent's Exhibits 7 to 11 into evidence?

Mr. Bogacz?

MR. BOGACZ: Ms. Manning --

THE HEARING OFFICER: No. Mr. Bogacz --

MR. BOGACZ: Yeah.

THE HEARING OFFICER: -- is there any objection to the introduction of Respondent's Exhibits --

MR. BOGACZ: Oh, no. I'm sorry.

THE HEARING OFFICER: -- 7 to 11 into evidence?

MR. BOGACZ: No.

THE HEARING OFFICER: All right. Respondent's Exhibits 7 to 11 are entered into evidence.

(Respondent's Exhibit Nos. 7-11 admitted into evidence.)

THE HEARING OFFICER: At this time, Mr. Bogacz, you may address any questions you have to Ms. Manning which are specifically related to the questions and answers that have been heard here today.

CROSS-EXAMINATION

BY MR. BOGACZ:

Q. Ms. Manning, have you ever heard of the National Environmental Policy Act?

A. Yes, I have.

Q. Do you know if Commonwealth Edison is required to abide with that act in any way?

A. I know Commonwealth Edison is required to follow the law as is any corporate citizen.

Q. Well, I mean, that's not what I asked you. I asked you if Commonwealth Edison is -- do you know if

Commonwealth Edison is required to abide by that specific act?

MR. RIPPIE: Ms. Manning is not a lawyer. She has answered the question to the best of her ability given the Complainant has not referred her to any provision of the statute and given that her testimony has not been directed to that subject.

THE HEARING OFFICER: Objection sustained.

BY MR. BOGACZ:

Q. On these maps, they list Commonwealth Edison's lines in various circuits and multi-circuit. Just exactly what is a multi-circuit?

A. A multi-circuit would generally indicate that there is a structure that has more than one three-phase alternating current transmission line installed on that structure. So you may have four transmission lines on the same -- on the same structure.

Q. Do you know how many miles of transmission lines there are within the control of Commonwealth Edison?

A. Yes, I do. There are in total above 69,000 volts. When you add both overhead and underground, there's approximately 5,500 miles of transmission --

circuit miles of transmission lines.

Q. 5,000 -- What was that?

A. Approximately 5,500.

Q. Now, is that the total lineage of lines or is that just the total path of, say, four or six lines running together?

A. It is the total lineage of the lines, but what it is not is our lines -- We have a three-phase alternating current system. So each transmission line is comprised of three phases.

So if you wanted to know how many miles of wire, for instance, you'd take 5,500 figure and multiply by three. But the 5,500 mile figure is the -- is the number of circuit miles, not the structure miles, which is the other issue that you would ask about.

Q. I still don't quite understand that.

THE HEARING OFFICER: Mr. Bogacz, where are you going with your questioning?

MR. BOGACZ: I'm asking how many -- what is the total line -- linear length of lines in the system.

THE HEARING OFFICER: What is the purpose of your question then?

MR. BOGACZ: Well, in their response to

the -- to my interrogatory, they specified that there are about 3,000 miles of lines, but there was no explanation as to whether that's one line or 3,000 miles of six lines running together or 12 lines running together or -- You know, if it's 3,000 miles of six lines, then it's 18,000 miles. That's what I'm getting at.

BY MR. BOGACZ:

Q. So what is the linear -- the line -- the linear length of the total line?

A. 5,500 because the 3,000 number that you quoted is counting the structure miles. That number is lower than the 5,500 miles because it would count one mile of four circuits on the same structure as one mile. So it is a lower number. If you -- The 5,500 mile figure is the circuit miles of the transmission lines.

Q. So that includes the towers that are running parallel to each other that have six lines on each path running parallel with each other?

A. I don't believe we have any towers that have six lines necessarily. But if we did --

Q. You have them near -- right next to my home.

A. Six individual wires or --

Q. Yes.

A. Okay. That would be in our terminology a double circuit line. It would have two three-phase lines on those structures.

So the larger number, the 5,500, counts for a mile of that, counts each one of those lines as one mile, so you'd have two miles. If on the structure mile, the one that was provided as an answer by the Company, that would count that mile as one mile. That explains the difference in figures.

Q. So you're saying that the total miles then is approximately 5,200 miles?

A. Approximately 5,500, yes.

Q. Or 5,500.

A. Including the overhead and underground for all voltages at 69,000 volts and above, yes.

Q. When did the overhead line construction method begin to your knowledge, the best of your knowledge?

A. We've had it for about 95 to 100 years. We -- We certainly have lower voltages, but overhead transmission technology has existed for a long time.

THE HEARING OFFICER: I'm sorry. I'm going to interrupt at this point and ask Mr. Bogacz, when you have questions to ask on

cross-examination, they need to be directly related to this case.

I can't -- We do not have the time to expound on the history of electric utility generation in the United States or in the Midwest. We simply don't have that time.

This must be directly related to this case or we will never conclude.

MR. BOGACZ: Well, I have to disagree with you. I mean, what am I going to ask her? She just described information about and I've been writing notes here about her testimony.

THE HEARING OFFICER: I want you to refer --

MR. BOGACZ: And you're saying I can't ask questions about what she discussed?

THE HEARING OFFICER: I want you to refer directly to the statements that she's made in your question when you ask her the question. I want you to refer directly to the statement she made then. If you are going to ask questions based on what she said, then I want you to tell her what it is she said and ask

her the related question.

MR. BOGACZ: You mean verbatim?

THE HEARING OFFICER: No, sir.

MR. BOGACZ: I don't understand what you're trying to explain.

THE HEARING OFFICER: On cross-examination, you are required to limit your questions to the manner which was discussed.

MR. BOGACZ: Right.

THE HEARING OFFICER: Our witness has not made it her specialty to discuss the history of electric generation in the United States or in the Midwest.

MR. BOGACZ: I'm very sorry, but I disagree with you.

What are all these maps for? She's the vice-president of transmission within the company.

THE HEARING OFFICER: Would you please limit your questions to the statements that she has made which are specifically related to your complaint?

MR. BOGACZ: I'm asking a question

regarding this map.

THE HEARING OFFICER: What does it have to do with her testimony and with your complaint? Let's try to be --

MR. BOGACZ: She testified regarding this map.

THE HEARING OFFICER: Let's try to be as specific as possible, sir.

MR. BOGACZ: I am being specific.

You're not going to allow me to enter anymore test -- asking her questions regarding the maps that they submitted?

THE HEARING OFFICER: I am asking you to proceed as specifically as possible with your questions.

MR. BOGACZ: I am doing it right now.

THE HEARING OFFICER: I also am going to ask you to lower your voice and not to shout.

MR. BOGACZ: Well, I'm asking you to explain your position further and in a more specific way so I can understand it.

Now, I don't understand why I can't ask her questions regarding a matter she just testified to.

THE HEARING OFFICER: Proceed.

MR. BOGACZ: All these -- All these maps relate to what she testified to.

THE HEARING OFFICER: Proceed.

MR. BOGACZ: I'm asking her questions about the map.

THE HEARING OFFICER: Proceed.

MS. REPORTER: I'm going to change my paper real quick.

(A short recess was taken.)

BY MR. BOGACZ:

Q. Have you any knowledge regarding the ozone production of transmission lines, Ms. Manning?

A. Yes.

Q. Can you explain them to me?

A. It's very --

Q. For us.

A. It's a result of partial discharge of our transmission lines. It is a very small number.

Q. By small number, are you -- I mean, do you -- did you do any calculations to that effect or is this something that you obtain through company engineers?

A. My staff have made those calculations.

Q. The Federal Energy Commission is also a

regulatory body responsible for Commonwealth Edison lines --

A. Yes.

Q. -- you mentioned?

A. Yes.

Q. What specifically does Commonwealth Edison have to adhere to or comply with regarding the FEC?

A. Primarily, the ability for the interstate commerce and electric energy.

The Federal Regulatory Energy Commission approves rates for using the transmission system as it is essentially a common carrier. So they have the ability to set those rates, approve those tariffs, and primarily provide for the interstate commerce in electric energy sales.

Q. Well, the interconnection system between Com Ed and other power companies throughout the country, what -- primarily, they -- to the best of your knowledge, would you say that they were constructing overhead lines for the same period that you mentioned about Com Ed, 95 to a hundred years ago they had started that construction method?

A. I think it was available to them in that time frame as well, yes.

MR. BOGACZ: I believe that's all I have for Ms. Manning right now.

THE HEARING OFFICER: Do you have any redirect?

MR. RIPPIE: No, ma'am.

THE HEARING OFFICER: All right. Thank you, Ms. Manning.

The Respondent can call its next witness.

MR. ZIBART: Madam Hearing Officer, the Respondent would call Dr. Gary Johnson at this time.

THE HEARING OFFICER: Dr. Johnson, would you be sworn?

(Witness sworn.)

GARY B. JOHNSON, Ph.D.,

called as a witness herein, having been first duly sworn, was examined upon oral interrogatories and testified as follows:

DIRECT EXAMINATION

BY MR. ZIBART:

Q. Dr. Johnson, are you presently employed?

A. Yes.

Q. And what is your position?

A. I am the -- essentially, the owner/operator of

the company Power Research which does consulting on various power industry systems and phenomena.

Q. And before you were at Power Research Engineering, what did you do in your career?

A. Prior to that, for 16 years I was at the High Voltage Transmission Research Center located in New Lennox, Massachusetts, where we did a variety of studies involved with transmission systems and distribution systems basically focusing on the field and corona impacts of those systems.

Q. And would you briefly summarize what your educational background is?

A. I received my bachelor of science degree in physics from the University of Illinois in 1974, master's in physics from the University of Illinois in '76, and then electrical engineering doctor of philosophy in 1979 from the University of Illinois.

Q. Dr. Johnson, have you prepared a curriculum vitae which goes into more detail as to your professional qualifications?

A. Yes, I have.

MR. ZIBART: I have just one copy of this. You can use it. I just want it ...

Madam Hearing Officer, I have just one

copy of the CV at this time. If I could use it with the witness, certainly I would provide it to Mr. Bogacz if he'd like to go over it with the witness.

THE HEARING OFFICER: And to me also at the conclusion.

(Respondent's Exhibit No. 12 marked for identification.)

BY MR. ZIBART:

Q. Dr. Johnson, showing you what's been marked now as Respondent's Exhibit 12, is that a copy of your curriculum vitae?

A. Yes, it is.

Q. And if I were to ask you more detailed questions about your qualifications, would you testify consistently with what's on this document?

A. Yes, I would.

Q. Dr. Johnson, during your work at EPRI and in the research labs, have you had an occasion to look at the corona effects of high voltage transmission lines?

A. Yes. We've looked at several phenomena associated with both high voltage AC and high voltage DC transmission systems, including the electric fields, the magnetic fields, and various products due to corona on

those lines such as audible noise, radio noise, and ozone.

Q. And have you been involved in the development of any mathematical models for the prediction of how much corona or ozone is produced by a high voltage transmission line?

A. One of the endpoints of our research was to produce various predictive models such as the fields in corona, and we produced computer code, prediction code that went into a product known as the TL work station which, I believe, EPRI provides that calculates along with many other things the ozone levels.

Q. And did you have occasion to verify the accuracy of those models based on imperical research?

A. Basically, we looked at the measured quantities of ozone that we were able to detect and in many cases weren't able to detect and also went back to in some cases laboratory situations that were testing ozone production and used all of that information in developing these models.

Q. I'd like to ask you a few questions about some background of the science of ozone.

We've heard some testimony earlier that ozone can be created by electrical discharge in the air. Is that true?

A. That is true. If there is a sufficiently strong electric field, it will dissociate an oxygen molecule or two atoms of oxygen freeing the oxygen into individual atoms. Those atoms will then react with other oxygen molecules to form what's called ozone. As I said, if the electric field is strong enough, that can occur.

Q. Is there a chemical formula that's associated with that process?

A. You are basically having a single oxygen atom along with a certain amount of energy such as 69 kilocalories going into molecular oxygen, which is the two oxygen atoms, and that results in the ozone atom.

Q. Is ozone a stable compound?

A. Ozone is a fairly reactive molecule. It quickly will decay and interact with other constituents in the atmosphere. So many times after a few minutes, it will react with other atmospheric quantities and basically it will disappear and dissociate with the other compounds.

Q. Do scientists have a way of describing the rate at which ozone decays?

A. There are different decay half-lives or time constants. Typically, in terms of the transmission system, we might look at those in terms of half-lives under wet foul weather conditions and fair weather

conditions, and that would describe how quickly the ozone is going to decay into other products.

Q. Dr. Johnson, are you familiar with typical levels of ozone that are found in the absence of transmission lines?

A. As part of our monitoring, we would often measure the -- we call them ambient background levels of ozone with all of our transmission test lines turned off, and there were no other transmission lines within the area that would be affecting those measurements. So we had direct recordings of the ozone levels in the absence of transmission lines. We also received records periodically from other monitoring stations within the area of the ozone levels that they were tracking.

In general terms of the levels, those would vary oftentimes between about 10 parts per billion at night to daytime levels ranging from 40 or 50 parts per billion to about 90 to a hundred parts per billion during the sunny daytime hours.

Q. And would you rely on any treatise or other document to document the levels that you're talking about?

A. In addition to our own direct measurements, as I said, there were some measurements by some of the local monitoring stations which, I think, are run by the

Atmospheric Science Center.

There is also some documentation provided in a standard utility reference which is the -- oftentimes referred to as the red book or the 345 kV transmission line design book.

THE HEARING OFFICER: Are you just introducing this now?

MR. ZIBART: Yes.

THE HEARING OFFICER: Okay. It is entitled Transmission Line Reference Book.

And this is part of that book?

MR. ZIBART: Yes. It's an excerpt. I have the full -- I have the full book here if anyone would like to look at it.

THE HEARING OFFICER: Okay. The excerpt will be entitled -- will be numbered Respondent's Exhibit No. 12 -- excuse me -- Exhibit 13.

(Respondent's Exhibit No. 13 marked for identification.)

BY MR. ZIBART:

Q. Dr. Johnson, looking at what's now been marked as Respondent's Exhibit 13, is that an excerpt from the reference book to which you just referred?

A. Yes. It's the section of the reference book that deals with ozone.

Q. Okay. And was there any particular page of that book that specifically described the levels of ozone in the absence of transmission lines?

A. Okay. On what is labeled page 200 in that excerpt, there are two graphs there; the bottom one known as figure 4.7.2 is a measure of the ambient ozone variations over roughly a 10-day period.

What can be seen in looking at the graph, it varies essentially in a diurnal cycle or a daily cycle with nighttime lows in the range actually getting down to about five parts per billion to about ten parts per billion. Then the peaks up at around 80 to 90 parts per billion are essentially during the daylight hours when the sun is out.

There's also toward the latter half of the graph three days when the ozone concentrations are only in the roughly 35 to 45 parts per billion range during the daylight hours or daytime. On those days, it was basically overcast and you did not have sunny conditions. At no time was there a transmission line on during this period.

Q. And so what explains why the cloudy days would

have different levels than the sunny days?

A. It's my understanding that the interaction of the sunlight with other atmospheric particles, basically volatile organic compounds in the atmosphere -- you get into a wide range of sources -- interact with the sunlight to form ozone. And what you are seeing is that daily cycle between sunshine interacting with these volatile organic compounds producing ozone and the nighttime hours where you don't have that sunlight; and, therefore, the ozone decays, goes away, and you have very low levels.

Q. Now, I'd like to ask you some questions about transmission lines and corona.

What is transmission line corona?

A. Transmission line corona is basically an electrical discharge that forms at the surface of the conductor for the very high voltage transmission lines. Essentially, the transmission lines are designed so that they are corona free; however, atmospheric conditions, basically bugs, debris, nicks in the conductor, scratches on the conductor, essentially small protrusions on the conductor when they are at this high voltage can produce points and form corona at the surface.

Now, in fair weather, that generally is not a problem. However, in foul weather conditions when you

have the raindrops, if you think of the conductor, the raindrops form on it and produce nice little droplet points on it, and those will grow into corona.

So basically corona phenomena transmission lines basically occur during these foul weather conditions; and the higher the voltage the line, in some respects it's a little more likely to occur in foul weather.

Q. You mentioned voltage. Do other -- other electrical features of a line such as the load on the line or the amperage on the line, do those affect the corona?

A. No, not -- not the corona. The corona is basically a surface phenomena on the conductor due to its voltage.

The other things that are important is the exact geometry of the line, how far above ground it is, how far it is from the other conductors, but not the load or the current through the conductor.

Q. And how is ozone created by the corona?

A. When you have the corona discharge or the small electrical discharge into the surrounding air, you have what can be thought of as like a small amount of sort of leakage current into the air which then is sufficient with the high electric field strength on the surface of

the conductor to split the oxygen molecule, and then it recombines to form the ozone.

So, first, you go through the corona process. You can measure the amount of certain energy that's being lost from the corona as a corona loss. You then have a factor that relates that corona loss produced by a transmission line to the amount of ozone that's going to produce.

Q. How efficient is corona at creating ozone?

A. Very inefficient. A rough estimate as far as in terms of the corona loss to ozone produced, it's maybe about anywhere from .04 percent to -- oh, under sort of ideal laboratory conditions, you might get up to about, I believe, .7 percent; typically, about .15 percent.

Q. And do scientists and engineers have formulas for calculating the amount of ozone that would be associated with the particular transmission line in a particular condition?

A. Given the geometry and the voltage of the transmission line, we can calculate the corona loss it would produce under various weather conditions and then from that the amount of ozone that would be produced. That's one of the things that we put into some of the calculating predictive formulas.

Q. And could you describe without giving us all of the numbers and details because I know they will be in some of the documents -- can you sort of describe the formula, how the formula works doing that calculation?

A. Well, starting at the beginning, as I said, if you have the geometry of the line, basically the height of the conductors, the size of the conductors, the voltage on the conductors, that is then used to calculate the corona loss from that particular transmission line.

Once you have the corona loss, you have a conversion where you predict the number of grams of ozone produced per kilowatt hour of corona loss. That will give you the grams of ozone. Then you can calculate from that how that ozone will disperse from the conductor down to ground and put it in terms of the ozone concentration at a ground level and parts per billion.

Q. Given these formulas and the variables that go into them, is there anything that an electric utility like Commonwealth Edison can do to significantly reduce the ozone from corona losses?

A. As I said, it's basically a foul weather phenomena and the number of raindrops. The lines are already designed so that in fair weather, they are essentially corona free.

When you have these raindrops hanging on the conductor, that's the point that's going into corona. One -- I guess one obvious way would be to take the transmission lines and remove them from the weather. It's already been mentioned here today; underground it. Another possibility might be to make the conductors extremely big; so big that even with the raindrops, they wouldn't go into corona. But instead of conductors maybe an inch or two in diameter, my guess might be it would require conductors 10 times that size.

Q. And in your experience, would that be practical?

A. No. It would be -- you'd have to have much larger towers; much larger right-of-way; the questions of supporting the conductors would be a problem; along with all the questions of, I suppose, visual impact.

Q. I'd like you to discuss now some of the calculations you performed regarding the ozone from Commonwealth Edison's transmission lines.

Can you tell us and tell the Board where you -- sort of what the starting point was for those calculations?

A. Okay. Essentially, the calculations that were performed looked at the question of -- tried to address

the question of what was the ozone produced by the Commonwealth transmission system. In that regard, the system was broken up into voltage classes for the three voltage levels of lines in the transmission system, 765 kV transmission lines, 345 kV transmission lines, and 138 kV transmission lines.

It was then recognized that these transmission lines, at least for the 138 kV and 345 kV, would occur in typically two different configurations, either a single circuit where you had the three main conductor bundles or in some cases a double circuit where you had two circuits within the same structure.

So calculations were done for single circuit 138 kV lines, double circuit 138 kV lines, single circuit 345 kV lines, double circuit 345 kV lines, and then just a single circuit 765 kV line since that's all they have in their system at the moment.

So the calculations were done to determine the corona loss for these five different classes of lines and structures.

Q. And what did you -- What did you use in terms of a computer model to calculate that corona loss?

A. To determine the corona loss, we used what's called the TL work station, specifically the AC/DC line

module which part of the output of that does determine the corona loss for the various line designs.

THE HEARING OFFICER: Let the record show we are referring to what I'm going to number as Respondent's No. 14.

(Respondent's Exhibit No. 14 marked for identification.)

MR. ZIBART: Okay. I will show that to the witness.

THE HEARING OFFICER: Corona Loss Results of AC/DC Line Program, Corona.

MR. ZIBART: I believe there's -- As part of that same package, Madam Hearing Officer, it goes on to show the rest of Dr. Johnson's calculations. So perhaps the name of the document could be the Corona Loss and Ozone Calculations.

THE HEARING OFFICER: Okay. Thank you.

BY THE WITNESS:

A. Once we have the corona loss calculated for essentially three weather conditions, fair weather, typical average rain conditions, and heavy rain conditions, we went to a model that's used by the EPA and as referred to in their document which specifies a method

for going from corona loss to both the amount of ozone and the concentration of ozone, maximum concentration of ozone at ground level on an annual basis.

Within that model then, we took the corona loss in fair weather and foul weather, applied the factor that goes from kilowatt hours of corona loss to grams of ozone. Under those two weather conditions, the EPA prescribes a mix of weather conditions with 20 percent foul weather, 80 percent fair weather. From that, we determined the basically pounds of ozone per hour being produced for a certain voltage class of line and the number of miles for that type of line.

Q. Dr. Johnson, if I could show you what's been previously marked Respondent's Exhibit No. 6, I believe it is -- and I'm referring to pages 226 and 227 of that document -- are those the -- My question to you, sir, is are those the EPA formulas to which you were referring?

A. Essentially, the example and the procedures that the EPA refers to those are outlined on page 227 is the same example and method that we use in going from our corona loss to the ozone concentration at ground level.

MR. BOGACZ: Excuse me. Where -- Where is this in reference to, which document?

MR. ZIBART: This was Respondent's

Exhibit No. 6, which was previously admitted into evidence. And it was on page -- I believe the witness said 227.

THE WITNESS: 227.

MR. BOGACZ: Transmission line reference book?

MR. ZIBART: No. Here.

(A brief pause.)

BY MR. ZIBART:

Q. Dr. Johnson, I think you were describing how you calculated the concentration of ozone at ground level; is that right?

A. Right. Once we had the amount of ozone produced per hour, that then acted as what we call the source term in a diffusion model to describe how that ozone diffuses out away from the conductor and is transported down to the ground level.

Now, in the EPA model, it basically prescribes a somewhat simplification of the more complex diffusion formula so that what you end up is simply the maximum concentration. So it simply solves the equation looking for the maximum ground level concentration. We took our ozone source being produced at the conductor, took the -- a typical heighth of the conductor, a wind speed of one

mile per hour which is also described in the EPA documents, and then used that to calculate the concentration of the ozone at ground level.

In the case of the 765 kV line, the average annual mix of weather conditions resulted in an annual ozone level at ground of about .56 parts per billion.

Q. Can you tell us to what page of Respondent's Exhibit 14 you are referring?

A. It's about the seventh page in. It's the page labeled page 1, 8-9-96. And it's the page in the upper left-hand corner also as identified by the 765 kV.

Q. And on the following pages, did you do a similar calculation for the other voltages common in Commonwealth Edison's transmission system?

A. Yes, we did. We then looked at the other line configurations and voltage levels. Page 2 of that document -- what's labeled as page 2 of that document is the 345 kV double circuit configuration in the case where we had two 345 lines on the same tower configuration.

Q. And what was the result of your calculation?

A. The maximum ground level concentration for the year results at about .34 parts per billion.

The next page is for the 345 kV single circuit situation going through the same procedures that resulted

in about a .13 part per billion maximum ground level for the year.

Q. What about the 138 kV double circuit information?

A. Okay. Going on to the next page, on page 4 of that document, what's labeled page 4 of that document, for 138 kV, double circuit, that resulted in a .0024 parts per billion ozone level.

As I said, as we get into the lower voltage lines, there is less voltage and also much less corona and ozone being produced.

For the single circuit 138 kV line, an even lower level of ozone; the calculated amount being .0009 parts per billion.

Q. And to clarify, do these calculations that you did as to the concentrations, these parts per billion -- do those calculations take into account the constant decay of ozone that you described earlier?

A. No, they don't. In a somewhat simplified EPA model, the decay of the ozone is not considered. And, again, it is simplified just to determine the maximal level of ozone at ground level.

Q. Okay. What would you conclude about the actual amount of ozone that one would experience at ground

level?

A. That, if anything, these numbers are somewhat higher than what the actual levels would be for these line configurations.

Q. Dr. Johnson, have you done any other calculation regarding the total amount of ozone from Com Ed's transmission lines?

A. Yes, I have.

Since these calculations really did not take into the question of the ozone decay, and that would be a strong factor in foul weather conditions since the typical half-life of ozone in foul weather precipitation type conditions is only about five minutes compared to about an hour or so in fair weather.

What we did was went back and looked at the situation considering the ozone decay to determine what would be the total amount of ozone in the atmosphere due to the entire Commonwealth Edison system at any one time for different weather conditions, fair weather and foul weather and then extreme foul weather, very heavy rain conditions. Those calculations are shown later on in Exhibit 14.

Q. Okay. What was -- What was your result for the fair weather condition?

A. Essentially, there would be no contribution in fair weather. The lines would not be in corona and producing ozone.

Q. And what about foul weather?

A. In foul weather, because of the ozone decay, we would essentially hit an equilibrium level of ozone. And looking at the entire Commonwealth Edison system and using a decay of the ozone in these foul weather precipitation type conditions of 10 minutes, the total amount of ozone existing in the atmosphere at any one time was about 154 pounds.

Q. And that would be the entire Com Ed system all over Northern Illinois?

A. Right. That was considering census, all the circuit miles of 765, 345, and 138 kV transmission lines.

Q. Did you also do a calculation for that heavy rain situation?

A. Yes, we did. That's considering very heavy rain, also assuming that those same conditions would be present over the entire system at the same time, which is extremely unlikely.

But for those calculations for the entire Commonwealth Edison system, the total amount of ozone existing would be about 156 pounds. In those heavy rain

conditions, we had an ozone half-life of about five minutes.

Q. Okay.

A. So it was more intense corona, but a shorter half-life; and the end result was that it stablized at about 156 pounds.

Q. So which of the three scenarios had the highest ozone levels?

A. The extremely heavy rain conditions.

Q. Okay. And what would be the least?

A. Fair weather.

Q. Okay. Can you compare those numbers to when you would expect the ambient levels not due to transmission lines to typically be their highest and lowest?

A. Okay. As I mentioned earlier when I referred to the one figure showing the daily variation of the ozone, you had peak levels without transmission lines of about 80 to 90 parts per billion essentially on very clear, sunny days.

On days when it was overcast, but not raining, your levels dropped down about 40 to 50 parts per billion, and that compares with the different transmission line scenarios occurring under rain and foul weather conditions

where the levels were less than one part per billion.

Q. Dr. Johnson, based on your studies, would you conclude that someone living near a right-of-way, a transmission line right-of-way, a Commonwealth Edison transmission line right-of-way, would experience significantly increased ozone exposure?

A. No.

Q. And do you conclude that the Commonwealth Edison transmission lines are significantly increasing overall ozone in the Chicago area?

A. Just to make sure I understood that correctly, could you repeat it again?

Q. Okay. Actually, I'll rephrase it.

Do you conclude that Commonwealth Edison's transmission lines are significantly increasing overall ozone in the Northern Illinois area?

A. No.

Q. Dr. Johnson, I want to go back to your calculation on the highest concentrations at ground level, that first calculation that you did.

A. All right.

Q. I just want to be clear on what that calculation results in in terms of a maximum concentration.

Is that the -- Could you describe what that means, the distance from the line, or what the -- what the maximum concentration means of that calculation?

A. What the diffusional equation that the EPA is discussing, what it is set up to determine is, in actuality, if you have a transmission line and you're looking at a wind transverse to it, the ozone will diffuse out from the transmission line; and if you can envision it as sort of a plume moving out from the conductor.

As that moves out and downwind at ground level, if you're moving along, you will at the first as you move away from the line see nothing because the ozone is not diffused down to it.

As you go further and further away from the line, you finally reach a distance at which the ozone is just beginning to reach the ground. And so then you see the ozone concentration due to the line start to increase from zero.

As you go further downwind, essentially more of that ozone is reaching the ground; your concentration will go up. At some point, you hit your highest value downwind of the line. If you go down even further, by that point, the ozone has dispersed even more, and the concentrations start dropping.

So the model that the EPA uses in its approach is determine the position downwind where that highest level of diffuse ozone will be reached and what that level will be. So it's a -- essentially the maximal level of that profile of the ozone as you move downwind.

Now, it's for the conditions also -- that level is then figured for the various weather conditions in terms of the fair and foul weather.

THE HEARING OFFICER: This will be Respondent's Exhibit No. 15.

(Respondent's Exhibit No. 15 marked for identification.)

BY MR. ZIBART:

Q. Dr. Johnson, I'm showing you what's been marked now as Respondent's Exhibit 15. Do you recognize that document?

A. Yes, I do.

Q. And what is it?

A. It's a document describing the ozone levels that were measured downwind of a transmission line basically adjacent to the 765 kV line. I believe this is here part of the Commonwealth Edison system, study commission with Commonwealth Edison and IITRI.

Q. And what is IITRI?

A. Illinois Institute of Technology Research Institute.

Q. Is it fair to say this is a technical research or -- I guess it's a technical research paper?

A. Yes. It is a technical paper by its markings. It was submitted to the IEEE Transmission and Distribution Committee as part of the -- essentially peer review literature.

Q. And --

THE HEARING OFFICER: Can you identify the date of the document?

THE WITNESS: From the information that's on it, it was made available for printing in December of -- Actually, I believe December of '73 and was presented at the IEEE Power Engineering Society winter meeting in January/February of 1974.

THE HEARING OFFICER: Thank you.

BY MR. ZIBART:

Q. Based on your review of this document, would you agree with the conclusions that it reaches?

A. Yes.

MR. ZIBART: Madam Hearing Officer, I have no further questions for Dr. Johnson at

this time on direct examination.

At this time, I would move for the admission of Respondent's Exhibits 12 through 15.

THE HEARING OFFICER: Okay. With respect to the exhibits --

MR. ZIBART: Oh, I'm sorry.

THE HEARING OFFICER: -- I have a question on Respondent's Exhibit 13.

What is the date of that exhibit? That is the one entitled Transmission Line Reference Book, and it includes a short number of pages from that book.

MR. ZIBART: I am handing Dr. Johnson at this time the original of his dog-eared red book.

THE WITNESS: I apologize for that.

The second edition was published in 1982.

THE HEARING OFFICER: All right. Thank you.

And then we need to clear up whether a blank page in Respondent's Exhibit 14 was intended to include information that it does not include.

Counsel, do you want to look at my copy of that?

THE WITNESS: I have the same thing, I think.

THE HEARING OFFICER: Okay. Is that a page which did not include information which does not need to be in this exhibit?

THE WITNESS: It's an extra page and does not need to be included by any means.

THE HEARING OFFICER: It is an extra page?

THE WITNESS: It's an extra page.

THE HEARING OFFICER: Okay. Then is there any objection by Mr. Bogacz to the introduction of these exhibits into evidence?

MR. BOGACZ: No.

THE HEARING OFFICER: All right. These exhibits are entered into evidence.

(Respondent's Exhibit Nos. 12-15 admitted into evidence.)

THE HEARING OFFICER: At this time, Dr. Johnson, Mr. Bogacz is given an opportunity to cross-examine you on your testimony here.

Do you want to proceed?

MR. BOGACZ: Yes.

CROSS-EXAMINATION

BY MR. BOGACZ:

Q. Dr. Johnson, have you ever contracted with the United States U.S. EPA for any work or consulting?

A. No, sir.

Q. What is the under -- your understanding of the U.S. EPA in regards to ozone production by transmission lines or otherwise?

THE HEARING OFFICER: Could you be more specific in your question?

THE WITNESS: Thank you.

BY MR. BOGACZ:

Q. Well, what is the responsibility of the EPA basically?

A. I think -- I don't really feel qualified to answer that for the EPA.

Q. Well, I mean, it's basic -- Everybody knows it.

THE HEARING OFFICER: If you don't know, sir, you could say you don't know.

BY THE WITNESS:

A. I don't know.

THE HEARING OFFICER: If you do know something about it, then I think that the question is asking you to tell us what it is.

BY THE WITNESS:

A. My understanding of the EPA -- and this is a personal observation -- is it is interested in basic air quality and pollutants amongst many other things.

Q. I have a question about these calculations. I forget which one. The one with the table. I don't remember now. I didn't mark down which number it was.

A. Okay. We are talking about this one?

Q. Yeah. The results of AC/DC line program?

A. Right. Exhibit 14, I believe.

Q. Okay.

THE HEARING OFFICER: Correct.

MR. BOGACZ: Thanks.

BY MR. BOGACZ:

Q. On page -- Starting on page 1 in the back dated 8-9-96 --

A. And with 765 in the upper left-hand corner?

Q. Yes. In the left-hand bottom corner, it says Brian S. Cramer, P, period, E, period.

A. Right.

Q. Are you -- Did you make these calculations

along with Mr. Cramer or --

A. Yes. Brian Cramer is a professional engineer with Commonwealth Edison. He had the detailed information in terms of the line design and lengths of line, and the calculations were performed with -- in conjunction with him and basically directing him as far as the types of calculations and what calculations to perform. He had ready access to the information.

Q. So you did not do these calculations?

A. No. I did the calculations. I guess I'm not sure -- In terms of preparing this exact page?

Q. Right.

A. Brian Cramer prepared it; but in terms of the calculations and the actual numbers, I directed Brian Cramer.

Q. Were any of these calculations submitted to the United States EPA or the Illinois EPA at any time that you know of?

A. These calculations being presented here in Exhibit 14, to my knowledge, no.

Q. What are the byproducts of ozone deteriorating in the rain?

A. In many cases, that will go back into the constituent parts of the oxygen. Basically, you'll get a

reaction with the water droplet, the exact chemical species that are produced. I don't know specifically. Perhaps Dr. Vostal can speak to that.

DR. VOSTAL: That's correct.

BY MR. BOGACZ:

Q. In your -- With your knowledge, would you say that acids were formed?

A. I don't know.

Q. Would the oxygen -- or the ozone when it deteriorates, does it combine with any possible other pollutants in the atmosphere?

A. I'm sure it's possible.

Q. Dr. Johnson, do you know what acid rain is?

A. In general terms, I believe so.

Q. How is that form in the atmosphere?

THE HEARING OFFICER: Sir, could you please state the relationship of this question to the doctor's testimony?

MR. BOGACZ: Yes, the deterioration of ox -- ozone.

BY MR. BOGACZ:

Q. As I asked you before about the byproducts, would you say this acid rain is a byproduct of the deterioration of ozone?

A. I don't know.
Q. Has the document -- The large document here with the EPA description, identification, and characterization of missing or unaccounted for area source categories --
A. Right.
Q. -- you're familiar with that?
You're utilizing the page 226?
A. 227.
Q. And 227. The information -- The information obtained from sources by the EPA to compile this particular section is listed on 229.
MR. ZIBART: I don't think the witness has a copy of the document in front of him.
BY MR. BOGACZ:
Q. Oh, you don't?
A. You said page 229?
Q. Yes.
A. All right. Okay. I have it.
Q. There are references 1 through 7.
A. Correct.
Q. Basically, they are all sources of information compiled by the IEEE; would you agree with that?
A. That's correct. The reference list appears

that all of them are technical papers appearing in the literature of the Institute of Electrical and Electronic Engineers or IEEE.

Q. Do you know of any BPA studies regarding ozone production?

A. BPA has made measurements and reported on their attempts to measure the ozone downwind of some of their transmission lines. And I am aware of probably one or two documents in that respect, one of -- or both of which I think were presented this morning.

Q. In your description of these calculations utilizing this page 226 and 227, you were referring to fair weather and foul weather; is that correct?

A. That's correct, yes.

Q. Are there any studies that you know of indicating what the ozone emissions would be during fair weather?

A. Essentially, from the information that I know of, ozone emission by transmission lines in fair weather, high voltage AC transmission lines simply aren't in corona emitting ozone in fair weather.

Q. And why is that?

A. Mainly because of the design of the conductors and the fact that you don't have the

precipitation or the raindrops on conductors going into the corona.

Q. So would you say that moisture has a lot to do with the production of ozone?

A. For transmission lines, yes; mainly in the terms that it's producing the protrusions or the points sticking out on the conductor. If you had a very severe scratch or nick, something that would also form a protrusion or drop on the conductor similar to a raindrop, I suppose that also would cause corona.

Q. So would you agree that high humidity without rain would still produce corona and ozone without rain?

A. High humidity without rain, it is very unlikely because you're not getting the droplet, the precipitation droplet forming on the conductor. Generally, you are looking more for the snow, rain, ice type conditions.

Under extreme high humidity, saturation type conditions, 100 percent type humidity, then I suppose it might be possible depending on the exact temperature and heating at the line.

Q. Do you know of any studies in that regard?

A. We have tried to make measurements of the ozone from some of our transmission lines in a variety of

weather conditions, some of which include fog. I believe the BPA has also tried to look at some of their transmission lines under various weather conditions.

Essentially, it's been focusing on precipitation because if you are going to see something, that's when you are more likely to be able to detect it. In general, even fair or foul weather, either weather condition, at ground level they have not been able to detect any significant difference between the ambient levels.

Q. Can you list any specific numbers, EPA document or reports regarding this phenomena, you know, the fair weather, high humidity?

A. At this moment, I couldn't list any EPA documents. I believe there was the one BPA document that was referred to this morning along being supplied by the DOE that did in a limited extent say that attempts were made to measure the ozone and it was not seen.

Q. Are you acquainted with a Mr. James A. Raub, R-a-u-b, of the U.S. EPA, Office of Research and Development --

A. No, I am not.

Q. -- Reserve Triangle Park?

A. No, sir, I am not.

Q. You've never submitted any documents to Mr. Raub?
A. Not to my knowledge.
Q. On page -- let's see -- 228 --
THE HEARING OFFICER: You're referring to exhibit what?
MR. BOGACZ: Wait. Am I reading the right one? Oh, 226. I'm sorry.
THE HEARING OFFICER: What exhibit number are you referring to?
MR. BOGACZ: Oh, I'm sorry. It's the same document.
THE HEARING OFFICER: Six? Respondent's Exhibit 6?
BY THE WITNESS:
A. On page 226 --
Q. Yes.
A. -- of the EPA --
Q. Yes, of the extra high voltage transmission line designation at the top.
At the bottom of the page, the sources of direct ozone production are not covered in typical SIP inventories. The corona developed around EHV power lines produces ozone. Do you know what that designation means,

SIP inventories, that term?

A. I would have to say no, I don't. Could -- Could that be defined?

Q. In regard -- in reference to the EPA, it can be, I guess. I believe it's an abbreviation for stationary something or other.

But you're not familiar with that, SIP?

THE HEARING OFFICER: The acronym has several identifications. One of them is State Implementation Plan. I don't think that applies here.

BY MR. BOGACZ:

Q. On page 228, methodology, it says presently no methodology exists for estimating ozone emissions from EHV transmission lines.

THE HEARING OFFICER: What is your question?

BY MR. BOGACZ:

Q. Is that a term or -- Would you agree with that?

A. No, I would not. I don't believe that is true at the present time. I think possibly since this document has been -- or at least since that paragraph was initially written, there has been methodology developed and a number

of tests done to look at the question of ozone created from transmission lines and attempts to calculate and estimate what those levels are.

In fact, within the own document, they give a methodology that can be used to estimate that ground level ozone concentration.

Q. But you don't know of any major study by the EPA that defines any kind of emission standards from calculations or laboratory experiments and so forth?

A. For transmission lines?

Q. Right.

A. Not to my knowledge. In general, the levels from transmission lines are so low at this point, that they have not really come into question.

Q. You agree that Commonwealth Edison and the IEEE, the Electric Power Research Institute, and other private engineering or research laboratories, including yourself, they are not responsible for determining whether or not pollution is created by ozone being produced by high voltage transmission lines?

A. Okay. I'm not sure if I understand the question. Could you repeat that?

THE HEARING OFFICER: Do you mean are they legally responsible?

MR. BOGACZ: Right.

THE HEARING OFFICER: You mean are they legally required to do that, to test that?

MR. BOGACZ: Uh-huh, are they legally required to determine these -- do they have legal standing in any way.

THE HEARING OFFICER: That's a different question, Mr. Bogacz.

MR. BOGACZ: What?

THE HEARING OFFICER: That would be a different question.

MR. BOGACZ: Oh.

BY MR. BOGACZ:

Q. Well, do any of these private groups or individuals, companies, including the United States Department of Energy, the Bonneville Power Administration -- are any of these groups or individuals, companies, administrations legally responsible for enforcing the pollution laws of the country?

A. If I understand the question right, you're asking if a number of entities such as Commonwealth Edison, EPRI, IEEE, BPA --

Q. No, no, not the EPA. I didn't say EPA.

A. BPA, Bonneville Power Administration.

Q. Right. Oh, BPA, right.
A. (Continuing.) -- are legally charged with enforcing --
Q. The pollution laws for determining whether there is pollution in the environment.
A. They would have to abide by whatever rules and regulations there are.
I know that IEEE and EPRI are basically organizations that really would have no opportunity or role to even be in that arena.
As far as the other agencies I believe you mentioned, as I said, they have to abide by the rules and regulations that are out there.
THE HEARING OFFICER: I believe the witness has answered your question to the best of his ability.
Do you have any further questions for the witness on cross-examination?
MR. BOGACZ: Yes.
THE HEARING OFFICER: Would you please limit your questions to the statements that Dr. Johnson made during his testimony?
MR. BOGACZ: Are you objecting to the last one?

THE HEARING OFFICER: Would you please limit your questions to clarifications or challenges of statements that Dr. Johnson made during his testimony.

MR. BOGACZ: I think I asked that question already.

I think that's about it for now.

THE HEARING OFFICER: Does that conclude your questions of Dr. Johnson? Does that conclude your questions of Dr. Johnson?

MR. BOGACZ: Yes, at this time.

THE HEARING OFFICER: Is there any redirect?

MR. ZIBART: Just very briefly.

REDIRECT EXAMINATION

BY MR. ZIBART:

Q. Dr. Johnson, Mr. Bogacz asked you about some of the Bonneville Power Administration studies that -- or whether you were familiar with any of them.

And that's -- I guess Bonneville Power Administration, that's what you referred to by the --

A. BPA.

Q. -- BPA. All right.

I show you what's already been admitted into

evidence as Respondent's Exhibit 2. Take a look at that one and see if that's one of the documents to which you were referring.

A. Yes. That's the one I was referring to as far as the document earlier this morning, one of them.

Q. All right. And would you take a look at Respondent's Exhibit 5.

Is that also a Bonneville Power Administration study?

A. Yes, it is. It's basically a BPA report typical of what they file for the various research projects dealing with their 1,200 kV high voltage line.

Q. Would you tell -- In case some of the people here or members of the Board aren't familiar with Bonneville Power Administration, what is that organization?

A. Bonneville Power Administration is a -- essentially one of two government utilities, the other one being the Tennessee Valley Authority. Both were set up originally to administer and take advantage of the hydroelectric facilities, the river potential along the Columbia River in the case of Bonneville Power Administration and a similar role for Tennessee Valley Authority.

But they essentially are government associated utilities. Bonneville Power Administration is in the pacific northwest along the Columbia River.

MR. ZIBART: I have no further questions for Dr. Johnson.

THE HEARING OFFICER: Okay.

MR. BOGACZ: I have some questions.

THE HEARING OFFICER: The only question you could ask him at this point, Mr. Bogacz, would be a question that would challenge his answer related to what Bonneville Power Administration was --

MR. BOGACZ: Yeah.

THE HEARING OFFICER: -- or whether those two exhibits that were identified as Respondent's Exhibits Nos. 2 and 5 were, in fact, the ones that he was referring to.

RECROSS-EXAMINATION

BY MR. BOGACZ:

Q. The BPA is required to obey or comply with environmental regulations set by the U.S. EPA; is that not so?

A. I would have to assume that they are like any other agency; that they have to abide by the rules and

regulations that affect their operations.

Q. Thank you.

THE HEARING OFFICER: All right. Thank you very much.

At this point, we'll take a five-minute recess and discuss the remainder of the hearing schedule.

Off the record.

(Discussion off the record.)

THE HEARING OFFICER: Okay. We are back on the record just briefly, and it's a little after 4:00 p.m. The building that we are in closes at 4:30, and we have arranged previously for the use of this room tomorrow should we need it.

At this point in time, Respondent, you will have some additional witnesses, I believe?

MR. ZIBART: That's right.

THE HEARING OFFICER: Okay.

And so I think that what we've decided to do is conclude our proceedings for today, and we will come back into session tomorrow morning at 10:00 a.m. at this same location.

Thank you very much.

MR. ZIBART: Thank you.

MR. BOGACZ: Okay.

(Which were all the proceedings had in this matter at this time.)

STATE OF ILLINOIS)
) SS.
COUNTY OF C O O K)

I, MICHELLE M. DOSE, C.S.R., do hereby state that I am a court reporter doing business in the City of Chicago, County of Cook, and State of Illinois; that I reported by means of machine shorthand the proceedings held in the foregoing cause, and that the foregoing is a true and correct transcript of my shorthand notes so taken as aforesaid.

_____
MICHELLE M. DOSE, C.S.R.
Notary Public, Cook County, IL

SUBSCRIBED AND SWORN TO
before me this_____day
of_____, A.D., 1996.

_____
Notary Public