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 9:00 a.m.

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HEARING OFFICER TIPSORD: Good morning, ladies and gentlemen. This is day four. And we are continuing with the testimony of Mr. Cichanowicz. And I believe we are on question No. 62. Does anybody have any preliminary matters before we start?

MR. ZABEL: No.

HEARING OFFICER TIPSORD: I do want to remind everyone we have a board meeting here in Chicago today. So we will go until 10:30. And at 10:30 we will break and we will come back at 1:00. And if it is okay with everybody, we are going to come back at 1:00 o'clock. If we can do a break around quarter to 3:00 or so, then we might go until 5:30 tonight depending upon where a natural break might occur. But to give you a heads up, 5:30 may be where we go.

MR. ZABEL: I am worried about the travel schedules of some of our witnesses. If we go an extra half hour, that might help.

HEARING OFFICER TIPSORD: With that in mind question, No. 62. And I remind you you are still under oath.

MR. CICHANOWICZ: Question 62, you state on page 34 of your testimony that public pronouncements by suppliers of bromine that 100 percent price increases in bromine are possible further suggest that prices may not be stable. It should be noted there is only one source of bromine in U.S., saline aquifers in Arkansas, so transportation and supply conditions could be constrained. What is the basis for this statement that transportation could be constrained?

The availability of any bulk material at a single source can lead to bottlenecks in supply unless a wide variety of transportation options are available. Given the coal transportation bottlenecks experienced in the U.S. in 2005 and 2006, particularly with small generators that are captive to a single or limited number of transportation sources,

it is important to ensure that multiple transportation options are open to bromine suppliers.

HEARING OFFICER TIPSORD: Will we have follow-up, Mr. Ayers?

MR. AYERS: Yes. Mr. Cichanowicz, are you an expert in the area of bromine manufacture and the transportation?

MR. CICHANOWICZ: No.

MR. AYERS: So what is the basis for your statement that prices will increase by a hundred percent.

MR. CICHANOWICZ: There was a couple of quotes or statements that I basically pulled off the Internet with some representatives of some companies basically stating that the price escalation could be on the way.

MR. AYERS: Are you sure it was for bulk purified bromine rather than bromine derived chemicals such as fire retardants, which have seen substantial increases?

MR. CICHANOWICZ: My understanding was it was for bulk bromine.

MR. AYERS: Thank you.

HEARING OFFICER TIPSORD: Mr. Nelson?

MR. NELSON: Sid Nelson. Are you aware that Dow Chemical produces bromine in Michigan.

MR. CICHANOWICZ: No.

MR. NELSON: How many major bromine suppliers are there in the U.S.?

MR. CICHANOWICZ: I don't know how many there are. The basis of my statement is on -- with my knowledge or information that the sources -- the majors sources of bromine are in two adjacent counties in Arkansas. And that's the basis of it.

MR. NELSON: There are multiple suppliers that get bromine from that deposit; is that correct? It is not just one producer?

MR. ZABEL: I am objecting. He is testifying.

HEARING OFFICER TIPSORD: Mr. Zabel, if he is that correct we -- and Ms. Bassi has been guilty of that as well.

MS. BASSI: Sorry.

HEARING OFFICER TIPSORD: In fairness --

MR. ZABEL: I will object to her next time.

HEARING OFFICER TIPSORD: In fairness.

MR. CICHANOWICZ: Yes, I believe there are multiple suppliers of bromine.

MR. NELSON: Thank you.

MR. AYERS: I have a further follow-up.

HEARING OFFICER TIPSORD: Mr. Ayers?

MR. AYERS: We have an exhibit that we would like to introduce, which would be 106.

HEARING OFFICER TIPSORD: I have before me a document titled "Bromine Data in Thousand Metric Tons of Content Unless Otherwise Noted" prepared by Phyllis A. Lyday.

MR. AYERS: Yes.

HEARING OFFICER TIPSORD: No other information on who --

MR. AYERS: Madam Chairwoman, this

is from the U.S. Geological Survey. It says USGS.gov. And on the other side at the bottom you see the citation "U.S. Geological Survey, Mineral Commodity Summaries 2006."

HEARING OFFICER TIPSORD: I have the two-sided bromine and then the second.

MR. AYERS: Yes.

HEARING OFFICER TIPSORD: The first one is pages 40 and 41.

MR. AYERS: Of the U.S. Geological Survey, Mineral Commodity Summaries, January 2006.

HEARING OFFICER TIPSORD: If there is no objection, we will mark this as Exhibit 106. Seeing none, it is Exhibit 106.

MR. AYERS: According to the page that says bromine at the top -- well, the one that says Phyllis Lyday at the bottom, page 40, what happened the price trend since 2001 for bromine?

MR. CICHANOWICZ: It has gone up from 67 to 81.

MR. AYERS: And it has gone up all years.

MR. CICHANOWICZ: Yes.

MR. AYERS: And wasn't the 2002 price higher than the price in 2005?

MR. CICHANOWICZ: Yes.

MR. AYERS: According to this report, bromine is available in the U.S. from Michigan as well as Arkansas and abroad from Israel and other countries; is that correct?

MR. CICHANOWICZ: I haven't read it, but it looks like the first paragraph says that.

MR. AYERS: Thank you. Would you be concerned that we are running out of bromine if you looked at this chart?

MR. CICHANOWICZ: No. I'm not concerned we are running out of bromine and the annual production is on this chart. Yes, that's in excess of 200,000 tons per year. And when you look at the amounts, it is basically not very much. If you take the amount of activated carbon

-- halogenated carbon and put it into the precipitators in Illinois at the TTBS level, you get a plus one percent of the annual production.

So in terms of magnitude, it's not. But my concern was on transportation. And I say that because, you know, the power industry always seems to be the guy at the end of the transport sector that gets the fuzzy angle all the time. The coal deliveries are always made because of limited transportation. Tromine is a compound in Wyoming that some people are using sparingly and perhaps may evolve into FGD control. And the transport distances are great.

And it is not so much price, but it is bottlenecks in supply. And it was the only purpose for pointing this out. If there are alternative sources in Michigan, that's great.

MR. AYERS: We have a second item that we -- I think it was handed out -- which says "Mineral Information Institute"

at the top.

HEARING OFFICER TIPSORD: Yes. And this we will mark as Exhibit 107 if there is no objection. Seeing none, it is Exhibit 107.

MR. AYERS: The first sentence after the sources, I take it you agree with the sentence that bromine sources are --

MR. ZABEL: I am sorry, Mr. Ayers, I cannot hear you.

MR. AYERS: This is not usually a problem. Under the word sources --

MR. CICHANOWICZ: Sources or world resources?

MR. AYERS: No, just sources, you may have already answered this question. I just wanted you to look at the first sentence there and read that and let us know whether you agree with it. But I think you said you agree with it, that the resources are basically unlimited.

MR. CICHANOWICZ: I accept the first statement on that paragraph.

MR. AYERS: That's all my questions.

HEARING OFFICER TIPSORD: Mr. Nelson?

MR. NELSON: Just one quick question. Is there a need for the power plant to actually get bromine or would the bromine go to the carbon producer, which would brominate the carbon and the distribution would simply be bulk trucks to the various utilities.

MR. CICHANOWICZ: I am worried about the fact that, yes, the producers are the ones who are having a problem. But you know it -- it always ends up in the lap of the guy who is trying to make it.

MR. NELSON: Is it quite possible to actually put the brominate production facilities in Arkansas or Michigan?

MR. CICHANOWICZ: I imagine so.

MR. ZABEL: I believe he answered 63 in response to Mr. Ayres.

MR. AYERS: Yes, I think that's right.

HEARING OFFICER TIPSORD: Question 64.

MR. CICHANOWICZ: If it is only a

few percent, won't any cost impact from the price changes you predict for bromine be fairly muted?

Yes, the cost may be muted. But again my concern was for the limited physical source in transportation constraints. And with multiple suppliers and sources, that is mitigated as well.

MR. AYERS: I think question 65 has been asked and answered.

HEARING OFFICER TIPSORD: Okay. Question 66.

MR. CICHANOWICZ: On page 36 of your testimony, you state that "the role of coal blending on mercury removal performance of ACI with an ESP can be inferred by comparing data from Ameren's Meramac and Detroit Edison's Monroe Station. Both of the tested units featured ESPs of similar SCA but fired different fuels. Meramac exclusively fires PRB, while Monroe fires PRB with a 40 percent blend of bituminous coal. Does this demonstrate that fuel characteristics

play a very significant role in performance?

Yes, these results show that fuel type is important.

MR. AYERS: I think Nos. 67 and 68 have been responded to by the tables and exhibits that have been provided yesterday.

HEARING OFFICER TIPSORD: Which were 85, 86 and 87 I believe?

MR. AYERS: Yes, that's right. But we do have some questions that go to that.

Mr. Cichanowicz, yesterday you testified that larger ESPs were associated with longer lengths of ductwork, did you not?

MR. CICHANOWICZ: My statements in the satellite images suggest that large ESPs tend to have longer inlet ductwork.

MR. AYERS: That's why you speculate that while ESP size does not seem to significantly impact the mercury removal in the ESP, the longer duct runs associated with ESP may; is that right?

MR. CICHANOWICZ: The longer duct runs associated with larger ESPs may, that's correct.

MR. AYERS: And you testified that you had no specific data from Illinois or elsewhere to support this speculation, correct?

MR. CICHANOWICZ: That's correct. I do not have quantitative data defining ductwork runs and dimensions.

MR. AYERS: Are you aware of the review of plant layouts conducted by the Illinois EPA for this proceeding?

MR. CICHANOWICZ: I did not review it.

MR. AYERS: Are you aware that Waukegan 17 has an ESP with an SCA of about 131, a small SCA?

MR. CICHANOWICZ: I believe that was one of the images from yesterday.

MR. AYERS: Do you know what the approximate length of the duct between the air preheater and the ESP at Waukegan 17 was found to be by Illinois EPA?

MR. CICHANOWICZ: No, I do not.
MR. AYERS: Would a hundred feet seem possible?
MR. CICHANOWICZ: That would sound like a longer number than I would expect. But I did not go to the plant.
MR. AYERS: Do you know what the SCA is for Will County No. 4 for that ESP?
MR. CICHANOWICZ: No.
MR. AYERS: Or what the approximate length of the duct is between the air preheater and the ESP in Will County 4?
MR. CICHANOWICZ: No, I do not.
MR. AYERS: Would 80 feet seem possible?
MR. CICHANOWICZ: It would seem longer than I would expect from my experience. But I have not been to the site.
MR. AYERS: Is the Will County 4 than a larger boiler than Waukegan 17?
MR. CICHANOWICZ: From memory I can't reflect that.
MR. AYERS: Is it a newer ESP than

Waukegan?

MR. CICHANOWICZ: I don't know.

MR. AYERS: Did you know that Hennipen 2 with ESP with SCA of 125 has about 100 feet of ductwork between the air preheater and the ESP?

MR. CICHANOWICZ: No.

MR. AYERS: So isn't it really true that the length of the ductwork is determined entirely by site specific characteristics and can't be related to ESP size?

MR. CICHANOWICZ: I would have to review the results of the Illinois study before I can come to a conclusion like that.

MR. AYERS: But the results as we have discussed them, they would be inconsistent with the hypothesis that you advanced in your testimony, though, correct?

MR. CICHANOWICZ: If those results held up and I were to review them, they would be somewhat inconsistent.

MR. AYERS: Can we turn to figure 5-2?

MR. GIRARD: Mr. Ayers, before you do that, could I just ask a question? It probably goes to the agency. If there is a study of Illinois power plants that has a spreadsheet with ESP size and duct length and other information, is that in the record already?

MR. KIM: I believe the document -- John Kim for the Illinois EPA. I believe the document that has the information that we are referring to is the document that was provided in two forms to the Board, one in a redacted form for security reasons and one in a complete form for public viewing.

The document that is -- that has been requested to be withheld from public view has I believe those figure -- the relevant figures, schematics and distances that we are making reference to.

HEARING OFFICER TIPSORD: And that was in the post-hearing comment provided

to the Board and it is being held confidential in our clerk's office.

MR. KIM: That's correct.

MR. GIRARD: So the information is on a plant-by-plant basis rather than being on some spreadsheet where you have pulled it all together?

MR. KIM: That's correct. The manner in which that was compiled, my understanding is -- I think we testified to this at the first hearing -- was that copies I believe had already been provided to the utilities shortly after the Illinois EPA inspectors compiled the information. It was just the complete report itself was not provided to the board until the post-hearing comment period.

MR. GIRARD: Thank you.

MR. AYERS: We would like to turn to figure 5-2 if we might.

HEARING OFFICER TIPSORD: And, Mr. Ayers, you are going to be specific --

MR. AYERS: Yes, 5-2. I'm sorry I

think one of the views used was Exhibit 87.

HEARING OFFICER TIPSORD: Which is figure 5-2 in additional data, Exhibit 87?

MR. AYERS: Yes. Mr. Cichanowicz, would it be fair to say that the data in this figure provides the basis for your hypothesis that ESP size could be related to mercury removal?

MR. CICHANOWICZ: The data in this figure plus again my observations of the inlet ductwork for some of the modified ESPs and looking at other demonstrations, again that is the basis.

MR. AYERS: So could we go through in some -- question 69 and some of the additional questions that we would like to ask all address the data represented in this table. We would like to go through that in some detail. I think a way to start is just for you to answer question 69 and then we will go from there.

MR. CICHANOWICZ: 69, you state on page 38 of your testimony that "in

summary, although figure 5-2 mixes variables on one chart, sorbent type, duration of test, mass injection rate and ESP design, the resultant trend suggests that major ESP upgrades are required to derive 90 percent mercury removal." Does that statement take into consideration these and other critical factors such as fuel type?

No. The plot represented in figure 5-2 represents a global overview of the results achieved in a large number of demonstrations, displayed according to one ESP design feature.

Question A, do you agree that sulfur and coal type have significant effects on mercury capture?

Yes, coal type and sulfur content are important in determining mercury capture.

Question B, does this figure in any way distinguish those effects from others? No.

Question C, do not bituminous coals

tend to have higher sulfur levels than PRB coals? Yes.

D, if so, do bituminous coals not achieve as much removal at the same sorbent rate?

The relationship between coal type, sorbent type and mercury removal is application specific. It is generally true that as sulfur content of coals increases, as it does with bituminous coals, with all factors being equal, the higher SO3 generated by combustion will restrict Hg removal compared to a subbituminous, particularly a PRB, coal.

E, do you agree that sulfur and coal type have significant effects on the sizing of an ESP? All factors being equal, yes.

F, does this figure in any way distinguish those effects from others? No, it does not.

G, are not the ESP --

MR. AYERS: I would like to interject at this point with a question.

MR. CICHANOWICZ: Pardon?

MR. AYERS: I am sorry, may I interject a question at this point? Would the fuel type term determine whether or not halogenated or other sorbents were the best ones to use? I should say would the fuel type?

MR. CICHANOWICZ: Yes, they would.

MR. AYERS: Okay. Thank you.

MR. CICHANOWICZ: G, are not the ESPs designed for bituminous coals generally smaller than those for PRB coals? All factors being equal, yes.

MR. AYERS: Now, could I ask a few questions to follow up on that? This focuses on the data points in the table. First, are data points 4, 8 and 12, which are in the bottom middle, if you will of the chart, close together, are they the results of tests with untreated carbon on western coals?

MR. CICHANOWICZ: Test 4 is Leland Olds.

MR. AYERS: Leland Olds is 4.

Pleasant Prairie is 8. And Coal Creek is 12.

MR. CICHANOWICZ: If you don't mind, I would like to read through just to make sure.

MR. AYERS: Sure, of course.

MR. CICHANOWICZ: Four is Leland Olds lignite fired and that is not a halogenated sorbent test. Eight is Pleasant Prairie, PRB coal. That is not halogenated sorbent. Twelve is Coal Creek. It's a TOXECON, which is a little bit different than a conventional ESP and North Dakota lignite that is not a halogenated sorbent.

HEARING OFFICER TIPSORD: Does that mean it is not treated -- it is not a treated carbon sorbent?

MR. CICHANOWICZ: My answer is it is not treated. Correct.

HEARING OFFICER TIPSORD: Then I have a question before we go any further. Yesterday I asked you if the legend that was on Exhibit 86 carried to 87 and you

indicated that was correct. It looks to me that a pink box is indicated as a treated carbon sorbent.

MR. CICHANOWICZ: Okay. That's my mistake. That's my mistake. What I had meant was the descriptors and the numbers were the same. I incorrectly answered your question yesterday, Madam Chairwoman.

HEARING OFFICER TIPSORD: So the little box with pink in it does not mean the same thing on Exhibit 87 that it means on Exhibit 86?

MR. CICHANOWICZ: I regret to inform you that's true. I can -- I can fix that legend and make it clear.

HEARING OFFICER TIPSORD: Okay. That would be helpful.

MR. CICHANOWICZ: Because otherwise you are lost.

HEARING OFFICER TIPSORD: As I was, obviously, by my questions.

MR. ZABEL: We can file a corrected version of Exhibit 87.

HEARING OFFICER TIPSORD: Great,

thank you.

MR. AYERS: If halogenated carbon had been used on these units so that they were correctly taken, would you have expected a higher removal than what you see here?

MR. CICHANOWICZ: Yes, I would have expected a higher removal.

MR. AYERS: Don't points 4, 4-B and 4-C, which are all for the same Leland Olds plant, do you see them there, I think 4 is probably incorrectly pink. But then 4-B and 4-C go up a straight line because the straight line is the indicator of the SCA -- the size of the SCA of the ESP.

But you see the first four at about 67 percent, second one a little under 80 and the last one at 93?

MR. CICHANOWICZ: Yes.

MR. AYERS: So do those demonstrate the point about sorbent injection -- halogenated sorbent injection pretty clearly?

MR. CICHANOWICZ: Well, 4-B -- again

I need to see it and read it. Leland Olds, that uses a treated sorbent. And 4-C I believe is the Alstom Mer-Cure. And that is a treated sorbent.

MR. AYERS: So looking at that and the points that we were looking at before, you can conclude that the points No. 4, 8 and 12 would be considerably higher up if there -- they were treated rather than untreated sorbents.

MR. CICHANOWICZ: Treated sorbents will increase mercury removal, yes.

MR. AYERS: Okay. Now let's look at Nos. 12 and 17. Twelve is Coal Creek and 17 is Independence. Do you have those?

MR. CICHANOWICZ: Yes, I do.

MR. AYERS: Those are TOXECON II units, are they not?

MR. CICHANOWICZ: Yes, they are.

MR. AYERS: So we know that's still under development unlike -- unlike the sorbent injection upstream of the ESP? They have a different type of injection system, do they not?

MR. CICHANOWICZ: It is a different injection system and the technology is still developing.

MR. AYERS: Now, points 5 and 16, Lausche and Conesville --

MR. CICHANOWICZ: Yes.

MR. AYERS: -- those are high sulfur coals, are they not?

MR. CICHANOWICZ: Those are high sulfur coals.

MR. AYERS: And we know the condition of high sulfur is difficult and that probably explains the low mercury reduction, correct?

MR. CICHANOWICZ: It would be a contributing factor, yes.

MR. AYERS: Now looking at Nos. 2, 14, 6 and 15, that's Monroe, Lee, Allen and Yates 6 --

MR. CICHANOWICZ: Repeat those please, two?

MR. AYERS: Yes. Number 2, Monroe; No. 14, Lee; No. 6, Allen; and No. 15 Yates 6 --

MR. CICHANOWICZ: Yes.

MR. AYERS: -- these are all bituminous units, correct?

MR. CICHANOWICZ: Yes.

MR. AYERS: And we know that bituminous units are harder to control than western coals due to the sulfur, correct?

MR. CICHANOWICZ: That is true, yes.

MR. AYERS: So the fact that those four plants, Nos. 2, 14, 6 and 15, are a little lower in removal than the western coal units with halogenated sorbents, but still get 85 percent or better, is related to the fuel and not the ESP size, correct?

MR. CICHANOWICZ: Well, actually Monroe is a blend of PRB. It is 60 percent PRB and 40 percent bituminous coal. So I would be a little careful in generalizing in saying it is a bituminous coal. But it does have a fair amount of bituminous in it.

MR. AYERS: Do you know what the SO2 level is in that blended coal?

MR. CICHANOWICZ: No, I do not.
MR. AYERS: Would it be a surprise if it were over 1.25 pounds per million BTU?
MR. CICHANOWICZ: Well, it is combined. So it should be low.
MR. AYERS: But you do agree in general that of these four units they are higher sulfur units and that the higher sulfur increases the difficulty of achieving mercury reduction?
MR. CICHANOWICZ: That is correct, yes.
MR. AYERS: If there were a relationship between ESP size and mercury removal, you would expect Monroe 2 to have lower than Allen 6, wouldn't you? I am sorry, Monroe point No. 2 to have lower than Allen point No. 6? Do you see that points No. 2 and 6 on the figure are both at 85 percent removal even though the SCA of point No. 2 is under 300 and that of point No. 6 is well over 400, perhaps 500?
MR. CICHANOWICZ: Well, to the

extent that you can make a single point comparison, you know, perhaps. But, you know, again it is two points. And as I have always said, there is things that could be associated with other factors other than SCA. And I don't know enough about Allen and Monroe itself to be able to line up all those factors.

MR. AYERS: But other things being equal, you would expect that trend to show if the hypothesis were correct, right?

MR. CICHANOWICZ: Yes.

MR. AYERS: The fact that 2-D, Monroe with the SCR is a little lower than 2, Monroe with the SCR bypass is no surprise, right?

MR. CICHANOWICZ: Well, 2-D is different in a -- that's a 30-day test. It was the only 30-day test left under Monroe. So what was the question again?

MR. AYERS: The question was since 2-D was Monroe with the SCR operating and 2 was Monroe with the SCR bypass, it's no surprise that 2 shows higher removal than

2-D, isn't that right, due to the oxidation of SO2, SO3 in an SCR unit?

MR. CICHANOWICZ: But with what we are -- perhaps. But also 2-D was a 30-day test that was run at the end of a parametric test and 2 was the results of a series of parametric tests.

MR. AYERS: Is there any reason why you expect that to be different, though? Any reason that would be commensurate with the known effects of having the SCR unit on and the oxidizing effect of the SCR unit?

MR. CICHANOWICZ: I want to explain that there is -- we are changing two things at once, 30-day test at 2-D versus short-term performance tests at 2 and the role of SCR. And the 30-day test and the short-term tests, the results -- you know, the results were different because they are different test medians.

So we are changing two things at once. But I will say that with the role of SCR, basically, I would expect to have

an impact, yes.

MR. AYERS: So you would expect that to be a factor.

MR. CICHANOWICZ: Yes.

MR. AYERS: Brayton Point and Salem Harbor, and I don't have -- are they on this table or figure? I think they are not.

MR. CICHANOWICZ: Brayton is point 7 and it is on the table.

MR. AYERS: And Salem Harbor?

MR. CICHANOWICZ: That is 9.

MR. AYERS: Okay. They are also bituminous and had 90 percent removal. This was with the benefit of the high carbon fly ash, correct?

MR. CICHANOWICZ: The benefit of high carbon fly ash?

MR. AYERS: For mercury removal.

MR. CICHANOWICZ: The issue is the high carbon fly ash.

MR. AYERS: Take out all the modifiers. But the carbon, no doubt, played a role in this?

MR. CICHANOWICZ: I believe it did, yes.

MR. AYERS: So with the exception of Yates 1 -- Yates, which is point No. 1, we can pretty much explain the relationship between all these points with factors other than ESP size; isn't that correct?

MR. CICHANOWICZ: I wouldn't say you can explain away all the differences. I have just said that I believe all the things that have been stated are true, and they are certainly factors. Okay. But I don't know that that explains away all of the differences. It might, but I don't know that that's the case.

MR. AYERS: But you have agreed that each of these factors would alter the way these points show on this stable?

MR. CICHANOWICZ: I completely agree, yes.

MR. AYERS: And if altered in that way, they would -- this figure would tend to show very little, if any, relationship, isn't that correct, between the mercury

removal and SCA?

MR. CICHANOWICZ: It depends on the extent that those factors play out. If they played out 100 percent, as you described them to be, the answer would be, yes, there would be no relationship. But we don't know that. And that's the purpose of the additional demonstrations.

MR. AYERS: Well, we do know from looking at 4, 4-B and 4-C, you can see in that the clear impact of halogenated sorbents. And 4-C lines up with 11, even though the SCA is far less and probably maybe a third as big. I am trying to read the log scale here.

MR. CICHANOWICZ: Treated sorbents make a difference in Leland Olds, correct.

MR. AYERS: Okay. Thank you.

HEARING OFFICER TIPSORD: Are you ready then for question 70?

MR. AYERS: No, I am sorry, we aren't.

MR. CICHANOWICZ: That's okay. I thought when you said thank you that you

were done.

MR. AYERS: We would like to show you exhibit -- an exhibit presented at the 2003 EPA, EPRI, DOE combined power plant air pollution symposium. It was the mega symposium as we discussed yesterday.

HEARING OFFICER TIPSORD: I have been handed a document entitled "Results of Activated Carbon Injection Upstream of Electrostatic Precipitators for Mercury Control" by Starns, Bustard, Durham, Martin, Schlager, Sharon Sjostrom, Charles Lindsey and Brian Donnelly. If there is no objection, I will mark this as Exhibit 108. Seeing none, it is Exhibit 108.

MR. AYERS: Mr. Cichanowicz, on page 34 of your testimony, you describe modifications to Brayton Point unit 1, is that correct?

MR. BONEBRAKE: Madam Hearing Officer, just as a point of clarification, I don't see a date on this exhibit. Is there one, Counsel? Or do we know

otherwise what the date of this is?

MR. AYERS: We do know what the date is.

MR. STAUDT: It is 2003.

MR. AYERS: 2003. It is the 2003 conference.

MR. STAUDT: We have the disk right here.

MR. BONEBRAKE: We wanted to know what the date was.

MR. AYERS: We can get it for you if you would like.

MR. BONEBRAKE: 2003 is fine. I wanted clarification on the date.

MR. ZABEL: What page did you want him to reference?

MR. AYERS: 34.

MR. CICHANOWICZ: I'm sorry, is it table 5-2?

MR. AYERS: No. What we are looking at is a description of modifications to Brayton Point unit 1.

MR. CICHANOWICZ: On page 34?

MR. AYERS: I'm sorry, I think we

have the wrong article.

MR. STAUDT: It is 37 -- no. Yeah, 37.

MR. AYERS: It is page 37. And this is a table about ESP modifications and upgrades, demonstration units.

MR. CICHANOWICZ: Yes.

MR. AYERS: You state in your testimony that the first ESP at Brayton Point has an SCA of 156. And the second -- and that's newer ESP -- has an SCA of 403, didn't you?

MR. CICHANOWICZ: Yes.

MR. AYERS: And these ESPs are connected in series with the gas passing through the smaller ESP and then passing through the larger ESP; is that correct?

MR. CICHANOWICZ: That is correct.

MR. AYERS: We have -- if you will look now at figure 2 on page 5 of Exhibit 16?

MR. ZABEL: Which exhibit?

HEARING OFFICER TIPSORD: 108, Exhibit 108.

MR. AYERS: Figure 2 on page 5 of Exhibit 108, which is an isometric view of the ESP arrangement at Brayton Point No. 1?

MR. CICHANOWICZ: Yes.

MR. AYERS: Do you see the various locations for mercury CEMS that are identified on that?

MR. CICHANOWICZ: Yes.

MR. AYERS: Do you agree that this arrangement permits measurement of mercury removal across either ESP or both ESPs?

MR. CICHANOWICZ: Yes.

MR. AYERS: Please now look at figure 3 on page 8 of the paper. Do you agree that this figure shows the mercury removal trends across the second ESP?

MR. CICHANOWICZ: Yes.

MR. AYERS: From this figure could you state approximately the level of mercury removal across the second ESP when no sorbent is being injected? In other words, the, quote, native removal?

MR. CICHANOWICZ: Well, with no

sorbent injected, it looks like it is zero.

MR. AYERS: Would you agree then that this establishes that no mercury removal occurs across the second ESP when there is no sorbent being injected? I think you have answered that?

Now, if you would look at table 3, which is, I believe, on the previous page, page 7, do you agree that this table shows the average native mercury removal across both ESPs of more than 90 percent?

MR. CICHANOWICZ: Well, I am looking to make sure it says both ESPs.

Location 1, location 4. Well, figure 2 doesn't indicate numbers on the locations. I'm looking at the column on the left of table 3. And it is comparing location 1 versus location 4. And those are certainly, you know, 90 percent, 91 percent-type numbers. But it's location 1 versus location 4.

HEARING OFFICER TIPSORD: I agree with you it is not readily apparent that

this is both sources.

MR. ZABEL: I don't think he can answer the question, Mr. Ayres, without it. Maybe if he read the entire paper, that will become clear.

MR. AYERS: We will try to locate the locations of that.

HEARING OFFICER TIPSORD: It is not clear.

MR. AYERS: I may come back to that. But if we can take a moment to look?

HEARING OFFICER TIPSORD: Let's go forward for now.

MR. AYERS: Fine. That would move us to question 70.

MR. HARLEY: Before we move on, may I ask a question?

HEARING OFFICER TIPSORD: Yes.

MR. HARLEY: Good morning, Mr. Cichanowicz. A series of just two or three questions, could you describe the physical characteristics of ductwork at a coal-fired electric generating unit?

MR. CICHANOWICZ: The physical

characteristics?

MR. HARLEY: Yes. We are all talking about ductwork as if we know what it is. But for purposes of the record, it might be helpful to actually describe what is ductwork at a coal-fired power plant.

MR. CICHANOWICZ: That is a very good suggestion. Basically, the ductwork allows the flue gas to transit from point A to point B. But the particular flavor of ductwork we are concerned with is from the last heater exchanger in which you have a chance to recover heat, known as the air chamber, to the inlet of the ESP.

And the rule of thumb is you try to keep those velocities at about 40 or 45 feet per second. Because if you go less than that, then the ash particles have a habit of dropping out and collecting on the bottom of the ductwork.

So the ductwork is designed to -- at that location to feature about 40 to 45 feet per second. And there is a whole series of rules where making turns, like

everything else, you need to be careful of something to reduce maldistribution of low carbon. But that's basically what it is.

MR. HARLEY: What is a duct? Is it a contained sheet metal unit? Is that what we are talking about?

MR. CICHANOWICZ: Yeah, it is basically a pipe, so to speak, or a large duct like you might see in an air conditioning system but it is made out of much heavier steel and depending on the sulfur fuel can be built of materials to resist corrosion from SO3 that could can contaminate.

MR. HARLEY: Generally speaking, is it impossible to retrofit additional ductwork on existing coal-fired power plants?

MR. CICHANOWICZ: No. It is done all the time. It is just a matter of cost. Usually at that location it is access. It is the reason why you couldn't see the ductwork in the satellite images yesterday is because most of it is buried

under the boiler house. And when people do retrofits back there, you have to take apart the boiler house.

MR. HARLEY: So for each operator who might choose to have additional ductwork, there would be site specific factors that they would have to take into account before adding this ductwork?

MR. CICHANOWICZ: Yes.

MR. HARLEY: Do you have an opinion on the relative cost between installing additional ductwork by contrast to installing a larger ESP unit?

MR. CICHANOWICZ: No, I don't. It is very site specific. And those kinds of analyses are things I don't normally do. So all I know it is very hard to generalize because they are site specific.

MR. HARLEY: Thank you.

MR. AYERS: Can we go back to the Brayton Point that we were just discussing.

HEARING OFFICER TIPSORD: You know what, when you tilt your head down, we

can't hear you at all.

MR. AYERS: I'm sorry. It is hard to consult your notes and look up at the same time.

Let's go back to table 3 --

HEARING OFFICER TIPSORD: Of Exhibit 108?

MR. AYERS: -- of Exhibit 108 on page 7. The column that's marked location gives two -- there are two rows to show outputs from measurements at those locations. The first one is labeled inlet, is it not, inlet location 1?

MR. CICHANOWICZ: Yes.

MR. AYERS: And the outlet -- the second one is labeled outlet location 4?

MR. CICHANOWICZ: Yes.

MR. AYERS: If you could turn back to the schematic on page 5 of this exhibit, could you identify where the inlet and outlet would be on that schematic?

MR. CICHANOWICZ: Well, I would have to know inlet to what, outlet to what.

MR. AYERS: But we are measuring mercury. So presumably it is inlet to the precipitators and outlet from the precipitators, isn't it?

MR. CICHANOWICZ: Well, I understand. If we are -- if the -- if I take the statement to mean Brayton Point Unit 1 meaning the whole unit, then -- I still can't tell. I can guess and say it is the -- it is -- the inlet would be the Hg S-CEMS following the air heater and the outlet would be the Hg S-CEMS at the exit of the second ESP. I can guess and say that.

MR. AYERS: Certainly you would think that inlet and outlet would mean outlet would be at the end of the precipitator train and inlet would be at the beginning of it, would you not?

MR. CICHANOWICZ: Yes.

MR. AYERS: And we talked earlier about the lack of any removal of sulfur in -- I'm sorry, mercury in the second precipitator, didn't we? You testified to

--

MR. CICHANOWICZ: Yes.

MR. AYERS: -- that after looking at the exhibit? So if table 3 shows that 90.8 percent of the mercury is being removed, then it must be being removed in the first precipitator, is that not correct?

MR. CICHANOWICZ: I don't know. Because I believe it -- is the fly ash carbon content in this paper?

HEARING OFFICER TIPSORD: If I may, Mr. Ayers, I am not sure what you are trying to get to. But we are asking an awful lot of questions about what this paper says and asking him to review it on the spot. I think the paper speaks for itself.

If you have a specific point you are trying to get to, that's fine.

MR. AYERS: I do.

HEARING OFFICER TIPSORD: Like I say, continuing to ask him to draw conclusions from a paper he hasn't read I

think is a little unrealistic. The paper does speak for itself. If you have a specific point --

MR. AYERS: I do. Is it not true that -- well, let me put it this way. Does this example, this plant, not indicate that the increased -- that increasing the size of the precipitator in this case by adding a whole new precipitator at the end of the train does not increase mercury removal?

MR. ZABEL: I think I am going to make the objection that actually you just did. There are five locations on this diagram for mercury monitors. They are not identified. He has testified as to what figure 3 shows. Unless we can really read through this whole thing and identify where those are and what the conditions of data in table 3 was, was the FGD on, was it off during the testing, the things he asked him about on figure 3, I think it is really unfair to ask him that question without the opportunity to study the

table.

HEARING OFFICER TIPSORD: I will give you an opportunity to respond to that, Mr. Ayers.

MR. AYERS: I think we will pass on this and come back to it if we have a chance. We have had a chance to read it and they have.

HEARING OFFICER TIPSORD: We will end questioning for now.

MR. AYERS: Yes.

HEARING OFFICER TIPSORD: Question 70.

MR. CICHANOWICZ: As far as you know, is an even, parallel and somewhat laminar flow important for good ESP performance?

Well-behaved flow entering an ESP is desired to improve particulate removal performance.

A, if so, do you know why? A quiescent, low turbulence flow does not interfere with the migration velocity of a charged particle in transit to the

collecting plate and also minimizes any possible re-entrainment of the particles into the flue gas stream.

Question 71, don't ESP suppliers --

MR. AYERS: I am sorry, I do have one question.

HEARING OFFICER TIPSORD: Okay.

MR. AYERS: Is grade entrainment a reason why maximizing laminar flow is considered important?

MR. CICHANOWICZ: Well, I don't know that the flow is actually laminar. I didn't calculate the number.

MR. AYERS: As a principal, though?

MR. CICHANOWICZ: As a principal, what you don't want is turbulent aggressive flow adjacent to the layer of ash that is collected on the plate because it will pull the ash back through the flue gas stream.

71, don't ESP suppliers install devices to attempt to achieve these flow conditions?

Yes. Various baffle-plate or

perforated plates or turning vanes are used to effect good flow distribution.

72, do you think that TOXECON II possibly disturbs this flow field within the ESP by blowing carbon right into the middle of it?

The injection of carbon and the carrier air may distort the flow profile within the middle of an ESP.

73, in light of the fact that the Monroe ESP was smaller than the effective ESP, open parenthesis, what remained after sorbent injection, close parenthesis, at Coal Creek's TOXECON II site and no problems were cited at Monroe, is it likely that problems at Coal Creek's TOXECON II test were a result of challenges with the TOXECON II technology and not an ESP limitation that would exist if sorbent were injected upstream of the ESP?

Yes, it is possible that that is true.

74, on page 40 of your testimony you

state "carbon, like any other solid, can accumulate within the ductwork or internal surfaces of the ESP and influence the electrical properties. Specifically, erratic electrical behavior was witnessed at Yates due to shortening of current over insulators. And deposits on insulators at Coal Creek may have contributed to the T/R set failure. This problem, which perhaps contributed to a compromise in ESP performance at both sites, may not be a fatal law. But additional tests to evaluate new insulator designs or cleaning equipment is required." Wasn't the Coal Creek test a TOXECON II test where carbon is injected into the middle of the ESP rather than upstream of the ESP? Yes.

MR. AYERS: I am sorry, could I follow up?

HEARING OFFICER TIPSORD: Yes.

MR. AYERS: Your answer was yes?

MR. CICHANOWICZ: Yes, my answer was yes.

MR. AYERS: So that's different from

injecting the sorbent into the ductwork at a point upstream of the ESP hardware where it has additional time to mix and flow more smoothly through the ESP; is that right?

MR. CICHANOWICZ: That's a different application, yes.

MR. AYERS: But it is a different situation?

MR. CICHANOWICZ: Yes.

MR. AYERS: Is the TOXECON II a technology that's considered still under development?

MR. CICHANOWICZ: In my opinion, yes.

MR. AYERS: So let's focus for a minute on the simpler technology, just injecting sorbent upstream. Even without sorbent injection for mercury control, is there a lot of carbon in some fly ash?

MR. CICHANOWICZ: Well, as we discussed with the good Mr. Nelson yesterday, carbon can vary from -- generally people like to have it less than

five percent. And those cases are successful in having it less than five percent, in many cases less than two and three percent.

MR. AYERS: If I'm not mistaken, your testimony did not discuss any data from any other plant besides Yates 1 that had a small ESP where sorbent injection upstream of the ESP allegedly showed problems; is that correct?

MR. CICHANOWICZ: That is what the -- yes, that is the only item in testimony, absent the introduction of the Conesville data yesterday with the Exhibit 5-2.

MR. AYERS: Referring to the paragraph -- I'm sorry, is that -- I am sorry, that's your question.

MR. ZABEL: No, it is yours. It was his to answer.

MR. AYERS: It was an earlier question.

MR. CICHANOWICZ: So what am I doing?

HEARING OFFICER TIPSORD: 75.

MR. AYERS: Go ahead with 75.

MR. CICHANOWICZ: Referring to paragraph on page 11 of the paper entitled "Sorbent Injection for Mercury Control Upstream of Small SCA ESPs" by Dombrowski that is referenced in the TSD --

MR. AYERS: If it would be helpful, since this is a document that was in the TSD, you may not have it right in front of you, we can distribute this document again. Maybe you have had a chance to consult with it already. I don't know. I do want to ask some follow-up questions. So you may want to --

MR. CICHANOWICZ: Then why don't you distribute.

MR. AYERS: Thank you. It is No. 9. TSD.

HEARING OFFICER TIPSORD: Document No. 9 in what part of the TSD, the appendices?

MR. KIM: I think it is a reference document.

HEARING OFFICER TIPSORD: It is in the big box, then I don't have a copy of it. That's okay.

MR. KIM: Big box document No. 9.

MR. AYERS: You can go ahead and if you can answer questions A and B now, Mr. Cichanowicz.

MR. CICHANOWICZ: As you can imagine, I read this paragraph and I have an answer for you. But I did want the document to be in front of me.

Does this indicate any problem from carbon injection during this test?

No. But the observation is based on single-point measurements of particulate matter emissions which do not present a complete picture of particulate matter emissions.

B, could you please read the fourth bullet under conclusion on page 12? Does this indicate any problem from carbon injection during this test? I will read that fourth bullet. The fourth bullet states "carbon injection caused no

significant increase in ESP outlet particulate concentration in unit 1 or 2 as measured by a single-point EPA Method 17."

I wish to note, again these results, based on a single-point method acquired by Method 17 are inadequate to characterize any change in PM emissions. Specifically, a single-point Method 17 measurement would not comprise an adequate compliance test. More meaningful results are shown in figure 3-31 on page 3-52 of the quarterly report from April to June of 2005, which shows the variability in PM emissions on a pounds per million BTU basis, the standard to which the unit is held accountable to. The upper right-hand corner of the figure is entitled Method 17 traverse data, as this data were obtained with a four-point traverse and would comprise a compliance test.

So, basically, it's a single-point test. And if single-point tests were adequate for compliance, it wouldn't be a

requirement for traversing the data. The data in this paper was the result of a screening study conducted early. After the screening study, the owner operated a longer term test where they were able to have the time to conduct a multi-point traverse data. And that data I think does indicate there are particulate problems.

MR. STAUDT: Could you read back the cite citation ?

MR. CICHANOWICZ: It is the quarterly report from April to June 2005.

MR. STAUDT: Page and figure, please?

MR. CICHANOWICZ: Page 3-52, figure 3-31.

MR. AYERS: Which unit has the smaller ESP, Yates unit 1 or unit 2?

MR. CICHANOWICZ: I don't have the SCAs in front of me. I don't know. It is in the report. I don't know them offhand.

MR. AYERS: I think it is in the paper. I believe you will find it on table 1, page 4 of the exhibit we

introduced.

MR. CICHANOWICZ: Yates 2 has the smaller ESP.

MR. AYERS: And no problems are reported in this paper in the unit 2 ESP, even though this is smaller than unit 1; is that correct?

MR. ZABEL: Again we are back to asking questions about what's in a report that the witness hasn't read, at least not recently.

HEARING OFFICER TIPSORD: He was specifically asked questions on his report. We are looking at the Dombrowski paper. He was specifically asked questions on it, so I would expect him to be familiar with it.

MR. ZABEL: Right. But he is asking what it says in general and he hasn't read it today. To recall that -- I am happy to let the witness answer if he recalls. But I want the record to recognize he isn't reading it today.

HEARING OFFICER TIPSORD: Yes,

absolutely. Agreed. And, Mr. Ayers, it would be helpful if you could point him to the information that you are asking him about. If you are asking him about something that's in the report, you can tell him where you are looking. That would be helpful. You are going to have to be a little more specific because we are taking a lot of time looking for references that you guys are asking about. So you should be able to find it easily.

MR. ZABEL: The prepared question asked him to look at one paragraph. He had 99 questions to answer. If he would have read every reference in the 99 questions, we wouldn't have had him on the stand until Christmas.

HEARING OFFICER TIPSORD: I understand.

MR. AYERS: No reported -- the question I was asking is whether there were no reported problems on either unit 1 or unit 2. And that goes back to the conclusion which you read earlier I

believe.

MR. ZABEL: I think that question was asked and answered.

MR. AYERS: Asked and answered.

Let's discuss the issue related to long-term tests at Yates. Is it your testimony that the injection of activated carbon is responsible for several problems in the operation of the ESP?

MR. CICHANOWICZ: My testimony is that sorbent injection can induce higher particulate matter through break-through of sorbent.

MR. AYERS: And you, specifically speaking, include Yates?

MR. CICHANOWICZ: Yes.

MR. AYERS: Would you begin then to discuss this issue starting with question 76?

MR. CICHANOWICZ: 76, according 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," the Yates ESP has a design basis flow rate of 490,000 ACFM at a treatment rate of 17 pounds per million ACF, roughly the highest injection rate experienced at Yates 1. How much carbon is being introduced to the gas stream per hour? Approximately 500 pounds.

HEARING OFFICER TIPSORD: I have a point of clarification. I'm sorry. The paper referenced in this question is this a quote from Mr. Cichanowicz' testimony or is this another paper that is found elsewhere in the record?

MR. AYERS: This is from the paper --

HEARING OFFICER TIPSORD: The Dombrowski paper?

MR. CICHANOWICZ: No.

HEARING OFFICER TIPSORD: The title is different?

MR. AYERS: Yes, not Dombrowski. It is Exhibit 71 from the first hearing.

HEARING OFFICER TIPSORD: And then

we are on 76 A.

MR. CICHANOWICZ: A, how much at around six pounds per million ACF, approximately 176 pounds.

Question 77, according to 2004 EIA Form 767 data submitted by the plant owner, the average heating value of the fuel was about 12,400 BTUs per pound and the average ash was about 11.4 percent. Using this or other information you may have from the owner, please make a rough estimate of how much fly ash enters the Yates ESP each hour at full load. If you relied on other information from the plant owner, please describe the information.

Ash loading entering the ESP is estimated to be 7,355 pounds per hour, assuming a plant generating capacity of 100 megawatts, heat rate of 10,000 BTUs per kilowatt hour at 100 percent capacity factor.

78 --

HEARING OFFICER TIPSORD: Excuse me, I am going have to ask, when we have

something referenced in the question, this is a part of the record, is it not?

MR. AYERS: Exhibit 71?

HEARING OFFICER TIPSORD: According to the 2004 EIA Form 767?

MR. ZABEL: For the record that is the Energy Information Agency, which is a division of the Department of Energy. It is a published and publicly available document.

HEARING OFFICER TIPSORD: Thank you.

MR. AYERS: Could you turn your attention to the report "Sorbent Injection for Small Esp Mercury Control and Low Sulfur Bituminous Coal Flue Gas Quarterly Technical Progress Report, April 1 to June 30, 2005"?

MS. BASSI: Is that Exhibit 71?

MR. AYERS: I believe that's Exhibit 71, yes. Would you turn to page 3-9 of that document?

MR. BONEBRAKE: What page did you say?

MR. AYERS: 3-9. And if you would

read the last paragraph on that page.

MR. CICHANOWICZ: "There was no apparent increase in the carbon content of the ESP ash as measured by percent LOI for the activated carbon injection tests compared to baseline tests. As shown in figure 3-10, the mercury content of both the bottom ash and the ESP fly ash samples were directly related to LOI percent of the ash."

MR. AYERS: Is it possible in that statement it would be likely that there was no apparent increase in property content of the ESP fly ash because the carbon already in the fly ash so far exceeded the amount of carbon being added?

MR. BONEBRAKE: I'm sorry, was the question is it possible or is it likely? I couldn't tell which of the questions --

MR. AYERS: I will settle for likely. Is it likely? I used both.

MR. CICHANOWICZ: It is possible. I would have to calculate -- do a mass calculation to say it is likely. But it

is certainly possible.

MR. AYERS: According to table 3-8 of the Yates report on page 3-12, would you agree that the LOI of that plant is in the range of ten percent or so, sometimes more?

MR. CICHANOWICZ: Yes.

MR. AYERS: Isn't that significantly higher than the amount of carbon from activated carbon?

MR. CICHANOWICZ: Yes, it is.

MR. AYERS: So is it possible that the carbon from fly ash caused any problems that may have been experienced?

MR. CICHANOWICZ: It's possible that the carbon in the ash is responsible for some of the ESP data, yes.

MR. AYERS: Thank you. Question 78.

HEARING OFFICER TIPSORD: Okay, question 78.

MR. CICHANOWICZ: You state on page 40 of your testimony "first, the PM emissions standards for Yates are well below the Georgia limit of 0.2 pounds per

million BTU. The owner frequently operates these units at less than 0.10 pounds per million BTU, which typifies PM limits in other regions of their system, open parenthesis, for example, Alabama requires a PM limit of 0.10 pounds per million BTU, close parenthesis. Data presented in the quarterly report to the DOE summarizing these results, Richardson, 2005, shows baseline PM emissions less than 0.10 pounds per million BTU." Is this report by Richardson the sole source of your statement or there other sources?

My understanding of the PM emission standards for Yates units 1 to 4 and how the standards compare to other units in the Southern Company System was conveyed to me in a July 20th telephone conversation with Mr. Mark Berry of Southern Company, the staff engineer in charge of ACI testing.

Question 79 --

MR. AYERS: I'm sorry, I have some follow-up questions on this. There is a

scrubber after the ESP at this plant, is there not?

MR. CICHANOWICZ: On unit 1 there is.

MR. AYERS: And the emission limits apply to stack emissions. And the PM emissions of concern for compliance are at stack and after the scrubber, isn't that correct?

MR. ZABEL: That is a legal question, but I will let the witness answer, if he knows.

MR. CICHANOWICZ: Well, the PM limits that were described to me were basically as measured at the exit of the ESP with Method 17 that's shown in the figure.

MR. AYERS: Figure 3-31 of the long-term test report on page 3-52 shows Method 17 particulate measures at the ESP outlet planted against carbon injection rate. We are still looking at Exhibit 71.

MR. CICHANOWICZ: Okay. Thank you.

MR. AYERS: So that figure shows

particulate measures at the ESP outlet plotted against carbon injection rate, correct?

MR. CICHANOWICZ: That is correct.

MR. AYERS: Now, the baseline range is where there is no sorbent being injected and we compare the results of testing of the sorbent with the baseline, correct?

MR. CICHANOWICZ: Correct.

MR. AYERS: Could you state how many sorbent test points lie above the baseline range?

MR. CICHANOWICZ: I count six.

MR. AYERS: And how many sorbent test points lie below the baseline range?

MR. CICHANOWICZ: I count six.

MR. AYERS: And how many sorbent test points lie within the baseline range?

MR. CICHANOWICZ: I count seven or eight.

MR. AYERS: Would you agree that the test measurements show more scatter in the baseline measurements both above and below

the baseline?

MR. CICHANOWICZ: I would state that -- and this is what I was told my Mark Berry, that they did not have exceedences or they did not have PM emissions above the 0.10 level until they injected activated carbon. And certainly there is a lot of variability in this.

Dr. Staudt testified to this in Springfield, and it's still true. There is much data above as below. But it doesn't detract from the fact that until activated carbon was used, this type of -- when they had done PM emissions, they had not seen this type of variability. And when you look at the baseline data, granted there is three or four points, but it is within the range they are used to seeing.

MR. AYERS: This is commentary that is based on a conversation with someone outside the room? Yes?

MR. CICHANOWICZ: Yes.

MR. AYERS: Do you know when the

baseline measurements were taken relative to the tests with sorbent?

MR. CICHANOWICZ: My understanding was that the long-term tests, they -- the data was taken basically at the -- at the same time that they were conducting the parametric variations. That is what distinguished the tests in this report, that's different from what's in the mega symposium paper, is that these tests were long term. They allowed time for the system to come to equilibrium and they took the time to do the traverse.

What Mark told me -- and again this is based on a telephone conversation -- was that they rushed through the early parametric test for the reason of getting data for the paper that you handed out and they didn't take the time to do full traverse measurements. They were just trying to get a sense for what the mercury removal would be as a function of sorbent because they had a deliverable.

But once that was done, the next

phase of testing was more relaxed and they had the time to do the full traverse.

MR. AYERS: So it is your understanding that baseline measurements and the test measurements were taken at the same time?

MR. CICHANOWICZ: Yes.

MR. AYERS: Could you turn to page 334 of the same exhibit, 3-34. And read bullet No. 8.

MR. ZABEL: Do you want him to read it or read it into the record?

MR. AYERS: I think read it into the record, if you would.

MR. CICHANOWICZ: "Method 17 traverses were conducted in the ESP outlet duct to quantify ESP outlet particulate emissions. A handful of the data collected exceeded the baseline, open parenthesis, no injection, close parenthesis. ESP outlet emissions measured in three method 5 traverses from spring 2004. Furthermore, a few data points exceeded the compliance limit for

Yates unit 1, open parenthesis, 0.24 pounds per million BTU, close parenthesis. However, the unit itself was in compliance because the downstream PBR removed the broken-through particulate matter, open parenthesis, see next section for further discussion, close parenthesis."

MR. AYERS: That's sufficient, I think. Doesn't that say that the baseline tests were taken in the spring of 2004 over six months earlier than the tests with the sorbent in November 2004 or January 2005?

MR. CICHANOWICZ: That is what that says.

MR. AYERS: Now, could you turn to page 2-16 of the same document? And read the second to last paragraph. You don't need to read it into the record.

MR. CICHANOWICZ: I'm sorry, you want me to read it into the record or not?

MR. AYERS: You don't need to read it into the record. But I just wanted to

ask you, does that say that the Method 17 traverses for the long-term test with the sorbent were conducted during the week of November 30th and December 7th of 2004?

MR. CICHANOWICZ: That is what that says, yes.

MR. AYERS: So these tests that were compared to the February baseline were actually done in December, correct?

MR. CICHANOWICZ: That's what the report says, yes.

MR. AYERS: Is there a possibility then that the conditions are not quite the same as the baseline conditions in February of 2004 and the conditions under the -- during the test in December of 2004?

MR. CICHANOWICZ: That's possible, yes.

MR. AYERS: For example, there might be differences in the fuel that would affect the performance?

MR. CICHANOWICZ: Yes.

MR. AYERS: Thank you.

HEARING OFFICER TIPSORD: That was question 78. I would like to go a little bit longer to try to get through this paper. So we will see how we do. I will try not to break you off in the middle, but let's go to question 79.

MR. AYERS: We have quite a few questions on this. I think it will take awhile.

HEARING OFFICER TIPSORD: All right. We better take a break. We will come back at 1:00 o'clock.

(Whereupon the proceedings in the above-entitled cause were adjourned until August 17, 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.

_____
Notary Public, Cook County, Illinois
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