ILLINOIS POLLUTION CONTROL BOARD

August 17th, 2006

IN THE MATTER OF:	)
	)
PROPOSED NEW 35 ILL. ADM. CODE 225 CONTROL OF EMISSIONS (Rulemaking-Air) FROM LARGE COMBUSTION SOURCES (MERCURY),	) R06-25))))

TRANSCRIPT OF PROCEEDINGS held in the above-entitled cause before Hearing Officer Marie E. Tipsord, called by the Illinois Pollution Control Board, pursuant to notice, taken before Cheryl L. Sandecki, CSR, RPR, a notary public within and for the County of Lake and State of Illinois, at the James R. Thompson Center, 100 West Randolph, Assembly Hall, Chicago, Illinois, on the 17th day of August, A.D., 2006, commencing at 1:00 p.m.

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HEARING OFFICER TIPSORD: We are ready. Question 79.

MR. AYERS: Madam Hearing Officer, there is -- we are back to plant Yates. And these questions -- next couple of questions relate to carbon effects on ESP at Yates, effects that are described and the balance of the plant effects, other than the ones that relates specifically to mercury removal. So question 79 covers that. And we will go on from there.

HEARING OFFICER TIPSORD: All right.

MR. CICHANOWICZ: Question 79, with regard to the report titled "Sorbent Injection for Small ESP Mercury Control in Low Sulfur Eastern Bituminous Coal flue gas, Quarterly Technical Progress Report, April 1 to June 30, 2005," question A, did not inspections find that stand-off insulators were damaged?

As stated in my testimony, stand-off insulators were found to be damaged and the same investigators could not determine if the insulators were damaged by the

accumulated carbon or as found.

To repeat from page 3-8, "The stand-off insulators at the bottom of the high-voltage frame were fund damaged or broken. It is unclear when this damage occurred, open parenthesis, i.e., whether the damage is related to activated carbon injections, close parenthesis."

Question B, would damaged stand-off insulators impact the performance of the ESP?

It is very likely. The purpose of a stand-off insulator is to secure the base of the emitting electrode during operation which is subject to nonuniform forces induced by the electrostatic field and drag from the flue gas flow. A damaged stand-off insulator may allow arcing to occur by allowing the ESP current to intermittently short to ground.

The damaged stand-off insulator may allow a higher arc rate which will be interpreted by the power supply controls as increased sparking, resulting in a

relaxation of power delivered to charge and collect particles.

C, although visual inspection found carbon on the insulators, are there any other sources of carbon in the ESP than the activated carbon?

The Yates units have applied low NOx burners retrofit in the 1990s. The LNB procurement was competitively bid and a state-of-art LNB technology selected. However, the best technology available at the time does not provide complete combustion and generates residual carbon in ash.

It is possible the accumulation of carbon from carbon in ash may provide enough conductivity to induce arcing. However, Yates staff report that arcing in unit 1 ESPs had not been noted until the activated carbon injection testing in the spring of 2004.

Question 80, again, with regard to the report titled "Sorbent Injection for Small Esp Mercury Control in Low Sulfur

Eastern Bituminous Coal Flue Gas, Quarterly Technical Progress Report, April 1 to June 30, 2005," please refer to the first paragraph on page 3-32. Doesn't this state that ESP behaved erratically prior to injection of any carbon during the long-term test but leaves open the question of whether short-term tests affected the ESP insulators?

Yes. The key unknown is the status of the stand-off insulators, were they broken prior to short-term tests conducted one year earlier in spring 2004 or did they fail as a consequence of that parametric test and were not detected until one year later.

MR. AYERS: Could I ask a follow-up question or two on this point? According to the last sentence of the fourth paragraph on that same page, 3-32, does it not say that no visible signs of damage were observed, no damage to stand-off insulators like the ones found in the October 2004 inspection were found?

MR. CICHANOWICZ: The last sentence of page 3-32?

MR. AYERS: The last sentence of the fourth paragraph.

HEARING OFFICER TIPSORD: It is the third full paragraph, I believe.

MR. CICHANOWICZ: I will read the fourth if you want.

MR. AYERS: We will take the third.

MR. CICHANOWICZ: No visible signs of damage were observed. No damage -- no damage to the stand-off insulators like the ones found in the October 2004 inspection were found.

MR. AYERS: Does this confirm that activated carbon did not damage the insulators during long-term testing?

MR. BONEBRAKE: Mr. Ayers, for clarification, are you asking if that's Mr. Cichanowicz' opinion or if that's what this document says?

MR. AYERS: Both, I think.

MR. BONEBRAKE: Which question would you like answered first?

MR. AYERS: What the document says.

MR. CICHANOWICZ: Well, that's what the document says. But, you know, the text I quoted came from other sections of this document. So there actually might be two conclusions in the document.

MR. AYERS: Weren't the short-term tests at a different time, the ones that you are referring to?

MR. CICHANOWICZ: The short-term tests were in spring 2004.

MR. AYERS: And the long-term tests were December?

MR. CICHANOWICZ: Yes.

MR. AYERS: So these were different times. And as we discussed before the break, there are other sources of carbon in the Yates ESP besides any sorbent that may be added, correct?

MR. CICHANOWICZ: That's correct.

MR. AYERS: And these sources exceed the amount of the activated carbon in the sorbent, that's correct too, isn't it.

MR. CICHANOWICZ: In terms of

magnitude of carbon, yes. But as I would say again, the nature of the carbon injected as a sorbent is different than the nature of carbon that leaves the flame and the furnace enters the convective pass. It's a different animal.

HEARING OFFICER TIPSORD: Excuse me, Mr. Nelson, had a follow up.

MR. NELSON: Just quickly, do you know how activated carbon is made?

MR. CICHANOWICZ: Only in general terms.

MR. NELSON: What is the first step in production of activated carbon? It is basically a two-step process. What's the first step?

MR. CICHANOWICZ: Buy some coal.

MR. NELSON: That's a multi-step process. Is the first step carbonation where they devolatize the coal very similar to what happens in the convective pass or the boiler with carbon?

MR. CICHANOWICZ: Yes. But the temperatures at which that

devolatilization I believe is on the order -- is a lot less than the temperatures in the flame zone. Flame zone temperatures are on the order of 3,000 degree Fahrenheit. And from what I read, the devolatilization step in carbon manufacture is lower than that.

So, therefore -- I am quoting from papers I have read. The chrystiological -- and that's a word -- features of activated carbon are different than carbon generated in a flame.

MR. NELSON: The temperature may be lower. But is the length of time spent in the hot sun much, much, much longer?

MR. CICHANOWICZ: Gases in the flame zone are on the order of in the lower furnace a second, second and a half, two seconds for some big furnaces. I don't know what they are in many manufacturing carbon.

MR. NELSON: Would it surprise you if it was on the order of hours?

MR. ZABEL: Are you testifying or

asking a question?

MR. NELSON: I am asking a question, would it surprise you that it was on the order of hours?

MR. CICHANOWICZ: I don't know. I am more concerned with the temperature time history that the particle goes through.

MR. NELSON: Are bulk carbon materials devolatilized?

MR. CICHANOWICZ: Yes, but at very different temperatures.

MR. AYERS: Mr. Cichanowicz, if you believe that the activated carbon injection damaged the insulators during the short-term tests, why would it not damage the insulators during the long-term tests or are you not saying you believe that?

MR. CICHANOWICZ: I am saying that when you read the quarterly report, you know, what they were concluding was they weren't sure if the damage was done before or after the inspection.

MR. AYERS: There were two inspections, weren't there?

MR. CICHANOWICZ: Yes.

MR. AYERS: There was one from the first test and one from the second.

MR. CICHANOWICZ: Yes.

MR. AYERS: And the second long-term test did not demonstrate damage to the insulators?

MR. CICHANOWICZ: Yes.

MR. AYERS: So my question is why would there be damage in the first instance, the short term test, and not in the long-term test, if, indeed, the sorbent were responsible for the damage?

MR. CICHANOWICZ: I don't know. I mean one has to inspect these. Ideally you do it before and after a test. But usually the host utility isn't as compliant to bring the unit down to allow you to. But that is part of the mysteries that we are working on.

MR. AYERS: You do admit that fact casts doubt on whether the sorbent was

responsible in any way for this phenomena?

MR. CICHANOWICZ: I won't use the word cast doubt. I will say it is another unknown that must be considered.

MR. AYERS: Thank you.

HEARING OFFICER TIPSORD: Question 81.

MR. CICHANOWICZ: On page 3-33 of the report titled "Sorbent Injection for Small ESP Mercury Control in Low Sulfur Eastern Bituminous Coal Flue Gas, Quarterly Technical Progress Report, April 1 to June 30, 2005," it states that "the arc rate in the first, open parenthesis, A, close parenthesis, field is significantly higher than arcing in the B field, which is higher than arcing in the C field. Furthermore, arcing in the B and C field does not occur unless there is significant arcing in field A. While arcing in the first field was as high as 35 arcs per minute, no sparking was observed."

Is it not normal that the first

field has a higher arc rate than the subsequent fields because it captures the most material?

The first field can, indeed, exhibit higher arcing as the induced voltage is highest in the first field.

Question 82 --

MR. AYERS: I'm sorry, I do have follow-ups on that. Mr. Cichanowicz, for the benefit of the Board, could you explain what arcing is in an ESP?

MR. CICHANOWICZ: Well, first, what I would like to do is remind everybody what an ESP is. Dr. Staudt did a great job in Springfield and if I could have 90 seconds, Madam Chairman.

But, basically, an ESP, to remind us all, it is a large box where you -- the first thing you do like you do in many environmental control equipment is to slow down the gas velocity. You want to get the gas velocity on the order of in new precipitators, three or four V per second, some of the other ones five or six V per

second. So you have this big chamber where you are slowing down the gas velocity.

The second thing you want to do is charge the particles so they migrate to a collection plate. The way you do that is to have a number of electrodes hanging that used to be large thick wires called weighted wires, now they are more pipes and tubes. They provide one part of the charge and the collecting plate provides the other part of the charge. The gases flow between the pipes and the plates. And as they are charged, they basically pick up this charge and they migrate to the plate.

If things are good, the ash stays on the plate. I know we are in snow country so I know this analogy will work. I am sure you have spent February afternoons watching accumulated snow on your neighbors's house, once it warms up it, just sort of fall off in one complete sheath and fall to the ground. If there

is a wind, you will see wisps of that snow get convected away in the wind. That exactly happens when a plate is wrapped with mechanical hammers that remove the ash from the plate.

The good news is you drop the ash into this hopper. The bad news is that wispiness will take ash and pull it back into the gas stream. That's what we have called wrapping re-entrainment.

It is really important to maintain good spacing between the emitting electrode and the plate and also to have the proper voltage. And modern ESPs have computer-based controls that are always tailoring the right amount of voltage.

When you have arcing, what happens is these emitting electrodes that I will describe, they have to be secured somehow. If they just hang there, the electrostatic forces move them. The drag from the gas moves them. So they have to be secured. So they have to be held solid and tight. And the stand-off insulators do exactly

that, they allow the emitting electrodes to stand off from the high voltage frame so you have a security committing system.

What happens is some of these electrodes -- and they are made out of ideally a zero conductivity device because you don't want electricity to flow. What happens if they get carbon on them and it gets baked on, then you have created a short and the power you really wanted to go into the emitting electrode takes a shortcut. And that basically cuts the power way back. And you are not delivering the charging power into the ESP.

So we have arcing, you are not delivering the power that you want. And, basically, you want very low arc rates, if at all, to maintain the proper power. Does that suffice?

MR. AYERS: Thank you. Now, let's talk about the Yates arcing issue, if we may. Can you look at page 3-33 of Exhibit 71, the report on the Yates test

that we have been -- long-term test that we have been talking about today?

MR. CICHANOWICZ: Yes.

MR. AYERS: And I would like you to look at the bottom of the page, conclusion No. 3, and read that first sentence.

MR. CICHANOWICZ: "The arc rate is higher at high load versus low load."

MR. AYERS: So at the bottom of -- I'm sorry, please move to the last sentence on that page.

MR. CICHANOWICZ: You are not going to let me read the one in the middle? "The increase in arcing at full load is seen for both injection and baseline cases."

MR. AYERS: Would this be the normal expectation, the higher the load the more arcing you'd see?

MR. CICHANOWICZ: I believe that's true because you are delivering more power.

MR. AYERS: And if you could look at the top of the next page on 3-34. It

actually starts at the bottom -- it is the beginning of the sentence on 3-33 that carries over to 3-34.

MR. CICHANOWICZ: Pardon?

MR. AYERS: It is the sentence which begins at the bottom -- it is the last sentence on 3-33 and then carries over to 3-34.

MR. CICHANOWICZ: Well, the end of my 3-33, I have the sentence I just read, "the increase in arcing at full load is seen for both injection and baseline cases."

MR. AYERS: I am sorry, there is a period there. I didn't see it. Then the first one on the next page.

MR. CICHANOWICZ: "At low load the magnitude of the arcing does not appear to trend with the magnitude of the carbon injection rate. For example, the arc rate or injection rates between three and four pounds per million ACF was 4.6 APM, while the arc rate for injection rates greater than 70 pounds MCAF was 5.2 APM. However,

at high load, there may be an increase in arc rate with carbon injection rate, open parenthesis, with data --" there is typos there "-- with data either three to four or four to five pounds per MCAF accepted, close parenthesis."

MR. AYERS: So we can agree that arcing is elevated at high loads. And in this report arcing was not seen at low loads? Even with carbon injection -- sorry, let me say the question again.

Would it be fair to say that arcing is elevated according to this report at high loads even without carbon injection, even when no carbon is being injected?

MR. CICHANOWICZ: Yes. But we do have a sentence that says "however, at high load, there may be an increase in arc rate with carbon injection rate."

MR. AYERS: And low loads with carbon injection, the authors saw no adverse effect, no arcing? Is that what this says?

MR. CICHANOWICZ: At low loads

that's basically what this says, yes.

MR. AYERS: So these statements appear to indicate that injection at the rates that were used here, no real change in arcing was observed?

MR. ZABEL: I think that question was asked and answered. At high loads, it was; and low loads, it wasn't. Is this a different question, Mr. Ayers?

MR. CICHANOWICZ: The last sentence of item four, I just read it.

MR. AYERS: So the statement "however, at high load there may be an increase in arc rate with carbon injection, parenthesis, with data in 3-4 or 4-5 pounds per million ACF accepted," does that statement appear to indicate that with injection in that range no change was observed, but leaves open the question whether in high carbon injection rates, there is an increase in arcing?

MR. ZABEL: Again, are you asking him to interpret it or are you asking what it says?

MR. AYERS: I am asking what he believes it says, yes.

MR. ZABEL: I think it speaks for itself, Madam Hearing Officer.

HEARING OFFICER TIPSORD: I would be interested in his opinion. And we understand --

MR. ZABEL: If that's what he is asking, fine. If he is asking what it says, his ability to read has been demonstrated.

MR. AYERS: I will ask whether he is convinced and has an opinion on that subject by virtue of that.

MR. CICHANOWICZ: Well, it says the arc rate for injection rates greater than seven pounds was 5.2. And then it gives you what that number is.

The first sentence of item five says "the ESP appears to have recovered from carbon injection tests to nearly pre-test arcing rates to low load." So that suggests to me that when you stop injecting carbon -- a recovery usually

means a good thing. And it is saying it is getting better.

MR. AYERS: Or if you inject at a low rate, you don't have the problem.

MR. ZABEL: He gave you his opinion. You can give us yours, Mr. Ayers. You are under oath.

MR. AYERS: Most of the unscrubbed units in Illinois fire PRB coal, don't they?

MR. CICHANOWICZ: Yes.

MR. AYERS: Wouldn't their sorbent injection rate be in the range of three and a half to five pounds per million ACF?

MR. CICHANOWICZ: Probably.

MR. BONEBRAKE: Just for clarification, are you asking about some future activity or are you asking about current injection rates?

MR. AYERS: I think the witness has testified and other witnesses have testified that power river basin coal, that rate of injection is what would be expected at the order to achieve the goals

of this regulation.

MR. BONEBRAKE: So you are asking then about future sorbent injection?

MR. AYERS: I suppose.

MR. CICHANOWICZ: I thought I answered and said, yes, three to five pounds per million ACF is on the order of what is proposed.

MR. AYERS: So at the injection rates expected at most Illinois plants, the Yates results indicate that we should not expect a problem with increased arcing; isn't that correct?

MR. CICHANOWICZ: You know, the precipitators are different. And I think you are really stretching me to compare Yates with the ESPs here.

What I will agree with is at lower carbon injection rates, you are less prone to get arcing. But I can't take that next jump.

MR. AYERS: Okay. Thank you. I do have some questions on sorbent distribution, which is another area of

inquiry with respect to this plant. If the carbon is reportedly distributed in the gas stream, would that mean that there were regions of very high concentration in some parts and very low concentration in other parts of the ESP?

MR. CICHANOWICZ: Perhaps, if that's -- if your statement is correct and it plays out under those conditions, yes.

MR. AYERS: Is it possible that the high concentration areas might cause problems for the ESP?

MR. CICHANOWICZ: Possibly.

MR. AYERS: And is it also possible that very low concentration areas might cause poor mercury removal performance?

MR. CICHANOWICZ: That's correct, possibly.

MR. AYERS: Okay. Thank you.

MR. CICHANOWICZ: Question 82, on page 2-16 of that same report, the fourth paragraph says "the vortex-like flow at an ESP inlet made isokinetic sampling impossible. It was decided for the final

Ontario Hydro campaign that the ESP inlet site be omitted in favor of the stack location."

Question A, do you know if vortex-like flow is desirable or helpful in an ESP? Deviation from well-behaved parallel flow is detrimental to ESP performance.

Our text in the subject quarterly report do not necessarily support the proposition that the Yates unit 1 ESP was deficient. First, as discussed in testimony, Yates units 1 through 4 ESPs were completely rebuilt with unit 1 overhauled in 1997. Presumably the ESP supplier, who was BHA, provided state-of-art equipment. If a vortex flow exists, it a consequence of the BHA modeling. However, the sentence proceeding that quoted belies another fact, the presence of a vortex could have been a consequence of the single-point sampling probe. Specifically, I quote, in previous Ontario Hydro campaigns the

evaluation points were the ESP inlet and ESP outlet. In these previous campaigns, the reactivity of the fly ash captured on the particulate filler with flue gas mercury created a bias in the partitioning of the mercury between the solid and particulate phases.

The report makes no mention of vortex-like flows in these previous campaigns. And it is possible the observed vortex was a consequence of the location of the sampling probe and not a design malady.

It gets back to the single-point location where depending on where the probe was, it could have been behind a duct stiffener or something that could have been responsible for the vortex.

MR. AYERS: Are you aware that the Department of Energy is contracted with Fluent to model the injection system at plant Yates?

MR. CICHANOWICZ: That doesn't surprise me.

MR. AYERS: Fluent is the name of the company, F-L-U-E-N-T. And I don't think it is an acronym.

MR. CICHANOWICZ: I did not know that Fluent in particular did the CFD modeling, no.

MR. AYERS: So you are not aware of any of the results?

MR. CICHANOWICZ: No.

MR. AYERS: Could we call your attention to a PowerPoint slide.

HEARING OFFICER TIPSORD: I have been handed a PowerPoint entitled "ACI Field Test Support at Yates Unit 1." If there is no objection, we will mark this as Exhibit 109.

MR. AYERS: Madam Chairman, this exhibit is or was Exhibit 71 in the previous hearing. So it is already in the record in Exhibit 71.

HEARING OFFICER TIPSORD: For ease of discussion, we will mark it as Exhibit 109. Seeing none, it is Exhibit 109.

MR. AYERS: Do you recognize this as a computer flow modeling result, Mr. Cichanowicz?

MR. CICHANOWICZ: Yes, I do.

MR. AYERS: The left side of this slide says "particle traces colored by particle residence time" and shows the inlet ductwork to the ESP. And those blue stream lines show trajectories of injected carbon particles, would you agree with that?

MR. CICHANOWICZ: That appears to be the case as you described it, yes.

MR. AYERS: The flow of gases going from the bottom of this figure on the left and then upward and heading out of the page to the left-hand side, correct?

MR. CICHANOWICZ: Yes.

MR. AYERS: So on the left, red means a high residence time and blue means a low residence time, correct?

MR. CICHANOWICZ: Can you define what those units are on the scale on the left?

MR. AYERS: Those are seconds.

MR. CICHANOWICZ: Red is higher, blue is lower.

MR. AYERS: Red is about ten seconds of residence time, while green is about four or five seconds?

MR. CICHANOWICZ: Yes.

MR. AYERS: The highest residence time seems to be the corners of the flow where you would expect to see recirculation zones, correct?

MR. CICHANOWICZ: Yes.

MR. AYERS: And wouldn't a recirculation zone produce a vortex-like flow as is described as being the ESP on page 2-16 of the report on Yates testing?

MR. CICHANOWICZ: It might. It depends on the location of the probe. I mean, the concern of determining things like this, when we do this kind of modeling for SCR, you tend to see disruption in the corners. I don't know that it is a ten second residence time. You have to look at the length of the

ductwork and see where the alleged indication of vortex flow was to be able to tie it to one of these.

MR. AYERS: The red in the corners doesn't indicate to you that is a vortex-like flow?

MR. CICHANOWICZ: I said that. But you asked me where it was downstream.

MR. AYERS: Okay. Now, looking at the diagram on the right, this is also a computer-generated view where you are looking from the other direction, so to speak, the air is coming in at the bottom right and then coming out toward us as we look at the picture, correct?

MR. CICHANOWICZ: Yes.

MR. ZABEL: Just for the record, I am glad counsel and my witness agree. There is no indication on this of flow direction.

MR. AYERS: That's why we have experts. The rectangular area shows at the top of the right-hand figure. In that rectangular area, do you see the

calculated concentration gradients at the inlet ESP?

MR. CICHANOWICZ: I can't tell where the inlet of the ESP is on this. But I see concentration gradients. And I believe that is the scale to the left of that and those units are kilograms per cubic meter.

I see concentration gradients. I don't know how that compares to the inlet of the ESP. It looks to me like it is the exit flame behind the turns banks.

MR. AYERS: The six little blue lines show where the injectors are if the flue gas remained up and past that?

MR. ZABEL: Are you testifying that's what they show because it's not listed that way?

MR. AYERS: Question mark.

MR. ZABEL: It doesn't say what those are. It's not listed on this diagram.

MR. CICHANOWICZ: That would look like they were injectors.

MR. AYERS: Blue appears to be very close to zero concentration, does it not?

MR. CICHANOWICZ: Yes.

MR. AYERS: So doesn't that mean that the areas that are blue have little or no sorbent, the dark blue?

MR. BONEBRAKE: For clarification, there are various shades of blue.

MR. AYERS: I used the word dark blue. I will reask it.

Does it mean that the areas that have the darker blue colors have little or no sorbent?

MR. CICHANOWICZ: Yes.

MR. AYERS: And the lighter blue areas and the few yellowish areas have higher amounts of sorbent, correct?

MR. CICHANOWICZ: That appears to be the case, as I look at this.

MR. AYERS: Now, if you look at this figure, doesn't it appear that most of the sorbents seems to go to the outside corners of this duct? Places where you see the green and the yellow appear to be

the outside of the duct, do they not?

MR. CICHANOWICZ: The dark blue appears to be in the middle, yes.

MR. AYERS: So if a large part of the flue gas was untreated, wouldn't that mean the mercury reductions would be poor?

MR. CICHANOWICZ: All other things being equal, that would restrict mercury removal.

MR. AYERS: Could we talk some about the Conesville report which I think -- you mentioned Conesville this morning. You have that with you. It's a reference I think to your testimony.

MR. CICHANOWICZ: I have it on CD. I can bring it up if you would like.

MR. AYERS: Maybe you can answer questions without that.

MR. CICHANOWICZ: Pardon me, I might actually have it. One moment.

(Short pause in proceedings.)

HEARING OFFICER TIPSORD: I have an extra copy of the CD if you want.

MR. CICHANOWICZ: I think I have got it, thanks.

MR. AYERS: I am asking you to look if you have the report the paragraph on page 15 that you cite in your testimony that begins "ESP performance was effected by some sorbents."

MR. ZABEL: It is going to take a moment to get there.

HEARING OFFICER TIPSORD: What page of his testimony?

MR. CICHANOWICZ: I am not sure if it is in my testimony because I didn't access this report until after.

HEARING OFFICER TIPSORD: I am sorry. You said he referenced it in his testimony.

MR. AYERS: Page 15 is the reference to the testimony.

MR. ZABEL: Page 15 of his testimony?

MR. CICHANOWICZ: It is not in referenced in my testimony. I didn't have this until it was filed.

HEARING OFFICER TIPSORD: It is not in his written testimony.

MR. CICHANOWICZ: I am looking at page 15 of the subject report.

HEARING OFFICER TIPSORD: And for the record that report was in as part of the CDs in Exhibit 96?

MR. CICHANOWICZ: Correct.

HEARING OFFICER TIPSORD: He is there. Go ahead.

MR. AYERS: I was going to ask you to read the paragraph on that page that begins "ESP performance was effected by some sorbents."

MR. CICHANOWICZ: "ESP performance was effected by some sorbents in terms of spark rates in power. Opacity spikes were also noted during some tests, which may have been attributable to sorbents or to normal unit operational variations, both Darco E-12 and Sorbet Technologies EXP-2 had an opacity impact that would require further evaluation.

MR. AYERS: So the report that you

refer to indicates that there are normal opacity excursions under normal operations without sorbent, correct?

MR. CICHANOWICZ: Well, it says it could have been attributable to normal human operational variations.

MR. AYERS: And aren't Darco E-12 and Sorbent Technologies EXP-2 experimental sorbents?

MR. CICHANOWICZ: I believe so.

HEARING OFFICER TIPSORD: Excuse me, Mr. Ayers, just for point of clarification, is that -- by experimental sorbents, do you mean not commercially available?

MR. AYERS: Yes.

HEARING OFFICER TIPSORD: We had that discussion yesterday. I want to make sure we are on the same page.

MR. AYERS: Above that on the same page, does it not say, quote, because of difficulties controlling the feed rate, the actual injection concentrations, although relatively constant for each

material, ranged from nine to 18 pounds per MACF from sorbent to sorbent. The problems with the feeder were resolved during the second week of testing, close quote.

MR. CICHANOWICZ: Yes, that's what the sentence says.

MR. AYERS: Could that feeder problem have effected opacity?

MR. CICHANOWICZ: It could have effected opacity, yes.

MR. AYERS: Do you expect any of the PRB units in Illinois to have to inject levels of nine to 18 pounds of sorbent?

MR. CICHANOWICZ: Not unless the feeders get out of whack. And that's the whole purpose of one-year demonstration.

MR. AYERS: So my question is how relevant is this experience in the Conesville Plant to the Illinois units that would be subject to this rule?

MR. CICHANOWICZ: Well, I think it shows that despite the best efforts of the Sid Nelsons of the world and the people

that are designing these figures, things happen. Okay. And this whole thing about variation, there will be events that can induce variability on the low side. And if you can compensate -- we have them right here -- actually, this might be on the high side.

The point is these systems inherently vary. That's the way a power station works. And I think this is a good example of the kind of variability where you have a test curve out there dedicated to make this work. You know, ADA are the best people who are going to get doing this along with Sorbent Tech. And things still happen.

And I think it actually speaks well to the fact that this is the kind of stuff that happens day in and day out. And longer term tests and demonstration will prove this.

Having said that, yes, these are higher mass injection rates than all things being equal, we would have on ESPs

in Illinois. That is true.

MR. AYERS: Okay. Thank you. We can go onto No. 83.

HEARING OFFICER TIPSORD: He didn't answer B. Is that asked and answered, 82-B?

MR. CICHANOWICZ: 82-B, don't ESP suppliers attempt to straighten the flow out with flow control devices in order to improve performance?

Yes, recognize that these units are completely rebuilt in 1999 with state-of-art design techniques by BHA.

Question 83, on page 41 of your testimony it discusses the results of testing at Yates 6. Please provide the source of your information.

The source of data for Yates 6 was the technical paper entitled "Full Scale Evaluation of Activated Carbon Injection," Dombrowski, K., et al., presented to the Air Quality Control V Symposium, Arlington, Virginia, September, 2005, and discussions with the author Mark Berry.

HEARING OFFICER TIPSORD: Question 84?

MR. CICHANOWICZ: On page 42 of your testimony, you describe your version of a conversation with Mr. Peter Hoeflich regarding experience at a Progress Energy Station. Who is Mr. Peter Hoeflich?

Mr. Peter Hoeflich is the project manager of the Progress Energy Lee unit 1 demonstration tests for ACI.

Question 85 --

MR. AYERS: Mr. Cichanowicz, Mr. Nelson testified under oath that this data was provided to him by Progress Energy. Do you have good reason to doubt his testimony on it?

MR. CICHANOWICZ: I never said I doubted his testimony. What I said was -- I will answer your question. I don't have reasons to doubt his testimony.

MR. AYERS: If he is a credible person to make statements regarding these tests, is it possible for him to provide testimony -- I'm sorry. Let me back up.

Is Mr. Hoeflich is a credible person to makes statements regarding these tests, is it possible for him to provide testimony rather than having us rely on hearsay?

MR. ZABEL: If I may respond, the Board relies on hearsay all the time. The hearsay rules are, if not applied in these proceedings, they are certainly relaxed throughout all the testimony of all the parties. And it is not inappropriate in any administrative proceeding for a witness to pursue answers to questions and obtain data by personal contact, by other means.

And to answer your specific question, Mr. Ayers, no, it isn't possible to get Mr. Hoeflich in.

MR. AYERS: You would agree it would be better evidence to have him here testifying himself?

MR. ZABEL: It is always better evidence, of course. That's what the hearsay rule is about.

MR. KIM: Mr. Zabel is now testifying.

MR. CICHANOWICZ: We have a highly chaotic reporting protocol. The good Mr. Nelson yesterday introduced data with permission of DOE. I called the project manager, Lynn Brickett, within several hours and she, indeed, did say Mr. Nelson had talked to her about doing that. But she also cautioned me that it is preliminary data.

The number of hours of data accumulation that Mr. Nelson has is about half of my time in this witness chair. Okay. So I have the right to use the contacts that I have to corporate in ground truth what I have said. Nobody should be upset about it. That's the right I have as an expert in the and the contact that I have to make sure that all the facts line up.

I did the same in Springfield. Again, Mr. Nelson walked in with a sheet of paper. And he was under oath and he is

a truthful man. He did have the permission of DOE. I called Lynn Brickett again the week after that and she did say he did submit the data and he did have permission to release it.

I did call Mr. Peter Hoeflich. And Mr. Hoeflich had seen that plot three or four days prior to when I called him and that was the week after the Springfield meeting. So he hadn't seen it yet. That might be his problem. Okay.

But the whole purpose of this was to say do you agree with this general information. And all he said was this data that's presented is a subset of data that was generated. I have not had a chance to review it. And if you look at the language in my testimony, it very carefully says we need to treat this data with caution as Mr. Nelson stated in Springfield. It is very black and white.

HEARING OFFICER TIPSORD: Mr. Nelson, you have a follow-up?

MR. NELSON: Yes. If I may read two

sentences from your testimony. You state specifically --

HEARING OFFICER TIPSORD: Specify where they are at and you need to speak up.

MR. NELSON: Well, this is on page 42 of your testimony, second paragraph about halfway through the -- two sentences or three sentences that begin halfway through with "specifically after completion," could you reread those sentences?

MR. CICHANOWICZ: I'm sorry.

MR. NELSON: Page 42, second paragraph, a little more than halfway down where it says "specifically after completion."

MR. CICHANOWICZ: Okay. Well, do you mind if I read the sentence preceding?

MR. NELSON: You can if you wish.

MR. CICHANOWICZ: "Mr. Hoeflich cited results from a perhaps imprecise but insightful test in which the role of SO3 conditioning and B-Pac on ESP opacity was

incurred. Specifically, after completion of the 30-day trial with B-Pac showing 83 percent mercury removal, unit 1 opacity was noted to be 28 percent. Upon terminating B-Pac injection, opacity increased to 32 percent. Restoring conventional SO3 conditioning reduced capacity to 32 percent. In summary, these tests suggest that B-Pac can marginally improve opacity, but not to the extent claimed by Exhibit 73."

MR. NELSON: My questions begin with did you look at any data, any at all before testifying under oath that Lee 1 opacity was 28 percent when the sorbent was turned off and restoring to SO3 conditioning reduced opacity to three percent and that B-Pac can marginally improve opacity but not to the extent claimed in Exhibit 73?

MR. BONEBRAKE: Just for clarification, when you said did you look at any data, does that mean did he hear about any data or do you mean --

MR. NELSON: Did he actually observe any opacity data?

MR. CICHANOWICZ: No.

MR. ZABEL: You mean take a visual reading?

MR. NELSON: Exactly. Anything more than hearsay, did he look at plots of opacity?

MR. ZABEL: I think it speaks for itself, but he can certainly answer. It says where he got the data from.

MR. CICHANOWICZ: No, I did not. The sentence speaks for itself.

MR. NELSON: Did you ask to see any of the opacity data?

MR. CICHANOWICZ: No, I did not. Mr. Hoeflich said he was reviewing it. And as the project manager of the demonstration, that is his responsibility.

MR. NELSON: Could you have asked to examine the data?

MR. CICHANOWICZ: In concept I could have.

MR. NELSON: I would like to present

as an exhibit opacity data from Lee.

HEARING OFFICER TIPSORD: I have been handed a packet here titled "Opacity and Load at Lee Unit 1 during Baseline, Long-Term Run and Ends." And I will mark this as Exhibit 110, if there is no objection.

MR. BONEBRAKE: Can we reserve objections, Madam Hearing Officer, until we hear a little more about this document?

HEARING OFFICER TIPSORD: Sure. But for purposes of us talking about it, I am going to mark it.

MR. ZABEL: It is marked as Exhibit 110.

MR. KIM: Is that Exhibit 109 or 110?

HEARING OFFICER TIPSORD: 110.

MR. NELSON: For the Board can you explain what the baseline period is in these tests?

MR. CICHANOWICZ: Whose data is this?

MR. ZABEL: I have no idea who this

is. Don't ask me.

MR. CICHANOWICZ: It's your data, Sid. Why don't you explain what the baseline is.

MR. NELSON: Do you know what a baseline period --

MR. ZABEL: He has previously testified --

MR. CICHANOWICZ: How many times are we going to go through this?

HEARING OFFICER TIPSORD: Excuse me. Let's just take a deep breath.

MR. ZABEL: I think he testified on prior graphs as to what a baseline is. It is in the record, I believe. I think Mr. Ayers asked the question on another set of data.

HEARING OFFICER TIPSORD: Go ahead with your questions.

MR. NELSON: Let's look at the top two charts, which are opacity charts at Lee during the baseline period there in January. Is opacity --

MR. ZABEL: Excuse me, Mr. Nelson

what year is that?

MR. NELSON: It's this year.

MR. ZABEL: It's this year. Are you testifying that it's this year?

MR. NELSON: I will testify this is this year. This is not our data. This is data that comes from Progress Energy.

MR. ZABEL: Again, that is your testimony, Mr. Nelson?

MR. NELSON: That is my testimony.

Is opacity very sensitive to load, Mr. Cichanowicz, at many plants?

MR. CICHANOWICZ: Yes.

MR. NELSON: And you typically get the highest opacity at the highest loads, correct?

MR. CICHANOWICZ: Yes.

MR. NELSON: For example, here during the baseline period, the load is in pink and the opacity on the left-hand side is in black. At periods of peak load of this unit, which is pushing 80 megawatts, what opacities do you see in the top two graphs? What range?

MR. BONEBRAKE: Madam Hearing Officer, I am going to renew my objection I made yesterday, but particularly to pertain to this document. Mr. Nelson apparently is both testifying and asking questions. I don't know whether to be asking Mr. Nelson questions about what he is saying or whether Mr. Cichanowicz is supposed to be responding to what Mr. Nelson is asking.

MR. NELSON: He is supposed to be responding to what I am asking.

MR. CICHANOWICZ: Well, this isn't a test. This is your data. Can you just describe it? Well, then you are testifying. I guess you can't do that.

MR. NELSON: Unfortunately, my hands are tied.

You claim that the graph that was presented earlier was in error. Okay. That's in your testimony.

MR. CICHANOWICZ: No, no. Don't put words in my mouth. I claim I talked to the man who was in charge of the project.

And all he said was his opinion could be different and that I should be -- we should be cautious in how we treated the data. Anything else is your interpretation.

MR. ZABEL: It seems to me, Madam Hearing Officer, he is an agency witness. If they want to call him and put this in, they should do that.

HEARING OFFICER TIPSORD: I'm sorry, Mr. Zabel. I believe this is a direct refuting of your testimony. I disagree with -- I'm sorry Mr. Cichanowicz -- I understand you were repeating what this gentleman told you in your testimony. But you have provided sworn testimony that the opacity rates were this, this and this. And this is Mr. Nelson specifically offering what he at least believes, I assume, to be a rebuttal to that.

And so he is asking now for the opinion of the witness on what this means.

MR. ZABEL: The problem is, first, that's not what Mr. Cichanowicz testified.

He testified what the gentleman who is the project manager told him.

HEARING OFFICER TIPSORD: That's right. That's what I said.

MR. ZABEL: And that's all he testified to. What we have is no testimony as to how this data came about. Mr. Nelson can draw a graph. I don't believe he did. I think he took data. But we have no more testimony about the source of this than Mr. Cichanowicz' testimony that he spoke to the project manager.

MR. NELSON: Maybe I can make this very quick.

MR. ZABEL: That would be helpful.

MR. NELSON: Mr. Cichanowicz, are you willing to withdraw everything you said on that page about the Lee data?

MR. CICHANOWICZ: No.

MR. NELSON: Then let's continue, please.

HEARING OFFICER TIPSORD: I would point out, Mr. Zabel, you specifically

asked and Mr. Nelson has been sworn in where this came from and what it was, and he answered those questions. So we know that is data from Progress Energy that you got directly from Progress Energy on the opacity readings at this facility that the statements from the project manager were offered from, correct?

MR. NELSON: Yes.

HEARING OFFICER TIPSORD: I'm going to allow some leeway to ask the questions. What he is looking for is now an interpretation from Mr. Cichanowicz of this data. And I think that is a legitimate -- whether they are actually Mr. Cichanowicz' statements, he is the one who put them in the statement in his testimony. So I think it is fair to ask for his interpretation of this data.

MR. ZABEL: I would only make the observation that Mr. Nelson, as I said, is an agency witness. This is January data. He didn't include it in his testimony. The agency should have included it.

HEARING OFFICER TIPSORD: But he did include testimony at the Springfield hearing about this which Mr. Cichanowicz has taken issue with and now he is rebutting that. So let's go forward.

MR. NELSON: There was one chart. That was a summary of all this.

I will repeat the question. In the baseline period of those two top graphs, when the unit was at high load, what opacities was the opacity monitor indicating?

MR. BONEBRAKE: And just for clarification, Mr. Nelson, you are asking what your document tells him on that issue?

MR. NELSON: Correct, what these plots say.

MR. CICHANOWICZ: High load to 30 percent.

MR. NELSON: Or on the second graph 20 to 25 percent approximately at high load?

MR. CICHANOWICZ: Yes.

MR. NELSON: So between 20 and 30 percent depending on the operation.

To make this a little quicker, let's go to the second page on the top graph, this is the -- for clarification, those are dates, days along the bottom. This is a composite of it looks like a month of opacity in red again with the pink being the low again showing how over time and how it varies with the load.

Mr. Cichanowicz, if we look at the red graph and look at when they are at high load for those 30 days, approximately what is the average opacity now with the sorbent on, the B-Pac carbonated carbon on, and the SO3 flue gas conditioning off.

MR. CICHANOWICZ: Am I looking at the top graph or the lower one?

MR. NELSON: The top one is the boiler load and the bottom one is the opacity graph.

MR. CICHANOWICZ: And the question is what's the opacity at high load?

MR. NELSON: Yes. An average

opacity at high load opacity over 30 days?

MR. CICHANOWICZ: Well, I am not -- I am saying the top graph is the 30 days and the high load capacity is 21 percent.

MR. NELSON: About 21 percent, that's what we calculated as well.

The low load opacity, when they were at, essentially, half of 80 megawatts, that's as low as they go?

MR. CICHANOWICZ: Six percent.

MR. NELSON: Six percent plus or minus. That's about what we got.

Now, what Mr. Hoeflich told you over the phone and what you have down had to do with what happened at the end of the test -- before I ask that, is 21 percent significantly below that 20 to 30 that you saw during the baseline period?

MR. CICHANOWICZ: It is at the low end.

MR. NELSON: Yeah. It doesn't mean since that was a month or two earlier, okay, the coal may have been a little different, the ESP may have been a little

different. So you can't directly compare them, can you?

MR. CICHANOWICZ: Correct.

MR. NELSON: But at least it gives you an idea. Mr. Hoeflich was talking at the end of the test. And I want to show you -- that's the fourth graph, the bottom one that shows -- it doesn't actually show -- when the sorbent was turned off, if you look at the top graph at the end, where that arrow is -- and I admit the resolution is not good on this graph. But actually it was 21 percent when the powder activated carbon was turned off, which is the long-term average of the high low load. They were at high load when we turned it off.

Then what happened was they quickly -- they went to low load and opacity dropped.

MR. ZABEL: This is clearly testimony.

MR. NELSON: I am trying to explain. Can you get to the fourth graph?

MR. ZABEL: Your explanation is testimony, Mr. Nelson. That's the point of my objection.

HEARING OFFICER TIPSORD: And we are going to get to a question now.

MR. ZABEL: But it is premised on his testimony.

HEARING OFFICER TIPSORD: I understand that. And he has been sworn in. I understand your objection, but --

MR. ZABEL: Do I get to cross-examine him on his testimony?

HEARING OFFICER TIPSORD: If you want to. But, first, let's get to his question.

MR. NELSON: Then looking at the bottom graph, this is 30-second opacity numbers. The PAC is off and the SO3 is off. If you can start time wise, days, kind of describe what happens to opacity.

MR. CICHANOWICZ: So you are saying from left-to-right by looking --

MR. NELSON: April 7th.

MR. CICHANOWICZ: Sid, there is a

lot of things going on on this chart and your eyes are better than mine.
April 7th --

MR. NELSON: What happens at load when they go up to high load for the first time after the sorbent has been turned off?

MR. BONEBRAKE: Again, for clarification, all you are doing is asking Mr. Cichanowicz to comment on what's on your document, Mr. Nelson?

MR. NELSON: Right, what's on my document on this plot.

MR. CICHANOWICZ: I can make it easy by reading the words, opacity streaks up first time going to full load.

MR. NELSON: Right. And in fact, it looks like it goes over 30 percent?

MR. CICHANOWICZ: Yes.

MR. NELSON: Yes, it does. Actually, when it started streaking up -- just again I am testifying -- they got very frightened and turned the SO3 back on. The opacity peaked at about

30 percent and then they turned it on.

HEARING OFFICER TIPSORD: Mr. Nelson, you really need to get to a question now.

MR. NELSON: The question is what happens when they turned the SO3 on?

MR. CICHANOWICZ: Well, I can't tell. SO3 -- I will read the words, SO3 FGC brings it down again.

HEARING OFFICER TIPSORD: Okay. All we are doing now -- I really thought I was trying to give you some leeway here. I was trying to let you ask questions. All you are having him do is read your document, and that's in effect was he is doing. And that's fine, except that it's his turn to testify.

So I need you to ask him a question that don't involve him reading your document.

MR. ZABEL: I think Mr. Nelson is trying to put in evidence indirectly.

MR. NELSON: What happens to the boxes when the SO3 is turned on?

MR. CICHANOWICZ: They tend to drop

in magnitude. And I am reading words here.

MR. NELSON: Just look at the boxes. What was the -- for the next couple days, when they were at high load with SO3 on now, did they get down to three percent opacity?

MR. CICHANOWICZ: About that.

MR. NELSON: No, at high load.

MR. CICHANOWICZ: Okay. At 17 percent.

MR. NELSON: Okay. So in other words, it dropped. When they turn the sorbent off, you testified it went up to 30. And when they turn the SO3 on, it dropped down to about 17.

MR. ZABEL: Just for the record, he didn't testify it went to 30 percent. He read it off Mr. Nelson's chart. He is not testifying what it did at all.

MR. CICHANOWICZ: I am not trying to be difficult, Sid. But you have to understand this is a beautiful graph. But you really have to think about it and it

is just hard to look at.

MR. NELSON: It is. It would have been best if we would have looked at the data rather than relied on hearsay because sometimes we get it wrong.

MR. CICHANOWICZ: Well, and my comment is when are we going to be in position when we can have data that, you know, the host utility agrees with, that it isn't presented in their absence. That's the kind of solid information that in an ideal world would be desirable to base a rule on. And it just isn't happening that way. I don't know why. But all this is unnecessary if the data can be fed in and thought through and analyzed.

But as you can see, over the last few days, it comes out in bits and pieces. And the results sometimes depend on when it comes out. We are making this a lot harder than it has to be.

MR. NELSON: Can we turn to Exhibit 88 from yesterday?

HEARING OFFICER TIPSORD: Before we do that, I am going to admit this as Exhibit 110 for what it's worth.

MR. ZABEL: I object.

HEARING OFFICER TIPSORD: I understand your objection. But I am going to admit it over objection. I think the Board can accept it for how it has been offered.

MR. NELSON: Does everybody have yesterday's Exhibit 88?

MR. ZABEL: What is 88?

MR. NELSON: It was Midwest Generation's Crawford 7.

HEARING OFFICER TIPSORD: It is "Mercury Removal at Midwest Generation's Crawford No. 7."

MR. NELSON: Ed, if you can turn to the third page here, you have had a day to look this over, haven't you?

MR. ZABEL: Madam Hearing Officer --

MR. CICHANOWICZ: I have had a day.

MR. ZABEL: Before we go to that, Madam Hearing Officer, there is something

relevant to that I would like to introduce into the record. This is Mr. Nelson's letter to the Department of Energy from which he got this release. The data is actually tabbed.

HEARING OFFICER TIPSORD: I have a letter -- an E-mail, excuse me, from Lynn Brickett to K. Wanniger at Midwest Gen. And I will mark this as Exhibit 111, if there is no objection. Seeing none, it is Exhibit 11.

MR. ZABEL: You will note the date on the caption is the 16th, which was earlier this week. The only reason I wanted to put this into the record, there are two statements in here, which Mr. Kim may wish to comment on. And then I would be happy to let Mr. Nelson ask the witness whatever he wants.

The first sentence is "attached are some things that the State of Illinois is anxious to show in their hearing next week." And at the end of the next to last paragraph, again it says can "Illinois

show these next week. They are appropriately marked preliminary. Thanks."

I have shown this letter previously to Mr. Kim because we inquired whether Mr. Nelson was representing the State of Illinois in obtaining these.

MR. NELSON: Am I presenting this data for the utilities?

MR. ZABEL: I'm sorry.

MR. NELSON: What is the point?

MR. ZABEL: We will see what Mr. Kim says. I think it was misrepresented to the Department of Energy. Mr. Cichanowicz can comment on his discussion with Ms. Brickett after this information came into the record.

MR. KIM: And, I'm sorry, would you like a response -- I understand Mr. Zabel's statement. Would you like a response? I guess I am directing this to the hearing officer.

HEARING OFFICER TIPSORD: Sure. If you give us a response, we would love to

hear what you have a to say.

MR. KIM: That was not the answer I was looking for. I believe it is safe to say that we are -- the Illinois EPA has been and continues to be very appreciative of the voluntary efforts that Mr. Nelson has provided us through the course of these proceedings.

That being said, neither Mr. Nelson nor any consultant retained by the State of Illinois in this proceeding at the very least in my opinion, I am pretty certain about this, is authorized to make requests on behalf of the State of Illinois. I am loathed to make requests on behalf of the State of Illinois.

So insofar as that first statement has been highlighted by Mr. Zabel, I would say that that may have been a stretch to be kind.

MR. NELSON: Mr. Zabel, if this was being presented by your side, if this data was presented by your side, would you have the same rights to have it presented and

to have it approved for release by DOE?

MR. ZABEL: I am not suggesting he won't answer your question, Mr. Nelson. I don't know what the point of your inquiry is.

Furthermore, if I had a contract with the party who was doing the testing, I would have asked them in advance before I presented the data. You do have a contract with Midwest Gen, do you not?

MR. NELSON: I do. And do you have the E-mail sent to Midwest Gen with this data in it.

MR. ZABEL: That's five days, you will note, after the letter you sent to DOE saying you were asking for this on behalf of the State of Illinois. It was two days before you introduced it into this hearing -- or one day actually.

MR. NELSON: When was the data collected, Mr. Zabel?

HEARING OFFICER TIPSORD: Okay. Gentlemen, you know --

MR. ZABEL: The data has its dates

on it. I don't need to respond to that. It speaks for itself. I said I will let the witness answer your questions on it.

I just wanted the record to show how you came about it, Mr. Nelson. That's the purpose of it. It has been done.

MR. NELSON: We came about it -- this opacity --

HEARING OFFICER TIPSORD: Okay, Gentlemen, that's it. We are not talking about how it came about. We are going to ask questions.

MR. NELSON: Let's get to the question. This is similar data and you have seen it now with load and opacity. The week before we began injection with the second smallest ESP in Illinois, at full load, as they were at full load for a number of hours, what does this data indicate happens at opacity?

MR. CICHANOWICZ: What chart do you want me to look at?

MR. NELSON: The very first one. This is the third page of Exhibit 88, top

chart, one of the arrows.

MR. CICHANOWICZ: So red means load, blue means opacity. And the question is what happens at full load?

MR. NELSON: Yes.

MR. CICHANOWICZ: Well, it looks like it vacillates between 25 and 30 percent.

MR. NELSON: Does it vacillate or does it tend to go in one direction at a time?

MR. CICHANOWICZ: It goes in one direction.

MR. NELSON: About three to five percent absolute?

MR. CICHANOWICZ: I'd say that was right.

MR. NELSON: Now, the next week when we began the C-PAC injection beginning on 8/5, for four days as are indicated there, now what is the trend of time at high load?

MR. CICHANOWICZ: It's around 20 and in some cases 25 percent.

MR. NELSON: Not looking at the absolute values, it is lower, but there was a recalibration. But the trend, the time, does it continue to go up the high load or does it --

MR. ZABEL: I don't want to beat this horse to death because I think it is pretty wounded already. Mr. Nelson is testifying what this data is. His company is involved in the test, so he may well know. But it is not the proper way to ask a question of this witness about this data.

MR. NELSON: I asked for a trend and I didn't get an answer on the trend.

MR. ZABEL: You were testifying what happened.

HEARING OFFICER TIPSORD: Excuse me. Dr. Girard?

MR. GIRARD: Can I ask a question, Mr. Nelson? How does this data and your interpretation of this data differ from Mr. Cichanowicz' testimony?

MR. NELSON: Dramatically,

180 degrees. Mr. Cichanowicz in his testimony testifies that there are going to be opacity issues, that the particulate that comes out of the smoke stack when you add two percent carbon injected into the ESP, that is going to cause particulate issues. When, in fact, the data for brominated carbon that I would like to go over on the record on multiple plants shows just the opposite. That brominated carbon tends to have what they call co-benefit effect of increasing the performance of the ESP, not decreasing the performance, but increasing the performance so that there is actually less particulate going on.

And this can be an important issue because of NSR where you don't want to solve one problem and create another problem.

MR. GIRARD: So you think that the exhibit you have given us, Exhibit 110, has data which shows that?

MR. NELSON: 110, yes. They had

done what is called an SO3 flue gas conditioning system, that they put on their plant to help the ESP work. In 110 at Lee for the first time in years, when we injected the sorbent and saw this positive effect on the ESP, they were able to turn that system off and operate continuously for a month.

And then as soon as we turned the sorbent off, the next time they went to high load, they had to turn it back on again because the particulate was going high again.

MR. GIRARD: Thank you. Mr. Cichanowicz, does anything that Mr. Nelson said change anything in your testimony?

MR. CICHANOWICZ: If there was adequate data over a long -- over periods of time over a time scale where we can be comfortable with it, then it would change my testimony. But it is like everything else, there is a lot of short-term data and it has to be fully vetted and

evaluated.

So I think in time perhaps I would change my testimony. But it is hard for me to respond to basically the results as they come out in almost real time.

MR. GIRARD: And that basically is one of the major themes of the testimony of all of your people, basically, that we need more time.

MR. CICHANOWICZ: More operating time and to be able to evaluate data, but certainly operating time.

MR. GIRARD: Thanks. Do we need to beat this one any more? I think the data --

MR. NELSON: The answer is no. I think the points have been made.

MR. GIRARD: We got the data. We know what the issues are. I think we need another question.

MR. AYERS: Question 85. Question 85 I believe has been asked and answered. But I would like to follow up with one follow-up question, if I may. This

question is about the expressed concern that sorbent injection could trigger NSR.

My question is this. In light of the difference you expressed Mr. Cichanowicz yesterday as far as offering legal interpretation of the proposed Illinois TTBS, would you like to withdraw your testimony respecting the interpretation of the, if anything, much more complex federal NSR law?

MR. CICHANOWICZ: Well, I am not in a legal position to render an opinion on NSR. But all I can say is that the variations for a number of reasons, sorbent injection, coal variation, with the loss of the pollution control prevention, essentially -- that to me that just opens the door. And I don't know what is going to happen. I just pointed out that variations in the past weren't that big of a deal could now become a big deal. And that's all I feel comfortable saying. And the table that I have in my testimony just gave some examples of that.

And that's all.

May I proceed to 86?

HEARING OFFICER TIPSORD: Yes.

MR. CICHANOWICZ: On page 44 of your testimony, you state "the willingness of developers to offer such guarantees is a sign of their confidence in success. However, the terms and conditions of the guarantees are limited. This section will describe how, despite attempts by suppliers to mitigate risk, the uncertainties incurred by early adopters of control technology are significant risk in terms of uncompensated costs and revenue."

Question A, are you aware of any air pollution control supplier or any supplier of any piece of power plant equipment that is willing to take unlimited liabilities as part of their guarantees? No.

B, if so, provide details and supporting evidence. This question is not applicable.

Question 87, on page 44 and 45 of

your testimony you use the term collateral damage. Are you referring to what is normally described as consequential damages in contract language? Yes.

Question 88, on page 46, you state regarding demonstration tests and guarantees "the demonstration data suggests that in excess of 90 percent mercury removal can be achieved with three pounds of sorbent per million ACF." This is statement and not a question.

MR. AYERS: It is intended that 88 and 89 be read together.

MR. CICHANOWICZ: Question 89, if meeting the targeted Hg removal requires five pounds per million ACF instead of three pounds per million ACF, the additional cost for reagent at 80 percent capacity factor is 1.342 million per year at a delivered sorbent price of $0.85 per pound. The supplier will provide this additional sorbent at no cost but limited to the contract value of 1.27 million. Thus, after 25 months of providing

additional revenue, the owner must bear all costs while future revenue to the supplier increases by 66 percent. Consequently, the supplier has little to lose and significant upside market potential with this guarantee.

Question A, are you suggesting the supplier sees a benefit in missing a guarantee?

No. Suppliers of control technology reagent or sorbent must be aware of their reputation and will not benefit from missing a guarantee. However, their losses in cases like this are modest and short term.

Question B, in this case after the 25-month period where the extra sorbent is provided for a fee, what is to prevent the owner from shopping for other less expensive or more effective sorbents?

Nothing. The operator can access other sorbents.

HEARING OFFICER TIPSORD: Mr. Ayers?

MR. AYERS: Yes. On page 46 of your

testimony, it says, quote, guarantees in environmental control technology provide only partial compensation for short-comings and are not significant factors in the decision to adopt any particular technology. May we quote you on that, especially the second half of the sentence?

MR. CICHANOWICZ: Well, what I mean is at the end of the day, the owner knows that they have to make -- they are responsible for compliance. And they are responsible to make the process work. And they will do what they have to do to be in compliance.

You know, for example, the guarantees on catalyst for SCR, the guarantees are basically offer replacement catalysts if there is a failure. But if you are in the middle of ozone season, your costs -- if you do eventually agree with the catalyst supplier that the catalyst is defective and they offer you a replacement catalyst, your bigger cost is

taking the plant down when you don't want to and incurring those costs. The benefit of the discounted catalyst is small.

So my point is that guarantees don't always have a lot of weight in the decisions on a control technology. And that's basically what I mean.

HEARING OFFICER TIPSORD: Excuse me, I have a follow up to that. Dianne Trickner from Prairie State Generating referred to guarantees in her testimony. And one of the points she made in her testimony was that they are having problems getting guarantees for the 90 percent because a guarantee to them would make them whole and that that would be billions of dollars.

I am wondering if guarantees are different for retrofits than they are for a new facility.

MR. CICHANOWICZ: No, I don't think so. I heard the end of her testimony. And I think -- I didn't hear her whole testimony, so I shouldn't comment on it.

But I don't know of -- I don't know of anybody that would offer a guarantee that would, quote, make them whole, that is to cover completely the compensation.

HEARING OFFICER TIPSORD: Okay.

MR. AYERS: A guarantee like that would be like an auto company saying if your car breaks down Chevrolet will pay for your loss day at work, wouldn't they?

MR. CICHANOWICZ: Yes. And nobody is saying that that should be done. But, you know, the reason why I have this, Mr. Ayers, is not to make your life miserable.

MR. AYERS: But it might be an extra benefit.

MR. CICHANOWICZ: People hire me and Dr. Staudt to come in and provide some expertise in procuring a control technology. And to the extent that the guarantee doesn't completely satisfy them, what I do and I think what he does is help them build in some back-up plan. And, yeah, you can throw money at a particular

problem. You know, use space age -- space technology, space-race technology of triple component reliability, but you can't afford that. So I help people think through the extra back-up things they have to do, not indefinitely, but with a price tag. And they use that in the design and adopting the technology. And that's all I meant by that statement.

MR. AYERS: Pieces of equipment that are involved in controlling pollution are usually supplied by different companies, aren't they?

MR. CICHANOWICZ: Yes.

MR. ZABEL: Different from what?

MR. AYERS: Different companies.

HEARING OFFICER TIPSORD: Supplies different pieces.

MR. AYERS: From manufacturers. And the performance of one can affect the performance of one of the others, such as the mercury controlled performance?

MR. CICHANOWICZ: Yes.

MR. AYERS: So it is not very likely

the supplier of one piece of equipment will guarantee mercury removal to include the mercury removal by other devices, correct?

MR. CICHANOWICZ: Correct.

MR. AYERS: I realize you haven't done this. But we had the testimony earlier about this, isn't asking the supplier of a pollution control device to guarantee total mercury removal sort of like asking Goodyear Tire Company to guarantee your car's performance?

MR. CICHANOWICZ: Well, I never thought of that before. But if what you are saying is that if there is a single source of responsibility, it is difficult for an individual player in each one of those cases to offer a guarantee.

Now, that concept is what EPC or overall contractor will provide. But that's not always provided in retrofit cases.

MR. AYERS: I will close with this question. The typical guarantees in the

pollution control field cover the performance of the pollution control device and not the consequential damages; isn't that correct?

MR. CICHANOWICZ: I have never seen consequential damages covered in a pollution control context.

MR. AYERS: On page 48 of your testimony, you describe some statements by U.S. EPA and U.S. DOE.

MR. CICHANOWICZ: Yes.

MR. AYERS: As evidenced by this rule and rules being adopted by other states and a recent Congressional District Service Report, does these states believe that U.S. EPA is overly pessimistic?

MR. CICHANOWICZ: They might. I just don't know.

MR. AYERS: Both the EPA and the DOE quotes are conditioned that they do not believe that the technology is ready for all coals and boiler configurations. And there is a wide range of coals and boiler configurations in the U.S. Does Illinois

have every coal and boiler configuration?

MR. CICHANOWICZ: No.

MR. AYERS: Okay. That's the end of my questions.

HEARING OFFICER TIPSORD: Question No. 90.

MR. CICHANOWICZ: 90, on page 59 of your testimony you state "the ability to uniformly disperse sorbent throughout the entirety of the flue gas cross-section, necessary for high mercury removal, is assumed to increase with the size of the flue gas duct. This view is consistent with a global review of the various ACI demonstrations. Among the highest mercury removal noted was at the smallest generating sites, e.g., St. Clair, Meramac, and among the lowest at the largest generating sites, Pleasant Prairie and Monroe.

"Although coal composition and SCA likely also play a role, given the information available to date, it is not possible to exclude generating size. This

concern is bolstered by the release of results from CFD of the modeling of the reagent injection systems that report the distribution of residence time in real systems can only be half of that calculated for plug flow conditions.

"Although the specific results for Brayton Point did not compromise performance, they do not allay concerns that sorbent mixing and distribution problems are independent of generating size." This is a statement and not a question.

Question A, wasn't the smallest test site at the Lausche plant? How did the performance at the Lausche plant compare with that at St. Clair or Meramac?

Mercury removal noted at Lausche is less than that of St. Clair or Meramac.

B, isn't Monroe a bituminous unit which you'd expect to be more difficult in St. Clair or Meramac?

Monroe fires a mixture of PRB and bituminous coal in approximately a 60/40

fraction. Depending on the extent of the blend and other factors, the Monroe fuel use may present a more challenging application than 100 percent PRB.

Question C, didn't Pleasant Prairie use untreated sorbent, which we now know to be unsuitable for PRB units, while Meramac and St. Clair used halogenated sorbent, which is the best sorbent at this time for these units? Yes.

Now, let me state for the record what I did with this. First of all, the wording was a little bit odd in my testimony. What I meant was that I believe as we increase generating capacity, that it will become more difficult to get uniform dispersion. But let me tell you how I use this. Okay.

In most cases, when I prepared the control assumptions for the modeling, I didn't penalize -- I didn't penalize the high capacity units. What I did was actually added a premium in mercury removal to the lower capacity units. That

is, I assumed all things being equal, the smaller units would get higher mercury removal than they would have if I adopted the assumption.

So what I am saying is my belief is, essentially, translated into higher mercury removal on lower units. I didn't penalize big units. I enhanced the removal on lower units.

HEARING OFFICER TIPSORD: Question 91.

MR. CICHANOWICZ: 91, didn't the modeling at Monroe, Brayton Point and other sites show that turbulence, which controls mixing, is the most important parameter?

Yes. However, the modeling results, as I review them, maintain the various injectors at constant flow rate. My concern stems from the recognition that as the generating unit size increases, the number of individual injectors which sorbent must be uniformly delivered and disbursed increases. As the individual

number of injectors increase, it will become increasingly difficult to maintain uniform through-put to each.

Now, what does that mean, if I might, I would like to present a little story to the Board. If you bought a car 25 years ago, it probably had a device on it that you can't find right now on cars. And that's called a carburetor. What the carburetors used to do is mix air and fuel. And it would rely upon an intake manifold to distribute the air and fuel to the cylinders.

What was very exotic and rare at the time was fuel injection. If you look on the market now, I think they are all fuel injected and there are no carburetors. Why? The reason why is that even though you had uniform mixing of air and fuel in the carburetor, the job of having -- of ensuring that each cylinder got approximately the same air fuel ratio was challenging. And what generated carbon monoxide and hydrocarbon emission and

those sources early on was simply the fact that one of those eight or six cylinders was probably going to be out of whack. It might be a little bit rich and generate more CO and hydrocarbons.

Well, the solution to that was, essentially, over a couple decades to move the fuel injection where the fuel is tailored exactly for each cylinder.

That analogy is the basis of my concern with sorbent injection. We are looking -- we have looked to see the modeling runs. And again great work has been done. And we might have six or eight or ten injectors in a hundred megawatt equivalent unit. But as you scale that up to 3 and 4 and 500 megawatts, the unit can have six or eight injectors or more, you are going to have several times that.

My only concern is analogous to the car, making sure each one of those lancets sees about the same amount of sorbent coming in. And we do that now quite handily with selective catalytic reduction

NOx control. But we are mixing a gas in a gas. And that opens up some things we can do to effect that mixing. So we don't see this problem with generating capacity with SCR. Because when you are mixing a gas and gas, there is other things you can do.

I am concerned about solids only because we have kind of tried something like this before. And in the mid '80s dry sorbent injection was looked at as a low cost SO2 option. One of the reasons why it didn't play out was simply the difficulty in getting solid particles injected and distributed across large ductworks.

What we have here is different. What we have here is much more controllable. But to me it is somewhere in the middle between the very good conditions we have with SCR and the challenging conditions that we had with dry sorbent injection.

So I am concerned about generating size. But I think what it would translate

into is actually helping some of the smaller units.

MR. AYERS: Can mixing the devices add turbulence in mixing as they do when they are in SCA ammonia injection systems?

MR. CICHANOWICZ: That is correct, adding turbulence is a way of improving.

MR. AYERS: Do we have data on the performance of mixing in the SCR context and its relationship to size?

MR. CICHANOWICZ: Yes, we do. And as I stated, mixing is an invariant with size with SCR.

MR. AYERS: It is invariant?

MR. CICHANOWICZ: Invariant. That is I believe we can get the same degree of mixing on a 900-megawatt power plant as a 100-megawatt power plant through the use of static mixers. And some -- mainly through the use of static mixers and well controlled ammonia injection units. Again we are mixing a gas in a gas.

MR. AYERS: Is it also possible -- I think you said that -- to add more nozzles

for the injection?

MR. CICHANOWICZ: It is. But it is another thing that has to be monitored and maintained. Part of my business -- I am sorry to talk about NOx again. But I help utilities figure out what's the best time to spend 40 or 50 grand to tune their SCRs. And there is tests that you can do and things you can sort that out. And you can come in and increase injectors and adjust them. And that is commonly done. Yes.

But that is mixing a gas in a gas. And I don't know if we are going to have the latitude to be able to move sorbent around all these lancets the same we would have the latitude to move the ammonia gases through the ammonia injection unit.

MR. AYERS: Why would that be?

MR. CICHANOWICZ: Because now we have particles. And you need to monitor the distribution of a carrier gas carrying a solid particle. And that's different in my opinion than simply a gas. Look at

coal pulverizers. And it is different because coal particles are probably much more erosive than sorbent. But there is one challenge in the industry -- again this analogy with the car -- getting uniform air fuel ratio at each burner is compromised by the ability to uniformly distribute coal which -- pulverized coal, which would be solid particles in a carrier media, which to me could be somewhat analogous to sorbent a carrier media.

MR. AYERS: On page 59 of your testimony you state that Monroe had opacity problems.

MR. CICHANOWICZ: Can you point out the sentence please, Mr. Ayers?

MR. AYERS: I don't have it here, but I will have to look.

MR. CICHANOWICZ: I believe --

MR. AYERS: Mr. Kim has it here, I think.

HEARING OFFICER TIPSORD: It's the fourth paragraph, midway down, "SCA Monroe

Station anecdotal evidence of opacity problems were noted." It is under ESP SCA, that paragraph, the underlined ESP SCA?

MR. CICHANOWICZ: Yes.

MR. AYERS: My question about that is what's the source of that statement.

MR. CICHANOWICZ: You don't want to hear this.

MR. AYERS: I think I can probably fill it in. But go ahead.

MR. CICHANOWICZ: Mr. Bill Rogers, who I don't know his position at Detroit Edison, basically told me he was never fully convinced that Monroe was clean from opacity. The reason why is the following.

Monroe is set up so there were two units feeding one stack. The only opacity monitor was in the stack. So you have two units feeding one stack. One of those units was tested, the other was not. Better yet, only one quarter of one unit was tested.

So what Mr. Bill Rogers insists is

that the opacity signal that was detected in the stack was only one-eighth of what was actually incurred. And he wasn't -- he thought the results were inconclusive, that there was not an opacity issue. But, of course, it is not in any of the reports. It's just a concern on his part.

MR. GIRARD: Could I ask a question? If he was just eyeballing this, how would he come up with a one-eighth?

MR. CICHANOWICZ: The one-eighth is the opacity monitor treats, you know, X -- X actual cubic feet of gas per minute. But the gas that was in the ESP module that was tested contributed one-eighth of the gas to that stack.

So because it was only one of two units and the one unit had four chambers of the ESP and only one of those four was tested with opacity and they saw what they thought were some movement in opacity -- again I haven't reviewed the data. I haven't seen it. But they were never convinced that it was completely clean of

opacity. But the opacity monitors are not set up to make a measurement.

MR. ZABEL: If I may, Mr. Chairman, it was treating one quarter of one half of the input to the stack in the CEM; is that correct?

MR. CICHANOWICZ: Yes.

HEARING OFFICER TIPSORD: Mr. Nelson?

MR. AYERS: May I go ahead and follow up on that first?

MR. NELSON: At Monroe they tested the plain carbon, did they not?

MR. CICHANOWICZ: They tested --

MR. NELSON: Not long-term run?

MR. CICHANOWICZ: I can't remember if it was Darco Hg or Darco Hg-L. It was plain carbon, correct.

MR. NELSON: The charge on a carbon particle or any particle, is that primarily a surface charge effect or a bulk charge effect, solid charge effect, do you know?

MR. CICHANOWICZ: That's beyond my -- I don't know.

MR. NELSON: When a carbon is brominated, does just its surface primarily change?

MR. CICHANOWICZ: Are you releasing your patent? I don't know, Sid.

MR. NELSON: Is it possible that the electrostatic characteristics of brominated carbon are very different than the electrostatic characteristics of plain carbons?

MR. CICHANOWICZ: That is possible, yes.

HEARING OFFICER TIPSORD: Mr. Ayers?

MR. AYERS: I would like to show you a report regarding the Monroe plant, if I might. It is a quarterly technical report for the quarter July 1, 2005, to September 30th.

HEARING OFFICER TIPSORD: This is "Evaluation of Sorbent Injection for Mercury Control." Principal author is Sharon Sjostrom. I will mark this as Exhibit 112 if there is no objection. Seeing none, it is Exhibit 112.

MR. AYERS: If you could look at page 11, Mr. Cichanowicz, and just read the last sentence?

MR. CICHANOWICZ: "No balance of plant problems such as increased opacity or changes in the ESP operation were noted at Monroe as a result of the activated carbon injection.

MR. AYERS: So the people who actually studied this, as opposed to the executives of the company, did not believe there was any problem from the injection, is that what this means?

MR. CICHANOWICZ: Well, I don't know. Because it is -- I don't know what they are referencing here in terms of the opacity. If it's the opacity in the stack, then it is consistent with what I was saying. Let's put it this way. If you are only measuring one-eighth of the impact, then perhaps there was an impact, but it wasn't enough to translate into a measurable change because it was diluted by a factor of eight.

MR. AYERS: This may be a good point to go back to the Brayton Point. We reserved the opportunity to come back to that this morning.

HEARING OFFICER TIPSORD: I didn't hear all of that.

MR. AYERS: We reserved the right to come back to Brayton Point this morning because of the document that was disputed.

HEARING OFFICER TIPSORD: Okay.

MR. AYERS: This I hope will be shorter and simple. Dr. Cichanowicz, you recall that the SCA of the first ESP at Brayton Point is 156 and that of the second unit is 403.

MR. CICHANOWICZ: That sounds about right.

MR. BONEBRAKE: For clarification, are we referring to a specific exhibit, Mr. Ayres?

MR. AYERS: We are, but I can't tell you the number without help, actually.

MR. KIM: 108.

HEARING OFFICER TIPSORD: "Results

of Activated Carbon Injection."

MR. AYERS: It was the one with the diagram.

MR. ZABEL: There may have been limited copies of that one.

MR. BONEBRAKE: That is where we had the question regarding the inlet and outlet locations?

MR. AYERS: Exactly.

MR. ZABEL: I have got it. 108, you said?

MR. AYERS: Yes. You testified this morning, didn't you, that Exhibit 108 demonstrated that, essentially, mercury is removed -- essentially, no mercury is removed in the second ESP when carbon is not injected.

MR. ZABEL: I think that is a mischaracterization. I think he testified that's what the table shows. You asked him if the table showed that. He said yes.

MR. AYERS: I will accept that.

MR. ZABEL: Just to make it clear.

MR. AYERS: So you would agree then that whatever mercury was removed through the two ESPs, which are in series, as you recall, when no particle was injected had to be removed in the first ESP, correct?

MR. CICHANOWICZ: If I understand everything correctly, I think that's a fair deduction.

MR. AYERS: Would you agree also that the first ESP, which had an SCA of only 156, was responsible for removing whatever mercury was removed under baseline conditions when there was no sorbent being objected?

MR. ZABEL: I will go back to my statement this morning. He has not studied this document. It says what it says.

MR. CICHANOWICZ: I won't play games with you. I am looking for a carbon in the ash. And it is possible that with high carbon in ash the contacting with mercury happens before the ESP. That is, as soon as the gases leave the air heater

and start cooling, if we are not adding sorbent, the carbon in the ash will start acting, maybe not as effectively as it would if it was a sorbent, but it will start acting to draw mercury.

So I would rather not say it is a consequence of the ESP. But it is a consequence of the entire residence time in the air heater through the ESP. But I don't have enough data to sort that out.

MR. AYERS: All ESPs have ducts ahead of them. And so it would be in play in any ESP, whether it is small or large, right?

MR. CICHANOWICZ: Well, maybe or maybe not. It depends on where the sorbent injection location was. Here we are talking about inherently generated carbon. You know, I could say normally it starts absorbing the mercury at the air heater inlet. The temperatures don't refer to that. But it could.

So pretty much as soon as you leave the air heater, in concept, this could be

happening. But, you know, sorbent injection, there is no guarantee you are going to be able to install those lancets right up close to the air heater exit. Maybe you can. But there is no guarantee.

MR. AYERS: Well, let's look at, if I may, figure 5-2, your Exhibit 87, the one we talked a lot about this morning. If the first Brayton Point ESP removed 90 percent of the mercury, as it appears that document says, where would Brayton Point be on that diagram on that figure?

MR. CICHANOWICZ: You mean if we looked at the total, the first and second ESP?

MR. AYERS: If we placed -- if we placed Brayton Point on this, I think we agree that no mercury was being removed in the second ESP, haven't we?

MR. ZABEL: I don't think we have agreed. He answered what the table in the exhibit showed.

MR. AYERS: No, that's not correct, Mr. Zabel. He testified after having seen

table that he agreed that none of the mercury or essentially none was removed in the second ESP, I believe.

MR. ZABEL: The record will speak for itself, Mr. Ayres. Go ahead.

MR. AYERS: My point is this. If the Brayton Point ESP removed -- the first Brayton Point ESP, the small one, removes 90 percent of the mercury, where would that point be placed on your figure 5-2? It would be far to the left corner, wouldn't it?

MR. CICHANOWICZ: If it is --

MR. AYERS: The upper left corner?

MR. CICHANOWICZ: If it is 156 SCA ESP, it would be over to the left, yes.

MR. AYERS: So it would provide a point that was quite out of line with the hypothesis that you had advanced earlier about this, wouldn't it?

MR. CICHANOWICZ: Again, we are mixing. The carbon in the ash is there in complete transit from the furnace or the conductive pass. And, yes, at those

temperatures, you are not going to get a lot of mercury removal, but the temperature history I don't think -- I don't know if it is going to be the same with the carbon and everything generated in the ash, as opposed to a sorbent injection system.

This is the third time I have said this. I can't be more clear about this. To me it is a different temperature time environment.

MR. AYERS: Could we try to wrap up on table 5 or figure 5-2? I think it would be a good time to because we have spent a lot of time on that table or figure. I think you agreed that the -- or testified that figure 5-2 was the basis of your suggestion that there might be a relationship between ESP size and mercury removal; is that correct?

MR. CICHANOWICZ: The depiction in 5.2, the graphic, yes, is part of the submission.

MR. AYERS: And then this morning

when we looked at these, I looked more closely at this figure. You would agree, do you not, that the plants identified as 4, 8 and 12 would have moved up substantial -- that is to the top of the chart -- had those units tested halogenated sorbents.

MR. CICHANOWICZ: I agree that halogen -- the use of halogenated or treated sorbents would increase the removals. And again I feel we have talked about this. I said it would make it a contributing factor, but I don't know it would go all the way to the top. It certainly does with 4-C. But I do agree that they would go all the way to the top. I agree they would be a very important factor.

MR. AYERS: They would go considerably higher, though, wouldn't they?

MR. CICHANOWICZ: They would be higher, yes, and perhaps considerably.

MR. AYERS: And we agree, I think,

that high sulfur units were difficult to control and not really relevant to Illinois because there are hardly any to be concerned with?

MR. CICHANOWICZ: Yes.

MR. AYERS: And you agree that bituminous units were more difficult to control than power river basin fired units?

MR. ZABEL: Excuse me, are you making a distinction between high sulfur units, which was your prior question, and bituminous units, which is this question?

MR. AYERS: I am.

MR. ZABEL: Could you explain the difference so he knows what the question means?

MR. AYERS: I think he knows that if they are certainly bituminous coals, they would not be considered high sulfur.

So my question is do you agree that bituminous units were more difficult to control than power river basin fired units without respect to ESP size?

MR. CICHANOWICZ: Yes.

MR. AYERS: We also presented evidence that the poor performance at Yates, which is the one over here, No. 1, may be accounted for by poor distribution of sorbent flue gas which you previously testified could potentially cause the poor performance.

MR. BONEBRAKE: Madam Hearing Officer, it seems like we are going over and over questions that we addressed this morning.

MR. AYERS: We are summarizing.

MR. BONEBRAKE: Perhaps we can get to the point.

MR. AYERS: We will get right to the point.

MR. ZABEL: I don't want to interrupt, so we can get done with this. But summarization is more appropriate for the comments. If it is already in the record, it is already asked. To paraphrase the chairman, aren't we beating the horse a little to death?

MR. AYERS: I need to give the horse one more kick.

HEARING OFFICER TIPSORD: You know, I really -- I understand that you all suffered through this in Springfield at length. I also did this to them too. We need to pick up the pace a little bit. I don't want to keep you from asking questions. But I do sort of agree that we have now had six or seven, do you agree you stated this. So could we, please, get to the point?

MR. AYERS: These are the premise for the question I will now state.

MR. ZABEL: Which makes it repetitive, Madam Hearing Officer.

MR. AYERS: So in light of the exploration of these issues that we have done today, do you now agree that figure 2-5 does not support the hypothesis that there is -- I'm sorry, 5-2 does not support the hypothesis that there is a relationship between ESP size and Hg removal?

MR. CICHANOWICZ: I would say that if you could explain away all these differences as you -- as your words are, then it would not support that. But I don't know that we can explain away all these differences.

And again what I said was that 5-2, the value is not so much what it says, but what it doesn't say. It doesn't show a locus of points going around 90 percent from right all the way to the level.

So I still think it is perhaps an open question. But again, it is conjecture. You know, perhaps I am doing it. But with all due respect, Mr. Ayers, you are to. You are wanting me to explain away all these differences with mechanistic factors that I certainly agree with. But I can't quantify them.

HEARING OFFICER TIPSORD: Mr. Nelson?

MR. NELSON: If Crawford at 119 square feet per thousand ACFM gets 85 to 90 percent mercury removal at low injection rates, would you then probably

conclude that SCA size has very little, if nothing, to do with mercury removal?

MR. ZABEL: Could you read that back? I couldn't hear what he said.

(Record read as requested.)

MR. CICHANOWICZ: Depending on the length of the test, if the plant people and the testing people held hands and agreed on what the data was and that there was good, adequate measurements of particulate matter using traverses not capacities, I would agree with that and, frankly, applaud you, Sid. But we are not there yet.

MR. AYERS: Next question.

HEARING OFFICER TIPSORD: It has been two hours. I hope we are going to finish, but it has been two hours. Let's take a break.

(Short recess taken.)

HEARING OFFICER TIPSORD: Let's go back on the record. I believe we are ready for question 92.

MR. CICHANOWICZ: On page 60 of your testimony you state that "the data of Durham, 2005, suggests a compromise in mercury removal by 20 to 40 percent is incurred for only 6 ppm SO3. Accordingly, a 20 percent compromise is assumed contingent upon a 50 percent increase in AC injection rate." Are you assuming that it is not possible to reposition SO3 injection system to be downstream of the sorbent injection system?

Yes. The selection of a location for flue gas condition by SO3 is determined by, to a large extent, the same factors desirable for good sorbent injection, adequate space for access to injectors, ability to distribute an array of injectors across a duct section and ability to control the rate of injection equipment.

At some point, the FGC location was selected to optimize the performance. The opportunity for Hg sorbent to displace SO3 injection from desired location may

compromise SO3 conditioning and thus particulate removal.

Question A, are you assuming that companies would not try alternative flue gas conditioning methods?

It is possible that alternative means to condition the fly ash to improve electrical resistivity, such as using additives to the coal, could be used to replace the role of FGC by SO3. However, the constituent of the additive, perhaps alkali compounds such as sodium, could interfere with the sorbent and treatment agent.

Further, depending on the content of the additive, boiler slagging or deposition could be incurred. Although these potential problems may, indeed, be solvable, switching to an alternative FGC method will require a second determination or application project to be conducted in parallel with the mercury installation activities.

Without the time to singularly

investigate the role of each of relocating the FGC or trying an alternative FGC method and also installing ACI, it will not be possible to predict the final outcome until it is done.

Question 93, on page 60 -- I believe this has been asked and answered.

MR. AYERS: Yes.

MR. CICHANOWICZ: 94, on page of 66 your testimony, you state "the design study conducted to support this project shows the capital cost for three 90 megawatt units will be 34 million, equivalent to $120 a kilowatt. The capital cost can be scaled with a 0.33 power-law with values capped by those for units beyond 600 megawatts."

Is it your testimony that a 90 megawatt unit would be equivalent to $120 a kilowatt or that a 270 megawatt unit will be equivalent to $120 a kilowatt.

As the size of the filter treats 270 megawatts, the equivalent of $120 kilowatt was assigned to the 270 megawatt

generating capacity. The capital costs for TOXECON used in the study were not derived by this formula, but based on the results of actual engineering studies forwarded by Midwest Gen, Dynegy and Ameren.

Question 95, in section A-7 of your testimony, do you assume the FBC will have to retrofit a fabric fit?

A, doesn't the sole FBC in Illinois already have a fabric filter? Yes.

B, why would you add that cost?

The existing filter will collect fly ash as well as entrained solids that can carry over from the fluid bed that will contain unreacted limestone and remove chlorides. Unlike a dry FGD for which moisture is injected, forcing the fabric filter to operate at temperatures significantly less than 200 degrees Farenheit, the existing fabric filter from an FBC unit is anticipated to operate at temperatures more typical of a conventional boiler outlet. A separate

TOXECON-type application will allow the use of treated sorbent without interference.

Question 96, on page 84 you describe data for COHPACs derived from full fabric filter data and dry FGD data. Won't full fabric filter data be high because of the lower air to cloth ratio for a full fabric filter?

The cost for retrofitting fabric filters to many of the units cited is driven not by the cost of the fabric filter module, but the structural modifications and ductwork to access the flue gas to a location where the equipment can be installed. The air cloth ratio for these units was reported to range from four to one to six to one.

Question 97, what pressure drop was used for the COHPAC fabric filter? Six inches water gauge.

Question 98, on pages 87 and 88 of your testimony, you have estimates for capital cost and fix operating cost.

Please provide a table for the capital cost estimates to show, A, erected equipment cost estimated or quoted, what type of equipment.

My answers to 98 are cost data was derived from engineering studies conducted by Sargent & Lundy engineers. I do not have the additional details requested. Specifics can be answered by Mr. William DePriest in his testimony.

Question 99 provide a similar table to show how fixed operating cost was estimated. What activities does it include?

The cost data was derived from engineering studies conducted by Sargent & Lundy engineers. Specifics can be answered by Mr. William DePriest in his testimony.

HEARING OFFICER TIPSORD: I believe that Prairie State Generating also has some questions. Although they are not here, we should go over them to make sure they have been answered. And if not, if

we can answer them. See if they have been answered. If you believe they have been answered, then we will go on.

MR. KIM: I am sorry, before we do that, I had just two or three very short questions. I was trying to find a good place where they would lend themselves to follow up and I don't think they did.

I just wanted to ask Mr. Cichanowicz about the recent filing of the joint statement and the content.

HEARING OFFICER TIPSORD: Go ahead.

MR. KIM: Mr. Cichanowicz, I know you have been very busy in preparing for all this. But I was wondering if you had an opportunity to review the multi-pollutant standard language and the MPS language that is found in the joint statement that was presented and testified to by Ameren earlier in this hearing.

MR. CICHANOWICZ: Regrettably, Mr. Kim, I have not.

MR. KIM: So would it be safe to say then that you have no opinion or position

as to the impact or effect of that language?

MR. CICHANOWICZ: Yes, sir.

MR. KIM: Thank you. That's all I have.

HEARING OFFICER TIPSORD: I believe for clarification, I believe Mr. Harley asked similar questions yesterday about the MPS.

MR. HARLEY: Yes.

HEARING OFFICER TIPSORD: You don't intend there to be a contradiction between your answers to Mr. Harley and anything you said to Mr. Kim? I don't think there is.

MR. CICHANOWICZ: Exactly.

MR. KIM: I was out of the room at the time, so I apologize if I was repeating.

MR. HOJNICKI: Jeremy Hojnicki, McGuire Woods. Will you please turn to page 49 of your testimony? Will you please read the third paragraph?

MR. CICHANOWICZ: "Most

significantly, building an Hg compliance strategy upon the process equipment slated for CAIR implementation provides the most cost effective reliable approach. The equipment to be employed for CAIR, be it dry or wet FGD, and possibly the retrofit of a fabric filter, provides the residence time, mixing environment and process chemistry to transform elemental and oxidized mercury into solid effluents that may be proven to be benign to the environment. Coupling mercury compliance to SO2 and NOx reduction, in terms of both equipment and scheduling, provides the most cost effective and reliable compliance path.

MR. HOJNICKI: My question is, is this statement consistent with regulating mercury in a multi-pollutant strategy along with SO2 and NOx?

MR. CICHANOWICZ: I think generally yes.

MR. HOJNICKI: Okay. Thank you.

MR. AYERS: Thank you,

Mr. Cichanowicz. We appreciate your testimony.

MR. CICHANOWICZ: Thank you.

MR. ZABEL: I looked at the Prairie State questions and I think they have been answered, quite frankly. There is one exhibit we want to introduce.

MR. CICHANOWICZ: I guess the discussions with ESP SCA and the like, I wanted to make sure that the world understood that I am not the only person in the world that has expressed some concern about small precipitators. And I received last night by E-mail a position paper prepared by the Electric Power Research Institute that is willing to be used analogously in other state rulemakings summarizing at least their position on this.

And the authors will include a number of the people that authored some of the papers that Mr. Ayers presented to me and asked me if I knew them and, indeed, I did. So as you probably noticed, it is

like the same family that has been doing this work for the last seven or ten years.

I have not had a chance to go through this because I did download it at 11:00 o'clock last night. But I wanted to introduce it into evidence. And I do want to point out on page 4 --

HEARING OFFICER TIPSORD: Let's mark this as -- I will mark this as Exhibit 113. It is "Status of Mercury Controls for Coal-Fired Power Plants, an EPRI Assessment, August 2006," if there is no objection.

MR. KIM: Not so much an objection. But just a -- with the understanding that the Illinois EPA and you also have not had an opportunity review the contents of the document. And, therefore, I suppose maybe at some point perhaps with a comment we may reserve the right to take issues or address some of the comments contained therein.

HEARING OFFICER TIPSORD: Yes, absolutely.

MR. AYERS: Could I ask one question?

HEARING OFFICER TIPSORD: Let's mark it as an exhibit. It is admitted as an exhibit.

MR. AYERS: Just one question. Do you know, Mr. Cichanowicz, who -- what company or companies were the ones who paid for this study or initiated the study?

MR. CICHANOWICZ: I do not know who funded the study. This probably came out of the mercury group. And I don't know off the top of my head who the funders are.

MR. AYERS: Are they probably power companies?

MR. CICHANOWICZ: Oh, yeah.

MR. KIM: Is this document -- you said you downloaded it. Is this document available to the general public on their website?

MR. CICHANOWICZ: Yes. This was actually sent to me by somebody. And this

will be in the public domain because it is used as one look at mercury control technology.

MR. KIM: I haven't had a chance to look at it. Are the authors identified or do you know who the authors of the document are?

MR. CICHANOWICZ: I can guess who the authors are. But they aren't identified.

MR. KIM: Would you want to hazard a guess who they might be? Let me ask this. When it is made available to the public, would the authors be identified then, do you know?

MR. CICHANOWICZ: I think it is available to the public now. It was not given to me under the table. It was just bumped to me this is now out and available.

MR. KIM: So do you know who they might be?

MR. CICHANOWICZ: I would imagine it is some of the names that are on the

papers that were there, including Dr. Girabell (phonetic) and Dr. Ramsey Chan (phonetic) and there are probably others as well.

Anyway, I wanted to point out on page 4 the last subheading is "remaining uncertainties." And the first one talks about the ability to achieve high levels of control at all sites consistently over the long-term, i.e., more than one year. And then it says "this is especially a concern at sites with small ESPs --" and their idea of small is less than 200 SCA. And mine is probably close to 250. But we are on the same page. "-- and/or high SO3 levels in flue gas. So there is the SO3 level again.

So I wanted the Board to have this because it -- with all due respect, Mr. Ayers, yesterday afternoon it sounded like I was the only person in the world that was concerned about small ESP. And that just isn't true. I know you know that. But I wanted to have that in

evidence. And I know you thank me for introducing this document.

MR. AYERS: I don't know if I would go quite that far.

HEARING OFFICER TIPSORD: Well, the Board thanks you. And the Board thanks you for your patience and your testimony. And we appreciate it very much.

MR. CICHANOWICZ: And I will come back anytime.

HEARING OFFICER TIPSORD: I believe the next person on our list is Ishwar Prasad Murarka.

MR. MORE: Dr. Ishwar Murarka's testimony.

(Witness duly sworn.)

HEARING OFFICER TIPSORD: If there is no objection, we will mark the prefiled testimony as Exhibit 114. Seeing none, we will mark Mr. Murarka's testimony as Exhibit 114.

Do you wish to give a brief summary or go right to the questions?

MR. MURARKA: I will give a brief

summary. My full name is Ishwar Prasad Murarka, but you can all call me Ish, which would be easier.

I have lots of academic background, but I am not going to go ahead and recite that right now.

Overall I have been working in the field of coal ash management for about 25, 27 years. I am an environmental consultant. And I have two areas of specialty, one related to fossil fuel and combustion rate, coal being one part of the fossil fuels. And the other that I do lots of work for is the remediation and assessment of former manufactured gas plant sites that have significant land and water contamination issues.

I worked in different places as an employee before I started my company called Ish, Inc., in 1998. I moved from California last year to Raleigh, North Carolina, where I operate from now.

The technical expert testimony that I have provided written is the effects

activated carbon injection installed upstream of the existing ESP or fabric filler will have on the utilization of coal ash produced in Illinois for the following four points. Point one is use of activated carbon injection, ACI, as everybody has been calling, will increase the loss on ignition content in fly ash which is detrimental to its use of the fly ash as a substitute for cement in concrete.

Point two, use of ACI will darken the color of the fly ash, which is again detrimental to its use in creating for aesthetic and other reasons.

Third, use of ACI will result in an unacceptable foam index which is one of the measures used in the concrete industry, which is detrimental to its use in the concrete.

And the last point, that reduction in the utilization of fly ash in Illinois for concrete as a substitute for cement will result in increased disposal of fly

ash on land.

So with those four focus points of my testimony, I will begin reading the question and answering them to the best of my ability and knowledge.

HEARING OFFICER TIPSORD: Thank you very much.

MR. MURARKA: The first question is from Prairie State Generating Company. And the question is if a plant must dispose of its ash because it is not acceptable for making concrete, how much would that add to the cost of operation of the plant?

Response, since I am not familiar with the operation of each of the Illinois plants, I cannot say how much it will add to the cost of operation at each plant. However, I do agree with the projected cost of $25 per ton for fly ash that is not utilized as set forth in the TSD from the state. If the plant is no longer able to sell fly ash for the concrete substitute, then that facility will likely

incur an additional $25 per ton of fly ash that is not utilized.

This cost estimate as TSD also points out has two components. One is the lost value from the sale and the other one is the disposal and monitoring cost for the disposal itself.

Number two, again question from Prairie State, if mercury halogenated activated carbon is deemed to be a hazardous waste, how much would that add to the cost of disposal?

Response, I really don't quite understand the question completely. However, if the use of activated carbon does result in fly ash being deemed a hazardous waste then additional cost associated with hazardous waste disposal would increase substantially.

Now, the questions from Illinois Environmental Protection Agency. All remaining questions are from the Agency, so I won't repeat. I will go question number.

HEARING OFFICER TIPSORD: Thank you.

MR. MURARKA: 1-A, do you consider yourself a national expert on the use of fly ash in concrete?

Response, I am an expert, national, local, in the management of coal combustion bi-products from electric power plants in the U.S., including the use of fly ash for substitute in concrete and mine filling application, in agricultural uses and road base and sub-base uses.

1-B, question, have you ever worked for a fly ash marketing company or a concrete producer? The answer, no, sir.

1-C, please describe any specific concrete training or contracts with fly ash marketing companies or concrete company clients that you have had.

Response, I read a lot of literature on use of fly ash and have discussed the subjects with various engineers and university professors that I associate with. However, I do not have and never have had contacts with any fly ash

marketing companies or concrete companies.

Question 2 --

MR. KIM: Excuse me.

HEARING OFFICER TIPSORD: Excuse me, Mr. Kim has a follow-up.

MR. KIM: Dr. Murarka, by the way, Raleigh, North Carolina, is where you are from I believe now?

MR. MURARKA: Yes, sir.

MR. KIM: It is a beautiful part of the country.

MR. MURARKA: Come and join us.

MR. KIM: Would you, just so it is clear, state who it is on whose behalf you are presenting testimony today?

MR. MURARKA: The four Illinois utility companies. I believe if I remember them all, it is Dynegy, Midwest Electric -- Edison Electric, is that the right name? And the fourth one is Southern Illinois Cooperative.

MR. KIM: And are you also presenting testimony on behalf of Midwest Generation.

MR. MURARKA: Midwest Generation, I am sorry, that's the mix up.

MR. KIM: That's quite all right.

HEARING OFFICER TIPSORD: And what about Dynegy -- I am sorry, Dominion?

MR. MURARKA: No.

MR. MORE: Yes. Is it correct that you are presenting testimony on behalf of Dynegy, Midwest Gen, Southern Illinois Power Co-Op and Dominion.

MR. MURARKA: That's right. I couldn't remember each of the company names. Sorry.

MR. KIM: No problem. Thank you very much.

MR. MURARKA: Continue?

HEARING OFFICER TIPSORD: Yes.

MR. MURARKA: Number 2, please provide a list of your publication or conference presentations in the field of the use of fly ash in concrete.

I am not a concrete/cement researcher and have not published my own research papers in the field.

Question No. 3, are you or your firm a member of the American Coal Ash Association? Response, yes, sir.

4, what specific sources of actual data or information did you rely on to prepare your written testimony?

Response, please see those items listed in my prefiled testimony. I also interviewed a number of Illinois power plant employees who are tasked with managing fly ash utilization and reviewed portions of fly ash sales contracts from them.

MR. KIM: Excuse me, could you identify which companies that you had conversations with and specifically which ones and also who were able to review contracts of?

MR. MURARKA: I made notes on it. It is Dynegy and Electric Energy folks.

MR. KIM: Thank you.

MR. MURARKA: Number 5, what fraction of Ish, Inc., consulting revenues over the last three years were paid by

utilities or utility industry sources?

Over 90 percent of the Ish, Inc., consulting revenue is derived from electric and as utilities. The majority of the Ish, Inc., is derived from investigation and remediation projects involving former manufactured gas plant sites. About 30 percent of the revenue is derived from environmental consulting work and research on coal combustion by-product disposal and utilization projects.

Number 6, who are the three largest fly ash marketing companies for Illinois fly ash? I really don't know who they are.

7, if the American Association of State Highway and Transportation officials standard for carbon in concrete is five percent by weight and the ASTM standard is six percent by weight, why is that the Illinois power plants that have contracts to sell fly ash as a substitute for cement in concrete are required to meet a one percent limit on LOI contents in fly ash

sold?

That is the utility companies are contracted. That's how it is. I have also seen the documentation from WE Energy now, which used to be called Wisconsin Energy, that also indicates that a one percent LOI limit for fly ash used in concrete meets the specification and the utilization needs.

Number 8, are highways and roads --

HEARING OFFICER TIPSORD: Excuse me, Mr. Nelson has a follow-up.

MR. NELSON: You said you have seen contracts for Dynergy and then Electric -- EEI, which has one plant, Jaffa, correct?

MR. MURARKA: Yes, parts of those contracts, not the whole contract.

MR. NELSON: So in other words, you know nothing and seen nothing about all the Midwest Generation plants or all the Ameren plants?

MR. MURARKA: No, I have not.

MR. MORE: Is that with respect to the contracts?

MR. NELSON: With respect to the fly ash contracts. Would it surprise you if those -- all those contracts by those marketers, who you don't even know who markets, talk about -- do not have a one percent LOI but, in fact, have a five percent LOI in the state of Illinois, would it surprise you if Headwaters, which is the largest marketing -- flash marketer in the United States --

HEARING OFFICER TIPSORD: Wait a minute, Mr. Nelson. You asked one question now you are building. Let's go one question at a time.

MR. MURARKA: I will answer that question in two ways. What if, and then everything is possible. What if this happens, then would this happen. And if you fill in if and what, it may be possible, it may not be possible. And I have to know all that to figure out my answer.

But if, indeed, there are contracts with different utilities at different LOI

limits, that I do know is possible.

MR. NELSON: Doesn't your testimony specifically say, quote, the Illinois power plants that have contracts to sell fly ash as a substitute for cement in concrete are required to meet the one percent limit on LOI content in fly ash sold?

MR. BONEBRAKE: Mr. Nelson, what page are you reading from?

MR. KIM: That's on page five of Dr. Murarka's trial testimony.

HEARING OFFICER TIPSORD: And it is quoted in question No. 7 from the EPA.

MR. KIM: On page five it is in the full paragraph under the bold section No. 1, and it is about half -- three quarters of the way down.

MR. MURARKA: Yes.

MR. NELSON: But you say you don't know what the limits are of the -- for the Ameren plants and Midwest Generation plants?

MR. MURARKA: I have not reviewed

every one of the contracts to be able to say they are all below one percent.

MR. NELSON: Isn't that what your testimony says?

MR. MURARKA: My testimony does not say that.

MR. NELSON: Could I have you read that sentence one more time?

HEARING OFFICER TIPSORD: That's not necessary. It is in the record. We read it a couple of times, and he has answered the question.

MR. KIM: If I can ask a follow-up, perhaps I can clarify this. Dr. Murarka, the sentence that Mr. Nelson is referring to, you think perhaps it may be a more accurate statement if that sentence were to read Illinois power plants that have contracts to sell fly ash that I have reviewed as a substitute for cement in concrete are required to meet a one percent limit on LOI content in fly ash sold?

MR. MURARKA: I will agree to that,

yes.

MR. KIM: Thank you.

HEARING OFFICER TIPSORD: Mr. Nelson, do you have any follow-up?

MR. NELSON: And you have not reviewed the contracts for Ameren and --

HEARING OFFICER TIPSORD: He answered that question.

MR. MURARKA: I answered that.

HEARING OFFICER TIPSORD: Three times actually. Question No. 8.

MR. MURARKA: Thank you. Are highways and roads the largest use of concrete in Illinois? Consequently, is the State of Illinois itself the largest purchaser of concrete? Doesn't the State of Illinois itself control any color requirements for highway concrete?

I do not know, so I cannot answer the question as to if the state highway is the largest use for concrete ash.

Nine, how many of their Illinois ash marketing contracts have you personally examined over the last ten years?

I recently reviewed portions of two contracts and interviewed Illinois utilities who are tasked with the management of fly ash. And again this could be I interview the utility that then were asked to send me the portions of the contract so I can read them.

MS. BASSI: Can I ask a clarifying question, please? When you use the pronoun their in question No. 9, how many of their Illinois fly ash marketing contracts, is that their IDOT or is it some other?

MR. KIM: That was what I was going to follow up on. And, Dr. Murarka, perhaps we could have worded question No. 9 a little better. But I think that -- let me ask you this.

How many State of Illinois contracts for fly ash have you personally examined over the last ten years?

MR. MORE: Contracts with the State of Illinois?

MR. MURARKA: None. That is a

different question than was asked.

MR. KIM: Yes.

MR. MURARKA: 10, can high LOI fly ash such as might be generated with ACI be used beneficially flowable fill, raw feed for clinker, structural fills, embankments, road base, subbase, pavement, soil modification, or stabilization, mineral filler in asphalt, snow and ice control, roofing granules, mining applications, waste stabilization or solidification, agriculture, aggregates and other issues?

Some of the listed uses, yes. Some of the listed uses there, no. However, the markets for all these combined uses is not large enough if the elimination or complete reduction of utilization of fly ash in concrete is to come about.

HEARING OFFICER TIPSORD: Excuse me, before you go on, I am going to ask the obvious question. You said some yes, some no. Could you tell us which ones it could not be used for?

MR. MURARKA: For example, I will tell you that fly ash in snow and ice control, I haven't seen it at any time used. But maybe it is in Illinois used, but I don't believe so. Roofing granules is bottom ash, not fly ash. Mine application in Illinois, people want to use it, but I am not aware of having successful applications. Waste stabilization, solidification, very small quantities. Agriculture, again, extremely small quantities. Fly ash in aggregates just asking for it. Soil modification and stabilization, again stabilization is possible in the waste stabilization sense, but not in a soil stabilization sense.

HEARING OFFICER TIPSORD: Thank you. Mr. Harley?

MR. HARLEY: I am Keith Harley. I am an attorney with the group called Environment Illinois. The question I have for you is the limits that you just described on the use of fly ash, for example, in snow and ice control and other

applications, that is true whether or not it is high LOI or low LOI; is that correct?

MR. MURARKA: The fly ash is not utilized because of its physical properties for ice and snow control. It doesn't matter what LOI is.

MR. HARLEY: Thank you very much for clarifying that.

HEARING OFFICER TIPSORD: Mr. Kim?

MR. KIM: And I can't remember if you answered this previously in one of the earlier questions. But is your -- aside from your review of the contracts that you looked over as part of I assume your preparation for the testimony, do you have any first-hand knowledge in terms of business experience or contracting with any entities within the State of Illinois?

MR. MURARKA: Contracting for what?

MR. KIM: I guess let me ask you this. Do you have any business -- have you had any business practice with any clients within the State of Illinois?

MR. MURARKA: Yes, sir.

HEARING OFFICER TIPSORD: I believe we are on question No. 11.

MR. MURARKA: 11, you testify that according to American Coal Association 40 percent of electric power plant fly ash was beneficially utilized nationally in 2004, 28 million tons of which 14.1 million tons or one-half was used in concrete. Similarly, you testified that 40 percent of Illinois fly ash was beneficially utilized in 2004 according to the TSD. If only half of beneficially used fly ash is typically used for concrete, how do you explain your testimony that Illinois power plants utilized approximately 40 percent of fly ash produced in 2004 as a substitute for cement in concrete?

Response, based on my interviews of the Illinois utilities employees who are tasked with managing fly ash utilization and a review of the available data from Illinois power plants, most of the fly ash

is utilized as cement substitute in concrete. And limited amounts are utilized in raw feed for cement manufacturing in Illinois.

Also, as set forth in the TSD, the agency when calculating the cost associated with the new rule assumes that approximately 40 percent of the fly ash produced in 2004 will no longer be utilized.

Table 8.8 on page 161 of the TSD sets forth a summary of the 2004 fly ash utilization data for Illinois. According to that table, 40 percent of fly ash was sold. Table 8.9 on page 163 of the TSD, then sets forth the cost of compliance with the Illinois rule by multiplying $25 per ton by the amount of fly ash generated that is not utilized, that according to table 8.9 will most likely utilize sorbent injection or ACI technology.

Table 8.7 on page 157 of the TSD then sets forth a total ash disposal cost based on table 8.9 and the assumption that

all of the ash currently sold by those units affected by the Illinois rule will no longer be sold. This cost is based on the assumption by the agency that the fly ash will no longer be utilized for substituting cement in concrete because that is the only use that it has been determined will be adversely affected by the Illinois rule.

HEARING OFFICER TIPSORD: Mr. Harley?

MR. HARLEY: Dr. Murarka, I don't want to belabor this or any point, but this is the second time in your testimony where you have referred to one basis of your answer interviews with Illinois attorneys.

MR. MURARKA: No. Utilities.

MR. HARLEY: Utilities, I am sorry, I miss heard.

MR. MURARKA: English is still a foreign language for me.

MR. HARLEY: No. It's the microphone, it distorts.

MR. MURARKA: I am sorry if I said

attorneys.

Number 12, according to plant-specific data on fly ash sales in this exhibit, what fraction of Illinois fly ash that was sold for beneficial use in 2003 and 2004?

I don't understand this question and I am not sure what this exhibit is.

MR. KIM: I apologize once again. The exhibit -- we meant to reference Exhibit I believe it is 44 from the Springfield hearing. And this was a document that contained a plant-by-plant breakdown of a number of different of pieces of item including the amount of fly ash generated and the amount of fly ash sold on an annual basis. So having said that -- well, why don't we just disregard that question since you haven't had a chance to look at the document.

MR. MURARKA: Thank you.

HEARING OFFICER TIPSORD: Okay. Dr. Murarka, let's try shutting off the microphone. I think your voice may carry

loud. If you can't hear in the audience, let me know, we can turn it back on. But the microphone I think was distorting more than it's helping.

MR. MURARKA: If only 30 percent to 35 percent of Illinois fly ash was actually beneficially sold, not 40 percent, and if half of this could be sold because added carbon -- could still be sold because added carbon is irrelevant, would your estimate of deleterious impact decline further?

My answer to this hypothetical question is yes. And estimates by the agency will also decline too.

Number 14, didn't the TSD assume the worst case in its economic cost modeling anyway, that no fly ash with PAC would be sold for concrete, so anything able to be sold would just lessen the relatively low total costs already calculated?

I really don't know what the TSD assumed. However, the TSD states that $25 a ton differential, quote, is likely to

overestimate the impact, unquote, and says nothing about a worst case. Any fly ash that would be sold will lessen the impact, however. The remaining nonconcrete utilization markets are not large enough to offset the impacts, however, for the total revenues that are generated on a per ton basis.

Those markets are considerably lower than those generated for the sale -- or from the sale of fly ash as a substitute for cement in concrete.

Number 15, prior to beginning your company, you worked 25 years for the Electric Power Research Institute, which is funded by utility companies, correct?

I worked for the Electric Power Research Institute from October 1979 through April 1998 as a research manager for land and water quality studies. EPRI is funded by utility companies and some other sources such as Department of Energy.

Number 16, please describe the

purpose of Electric Power Research Institute's TOXECON, TOXECON II and TOXECON III technology.

Response, I do not know the purpose of Electric Power Research Institute's TOXECON, TOXECON II and TOXECON III technologies.

Number 17, why did you leave mention of these technologies out of your testimony?

Response, as presented in my written testimony, I presented my technical material pertaining to the effects activity carbon injection installed upstream of the existing ESP or fabric filter will have on the utilization of coal ash produced in Illinois. I did not consider what other technologies were available to facilities in Illinois and, therefore, did not discuss issues raised by those technologies.

18, you testified that ozone passivation (sic) technology to solve the carbon/concrete issue is not commercially

available yet. What have the results been from EPRI's tests?

Response, I do not have access to EPRI data and information since I am not an EPRI member. So I cannot present any EPRI test results.

19, are you familiar with data from any company on the foam indexes of fly ash containing cement-friendly activated carbon? No, sir.

20 --

MS. ROCCAFORTE: I have a question. Gina Roccaforte on behalf of Illinois EPA. Do you know that Sorbent Technology and Headwater Resources market a concrete-friendly activated carbon?

MR. MURARKA: I have been told that's the case.

MS. ROCCAFORTE: Thank you.

MR. MURARKA: Number 20, what fraction of U.S. utility coal mercury is already going into utility fly ash today?

I really don't understand this question.

Number 21, what percent of this is liberated when fly ash is used in clinker/cement manufacturing?

I do not have any data from clinker/cement manufacturing facilities to be able to answer this question.

22, if substantially all of the mercury contained in fly ash is liberated by the kilns of clinker/cement manufacturing, do you think that it would be a good idea today for Illinois or the U.S. EPA to regulate or restrict mercury containing fly ash going to this use?

Response, as indicated in my response to question 21, I do not have any data on mercury liberation by the kilns manufacturing cement or clinker. So I do not wish to speculate on a good or bad idea.

However, if fly ash is not utilized in cement manufacturing application, then that fly ash volume will also need to be disposed, resulting in additional land disposal cost to the Illinois utilities or

any utility for that matter.

Number 23, what evidence in your submitted testimony did you rely on for your overall conclusion that it is almost a foregone conclusion that the proposed rule will increase the potential for environmental impacts from land disposal operations?

Response, I want to first repeat my conclusion as written in entirety and not in the way the question is written. It is almost a foregone conclusion that activated carbon injection --

MR. KIM: Excuse me. Can you refer to the page of your testimony just so we are clear.

MR. MORE: It is page 8.

MR. MURARKA: "It is almost a foregone conclusion that activated carbon injection will reduce/eliminate the use of fly ash as a substitute for cement in concrete --" I probably should have put a period right there and then started with a new sentence. But continuing on,

"-- increasing the economic burden the proposed rule will place on Illinois power plants and increase the potential for environmental impacts from land disposal operation."

Continuing the answer, my foregone conclusion relates to reduction/elimination of user fly ash generated by the activated carbon injection technology that will put increased burden on Illinois power plants -- economic burden on the power plants.

The decreased utilization of fly ash will result in land disposal of the fly ash that is not utilized resulting in a potential for environmental impact. Therefore, my conclusion, as stated in my written testimony, did not claim that it is almost a foregone conclusion that the proposed rule will increase the potential for environmental impacts from land disposal operations.

24 --

MR. KIM: Excuse me. Dr. Murarka,

isn't it correct that the -- any possible increased economic burden that the proposed rule would place on Illinois power plants has already been reflected and accounted for in the cost analysis that was prepared by the Illinois EPA as reflected in the technical support documents?

MR. MURARKA: That's what the overall conclusion from the previously stated testimony tried to capture in just a few sentences. So, yes, that's reflected in that aspect.

MR. KIM: Thank you.

MR. HARLEY: Dr. Murarka, are you familiar with the waste classification of fly ash under the Illinois Environmental Protection Act or the Illinois Administrative Code?

MR. MURARKA: Yes, I am familiar with that.

MR. HARLEY: Could you please describe how fly ash is dealt with in terms of its waste classification in

Illinois.

MR. BONEBRAKE: I would like to put a question on the record that the question is asking for a legal conclusion. But you can go ahead, Mr. Murarka.

MR. MURARKA: I don't recall. It has been about a year or two since I read that material. And I don't want to misstate my memory.

MR. HARLEY: Are you familiar with the provisions of the Resource Conservation and Recovery Act as it relates to the waste classification of fly ash?

MR. MURARKA: Yes.

MR. HARLEY: Could you please describe those?

MR. BONEBRAKE: Same objection. Go ahead.

MR. MURARKA: Actually, in Resource Conservation and Recovery Act, there was an amendment that exempted fly ash, bottom ash scrubber sledge and fossil fuel combustion residuals until the United

States Environmental Protection Agency presented report to Congress and made subsequent determination. The determinations have been made. I don't remember exactly the year now, it has been four or five years at least. In two different determinations and two different reports of Congress that lead to the EPA stating or deciding that the fossil fuel combustion wastes are to be classified or -- actually, it said do not need to have a hazardous waste classification under that rule.

And then there were additional things that utilization of fossil fuel combustion waste in mine application needs more study and assessment and determination further. And there were two other conclusions that I don't remember exactly how they go.

MR. HARLEY: Thank you, Doctor.

HEARING OFFICER TIPSORD: Question 24.

MR. MURARKA: Question 24, what

sources of data did you rely on for your overall conclusion that it is almost a foregone conclusion that the proposed rule will increase the potential for environmental impact for the land disposal operation? See my response to 23.

25, are you familiar with data indicating that activated carbons in fly ash continue to absorb --

MR. KIM: Excuse me, your answer to No. 25 --

HEARING OFFICER TIPSORD: 24.

MR. MURARKA: It is the same as the answer to 23.

MR. KIM: I am sorry, I thought I heard you say 20 instead of 23.

MR. MURARKA: 25, are you familiar with data indicating that activated carbon in fly ash continue to absorb mercury from ambient air when placed in landfills or absorb mercury from water when ponded?

I have not seen any peer-reviewed journal papers during the last at least ten years with this type of information

pertaining to field scale measurements. And I emphasize the word field scale measurements. So I am not familiar with any factual details of this hypothesis, as stated in this question.

Number 26, are you familiar with U.S. Environmental Protection Agency, U.S. Department of Energy or Electric Power Research Institute data on the leachability or revolatilization of mercury from fly ash samples containing plain or brominated carbons?

Yes, I am familiar with most of the information on the leachability of fly ash generated by powdered activated control technology.

Number 27, what are the positions or preliminary conclusions of the U.S. EPA, DOE and EPRI concerning the expected adverse environmental impacts from the disposal of such PAC containing fly ash?

Response, a few preliminary conclusions are available in papers supporting the results of mercury studies

funded by these organizations. Fly ash produced by ACI do contain increased amounts of mercury than those without ACI use. Some of the fly ashes produced by ACI contain increased amounts of arsenic and selenium too. Leaching of the mercury from these fly ashes does not raise environmental concerns of any significance. However arsenic and selenium may be leached at levels of potential environmental concerns.

Number 28, how do you square these with your overall conclusion? Very well, see my response to question 23 and 27.

MR. KIM: The only follow up I have, I am going to take one last stab at question number 20. I am going to try and reword this, maybe it will -- you will be able to understand it better.

Let's try the question this way. What fraction of mercury in U.S. utility coal is already going into utility fly ash today? In other words -- you understand?

MR. MURARKA: I understand the

question.

MR. KIM: Thank you.

MR. MURARKA: I can't tell you what the percentage is or quantities are. I used to know the numbers in fly ashes and the ranges. I did not review that information before coming to this hearing.

But the best memory, subject to revisions, I think it is between 30 percent to upward of around of 60 percent of the mercury in coals ended up in fly ash or bottom flash or scrubber sledge or all of them combined. But that range is a national average that if I remember right would be the range.

MR. KIM: And I can't recall exactly your specific answer to No. 21 related to the clinker/cement manufacturing. Given your answer now, would the previous answer to 21 be any different?

MR. MURARKA: The answer I still will provide you, I do not know what kind of mercury control technologies those companies have.

MR. KIM: That's fine.

HEARING OFFICER TIPSORD: Anything further?

MR. MORE: I have a couple of follow-up questions.

HEARING OFFICER TIPSORD: Okay.

MR. MORE: Do you recall being asked a couple of questions -- do you recall being asked a couple questions about whether or not sorbent technologies or Headwaters is marketing a cement-friendly sorbent?

MR. MURARKA: Yes, I remember those questions being asked.

MR. MORE: Would you turn to page 6 of your testimony?

MR. MURARKA: Yes, sir.

MR. MORE: And the second to last paragraph begins "the technical support document." Do you see that paragraph?

MR. MURARKA: Yes, sir.

MR. MORE: Would you read it yourself, please.

MR. MURARKA: Yes.

MR. MORE: So is it correct that any cement-friendly sorbents have not been demonstrated at this time to be able to achieve a 90 percent reduction in mercury emissions and have not been demonstrated to show that they do not adversely impact the marketability of fly ash?

MR. MURARKA: Can I answer last half of your question only?

MR. MORE: Sure.

MR. MURARKA: For fly ash utilization of such fly ash generated by the cement-friendly sorbents, I have not seen information enough in the peer-reviewed journal to be able to say that that has been demonstrated and that such a technology and effects on use of those fly ashes for concrete will remain as is.

MR. MORE: I would also like to direct you to Mr. Nelson's testimony on page five. I apologize I don't have multiple copies with me. Would you take a look the last paragraph that begins "my

company has a new product called C-PAC?" I would like you to read the second sentence that begins "we are going to demonstrate." Would you read that into the record, please?

MR. MURARKA: "We are going to be demonstrating this C-PAC product in just a few months and at full scale in a DOE program at the Crawford plant of Midwest Generation in the Chicago area."

HEARING OFFICER TIPSORD: Excuse me, for the record that is Exhibit 43.

MR. MORE: Thank you. At this time do you know whether or not the demonstration that Mr. Nelson is discussing here in his testimony, if that has been completed?

MR. MURARKA: I don't know.

MR. MORE: Also on Exhibit 43, do you agree with Mr. Nelson's conclusion, the last sentence of the first paragraph, that, quote, unfortunately with our particular technology, activated carbon injection, the slightest bit of plain

activated carbon that gets into that fly ash generally makes the fly ash unusable for this reuse application?

MR. MURARKA: Yes.

MR. MORE: And do you understand that Mr. Nelson when he is discussing reuse application is referring to the use of fly ash as a substitute for cement in concrete?

MR. MURARKA: Yes, sir.

MR. MORE: I have no further questions.

HEARING OFFICER TIPSORD: Mr. Nelson?

MR. NELSON: Are you aware of exhibit -- were you here earlier today or yesterday when Exhibit 88 was introduced.

MR. MURARKA: No, sir.

MR. NELSON: Are you familiar with Exhibit 88?

MR. MURARKA: No, sir.

MR. NELSON: Are you familiar with the initial results -- the initial parametric results from the Crawford demonstration?

MR. MURARKA: No, sir.

MR. NELSON: Thank you.

HEARING OFFICER TIPSORD: Anything further? Thank you very much for your patience and thank you for being here today.

MR. MURARKA: Thank you very much too. I am glad I was on a different seat than Ed was.

HEARING OFFICER TIPSORD: Please swear in the next witness.

(Witness duly sworn.)

HEARING OFFICER TIPSORD: And I have been handed a copy of Mr. DePriest's prefiled testimony, which I will mark as Exhibit 115 if there is no objection. Seeing none, it is Exhibit 115.

Did you want to give a short summary before you started the questions?

MR. DePRIEST: I thought I would.

HEARING OFFICER TIPSORD: Go ahead.

MR. DePRIEST: I am not sure how much people know me or the company I work

for.

But my name is Bill DePriest. I am a senior VP at Sargent & Lundy. And my area of expertise is in the area of environmental controls, and I direct our environmental services group.

And we have -- just as a bit of an introduction to our participation in the state of Illinois, we have done work for a number of utilities in the state. And I just want to, you know, maybe as a preamble caution, some of the questions that have been asked of me are asking me to reveal things that are proprietary confidential information that we develop specifically for the utilities in the state of Illinois. And I am not going to be able to share that specific information with anyone here.

But I have developed -- my testimony is developed more on a generic sense as to how we see the industry. And we work not only in the State of Illinois but across the country. And we have been working

with mercury controls and related equipment related to pollution control equipment on the back of power plants. And that's, I think, the expertise that I intend to bring to bear or have brought to bear in my testimony.

So when we get into specific questions about specific utilities and specific power plants and the work we did for them, that's kind of off bounds. But it has been included as part of my overall analysis of the issue at hand.

HEARING OFFICER TIPSORD: Can you hear him okay?

MR. HARLEY: I can hear him, but I have a bit of a concern about the way he has phrased the characterization of what he will and will not testify to.

Perhaps this is better for Mr. Bonebrake, but will you be indicating that you are claiming a confidentiality exemption for certain portions of the testimony?

MR. BONEBRAKE: Well, I guess my

suggestion would be to wait and see where and when the issue rises and then we can address it. I don't know that we can and should address it in the abstract.

MR. HARLEY: The reason I am saying that is if this witness has not identified and he is refusing to answer some portion of a question on the basis of confidentiality, we will not know that he is generalizing according to the ground rules that has self announced.

MR. BONEBRAKE: I guess what we can do is if there is a particular --

MS. BASSI: Can I ask a question? Mr. Harley, is your question will Mr. DePriest indicate where he cannot answer a question because of the confidentiality provisions of his contracts with companies?

MR. HARLEY: Yes.

MS. BASSI: Yes, he will do that.

MR. DePRIEST: Question No. 1, are you familiar with the cost estimates described in section B-5 of

Mr. Cichanowicz' testimony regarding activated carbon injection hardware?

Answer, I have seen Mr. Cichanowicz' testimony and understand that it does include cost estimates. But I am not familiar with the details of those estimates. So I simply reviewed -- I looked at it, but I am not sure how he developed those.

Question No. 2, did your company produce these estimates?

Sargent & Lundy did not provide any cost estimate information to Mr. Cichanowicz. I understand that one or more of the Illinois generating companies may have provided him with studies that we performed for them. But I am not aware of how he used this information in his testimony.

MR. KIM: Before we go further, just for paper purposes, did we admit Mr. DePriest's testimony?

HEARING OFFICER TIPSORD: Yes, as Exhibit 115.

MR. KIM: Thank you. And I am sorry, Mr. DePriest, did you finish answering No. 3?

HEARING OFFICER TIPSORD: 2.

MR. KIM: I'm sorry.

HEARING OFFICER TIPSORD: Excuse me, Mr. DePriest, I have a follow-up on that because Mr. Cichanowicz indicated in a couple of his final questions that he did, in fact, use information from your testimony in his testimony. Are you saying you are not aware --

MR. DePRIEST: I am aware that -- I understand that he did receive some of the work that we did for utilities in the state.

HEARING OFFICER TIPSORD: But you didn't provide it specifically to him?

MR. DePRIEST: I didn't give it to him. He got it from the utilities, which I guess is okay.

MS. BASSI: Just also to clarify, I believe that he did not say it came from Mr. DePriest's testimony. It came from

Sargent & Lundy. And it got to -- if it came from Sargent & Lundy, it came through the individual companies, not directly from Sargent & Lundy.

HEARING OFFICER TIPSORD: Thank you.

MR. KIM: My understanding is there were at least two questions -- I think there were at the end of Mr. Cichanowicz' testimony -- questions No. 98 and 99 that I think he deferred them to Mr. DePriest and indicated that you might be in a better position to answer those questions.

MR. DePRIEST: I will give it a shot.

MR. KIM: As long as we are on the subject of Mr. Cichanowicz' testimony, I don't know if you want to take a crack at those now or if you'd rather --

MR. DePRIEST: I wasn't here for it; but I would be willing to take a crack at it.

MR. KIM: You can thank him. He is right back there.

MR. DePRIEST: Thanks, Ed.

MR. AYERS: I will read 98 for the record. On pages 87 and 88 of your testimony -- that being Ed's -- you have estimates for capital cost and fixed operating cost. Please provide a table of the capital cost estimates to show how the cost data was derived -- well, this is answer, I guess -- to erected equipment costs which -- was equipment is included, assumptions regarding retrofit difficulty, engineering and home office fees, et cetera, et cetera. All that information does exist in the work that we provided and did perform for the utilities I believe that are in question here. We did provide that type of information.

MR. KIM: Has it been provided in the course of your prefiled testimony or Mr. Cichanowicz' prefiled testimony?

MR. DePRIEST: No. But if you look in the testimony, the last third of it deals with the subject of costs. The costs that are in that particular section of my testimony encompass in a general

fashion the work that we did for the utilities in the state of Illinois. But they are not specific and shouldn't be construed to be specific for any particular unit. But they represent the range of what we feel the costs would be to apply I believe it is fabric filter technology specifically to the plants in the state of Illinois.

MR. KIM: Would it be safe to say then that the answer to the extent it exists to question No. 98 that was presented to Mr. Cichanowicz would be found in various places in the latter portion of your prefiled testimony?

MR. DePRIEST: Yes.

MR. KIM: And to the best of your knowledge, does that -- would the answer to question 98 exist in any other form in any document that has been presented to the Board as part of these proceedings?

MR. DePRIEST: Not that I'm aware of.

MR. KIM: And I assume your answer

to question 99 to Mr. Cichanowicz' questions would, essentially, be the same as your answer to 98?

MR. DePRIEST: Yes, it would.

So question No. 3 in my question says if yes to the answer to question No. 2, please provide details of these cost estimates in a table. I guess we have kind of gone through that issue. They exist in the work that we did for the utilities in the state of Illinois. But I did not include those in my testimony.

HEARING OFFICER TIPSORD: The question is asking you to provide it.

MR. DePRIEST: Yes. And I am not at liberty unless they tell me I can do that, to provide them to this Board.

HEARING OFFICER TIPSORD: So this would be one of those instances where you are not answering the question because of proprietary...

MR. DePRIEST: That's right. And I think we can understand why the utilities in question, if you think of them, Ameren,

Dynegy, Midwest Gen and others are all in competition with each other in the state of Illinois. So we work for all of them. It is very important that we maintain that China wall between all the work that we do for the different utilities and not share it back and forth. That kind of shares competitive information.

MR. KIM: That raises a good question when you make reference to the different utilities. Could you state who you are representing today in these proceedings, who your clients are in terms of your presentation of testimony today?

MR. DePRIEST: We are working for Schiff, Hardin, who is working for the utilities I mentioned, amongst others.

MR. KIM: So consistent with Mr. Murarka's testimony, would it be Dynegy, Midwest Generation, Southern Illinois Power Co-Op and Dominion?

MR. BONEBRAKE: I think as of today that would be correct, John.

MR. KIM: I appreciate the

qualification.

HEARING OFFICER TIPSORD: Mr. Harley?

MR. HARLEY: Are you familiar with the process by which the Board can review materials which are designated as being confidential and trade secret documents?

MR. DePRIEST: Not enough to speak to it, no.

MR. HARLEY: Are you familiar with the process through which the board can conduct an in camera review, that is the Board can review the documents to inform its decision without making them publicly available in any manner?

MR. DePRIEST: I understand that does exist, that capability to do that.

MR. HARLEY: In order to ensure the Board is given a full and complete record on which to base its decision, in light of your testimony and your presentation as a witness, are there any documents or portions of documents that you would be willing to provide to the Board if they were afforded the protection of an in

camera review not available to members of the public?

MR. BONEBRAKE: This question in the abstract I think is just about impossible to answer.

HEARING OFFICER TIPSORD: I don't think it is in the abstract. We just had him tell us he is not going to give us information for proprietary reasons.

MR. BONEBRAKE: Are you directing your question specifically to this cost item in No. 3? Is this where the question is headed?

MR. HARLEY: This is the first time that the witness has invoked his refusal to provide information that he does have on the basis of proprietary interests of his company. So this is the first opportunity I have to test this.

The reason for testing it is the purpose of these proceedings is to provide a full and complete opportunity for the Board to develop a complete record. The record will not be as complete as it can

be because this witness is refusing to provide information. I am testing the limits of that refusal.

MS. BASSI: The refusal to provide information is the information about specific companies, not the information in the aggregate. And the information in the aggregate has been provided in his testimony. And, you know, if -- that's all I can say.

MR. KIM: I think -- and I don't want to step on Mr. Harley's toes, but consistent with the presentation of information we made to the Board in our post-hearing written comments following the Springfield hearing, we presented certain documentation that would be provided for the Board to review only without being made public and would not be disseminated in any way on the Board's website and what have you.

I assume what Mr. Harley is asking and, certainly, I would join in this request is that is it possible for the

information that you have deemed -- and I am not disputing the fact that it may very well be proprietary. But is it possible for that information to be presented to the Board in camera for their review as part of their consideration and review of the rules?

MR. BONEBRAKE: Let me put two things on the record and then maybe you can respond to that, Mr. DePriest. First, I think Ms. Bassi has already indicated the aggregate cost data is already in the testimony. So that piece of information, which appears to be most relevant to the Board's consideration, is part of the public record.

And, second, you did mention the fact that there was some materials that were filed under seal or otherwise confidential. But we have to recognize as well that there have been some materials in this proceeding that have not been provided, including Dr. Keeler's report, on the grounds of confidentiality or other

restrictions.

So while I appreciate Mr. Kim's suggestion of having submitted some materials under confidential restrictions, there are some of these precedents proceeding already for some materials not being provided into the record at this juncture.

I don't know if you have anything further that you wanted to add, Mr. DePriest.

MR. DePRIEST: I am not a lawyer or anything, so I am not sure I can answer those types of questions anyway. But I think what I attempted to do and I think I have done in my testimony is the information is in there, but you just can't tell which specific plant it applies to. So if you look at the cost data, dollars per kilowatt, millions of dollars to apply technology, operating cost, capital cost, construction cost, the information is all there. It is just that I can't tell that that is the Vermillion

Station or that's the Hennipen Station or that's the Joliet Station.

That's not apparent. And I attempted to put the information in there without tying it to specific facilities?

HEARING OFFICER TIPSORD: Let me comment generally. Okay. Here is my feeling -- and this is my feeling about Steubenville, which we are still hearing about. And I understand that and I plan to ask the Agency what progress we have on Steubenville.

If the Board asks for information that we do not receive, whether it is received in camera or information is not put in our record, we then cannot review it. If the Board cannot review it, then the information that is in the record may, in fact, suffer because we can't review all the information.

If you are willing to take the risk that the Board not having the specific information in camera is okay or if the Agency can't provide for Steubenville and

is willing to take the risk, those are the risks that you are willing to take. Do you understand what I am saying?

I understand what you are saying. But I also have heard repeatedly from witnesses at both sets of hearings that a lot of cost involved in this mercury control are very site specific and very data -- very specific to each plant. And I understand your testimony has been given to us in the aggregate on the cost. And that's wonderful. It's good information.

But if there is site specific data out there that shows it is going to cost one plant $2 billion to come in, you know, I just -- I think -- I'm not asking for that information at this point. But I am just -- I just want to say generally that that's my feeling.

This is an information gathering process. And sometimes in an information gathering process, the information that is not provided is far more important than the information that is.

So with that caveat, I am willing to at least at this point allow Mr. DePriest to claim proprietary and not provide the information. But I throw that caveat out there.

MR. BONEBRAKE: We thank you for your position.

MR. DePRIEST: Question No. 4, with reference to your statement on pages 5 and 6 of your testimony, quote, however, it is likely that enhance mercury control will be needed to achieve overall control efficiency in the range of 90 percent, unquote, on what basis is that statement made?

So I think you have to refer to that particular paragraph. And my answer would be mercury capture with an FGD system alone will depend on the speciation of the mercury in the coal and the flue gas and will vary depending on the coal chemistry, combustion technology and other variables.

For PRB coal, which is the primary fuel for the Illinois units, a significant

portion of the mercury in the flue gas is expected to elemental. Industry testing to date has not shown a reliable ability to achieve mercury capture of 90 percent for PRB coal with an FGD system alone.

Number 5, do you have any test results for mercury removal on Illinois units with SCR and FGD?

We are aware of some testing performed on one of our client's -- by one of our clients on a specific unit in the state of Illinois. I think there is only two or three combined SCR/FGD units in the state of Illinois. But we are aware of testing at one of them. However, we are not at liberty to share that information due -- again due to confidentiality that we have in looking at that.

MR. KIM: Can you at least identify the client or the facility, not getting into the results?

MS. BASSI: Madam Hearing Officer, on these things where these are related to contracts that Sargent & Lundy has with

individual companies, may I suggest that we can take these questions back to these companies and see what the companies are willing to share in camera and not put Mr. DePriest on the spot for being potentially in breach of his contracts with them?

HEARING OFFICER TIPSORD: I don't think any of us are asking him to breach the contract. I think we are asking what the limits of the contract are at this point.

I would appreciate that. I think this is one in particular that the information might be very helpful to the Board. But again, I think Mr. Kim's question can you tell us which companies are involved, if the answer is no, we will go on from there. If you are uncomfortable with it, then the answer is not. If you are slightly uncomfortable --

MR. DePRIEST: I suspect it is okay. Because I think they are going to publish the information eventually when the

testing is done. But they have not specifically told us that we were allowed to use that information outside of our contract with them.

MR. KIM: I am not trying to have you testify to anything that you feel uncomfortable. If you can answer it for whatever reason, that answer is fine with us.

MR. GIRARD: Except I have a question. Is your contract being paid for with Department of Energy funds or some other public funds? Why is it a secret what company is doing the testing?

MR. DePRIEST: This particular testing, as far as I know, is not being done with government funds. It is being done by the utility itself.

MR. KIM: It's all very intriguing.

MR. DePRIEST: When they publish the paper, it won't be that exciting.

MS. MOORE: I am curious, how long have you had the questions?

MR. DePRIEST: The questions I

believe came in last Friday.

MS. BASSI: They came July 28th.

MS. MOORE: Did you not think to ask any of your clients that you were going to be on the spot here, would they mind if you gave this information?

MR. BONEBRAKE: The questions didn't come in until the 7th.

HEARING OFFICER TIPSORD: Yes, that's correct.

MS. BASSI: I am sorry.

HEARING OFFICER TIPSORD: The testimony came in about the week --

MR. BONEBRAKE: We had about a week to try to work through the issues.

MR. DePRIEST: I didn't think on this particular question. I guess I did on the cost questions, and I was told that that's proprietary information. I mean, I think we can all understand why it would be. They are in competition with the guy down the road. If they can make something happen at lower cost on their site, they may have an advantage and they don't want

to tell anybody about it.

And specifically with their fuel purchases, if their technology allows them to accommodate more fuels, they might have that leverage in their fuel buying practices. We don't want to take that away from them.

HEARING OFFICER TIPSORD: Number 6.

MR. DePRIEST: Six, with reference to your statement on page six of your testimony, quote, this scenario should provide some mercury reduction, but it will be limited by the capability of the existing ESP to capture the activated carbon without exceeding the plant's particulate emission limit or opacity limit, end quote.

Have you calculated any increase in particulate emissions for any Illinois plants as a result of use of sorbent injection for mercury control? If so, please provide all calculations.

Answer, in general our analysis of the capabilities of existing ESPs to

accommodate ACI was performed on a qualitative basis considering the existing ESP size or I think as you have heard earlier in testimony the SCA and current emission rates and opacity levels.

More importantly, any particular increase in the inlet loading of an ESP will result in an increase in the outlet loading, which will impact the emission rate and potentially the opacity. Specifically, the calculation work that we have performed for Illinois plants would again be governed by confidentiality agreements with our plant owners.

Generally speaking, though -- I don't want to make it sound like we produced a whole bunch of calculations and we are trying to hold them secret here. Our work was basically done on a qualitative basis. We looked at the existing ESPs, their specific collection areas that they had available in them, their current operating particulate load and opacity level. And we made a judgment

based on our experience in the business as to whether or not activated carbon injection to the point necessary to achieve 90 percent removal was achievable with that precipitator.

HEARING OFFICER TIPSORD: Mr. Nelson?

MR. NELSON: What is the basis of your statement there that any increase in particulate into the ESP will result in increases out of the ESP?

MR. DePRIEST: Well, generally speaking, an ESP operates on a percent reduction capability. So if you increase the inlet loading and it continues to operate on a percent reduction basis, the outlet loading will inherently go up. It does not necessarily mean that the opacity will go up, but the outlet particulate loading will typically go up. I won't say it will go up in every case. But it will typically go up.

MR. NELSON: Why would the particulate go up and not the opacity?

MR. DePRIEST: The opacity and the

particulate loading are really two independent things. They are connected in some ways. But the particulate loading, as it effects the opacity -- the opacity is a lot scattering type of detection device and it is a function of the particle size principally amongst some other qualities of the particles. Not necessary directly connected to an increase in particulate loading means an increase in opacity load.

MR. NELSON: Carbon has a lower resistivity than fly ash, does it not?

MR. DePRIEST: Yes, it does.

MR. NELSON: So it could differentially impact the resistivity of the filter having on the plates, would it not?

MR. DePRIEST: I guess there is some information that might suggest that could happen, yes.

MR. NELSON: Are you familiar at all with data from the Stanton plant that brominated carbon was injected into a

cold-side ESP and the particulate emission removals traverses actually show during the long-term test went down compared to baseline?

MR. DePRIEST: I'm not familiar with that data, no.

MR. NELSON: Do you think there are theoretical ways that that might be possible?

MR. DePRIEST: Yes, I think there has been some testing that has shown that in some cases the activated carbon or a carbon particle itself has changed the resistivity the bulk ash and has had that effect. I think there is as many if not instances where it has been just the opposite.

So to draw the strict conclusion that it is going to operate one way or the other the influence will be a specific way would be difficult for us to make.

MR. NELSON: So it is really quite uncertain right now to be able to offer firm conclusions?

MR. DePRIEST: I think you will see that from my testimony, that there is not a whole lot of information to bank a firm conclusion on that basis, yes.

HEARING OFFICER TIPSORD: Yes, Mr. Harley?

MR. HARLEY: To be clear, as to the calculations which are requested in question 6, you have been directed by your clients, utility companies who are participating in this process, not to provide those calculations to the Pollution Control Board; is that correct?

MR. DePRIEST: Not specific, I did not ask them specifically that question, no.

MR. HARLEY: So you have made a choice not to provide those calculations?

MR. DePRIEST: Understanding my -- the contract that I have with them, yes.

MR. HARLEY: And so the calculations of which your testimony is based are not available as part of these proceedings?

MR. DePRIEST: I guess you could say

that, yes.

MR. HARLEY: Thank you.

MR. BONEBRAKE: Just for clarification I think Mr. DePriest has also testified that he primarily relied upon qualitative analyses as opposed to calculations. So to be fair to the witness, he did provide that indication in his testimony.

HEARING OFFICER TIPSORD: Mr. Kim?

MR. KIM: I was just trying to get clear. You said -- I think you had been using the plural tense. So have you -- the question asks have you calculated any increase in particulate emissions for any Illinois plants. Is it safe to say that to the extent such qualitative analysis has been done, it has been done for more than one plant or is it just one plant?

MR. DePRIEST: The qualitative analysis?

MR. KIM: Yes.

MR. DePRIEST: It was done for every plant.

MR. KIM: Okay. And consistent with -- I think what you sort of answered as part of your question No. 5, would any -- I understand the distinction in terms of maybe not the part of calculations. But would any of the results of your work related to your answer to question No. 6 somehow down the road make the way into a published study consistent with what you stated as far as your answer to question No. 5?

MR. DePRIEST: I really don't think it is interesting enough to make it into a book study, like a published paper of some nature, probably not.

MR. KIM: The work you did was intended specifically for the use of your utility clients and to the best of your knowledge was not intended to be part of anything beyond that in terms of a published document or published study?

MR. DePRIEST: Just internal work that they need, yes, information they needed to do some internal work.

Question No. 7, with reference to your statement on page 6 of your testimony, quote, in the dry FGD control scenario activated carbon would be injected upstream of the FGD reaction vessel and the baghouse. Injection of the activated carbon prior to the FGD is necessary to take advantage of any halides, particularly chlorides, in the flue gas as they enhance the ability of the carbon to capture mercury.

Most halides are effectively captured in the FGD system. And, therefore, the activated carbon injection needs to be prior to the FGD system, end quote. Could not halogenated activated carbon be injected after the FGD reactor and prior to the fabric filter for high mercury removal as was performed at Sunflower Electric's Holcomb Station for roughly 95 percent removal at only about two pounds per million ACF?

And my answer is, I am not aware of the testing of halogenated activated

carbon after the FGD and before the fabric filter at Holcomb. However, with the recycle system of the FGD and considering the halogenated activated carbon testing done at Holcomb, I believe a 90 plus percent mercury removal is achievable there. The only remaining question is whether it is sustainable on a continuous basis. So if people understand that, I will move on.

Question No. 8, with reference to your statement on page 7 of your testimony, quote, in the wet FGD control scenario, an activated carbon injection system with an associated baghouse could be used to supplement the inherit mercury capture capabilities of the wet FGD absorber and would not be located upstream -- and would be need to be located upstream of wet FGD vessel. Mercury absorbed onto the activated carbon would be removed from the flue gas stream in the baghouse prior to the wet FGD. Why would a company install a fabric filler rather

than inject the sorbent upstream of the existing ESP?

And my answer is, a fabric filter would be required wherever precipitator size is too small for adequate mercury capture and/or where there are concerns about increases in particulate emissions due to the addition of the carbon.

Number 9, with reference to your paragraph on page 7, quote, although activated carbon injection is the most commercially developed mercury controlled system, pollution control companies are actively working on other techniques to enhance mercury capture in FGD control systems.

For example, the research is underway to evaluate existing SCR catalysts and develop new catalysts that oxidize elemental mercury in the flue gas stream. Oxidized forms of mercury are effectively captured in FGD control systems. Similarly, strategies to modify the flue gas composition are being studied

to increase mercury capture in FGD control system. Flue gas modification strategies include introducing halogens, primarily chlorine or bromine into the combustion progress to enhance mercury oxidation and facilitate its capture in the FGD control system.

And then the real question is, what is the relevance of this paragraph?

And my answer is this paragraph was intended to illustrate that implementation of a mercury reduction program in concert with the CAIR program for SO2 and NOx reduction may allow other more effective mercury control technologies to be considered.

For example, mercury capture in an FGD system occurs at a significantly lower parasitic power requirement than similar reduction in a mercury specific fabric filter installation.

HEARING OFFICER TIPSORD: Mr. Kim?

MR. KIM: But isn't it true that if you are a technology supplier of control

equipment, such suppliers are continually trying to improve their product? It is not a -- in other words, it is not a static process; it is an on-going dynamic process; is it not?

MR. DePRIEST: That's true.

MR. KIM: So in that sense you can never really say if we wait for someone to build the perfect car, we would still be waiting and we wouldn't be buying any cars. If someone said I am not going to sell a car until it is perfect, no one is going to be driving a car today.

So you are not suggesting that a rule relating to the control of a pollutant, for example, mercury, should be held up until a supplier indicates I have the perfect device, it can go on the market, are you?

MR. DePRIEST: I am not making any suggestion on how rulemaking might proceed. I am simply saying that the CAIR program has allowed for mercury development to occur within the CAIR

technologies such that we can leverage that investment to do more than just capture SO2 or NOx but also capture mercury.

Whether or not that's appropriate for the rulemaking process, I am not making a judgment in that regard.

MR. KIM: As long as you bring up the pollutants, NOx and SO2, are you familiar with or have you had an opportunity to read the multi-pollutant standard or strategy that is contained within the joint statement that was submitted with Ameren and the Illinois EPA earlier to the Board in this proceeding?

MR. DePRIEST: Yes, I read it about a week ago.

MR. KIM: And based upon your reading, do you have any opinion as to the effect or the viability of that provision if it were included within the Board's rule?

MR. BONEBRAKE: Just for

clarification, I think you said viability.

MR. KIM: Let's limit it to effect. The impact, the effect of the impact of that rule.

MR. BONEBRAKE: On what, Mr. Kim?

MR. KIM: On utilities that would be seeking to comply with the Illinois mercury rule?

MR. DePRIEST: I am not sure exactly what the question is. But I certainly think that it goes -- it fits fairly well with my opinion on integrating the CAIR and CAMR program into the mercury program in the state of Illinois and that there are synergies to be exploited in that regard that might turn out to be a lower cost solution for mercury control and ultimately achieve maybe the same goals.

MR. KIM: So at least conceptually is it safe to say that your opinion is that a multi-pollutant approach could possibly take advantage of, you know, better overall concept in terms of

regulation of the specified pollutants within that strategy?

MR. DePRIEST: I think generally speaking the answer would be yes to that.

MR. KIM: Thank you.

HEARING OFFICER TIPSORD: Ms. Bassi?

MS. BASSI: Just as a follow-up, does the combination of CAIR and CAMR also provide those same synergies and cost benefits or cost effective benefits or whatever you said?

MR. DePRIEST: Yes, I think that's what I was answering. I think Mr. Kim was saying -- wasn't he?

MS. BASSI: I believe he was talking about the multi-pollutant strategy that was proposed, which is not exactly the same as the CAIR and CAMR combination.

MR. DePRIEST: No. That's true. But the multi-pollutant program that Ameren is proposing would also make them compliant with the CAIR program.

MR. KIM: Thank you.

HEARING OFFICER TIPSORD: But I don't think you answered Ms. Bassi's question about CAIR and CAMR. The federal CAIR and CAMR, would they not provide the same synergy?

MR. DePRIEST: Yes, they would. I think I am on question 10. With regard to your paragraph on page 8 that begins, quote, for units where dry FGD/fabric filter is planned for CAIR compliance, A, if 90 percent reduction is achievable with halogenated activated carbon on the unit injected upstream of the ESP, why wouldn't the plant install halogenated activated carbon upstream of the existing ESP to meet the mercury requirements of the rule and then add the dry FGD/fabric filter later?

Answer, for many of these units 90 percent reduction may not be achievable with capturing the existing ESP based on ESP size and concerns about additional particulate emissions. In addition, ACI suppliers to date have been unwilling to

unilaterally offer a guarantee of 90 percent removal in an ESP without addition of a baghouse.

B, if that were done --

MR. RAO: I will follow up Mr. DePriest. You mentioned just now that the suppliers are not willing to provide guarantees of 90 percent without the additional control equipment.

MR. DePRIEST: Not unilaterally in every case, in other words, right.

MR. RAO: But is it your position that they do give guarantees, if all the other additional control equipment are also included in addition to what's mentioned in the question about mercury control?

MR. DePRIEST: Are you saying would they be willing to offer a guarantee on mercury capture to the level of 90 percent if the precipitator was big enough to accommodate that, yes, I think they would be willing to do that. The question with the guarantee is what's behind it. And a

guarantee is a guarantee.

MR. RAO: A lot of the discussion today is about suppliers not willing to provide guarantees with 90 percent reduction for mercury.

MR. DePRIEST: And I am saying if the situation is correct and all the stars are lined up, I think you are going to find some that would be willing to do that.

MR. RAO: So there are suppliers who would do that.

MR. DePRIEST: And then you have to ask yourself what's behind the guarantee when you get it. It's like if it doesn't work, do you get a sincere letter of apology or is there something else involved.

A guarantee is a guarantee. But you have to evaluate what it means financially to you to help you correct the situation.

MR. RAO: I guess from the discussion that we heard yesterday, I am

talking about in your industry a typical guarantee, when you get equipment for -- pollution control equipment, typically, what kind of guarantee you get in that sense would be able to obtain a guarantee for 90 percent mercury reduction?

MR. DePRIEST: There is a possibility you would. A typical guarantee would have limitations certainly on its limits of liability. And if you think of, let's say, an activated carbon injection system upstream of an existing ESP, you might be talking somewhere between one and $5 million to install that equipment. And the limit on liability may be -- I would be surprised if it was -- if it was limited to anything in excess of the value of the contract. And one to $5 million is fairly meaningless in considering the consequences of not being able to run your plant because you can't make mercury removal.

So even though a guarantee is kind of an important thing, it is also very

important that you think whatever you are putting in there is going to work. And so the two things have to come together. You need to have a guarantee in order to make sure you have the attention of the vendor if things start going wrong. But in reality you should never have entered into a contract with the guy if you didn't think the technology he was supplying was going to work.

MR. RAO: Thank you.

HEARING OFFICER TIPSORD: 10-B.

MR. DePRIEST: 10-B, if that were done, wouldn't that avoid the costs associated with the ductwork that you referred to and only leave the possible cost of relocating the activated carbon injection port to the fabric filter which would be much less expensive?

If a particular unit could achieve 90 percent reduction with ACI upstream of a precipitator, which is a possibility, the additional ductwork cost would be avoided.

HEARING OFFICER TIPSORD: C.

MR. DePRIEST: Regarding the same paragraph, if the company compose install the FGD/fabric filter earlier, wouldn't that provide the benefit of earlier SO2 reduction as well, including SO2 allowances that might be sold or banked?

Answer, if the company chose to install the dry FGD/fabric filler earlier, SO2 reductions would be achieved earlier. However, this decision would need to consider the value of this early SO2 reduction, considering the current SO2 allowance pricing, there is little incentive in most cases to proceed with SO2 reductions earlier than mandated by CAIR.

HEARING OFFICER TIPSORD: D.

MR. DePRIEST: Regarding the paragraph on top of page nine, if the company chose to install the dry FGD/fabric filter earlier, wouldn't that avoid additional outages related to

installing the equipment separately?

Installation of the FGD/fabric filter earlier would avoid the second outage discussed in the testimony but would result in the expenditure of significant capital and O&M dollars earlier than would otherwise be required by CAIR and CAMR regulations with little, if any, economic incompetent sensitive to do so.

HEARING OFFICER TIPSORD: Okay. Mr. DePriest, as much as I hate to do this and as much as I hoped we'd get through it today, it is already quarter after 5:00.

MR. DePRIEST: I can talk faster.

HEARING OFFICER TIPSORD: Well, unfortunately, it is quarter after 5:00 for our court reporter as well.

I think we are going to have to take this up in the morning. Let's recess. And we will start again tomorrow morning at 9:00 and hopefully be done before lunch.

Thank you all very, very much. Thank you for all working to try and get it done, but I think it is unrealistic at this point today.

(Whereupon the proceedings in the above-entitled cause were adjourned until August 18, 2006, at 9:00 a.m.)

STATE OF ILLINOIS)
) SS:
COUNTY OF LAKE)

I, Cheryl L. Sandecki, a Notary Public within and for the County of Lake and State of Illinois, and a Certified Shorthand Reporter of the State of Illinois, do hereby certify that I reported in shorthand the proceedings had at the taking of said hearing and that the foregoing is a true, complete, and correct transcript of my shorthand notes so taken as aforesaid, and contains all the proceedings given at said hearing.

_____
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