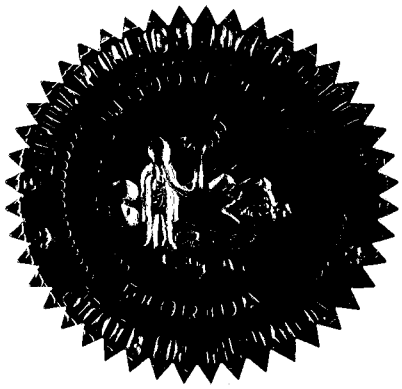
BEFORE THE
FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 060658-EI

In the Matter of:

PETITION ON BEHALF OF CITIZENS OF THE STATE OF FLORIDA TO REQUIRE PROGRESS ENERGY FLORIDA, INC. TO REFUND CUSTOMERS $143 MILLION.
_____/



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VOLUME 9

Pages 1179 through 1382

PROCEEDINGS:	HEARING
BEFORE:	CHAIRMAN LISA POLAK EDGAR COMMISSIONER MATTHEW M. CARTER, II COMMISSIONER KATRINA J. MCMURRIAN
DATE:	Wednesday, April 4, 2007
TIME:	Commenced at 2:00 p.m. Concluded at 5:15 p.m.
PLACE:	Betty Easley Conference Center Room 148 4075 Esplanade Way Tallahassee, Florida
REPORTED BY:	JANE FAUROT, RPR Official FPSC Reporter (850) 413-6732
APPEARANCES:	(As heretofore noted.)

I N D E X

WITNESSES

EXHIBITS

NUMBER:	ID.	ADMTD.
166-184		1250
185-203		1379

PROCEEDINGS

(Transcript follows in sequence from Volume 8.)

CHAIRMAN EDGAR: Mr. Burgess, when you are ready you can call your next witness.

MR. McGLOTHLIN: We call Mr. Sansom.

ROBERT L. SANSOM

was called as a witness on behalf of the Citizens of the State of Florida, and having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. McGLOTHLIN:

Q Would you state your name and business address, sir?

A Robert L. Sansom, 1901 North Moore Street, Arlington, Virginia.

Q Mr. Sansom, did you prepare and submit rebuttal testimony on behalf of the Office of Public Counsel in this docket?

A Yes.

Q Do you have that document in front of you?

A I do.

Q Do you have any changes or corrections to make?

A No.

Q Do you adopt the questions and answers contained in this document as your testimony today?

A Yes.

MR. McGLOTHLIN: I request that the prefiled rebuttal

testimony of Robert L. Sansom be entered into the record as though read.

CHAIRMAN EDGAR: The prefiled rebuttal testimony will be entered into the record as though read.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 060658-EI

REBUTTAL TESTIMONY OF ROBERT L. SANSOM

ON BEHALF OF CITIZENS OF THE STATE OF FLORIDA

Q. Please state your name and business address.

A. My name is Robert L. Sansom. I am President of Energy Ventures Analysis, Inc. My business address is 1901 N. Moore Street, Suite 1200, Arlington, VA 22209.

Q. Did you file Direct Testimony in this case on October 19, 2005?

A. Yes.

Q. What is the purpose of your Rebuttal Testimony?

A. To reply to the testimonies filed on behalf of PEF by Witnesses Davis, Pitcher, Weintraub, Heller, Hatt, Dean, Kennedy, Felter, and Franke. I also reply to the testimony filed by Staff Witness Windham.

Q. Has any of the testimony filed by PEF caused you in any way to reduce or consider reducing the $134.5 million of overpayments (exclusive of interest) you originally estimated were incurred by PEF's ratepayers because of the imprudent 1996-2005 coal procurement policies of PEF?

A. No. If anything the overpayments are greater than I originally estimated.

Summary Points Regarding PEF Witness Heller

Q. Mr. Heller, PEF's rebuttal witness, testifies that PEF's actions saved PEF ratepayers fuel costs. Do you agree?

A. No. Mr. Heller's analysis is fundamentally flawed.

Q. Please summarize the flaws in Mr. Heller's analysis.

A. The Commission should not give Mr. Heller's analysis any weight for the following reasons:

1. He uses Mr. Hatt's flawed work as a basic input to his opinions and financial analysis and makes invalid CR 4 and CR 5 coal quality performance findings, while ignoring the engineering work of B&V, B&W, S&L and PEF's own engineers, including Dan Donochod.
2. His estimates of the cost of PRB coal delivered to CR 4 and CR 5 ignore actual bids for PRB coal received by PEF in 2003 and 2004 and PEF's evaluation thereof.
3. His analysis of barge and transloading rates ignores real bids and transactions in favor of "assumed methodologies" that give results that are inconsistent with actual transactions and bids.
4. He did not even consider the PRB rail route to CR 4 and CR 5 via Mobile, Alabama or by all rail to Crystal River; rather, he assumed so-called "Waterborne Proxy" rates via IMT would apply, when no such rates for PRB coal have been established or approved by the FPSC.
5. He assumes contractual constraints on the tonnage of PRB coal that can be delivered by water to CR 4 and CR 5 that ignore the favorable economics of moving these CAPP coal contracts from the water to the all-rail route. These facts were even recognized by PEF.
6. He buys into the myth that in the 1990's PRB bidders would not provide bids to PFC for shipment to CR 4 and CR 5 without providing any plausible explanation, and he apparently accepted PEF's erroneous view of the October 15, 1998

Kennecott letter without ever reading it. See PEF's Responses to OPC's Fifth Set of Interrogatories Nos. 48-51.

7. He assumes, p. 31 lines 1-8, PRB coal would be blended with bituminous coal at IMT, in contradiction to the capability to blend at, and the favorable economics of blending at, Crystal River.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes. I am sponsoring the following exhibits:

- Rebuttal Exhibit No. ____ (RS-30) PRB Analysis Regulated Coal by PFC's Dennis Edwards which is an October Estimate of 1996 EFC Affiliate Profits.
- Rebuttal Exhibit No. ____ (RS-31), an Affiliates Profit Table.
- Rebuttal Exhibit No. ____ (RS-32): Back Calculated FOB Mine Prices from Exhibit DMD-13, p. 1.
- Rebuttal Exhibit No. ____ (RS-33): Davis/Heller Rates v. Market Rates.
- Rebuttal Exhibit No. ____ (RS-34): Transportation Miles.
- Rebuttal Exhibit No. ____ (RS-35): Bids by western railroads to ship PRB coal to Mobile and river docks. **[CONFIDENTIAL]**
- Rebuttal Exhibit No. ____ (RS-36): October 15, 1998 Kennecott letter offering PRB coal to PFC.
- Rebuttal Exhibit No. ____ (RS-37): 41 Plants East of Mississippi River Using PRB Coal in 1996.
- Rebuttal Exhibit No. ____ (RS-38): TECO data on PRB Prices.
- Rebuttal Exhibit No. ____ (RS-39): September 14, 2004 email from Mr. Pitcher Spot Barge Purchases declaring Massey coal is more economical if moved by direct rail to Crystal River.

- Rebuttal Exhibit No. ____ (RS-40): Sansom Photographs From February 22, 2007 Visit to Crystal River plant.
- Rebuttal Exhibit No. ____ (RS-41): Crystal River Coal Yard Layout.
- Rebuttal Exhibit No. ____ (RS-42): PE's notes on a 2005 conversation with Mr. Hatt.
- Rebuttal Exhibit No. ____ (RS-43): 2004 PRB Bid Quantities to PFC for 2005-2007 Coal.
- Rebuttal Exhibit No. ____ (RS-44): PRB SO_2 Emissions vs. CAPP SO_2 Emissions.
- Rebuttal Exhibit No. ____ (RS-45): Revised SO_2 Overpayments of Ratepayers by Sansom.
- Rebuttal Exhibit No. ____ (RS-46): Proposed Agenda March 2005 PFC Synfuels Meeting with Davis and Weintraub participating.
- Rebuttal Exhibit No. ____ (RS-47): Mr. Pitcher's 2001 Black Hawk Synfuels Offer to Mr. Edwards.
- Rebuttal Exhibit No. ____ (RS-48): Undated PFC Marketing and Trading "Indication of Product Availability".

Reply To Davis and Heller On So Called "Market" And "Waterborne Proxy" Rates For PRB Coal Movements

Q. Do you have any reactions to the testimony of Ms. Donna M. Davis filed by PEF on January 16, 2007 in response to your October 19, 2006 testimony on PRB delivered fuel costs?

A. Yes. In response to PEF Witness Davis, I would point out that she has offered no evidence to refute my finding that due to PEF's affiliate bias it favored CAPP coal via IMT to CR 4 and CR 5 from 1996-2002 when it was more expensive than PRB or imported coal. In fact, she offers evidence to the contrary. Prudence determinations are made on the basis of what was known or should have been known at the time procurement decisions were made. Witness Davis, who addresses PEF procurement during the Dennis Edwards era of 1996-2002, offers good 1998 evidence (DMD-14, p. 2) that Mr. Edwards believed PRB coal would be the most economical choice "by about 2000 (my guess)" via the water route to CR 4 and CR 5. She also provides a 1999 document (DMD-15, p. 1) which projects PRB will be less expensive than CAPP coal in 2003. There is no evidence in all of Mr. Edward's documents that he believed CR 4 and CR 5 could not, for technical reasons or for environmental permitting reasons, burn a 50% PRB blend. He expected PRB coal to compete with imported coal by water and displace CAPP coal via the affiliate dominated water route in that role.

Q. Provide the full text of Mr. Edward's 1998 statement.

A. The February 9, 1998 Edward's statement (at Exhibit DMD-9 p. 11) was: "In addition to these costs, I believe we should recognize that we will in all likelihood, be using Powder River Basin coals at CR 4 and CR 5 by about 2000 (my guess). Since these coals and others like South American, best move to Crystal River by water and are generally "compliance" grade, we would likely switch back to "D" water at this time in any event."

Q. Were CAPP and PRB markets the same from 1996 through 2000?

A. Yes. This is evident for 1996-2000 if one compares Mr. Heller's Exhibit JNH-2 p. 1 of 1 for PRB prices with the left most column of JNH-7 for CAPP coal prices. They were

almost unchanged for these five years. Therefore Mr. Edwards' 1998 forecast for 2000 applied to 1996-1999 as well.

Q. Then why would Mr. Edwards find PRB likely to be the best option in 2000 (in a 1998 document) and not in 1998 or in 1996.

A. There would have been no reason if the purpose of PFC's procurement had been the procurement of low cost coal supplies for the benefit of customers. But that was not PFC's purpose. PFC had another agenda. That agenda can be found in the October 1996 EFC/PFC document at DMD-13 p. 2 of 26, provided here for convenience as Rebuttal Exhibit No. ___ (RS-30). PFC had a conflict of interest. Affiliate interests favored CAPP coal, while ratepayer interests favored PRB coal. Apparently Mr. Edwards's boss, Mr. Carter, was interested in maximizing affiliate profits, even if it cost ratepayers millions of dollars per year.

Q. How does DMD-13 p. 1 or 2 of 26 show this bias?

A. It shows that PEF affiliates were making $7.04/ton in profits plus whatever profits or avoided losses applied to "DMCC" [Diamond May Coal Company] on CAPP coal via the river route.

Q. Explain how it shows this.

A. On the left side of DMD-13 1 or 2 of 26 is information that I have summarized at Rebuttal Exhibit No. ____ (RS-31).

Q. How many tons did PFC move via IMT in 1996?

A. 1,958,2000 tons according to PEF's filings at FERC.

Q. So how much were they making in 1996 on water route coal?

A. $7.04/ton times 1,958,200 tons or $13.7 million.

Q. Doesn't the right side of DMD-13 1 of 26 show PEF's affiliates could make even more (less $/ton but on more tons) moving PRB coal to CR 4 and CR 5 via Mobile?

A. In this example prepared by Mr. Edwards, it shows more profits on PRB coal, but apparently PEF realized that the PFC "Waterborne Proxy" did not apply to PRB coal via Mobile, Alabama, as the analysis for PRB coal assumes. Second, Mr. Edwards' PRB calculations include a mistaken margin of $1.20/ton (or $1.70/ton on 340,000 tons) to MEMCO which would not be recovered, as a river barge rate, on an all-rail movement to Mobile, Alabama. Nor does he deduct the $1.20/ton paid to MEMCO (apparently a "take or pay" penalty because PRB coal moving by rail to Mobile, Alabama would not use MEMCO's river barges) from the "market" or assumed waterborne proxy. Third, the calculation mistakenly assumes PEF's waterborne proxy rate for transloading at affiliate IMT would apply to transloading at McDuffie, AL, giving it another profit center. Fourth, not shown but recognized by Mr. Edwards in Rebuttal Exhibit No. ____ (RS-30) after DMCC was that PFC's coal producing affiliates were losing large amounts of money, and would lose more without EFC's captive affiliate market. Fifth and finally, the calculation assumes CAPP coal could be delivered for $1.822/MMBtu like PRB coal, but the actual PFC procurement of CAPP coal was much more expensive. So Edwards' calculations did not account for the financial damage PRB use would cause EFC's affiliate companies, and assumed, wrongly. that CAPP coal could be delivered as inexpensively as PRB coal. Regarding affiliates, PFC's coal producing affiliates, in 1996 took a $25.5 million charge against earnings, offsetting the $27.1 million PFC reported making on its transportation affiliates. See Coal Outlook, April 21, 1997 and February 3, 1997. FPC's money losing coal companies frequently obtained business from PFC,

including deliveries via the expensive water route. See Coal Week April 1, 1996 p. 1 and Coal Week, June 3, 1996.

Q. Can you simplify what is going on in these calculations?

A. Yes. Mr. Edwards, as his documents at DMD-15 in February 1999 and DMD-14 p. 2 in February 1998 as well as in this document (DMD-13), recognized PRB coal's potential at CR 4 and CR 5, delivered all-rail to Mobile and by Gulf barge to Crystal River. While his affiliate profit calculation of $7.04/ton plus DMCC's profits or reduced losses on moving CAPP coal via IMT was real, his PRB calculation was a "straw man" based on many invalid assumptions. Responding to our discovery request for accompanying documents, PEF found none. Therefore they were either destroyed or his calculations received no attention and spurred no action.

Q. What about Mr. Edwards' assumption in Exhibit DMD-13 p. 1 that in 1996 both the CAPP and PRB prices would be delivered to CR 4 and CR 5 at the same $1.822/MMBtu?

A. The assumption in DMD-13 p. 1 of a $1.822/MMBtu delivered price was realistic for PRB coal, but it was an invalid assumption for CAPP coal. See Direct Exhibit No. ____ (RS-19) where the year 2000 delivered PRB price to CR 4 and CR 5 would have been $1.81/MMBtu vs. actual CAPP coal/synfuels which was delivered for $1.95/MMBtu. This conclusion holds for 1996-1999 too as is shown in Direct Exhibit No. ____ (RS-21) which shows delivered CAPP coal prices to IMT in 2000 were the lowest of the 1996-2000 years, meaning CAPP coal in 1996 would have been more expensive relative to PRB coal. Therefore the assumed, by Mr. Edwards, delivered CAPP coal price of $1.822/MMBtu was not consistent with PEF's actual purchases of this coal.

Q. Have you shown the implicit F.O.B. mine prices in Exhibit DMD-13, p. 1?

A. Yes. They are at Rebuttal Exhibit No. ____ (RS-32).

Q. Why do you say the Waterborne Proxy would not have applied to a PRB coal movement?

A. The 9/13/93 FPSC Order PSC-93-1331-FOF-EI in Docket No. 930001-EI (p. 5) is applicable to a move from up-river docks via river barges, none of which would be involved in a PRB coal movement by rail to Mobile, Alabama.

Q. Was this Waterborne Proxy ever found to be applicable to other coal markets?

A. Yes, when EFC brought imported coal to CR 4 and CR 5 via IMT, it negotiated a specific waterborne proxy for that movement.

Q. Why couldn't PEF/PFC have achieved a "waterborne proxy" for PRB coal movements as Davis and Heller contend?

A. Ms. Davis at pp 30-33 and Mr. Heller at the bottom of p. 29 argue that a waterborne proxy could have been negotiated for or applied to PRB movements. But had PEF sought such a proxy, it would have risked losing $14 million/year, and the PSC would have realized PRB coal via Mobile could have been delivered for less than the price of CAPP coal via IMT. The FPSC would have seen that PFC was making millions of dollars per year charging non-market prices on CAPP coal via the affiliate water route that could not be charged to ratepayers had the Mobile route been used, or had the IMT route been forced to compete with the Mobile route.

Q. And PEF/PFC never approached the Commission with a PRB waterborne proxy proposal?

A. No. This makes the affiliate accounting on the right side of DMD-13, (because of the assumed delivered price equivalency of CAPP and PRB coal and because of the assumed waterborne proxy for PRB coal), a purely hypothetical exercise, while the left side of

DMD-13 represented real profits to the water transportation affiliates of FPC and fewer losses on its coal operations.

Q. Isn't PEF's key Exhibit DMD-4 which is repeated as JNH-4? Isn't this Witness Davis' basis for saying PRB coal was considered and economically rejected?

A. This is a critical PEF exhibit. Ms. Davis opines on it from p. 32 to p. 33. Mr. Heller even claims the waterborne rates in it are too low. His PRB water transportation rate estimates are even higher than DMD-4's assumed rates (see Heller pp. 29-30)

Q. What is wrong with Exhibit DMD-4?

A. It is not based on transactions, bids, or reliable market data, ignores the route via Mobile, Alabama, and assumes for the water route via IMT (New Orleans) that a PRB waterborne proxy on PEF's terms was or could be obtained.

Q. How do the "calculated" rates in DMD-4/JNH-4, a 1997 document, compare with market rates?

A. Not very well, as I show in Rebuttal Exhibit No. ____ (RS-33). In summary, only if one picks the wrong origin (Cora vs. Cook), assumes a waterborne proxy rather than market rates, assumes a mileage ratio method to adjust the assumed waterborne proxy, and ignores the effect of competition from the all-rail route to CR or the route via Mobile Alabama, does one gets a number in Mr. Heller's or Ms. Davis' range. But these are self serving assumptions and "assumed" numbers, not numbers based on market transactions, bids, or on FPSC rulings.

Q. Did Mr. Heller consider the Mobile route or the all-rail route for PRB coal?

A. No. (See Response to OPC's 5th Set of Interrogatories, Question 44.)

Q. Do you agree with Mr. Heller's FOB mine prices for PRB coal at Exhibit No. ____ JNH-6, p. 1 of 1 Column 1 and at JNH-2?

A. Yes. I checked actual transactions and they confirm Mr. Heller's PRB spot prices. For example, in February 2000 TECO, on its FPSC 423, reported a $4.55/ton FOB spot price vs. Heller's 2000 PRB spot price of $4.54. Apparently the source for his FOB mine PRB prices in JNH-2 (not identified) relies on market transactions.

Q. In your earlier testimony you said (p. 39, line 5: "I believe coal via McDuffie at Mobile would have been the most economic [route for PRB coal]." See pp 39-40. See also Direct Exhibit No. ____ (RS-20) and the map at Direct Exhibit No. ____ (RS-17). Do these newly produced PEF documents by Ms. Davis confirm your opinion?

A. Yes, I had not seen Mr. Edwards' documents (at DMD-13 and DMD-15 p. 1 of 1) which show he believed Mobile by rail was the likely route for PRB coal to the Gulf.

Q. What mileages are involved?

A. The haul distance for PRB coal from the PRB to CR4 and CR5 via Mobile, Alabama docks is less than the haul distance for PEF purchased CAPP coal and synfuels for CR4 and CR5 via IMT at New Orleans. See the mileages for each route at Rebuttal Exhibit No. ____ (RS-34).

Further, the IMT route involves approximately a 21 day transit time from the mine to IMT, vs. about five to six days from the PRB by rail to Mobile. Plus, the IMT route requires two transloadings and potential storage at docks, while the PRB-to-Mobile route involves only one transloading step.

Q. How does the delivered price of PRB coal via Mobile compare to Mr. Heller's estimate of the delivered PRB price via IMT?

A. The delivered price of PRB coal via Mobile was less expensive because of the affiliate dominated charges for moving PRB coal via IMT as assumed by PEF's witness Heller (compare Exhibit No. JNH-6 page 1 of 1, column (7) and with Direct Exhibit No. ___ RS-20, which uses non-affiliate pricing). My delivered PRB price via Mobile was $1.91/MMBtu. Heller's delivered PRB price via IMT (for 2003) was $2.42/MMBtu. My estimated PRB price delivered via IMT in 2003 was $1.99/MMBtu. (See Direct Exhibit No. _____ (RS-19).) I used my IMT estimate rather than my Mobile estimate to calculate overcharges. Had I used the Mobile route, the overcharges would have been greater by a significant amount.

Q. What are the underlying differences?

A. FPSC Orders do not establish water route proxy transportation rates for PRB coal, nor do I agree with (nor did the FPSC ever accept) the Heller/Davis "water proxy", mileage pro-rate method for estimating barge rates as assumed in DMD-4 and JNH-4 and supported by Heller (pp 29-30).

Q. What would be the effect of Heller's assumptions?

A. The use of Heller and DMD-4 assumptions for river route and IMT pricing make the PRB rail route to Mobile, Alabama, then by ocean barge, the most economical route for PRB coal to travel to CR4 and CR5. The TECO-to-Davant barge rate that I implicitly used by relying on TECO's PRB delivered prices to Davant for 1996-2002 is sufficient to cover both the Cook-to-IMT barge rate (established in FPSC Order PSC-04-0999-FOF-EI p.17, as $3.60/ton in 2001 and $3.75/ton in 2004) and "market" transloading costs at IMT, $1.50 to $1.80/ton. See DMD-20 Column C for "TEC" for TECO's river barge

rates which exceed the FPSC's established market rate by a wide margin. Heller "estimates" a market transloading rate at about $1.00/ton at a PRB rail to river transloading dock (Cora) for 2003 (see Exhibit ___ JNH-6, Column 3). Heller assumes, in contradiction to his own "market" transloading rate in Column 3, that PEF affiliate IMT would receive for "transloading and blending" from PEFs ratepayers six times that amount or $6.01/ton in 2003 to transload at IMT, in Column 5. Blending would not have been required at IMT. Moreover, Heller's assumed IMT rate is also in contradiction to the "market rate" IMT bid to TECO as reviewed and approved by the FPSC in Docket No. 031033-EI. Further, PEF's 2005 IMT transfer rate, which results from a market solicitation (see PEF's Confidential response to Citizen's second set of Interrogatories (No.'s 6-14) at p. 4 in Docket No. 05001-EI), shows New Orleans transloading at market pricing is a fraction of Mr. Heller's "assumed" rate.

Q. Please summarize why you believe the $/MMBtu PRB delivered prices estimated by DMD-4 and Heller are so much higher than your estimate ($2.42/MMBtu in 2003 vs. your $1.91/MMBtu in Direct Exhibit No. ____ (RS-20))?

A. PEF witnesses, Davis relying on DMD-4 and Heller, ignore the following:

1. The FPSC never approved a "waterborne proxy" for affiliate movement of PRB coal via affiliate river barges and IMT (or anywhere).
2. The fact that barge tows on the Cook to IMT haul are 35-40 barges/tow vs. 15 barges/tow on the Ohio River and the numerous locks along the Ohio River vs. a one-lock Cook Terminal to New Orleans movement, make the mileage pro-rate method inaccurate.

3. The FPSC's Order PSC-04-0999-FOF-EI establishes 2001 and 2003 Cook-to-IMT rates using market transactions. These rates contradict Heller's and Davis' numbers.

4. The role of the Mobile, Alabama route (which PEF witness Heller ignored), as the most economical route, makes it a market cap on PRB via the rail-to-Cook and water-to-IMT route. It would be very difficult for the PRB-to-Cook-to-IMT-to-CR-4/5 route of 2,640 miles to prevail in head-to-head competition with a 2,042 mile all rail to Mobile, Alabama (McDuffie), and ocean barge movement to CR 4 and CR 5. Using Mr. Heller's "assumed" affiliate numbers and Cora, instead of Cook, rail to water transloading point would insure that the all rail route to Mobile won PEF's PRB business, not PEF's "affiliates" at Heller assumed pricing. The BNSF's bids to PEF for 2002 and 2003 support this conclusion, not to mention BNSF's rail rates to the Scherer (with the NS) and Miller (an all BNSF haul) plants. (See confidential Rebuttal Exhibit No. ____ (RS-35) herewith for rail bids to PEF for PRB coal.)

Q. Do these new PFC documents or others, provided by Ms. Davis cause you to change in any way your estimate of the delivered price of PRB coal to CR 4 and CR 5 for 1996-2005?

A. No. By using the Davant (TECO) delivered price to New Orleans which incorporates an above market TECO affiliate barge rate (as confirmed by the FPSC's October 12, 2004 Order referenced above), my estimate of ratepayer overpayments is, if anything, too low. Alternatively, had I used the Mobile route for PRB coal to CR4 and CR5 instead of via New Orleans (which implicitly I do by using TECO's delivered PRB price), the overpayments by the ratepayers due to PEF's imprudence would be even higher.

Reply To Davis, Weintraub, And Heller On The Kennecott Letter And PRB Coal Availability East Of The Mississippi?

Q. PEF witness Davis (pages 36, 38, and 55) alleges PRB coal producer Kennecott in 1998 "expressly declined to make a proposal, and we received no proposals from any other subbituminous coal supplier." PEF expert witness Heller (top of p. 21) repeats these assertions. What is your response? For the Kennecott letter see Exhibit DMD-5, p. 21 of 21, attached here for convenience at Rebuttal Exhibit No. ____ (RS-36).

A. These are truly amazing assertions that conflict with the language in Kennecott's letter. Kennecott's letter at Exhibit DMD-5 offers "8400 to 9400 Btu/lb" PRB coal and Colorado coal. It says (see Exhibit DMD-5): "Our current coal portfolio is comprised of subbituminous Powder River Basin coals, with a heating value ranging from 8,400 to 9,400 Btu/lb and a Colorado coal with a heating value of 10,500 Btu." [Emphasis not in the original.]

Q. Doesn't PEF's summary bid response sheet at Exhibit DMD-5 p. 10 of 21 show alongside "Kennecott" the statement "Letter of Decline"?

A. Yes. This should have read "Letter to Decline" to provide CAPP coal. In 1998 Kennecott owned the Jacobs Ranch, Spring Creek and Codero Rojo PRB mines. It also owned 50% of a fourth PRB mine, the Decker mine. As Ms. Davis herself testifies (p. 55), TECO was able to buy spot PRB coal from Kennecott in 1998. Again, PEF was imprudent.

Q. Do you believe PRB producers would refuse to offer coal to PEF in the 1996 to 2000 period?

A. Of course not. PRB producers had excess capacity and were bidding to all interested buyers. Other utilities added over 100 million tons per year in demand, between 1996 and 2000, but that was not enough to boost prices or preclude the idling of two PRB mines, Peabody's Rawhide and Arch Coal's Coal Creek mines. Prices did not rise (see Direct Exhibit No. ____ (RS-7)). PEF just wasn't interested.

Q. **But you've testified PEF solicited for PRB coal in 1996, 1998. What is your explanation?**

A. The experienced PRB companies had been told by PEF that only CAPP coal would be purchased. However, Kennecott had just acquired PRB mines and its salesman had not figured out PEF's "exercise".

Q. Are there other instances of this?

A. Yes. PRB bidder DTE which became a big seller of PRB coal and transportation services in the east in the early 2000's offered both to PEF in response to PEF's March 2004 solicitation. Apparently this salesman and "his President" believed PEF was seriously considering buying PRB coal. The salesman contacted Mr. Pitcher as follows: "This RFP has received notice from our President and he is anxious to receive information about our bid" (see PEF-FUEL-000368-378).

Q. Did PEF buy the PRB coal bid in response to the Spring 2004 solicitation?

A. Regrettably, no. That PEF did not- and had placed itself in a position where it could not- was a very costly refusal to PEF's ratepayers.

Q. How did the other more experienced PRB bidders respond?

A. Both Arch and Peabody could offer eastern CAPP coal and PRB coal. When PEF's Dennis Edwards on May 31, 2001 notified Arch that its bid was accepted, his handwritten note to Arch was as follows: "P.S.! Central App only"! (See PEF-FUEL-004822)

Q. What about Ms. Davis assertion (p. 38 lines 11-12) "To my knowledge during the 1996 through 2002 time period we never received an offer for a spot sale of sub-bituminous coal."

A. That is either due to the fact that PEF never asked for a spot offer of PRB coal or because the PRB producers weren't wasting their time, knowing PEF only purchased CAPP coal and usually coal transported by affiliate companies, which were not economic links in moving PRB coal to Mobile, Alabama.

Q. Were the western railroads interested?

A. When asked. At Confidential Rebuttal Exhibit No. ____ (RS-35) are bids from the PRB-serving railroads and DTE, which offered railroad services and unit trains of rail cars. These bids were highly competitive.

Q. Is there any reason PEF could not have located and purchased PRB coal supply for CR 4 and CR 5?

A. No. In 1998, 141 U.S. coal-fired power plants were burning 330 million tons of PRB coal. In 1998, 101 mmt of this PRB coal was burned at plants located east of the Mississippi River.

Q. At which plants east of the Mississippi River in 1996 was PRB coal used?

A. According to FERC 423 data, in 1996 there were 41 eastern plants, most not designed for PRB coal, were burning PRB coal. A list of these plants is at Rebuttal Exhibit No. ____ (RS-37). Many of the above listed plants were increasing their percent of PRB blends in and after 1996 to capture the favorable economics of PRB coal and to meet Clean Air Act Phase I SO_2 requirements.

Q. How were the owners of these plants able to buy PRB coal when PEF could not buy it or get bids for CR 4 and CR 5?

A. They wanted to purchase PRB coal to reduce fuel cost while PEF did not want to reduce ratepayer fuel costs.

Q. Why was PEF/PFC able to obtain PRB bids in 2003 and 2004 and not 1996-2000? Was there more PRB oversupply in 2003 and 2004?

A. No. I believe Mr. Pitcher was seriously interested in PRB coal, particularly in 2004, when CAPP and imported coal prices were very high and the waterborne proxy had been reduced. Then he found out PEF had let its air permit for PRB use at CR 4 and CR 5 lapse.

Further Reply To Davis Testimony

Q. What is your response to Ms. Davis's testimony (p. 39) regarding PEF's 2001 procurement which rejected the PRB bids despite the fact they were the low bids for the two year and five year terms?

A. The PRB bids were the low bids for these periods despite the fact that the bid evaluation sheets (see Exhibit No. DMD-8 pp 1-4) show PFC evaluated the PRB bids using the "waterborne proxy" transportation cost of $29.45 per ton. As I testified earlier, there was no basis for this assumption. Had actual rail bids been obtained and utilized, the PRB bids would have been the low bids for all time periods. At that point, in 2001, PEF had not even sought a bid from the BNSF to haul coal to Mobile, Alabama. The first BNSF bid PEF received is dated August 23, 2002. (See confidential Rebuttal Exhibit No. ____ (RS-35).)

Q. Did the 2001 PRB evaluations reflect PEF's view that CR 4 and CR 5's air permit did not allow the use of PRB coal at CR 4 and CR 5 or that CR 4 and CR 5, as PEF has testified in this proceeding, could not technically burn PRB coal in a 50/50 PRB/CAPP blend?

A. No.

Q. Do you have any response to Ms. Davis extensive testimony regarding TECO's coal procurement vs. PEF's coal procurement? Please start with her statement on p. 7 criticizing your alleged statement that TECO purchased PRB coal for less than PEF purchased bituminous coal.

A. My Direct Exhibit No. ____ (RS-19) shows the data that confirm my testimony. She provides no rebuttal analysis.

Q. What about her assertion on p. 9 that PEF was aware of TECO's delivered PRB prices but believed them to be higher than TECO's other purchases.

A. This testimony demonstrates a lack of fundamental understanding of coal prices. One does not compare the delivered price of a 6.0 lbs. SO_2/MMBtu to high sulfur bituminous coal (which TECO buys for its scrubbed units at Big Bend) with 0.5 lbs. SO_2/MMBtu PRB coal (which meets CR 4 and CR 5's 1.2 lbs. SO_2/MMBtu specification) because of the differences in qualities. The appropriate comparison is the one I made at Direct Exhibit No. ____ (RS-19), which compared coals that meet the 1.2 lbs. SO_2/MMBtu specification.

Q. Ms. Davis asserts on p. 42 that PRB coal delivered to TECO was "never the cheapest, and often the most expensive, coal TECO purchased on a delivered basis to the transfer facility." What is your response.

A. I present the data she relies on in Rebuttal Exhibit No. ____ (RS-38) as it appears in her Exhibit DMD-10, for the years TECO took PRB coal.

These results show low sulfur PRB coal purchased on a spot basis was <u>less</u> expensive than all spot coal purchased by TECO at ECT for 1999-2002. From 1996-1998 it was

more expensive than the average spot purchased high sulfur coal. Again, this is not the appropriate frame of reference.

Q. Please respond to Ms. Davis' testimony from the bottom of p. 41 through p. 43, where she says PEF purchased coal for less than TECO.

A. Again, Ms. Davis is wrong. She continues to ignore the differences in coal quality I commented on above and the fact that the issue is the delivered cost of PRB coal via the water route vs. bituminous coals via the water route to Crystal River that is at issue. Further, she does not acknowledge that it was the lower cost of direct rail delivered CAPP coal to CR 4 and CR 5 that enabled PE to have lower overall coal delivered cost than TECO's. This route avoided transportation using PEF's affiliates. Most of the coal delivered to Crystal River moved by rail.

Reply To PEF's Kennedy

Q. What is your response to PEF Witness Kennedy's assertions on p. 5 about why PEF failed in 1996 to request a Title V permit that allowed it to burn subbituminous coal at CR 4 and CR 5.

A. PEF has continued to shift its "story" as to why it failed to secure a Title V permit for subbituminous coal at CR 4 and CR 5. In its response to OPC's 4th Set of Interrogatories No. 25 (a) through 25 (d), PEF offered different reasons.

Q. Did PEF originally contend it could not burn subbituminous coal because it had no permit to allow it to do so?

A. Yes. This assertion required OPC to approach the FDEP directly in order to determine that PEF's failure to maintain permission to burn PRB coal rather than any action by FDEP caused PEF to lack authority to burn PRB coal.

Q. What did PEF say?

A. In PE's November 7, 2005 Response in Opposition to OPC's Motion . . ." PE stated:

> "For exaple, Mr. Samson's [sic] opinion that PEF failed to award a contract to the "lowest bidder in the 2004 RFP process" fails to reveal that the referenced bids either offered *sub-bituminous* coal which the Crystal River units cannot burn under existing environmental permits or they involved transportation logistics that would not provide efficient and reliable delivery of the coals offered."

Q. This was not the full story was it?

A. No. Omitted was the fact that PEF chose not to maintain or acquire the air permits to burn PRB coal. In other words, PEF allowed its authority to burn a PRB/CAPP blend to lapse, then justified its failure to buy the lowest cost coal bid to an RFP by invoking the limitations of the environmental permit that it had shaped. PEF's explanation was disingenuous, and belies, the claim that PEF has been open about its procurement efforts. Further, PEF's witnesses have not alleged PRB coal could not be delivered reliably.

PEF's Reliance On Sargent & Lundy's 50/50 Comment

Q. PFC Witness Weintraub (bottom of p. 31) and PEF's expert Hatt (top of p. 51) claim Sargent & Lundy recommended against a 50/50 PRB/CAPP blend. Do you agree?

A. No. Sargent & Lundy's report addressed a 50/50 blend of ILLB/PRB, not a PRB/CAPP 50/50 blend. S&L's comment on an Illinois Basin blend is so cryptic and undocumented, it appears to have been offered as an aside. In any event, Sargent & Lundy's statement would not apply to a PRB/CAPP blend. The ash fusion characteristics of Illinois Basin coal and PRB coal make this combination a more difficult blend for a pulverized coal (PC) boiler. (CR4 and CR5 are PC boilers). By contrast, ILLB/PRB blends have been used successfully in cyclone boilers, and also in PC boilers (see my list above).

Q. Does the Sargent & Lundy statement apply to a PRB/CAPP 50/50 blend at CR4 and CR5?

A. No, and efforts by PEF to claim or imply otherwise are wrong. Mounds of evidence from almost 20 years of PRB/CAPP blends at 50/50, 70/30, 30/70, etc. demonstrate that there is no evidence a 50/50 PRB/CAPP blend would not work at CR4 and CR5.

Q. Didn't B&W design CR 4 and CR 5 for a 50/50 blend?

A. Yes. If CR4 and CR5 could not operate on a 50/50 CAPP/PRB blend, PEF would have had recourse against B&W and B&V. Given the decade of PRB and PRB/bituminous experience available to B&W when it began its CR4 and CR5 design, one can be confident B&W never would have accepted FPC's design specification if Sargent & Lundy's report could be read as PEF's witnesses read it.

Heller, Dean, And Windham's "Contractual And Physical Constraints" On Potential PRB Tons Via The Water Route

Q. Witness Heller, at the top of page 27, claims that PRB coal could not have been delivered at the tonnages you assume because of other contract commitments to move Massey contract CAPP coal via the water route. Witness Windham (bottom of p. 12) limits his imports to CR 4 and CR 5 to 1 MMTpy for the same reason. Also Mr. Dean (pp. 21-22) in his SO_2 calculations relies on Heller's contractual constraint theory. What is your response?

A. Heller (thus Dean) and Windham both ignore the fact that Massey coal was more economically delivered to CR 4 and CR 5 via rail. In fact, it was originally purchased for rail delivery. Even PFC's Al Pitcher found Massey coal was more economical by rail. He informed PE's Kyle Crake in a September 14, 2004 email (see Rebuttal Exhibit No.

____ (RS-39)) as follows: ". . . we have shifted the entire Massey Delta [CR 4/5] contract to rail delivery, because this is the most economical move for this coal. . ."

Q. What does this email reveal about PEF's new 2005-2006 affiliate contract awarded after the fall 2004 solicitation?

A. This email is further evidence of the imprudent award PFC made to its affiliate coal companies that I described at p. 49-50 of my direct testimony. Why would PFC buy coal from itself to move by the same route to CR 4 and CR 5 that it had just found uneconomic for the Massey coal? The answer: To provide another imprudent award to an affiliate.

Q. As a result of the April 2004 water route pricing settlement, didn't water transportation cost drop, and wouldn't these lower rates have made Massey more competitive by water?

A. Massey coal was never competitive by water compared with the rail route. Therefore, Mr. Pitcher's statement in September 2004 is an admission that Massey coal by the water route was even more costly to ratepayers (than via the rail route) prior to April 2004.

Q. What about Mr. Weintraub's claim at p. 24-25 that the water route unloading capacity at CR 4 and CR 5 would preclude deliveries of PRB coal by water in the tonnages you found economical?

A. This is incorrect. The PRB tonnage I assume (1996-2005) to be delivered by water to CR is well below the level of demonstrated water route unloading capability at CR. PEF represented in 2006 to FDEP that the past barge delivery capability to CR was 2.5 mmtpy. The maximum annual PRB tons delivered to CR4 and CR5 by water 1996-2005 in my analysis was 2.280 mmt.

Q. Do you agree with Staff Witness Windham that imported coal was an option?

A. Yes. Imported coal could displace PRB coal by water to CR4 and CR5 if it becomes less expensive. In the past, PRB coal to CR4 and CR5 was less expensive than imported coal; however, imported coal was less expensive than CAPP coal and synfuels delivered by the water route. See Direct Exhibit No. ____ (RS-19) page 1 of 1. I agree with STAFF Witness Windham's findings to this extent.

Mr. Heller's Reliance On Mr. Hatt

Q. What is your assessment of Mr. Heller's use of Mr. Hatt's estimates of the cost to modify CR 4 and CR 5 coal yard and boilers to burn PRB coal?

A. Mr. Heller relies on Mr. Hatt's estimates (see Heller at p. 31 lines 14-17, p. 33 lines 8-15 and JNH-5). He apparently accepted Mr. Hatt's numbers without any review or check as to their quality and consistency with the capability of CR 4 and CR 5.

Q. How do you know this?

A. In response to OPC's Fifth Set of Interrogatories No. 47, Mr. Heller claims he did not assume another pulverizer was required at CR 4 and CR 5 to burn a 50/50 blend of PRB/CAPP coal. But he uses Mr. Hatt's estimates in Exhibit JNH-5 which assume another pulverizer is necessary. (See Hatt Exhibit RH-8.) See also Hatt's handwritten notes at PEF-FUEL-007305-16.

Q. Are you saying Heller's results rest on Hatt's "back of the envelope" estimates?

A. Yes. If Hatt's estimates are invalid, Heller's results are invalid. OPC Witness Barsin addresses Hatt's results.

Q. What is your opinion of Hatt's results?

A. They ignore the engineering capability designed into the CR 4 and CR 5 boilers, ESPs, and pulverizers by B&V and B&W and they ignore the coal yard design and as-built capabilities. OPC Witnesses Barsin and Putman address these subjects in detail.

Q. When you performed your analysis: (a) What additional cost did you assume would be incurred to burn a 50/50 PRB/CAPP blend at CR 4 and CR 5? And (b) On what did you rely?

A. I assumed a cost to blend at CR 4 and CR 5 of 4 ¢/MMBtu, or about $1.2 million per year (see Direct Exhibit No. ____ (RS-27) item (9)), and that CR 4 and 5 were properly designed by B&V to burn a 50/50 PRB/CAPP blend. (See my direct testimony at p. 53 lines 6-11 and Direct Exhibits No. ____ (RS-2) through Rebuttal Exhibit ____ (RS-4).)

Q. Do you have anything to add after reviewing Mr. Hatt's and Mr. Wientraub's testimonies and visiting CR on February 22, 2007?

A. Yes. First, I believe Mr. Hatt and Wientraub ignore the engineering work of Sargent & Lundy and PEF engineers which confirm the B&V and B&W design. Both witnesses note the studies but dismiss their findings. Mr. Heller completely ignores these studies. The increased investment and extra operational measures in the coal yard required to burn PRB subbituminous coal compared with bituminous coal were well known when CR4 and CR5 were designed. These characteristics were even singled out in FPC's February 28, 1980 filing for site certification of CR4 and CR5 (see my Direct Exhibit No. ____ (RS-4), p. 11 of 11). The design of CR4 and CR5 incorporated the equipment necessary to blend PRB coal at the CR4 and CR5 site (see Florida Power Corporation System Design Specification, Volume II, Crystal River Plant Units 4 and 5 by Black & Veatch Consulting Engineers).

PEF's own studies of the repairs and upgrades required at CR4 and CR5 to utilize PRB coal recognized that the bulk of the expenditures required were to return CR4 and CR5 to its original capability. Items on PEF's Dan Donochod's list include "repair Mill inerting

system, install new crusher by pass screens, fix chute bottlenecks, fix soot blowers, etc." These repairs and upgrades were estimated to cost $8.0 million in one-time costs (see PEF-FUEL-002314) in April 2006 and $5.3 million on January 13, 2006 (PEF-FUEL-002199). Annual O&M costs were expected to increase by $420,000 per year for up to 100% PRB utilization (see PEF-FUEL-002319). See the following PEF engineering documents:

- March 2006 PEF-FUEL-001937-1948
- April 27, 2006 PEF-FUEL-002284-003506
- October 24, 2005 PEF-FUEL-002070-002101
- January 13, 2006 PEF-FUEL-002237-002306

PEF did its own engineering ("Vista") modeling that showed (12/19/05) that for a 20% PRB/CAPP blend the performance results at CR4 and CR5 would be favorable (PEF-FUEL-002153), as the May 2006 test burn confirmed.

Q. Did PEF's work find a PRB blend to be uneconomic as Mr. Heller claims?

A. No. PEF's October 24, 2005 estimate of the savings in fuel and SO2 costs of a 20% PRB blend were:

- 2007 $15.5 million
- 2008 $13.2 million
- 2009 $10.8 million
- 2010 $ 9.4 million
- Total $48.9 million (see PEF-FUEL-002047 at Direct Exhibit __ RS-12, p. 7 of 10)

Of Course, the savings would be greater with a 50% PRB blend.

The "pay back" on the estimated $7 million investment required (mostly to repair equipment at CR4 and CR5) was described as "payback < 1 yr" (see PEF-FUEL-002090). Of course PEF's investment to return CR4 and CR5 to its original capability is not a fuel cost expense and could not be charged to ratepayers. PEF has separately asserted its cost to blend synfuels was not billed to ratepayers.

Q. Were these engineering findings confirmed by your plant visit?

A. Yes. The coal yard, as designed and built, was in disrepair. Recently, I accompanied other OPC representatives on a site inspection of CR 4 and CR 5. I took photographes, which fairly depicted what I saw. My photographs, Rebuttal Exhibit No. ____ (RS-40), show the equipment to maintain proper dust controls had been cut out, stubbed off, and discarded, or was unused. Nonetheless, the basic infrastructure was intact with water for dust control and safety available throughout the system, the baghouse infrastructure for dust control at the boilers was intact, and inerting ports were visible on the pulverizers.

Q. What about Mr. Hatt's "discovery" of un-built conveyors (see Hatt testimony at the bottom of p. 28)?

A. The un-built conveyors are shown in a PEF 1980 engineering layout as dotted lines. Consequently, Mr. Hatt has not discovered un-built conveyors between transfer points 24 and 27. These "un-built" conveyors are clearly shown on CR 4 and CR 5's coal yard lay out (at Rebuttal Exhibit No. ____ (RS-41)). All are prior to CR 4 and CR 5's stacker/claimer No. 2 in the north coal yard. This means the 100% redundancy in the B&V design is not affected (see B&V coal yard manual), because the CR 4 and CR 5 units always have two reclaim methods and belts from stockpiles to the crusher building. The only role of the un-built conveyors would be to provide redundancy from the south coal yard and unloading points to the CR 4 and CR 5 north coal yard; that is, to handle

unloading contingencies, not boiler fueling contingencies. These un-built conveyors are unnecessary given the capacity of the single conveyors from TP 24 to TP 27 and the ability of south coal yard to take rail and barge coal without interruption if these conveyors are inoperable. They could fail and be repaired without interrupting coal flows to CR 4 and CR 5 or disrupting unloading.

Q. Did you find anything else that conflicted with Mr. Hatt's coal yard assessment in his testimony in this case?

A. Yes. A PEF engineer had contacted Mr. Hatt on May 3, 2005 at which time Mr. Hatt's assessment of the task of utilizing PRB coal safely was much more benign than it is in Hatt's 2007 testimony (PEF-FUEL-001762 at Rebuttal Exhibit No. ____ (RS-42)).

Q. What did Mr. Hatt say in 2005 vs. 2007?

A. According to the notes of PEF's engineer, in 2005 Mr. Hatt said the key to successful PRB use was: **Ability to clean up each day immaculate housekeeping**.

Q. Having reviewed Mr. Hatt's testimony, having obtained the Black & Veatch Coal Yard Design Specifications, having visited Crystal River, and having seen PEF's responses that admit PEF blended synfuels and bituminous coal at Crystal River, would you change anything in your testimony about blending PRB and CAPP coal at the Crystal River site?

A. These documents and my visit show I was unnecessarily conservative in my overcharges estimate when I assumed a 4 ¢/MMBtu of PRB coal blending cost, which was deducted from my estimated overpayments by PEF's ratepayers. The Crystal River coal yard was designed to blend PRB/CAPP coal at a 50/50 blend. The stacker/reclaimers, the belt scales and drives, and the coal yard control system and the conveyor capabilities were installed to blend and supply 330 tph per unit for CR 4 and CR 5.

Q. How much would this reassessment change your overcharge estimate?

A. It would increase it by $13.2 million without interest.

Q. Do you agree with Mr. Heller's use of 8910 Btu/lb. "big box" specification at p. 14 and 15 of his testimony?

A. No, and as disclosed by Mr. Heller's answer to OPC's Fifth Set of Interrogatories Question 46, this appears to be another example of Mr. Heller blindly accepting a specification or cost estimate without examining its underlying basis. His specification was not based on the B&V and B&W specifications, which apparently Mr. Heller did not examine or utilize. Mr. Heller touts B&V's involvement with CQIM (at Heller p. 20 lines 1-4), but ignores the fact and consequences of B&V's design of CR 4 and CR 5.

Q. Please explain.

A. As addressed in detail by Mr. Barsin, B&V's design of CR 4 and CR 5 renders incorrect Mr. Heller's so-called evaluated or CQIM penalties and purported de-rates resulting from the use of PRB coal in a 50/50 blend at CR 4 and CR 5 (See Heller p. 15 line 1, p. 20 lines 1-4, pp. 35 and 36, and p. 39 lines 18 to p. 40 line 3). The engineering work of PE's engineers using PE's Vista model, which is an updated CQIM model, and incorporating Sargent & Lundy's October 14, 2005 report on CR 4 and CR 5, which I summarize above, conflicts with Mr. Heller's work which relies instead on Mr. Hatt's non-engineering analysis.

Q. What is your response to Heller's use of spot PRB prices for his analysis rather than use the PRB bids received by PEF for CR 4 and CR 5 in 2003 and 2004?

A. Heller criticizes me (p. 41 lines 8-14), as does PEF's Davis, for using (for 1996-2002) TECO's delivered PRB costs because TECO purchased PRB coal on a spot basis. Yet, when Mr. Heller had PFC's 2003 and 2004 term contract PRB bids (p. 22 lines 3-11), he

does not employ them. I explained my choice to use TECO's PRB prices in my direct testimony at p. 40 lines 14-22. My reliance on TECO's transactions "came down to the availability of good data". This caused, as I noted in my testimony, my estimates of overpayments by PEF's ratepayers to be less than had I used the less costly Mobile route for PRB transportation.

Q. Were PRB FOB mine contract prices, during the period 1996-2003, materially above the spot prices TECO apparently employed?

A. Contract PRB prices FOB mine were approximately 25 cents/ton or about 5% (e.g. $4.75/ton vs. $4.50/ton) FOB mine above spot prices for 8800 Btu/lb coal. This on a ¢/MMBtu basis is 1.42 ¢/MMBtu. This adjustment to TECO's prices would not have a significant effect on my results. In any event, it is only 35% of the 4.0 ¢/MMBtu blending cost I included, but, now after receipt of the information described above on the coal yard, realize was unnecessary. Nor did I add to the overcharges the additional savings available had the PRB coal moved via Mobile. In other words, the net effect of any adjustment in these two items - including the difference between TECO's spot and contract prices - would be to increase OPC's $143 million estimate of ratepayer overpayments by about $25 million for the 1996 to 2005 period.

Q. Please summarize the PRB bids PEF received in 2003 and 2004 that Mr. Heller refuses to employ in his analysis.

A. PEF received firm economical bids for PRB coal and transportation in 2003 and in 2004 from the major PRB producers. In 2004 PEF had bids for PRB rail transportation only, allowing it to couple FOB mine bids with a low cost transportation bid including rail cars. (See 5/20/04 CR4 and CR5 evaluation sheet and supporting PRB bid documents from (at PEF-FUEL-000357-000473) Arch Coal Sales, DTE Energy, Peabody CoalSales, Triton

Coal Company, and Kennecott. See also UP and BNSF letters. Simultaneous bids from South American and CAPP bidders reflected much higher prices. The bids received in 2004 for 2005-2007 were for fixed prices for three years and offered 2 mmt in 2005, 2.2 mmt in 2006, and 2.2 mmt in 2007. The quantities bid by the four major PRB producers are shown at Rebuttal Exhibit No. ____ (RS-43).

Therefore, acting on 2004's bids would have secured PRB coal supplies for CR4 and CR5 through 2007. Mr. Heller ignores both 2003 and 2004 PRB bids, which had they been accepted would have saved PEF ratepayers tens of millions of dollars.

Ratepayer SO_2 Overpayments And Mr. Dean's Testimony

Q. Mr. Dean's testimony (p. 5 lines 18-19) claims you have overstated the SO_2 excess ratepayer cost by $2,913,513. His view is that had PRB coal been blended at CR 4 and CR 5, the ratepayer is entitled to only $15,015,204 in relief, not your $17,928,717. Do you agree?

A. No.

Q. Why?

A. Mr. Dean criticizes my use of EPA AP-42 SO_2 emission factors for CAPP coal vs. PRB coal and believes I have made calculation errors.

Q. What is your response?

A. Reliance on AP-42 is a common method. In fact PEF in its response to OPC's Interrogatory No. 26 said as follows, specifically relying on AP-42: "With subbituminous coal about 10% more fuel sulfur in ash is retained in the bottom ash and particulate because of the more alkaline nature of the coal ash." Mr. Dean at pp. 18-19 disagrees with AP-42

and its "A" quality of data rating, but offers nothing better. Spurred by his criticism, I have a specific improvement to offer in response to his criticism of AP-42.

Q. What is your improvement?

A. I have obtained data on the as burned sulfur content and SO_2 emissions at Crystal River 4/5 and Southern Company's Miller Units 1-4 which are very similar B&W units.

Q. Where did you get this data?

A. The as burned data is from PEF's and Alabama Power's reporting respectively for Crystal River 4/5 and Miller 1-4 on DOE/EIA Form 767 and the emissions data from the utilities CEMS (Continuous Emission Monitoring) data reported to U.S. EPA.

Q. What are these results?

A. They are shown at Rebuttal Exhibit No. ____ (RS-44).

Q. How do the percent removals of SO_2 shown at Rebuttal Exhibit No. ____ (RS-44) for the specific B&W boiler type installed at Crystal River compare with the estimates in U.S. EPA AP-42?

A. These actual results, which are responsive to Mr. Dean's criticisms of the dated quality of the data underlying AP-42, show a greater than 10% greater sulfur removal in ash due to PRB coal use compared with CAPP bituminous coal. On average 18.3% of subbituminous SO_2 is removed in the B&W Miller boilers versus only 6.0% in the similar B&W boilers at Crystal River 4/5 burning bituminous coal.

Q. Have you prepared an exhibit in which you re-calculate the SO_2 overpayments using this new data and accepting Mr. Dean's mathematical approach?

A. Yes. Rebuttal Exhibit No. ____ (RS-45) shows that my estimate of the SO_2 overpayments was $989,009 above what it should have been, i.e. the ratepayer overpayments for SO_2 allowances should have been $16,938,708 not my $17,928,717 or

Mr. Dean's $15,015,717. Seventy-eight percent of this $989,009 reduction in my estimate was due to my failure to take the 7.5% PRB Btu reduction in 2005 due to my adjustment for the reduced PRB rail deliveries from May-December 2005 experienced by many utilities receiving PRB coal.

Q. Did this error carry over to your calculations of the excess fuel cost estimate you made which appears at Direct Exhibit No. ____ (RS-26) and Direct Exhibit No. ____ (RS-27)?

A. No.

Damages Summary

Q. Do you continue to believe your estimate of the over payments by PEF's ratepayers as estimated by you at Direct Exhibit No. ____ (RS-26) is conservative i.e. an underestimate?

A. Yes. As I've pointed out, I included what is now an unneeded (and even if applicable, unrecoverable) 4 cents per MMBtu for blending at Crystal River. This would increase my overcharge estimate by $13.2 million without interest. I did not use PRB transportation rates via Mobile, Alabama which would have been less expensive than via New Orleans, providing another ratepayer savings of at least another $15 million without interest.

Q. Anything else?

A. Yes. Given the higher (8,800) Btu/lb PRB coal available as opposed to the B&W design PRB Btu/lb assumption of 8,125 Btu/lb, I could have increased the PRB Btu percent of the blend at Crystal River to 41.3% as opposed to 40% and still met design conditions. This would have saved ratepayers an additional $4,580,092.

Safety of PRB

Q. Do you have any comment on Mr. Hatt's testimony regarding the risks of fire and explosions at plants using PRB coal?

A. As I noted earlier, Mr. Hatt has changed his tune between 2005 and 2007. In his 2005 telephone conversation with PEF's engineer he said what I've heard for decades about the "good housekeeping" care that must be taken in PRB coal yards. I've toured the coal yards at about a dozen PRB using (some in blends) power plants and many PRB coal mines. During these visits, not only have I never been warned that I was in any way at risk (more than I was driving to the plant on public roads), I have never felt a significant risk.

Q. Do explosions occur at coal boilers?

A. Yes. In the last 10 years one occurred at a unit of KCP&L's Hawthorne Unit 5 and another at Power House #1 at Ford Motor Company's River Rouge plant. Boiler explosions can be extremely dangerous. Neither explosion was attributed to subbituminous coal. Explosions are rarely a risk in the coal yard prior to the enclosed areas of the crusher building or the boiler area itself. Fires can and do occur in coal yards, and in fact, above ground at coal mines, including bituminous coal mines.

Q. What is your response to the consideration given to these matters by PEF's nuclear safety expert Mr. Fetter and PEF's CR 3 plant manager Mr. Franke?

A. Their concerns are invalid and misplaced. The movement of PRB coal from the barge and rail unloader would not be a serious risk for the reasons I outlined above. If there is any concern it would be due to bituminous coal within the boilers at CR 1 and CR 2, which are located alongside the nuclear unit at CR 3. Neither witness even mentions this risk. If this more serious risk of a coal explosion does not merit PEF's or the NRC's

concerns, the movement of PRB coal through the coal yard to the boiler and crusher house enclosures at the far-to-the-north CR 4 and CR 5 units should be of no concern.

PFC And Synfuels

Q. After reviewing the testimonies of Davis, Pitcher, and Weintraub, do you still believe synfuels were important to your view that PFC failed to procure PRB coal for CR 4 and CR 5?

A. Yes. While in the 1990's PFC had ample affiliate incentives to ignore the benefits to ratepayers of PRB use in a blend at CR 4 and 5, even PFC coal buyer Edwards on February 9, 1998 predicted ("my guess") that by 2000 PRB "in all likelihood" would be the water route coal for CR 4 and CR 5 (see Exhibit DMD-9 p. 11 of 84). In my view the PE decision in 1999 to capitalize on synfuels tax credits put PRB coal on the back burner as a PEF/PFC priority. The value of synfuels tax credits per ton was about $24 in 2000 and this was on top of the roughly $7.00/ton price PFC's affiliates were making on CAPP coal via the water route. It was a "perfect arrangement" for shareholders. Unfortunately it cost ratepayers millions.

Q. But Weintraub (p. 25 line 15 to p. 27 line 6), Davis (p. 46 line 23 to p. 51 line 51), and Pitcher (p. 25 line 4 to p. 28 line 4) all deny synfuels played any role in PFC's failure to buy PRB coal. How do you respond? First address PEF's claims that synfuels saved PEF approximately $2/ton.

A. As I testified in my direct testimony, because PRB coal was much less expensive than "synfuels" at CR4 and CR5 for 2000-2005 (see Direct Exhibit No. ____ (RS-19), p. 1 of 1), substituting synfuels for PRB coal was very costly to ratepayers. There was no $2 per ton "savings" vs. PRB coal. Regarding even synfuels vs. bituminous coals, that

statement is wrong. Imported coals were less expensive than synfuels. PFC-bid synfuels were 2,091 miles away from CR; therefore, they carried high transportation costs. The use of synfuels entailed undisclosed blending costs and operational problems. (See, for example, DMD-9, pages 28 and 65. Note that the synfuels blend was "50/50".) Also, because of the applicable emission limit at CR4 and CR5 while blending synfuels, PFC had to use more expensive lower sulfur bituminous coal as a synfuel feed stock.

Q. What about PFC as a bituminous coal buyer for PEF? Did that role conflict with PFC's synfuels interest?

A. Yes, because PEF synfuel affiliates, like Black Hawk, as buyers of bituminous coals for synfuels plants were competing with PEF "regulated" fuel buyers, PEF was not only imprudent, it had a conflict of interest, allowing it to potentially intercept bituminous coal bids to PEF, and flip them to its synfuels plants. In its 2nd Quarter 2006 SEC Form 10-Q PE reports at page 71 its Coal Terminals and Marketing subsidiary received a $103 million payment from a coal supplier for a coal contract that was scheduled to run through 2007. This was the same term as the July 2003 bid from Panther/Infinity that Mr. Pitcher failed to secure for PE's customers following the July 2003 solicitation.

Q. Did PFC have reserves and coal production near its synfuels plants?

A. No. PFC's affiliates controlled no reserves or "owned" coal production near PE's Kanawha River synfuels plants. PFC needed to buy coal for its synfuel plants to earn tax credits and related profits, posing a direct conflict with PFC's interest as a buyer of coal on behalf of PEF.

Q. Were PE's witnesses in this case involved in these activities?

A. Yes. PEF witnesses Pitcher, Davis and Weintraub were in "revolving door" arrangements on behalf of PFC and Black Hawk as entities buying coal for synfuel plants (not

majority owned by PE affiliates), buying coal on behalf of PFC for PEF, and selling synfuels to PEF and others.

Q. Please explain their involvements.

A. At Rebuttal Exhibit No. ____ (RS-46) is a "Proposed Agenda" for a March 14, 2005 synfuels meeting involving among others PEF's Sasha Weintraub and Donna Davis, representing Black Hawk SynFuel LLC. Mr. Weintraub is PFC's witness on 2005 and 2006 coal procurement for PEF (see for example p. 2 lines 15-17 and p. 5 lines 21-23). He states on p. 6 lines 23-24 that in mid-to-late 2005 he "assumed responsibilities for coal procurement for Crystal River coal plants."

Q. PEF Witness Davis attended the same meeting. What was her PFC role?

A. Ms. Davis at pp 3 lines 22-24 and p. 4 lines 1-3 testifies she had through 2005 accounting responsibilities for both the "regulated business" and "fuels costs" and from 2004 "for the accounting of PFC's non-regulated coal activities". Having left PEF sometime in 2005, Ms. Davis became on December 1, 2005 a contract employee to PE, still involved in synfuel accounting.

Q. And Mr. Pitcher. What was his PFC role?

A. PEF files show (see Rebuttal Exhibit No. ____ (RS-47)), Mr. Pitcher, as of June 12, 2001, was a VP for Sales for Black Hawk Synfuel LLC, located in St. Petersburg Florida, bidding coal to Mr. Edwards, VP of EFC at the same location. According to Mr. Pitcher's testimony (p. 2 lines 5-9): "In September 2002, following the change of EFC's name to PFC, I assumed the position of Vice President of Coal Procurement." It appears that within a short period Mr. Pitcher went from selling synfuels as a Black Hawk employee to buying synfuels on behalf of PEF.

Q. Does the March 2005 "Agenda" at Rebuttal Exhibit No. ____ (RS-46) show New River Synfuel LLC was buying coal from entities that bid coal to PFC in response to PFC solicitations for PEF?

A. Yes. Infinity Coal Sales, was supplying Black Hawk Synfuel or New River Synfuel with bituminous coal feedstock. Infinity was the bidder in July 2003 to PFC for PEF's July 2003 coal solicitation about which I testified (pp 32-33) on direct.

Q. Do these Agenda notes confirm Mr. Pitcher's claim (p. 27 lines 15-17) that bituminous coal bidders would get more selling to PEF rather than to a synfuel plant as a feedstock?

A. No. The notes show that when Infinity supplied coal to New River/Black Hawk it received a $4/ton "spread" above the synfuels sales price. This means if the testimony of PEF's witnesses about a $2/ton differential between synfuels and bituminous coal sales prices is correct, that Infinity made $2/ton more selling coal to Black Hawk Synfuels/ New River Synfuels than to PFC for PEF.

Q. Does other evidence refute the assertion by PEF's Davis, Weintraub and Pitcher that synfuels were less expensive than bituminous coal?

A. Yes. The responses to PEF's July 2003 solicitation demonstrated that an unaffiliated non-synfuel (i.e., bituminous) bid from Infinity Coal Sales could not be matched by PEF's Black Hawk synfuel affiliate, despite PFC improperly giving Black Hawk the opportunity to match the bituminous coal bid. (Sansom testimony at p. 32, lines 1-13 and p. 31, lines 9-20. See also PEF-FUEL-004747-004763.)

Q. Mr. Pitcher goes to some length (pp 25-27) to deny any imprudence. What is your response?

A. He claims he was not imprudent to offer Black Hawk Synfuels the right to match Infinity's bituminous coal offer to PEF. I disagree. Black Hawk had no coal to offer in response to the solicitation. Fundamentally, you do not "short list" and give the opportunity to match the low bid to coal companies that have no coal to offer.

Q. How do you regard Witness Davis' testimony (pp 49-50) that "tax credits" from synfuel sales to PEF were "minimal" compared to other synfuel sales, and therefore could not have affected PFC's activities buying coal for PEF.

A. Synfuels profits to PE came from various synfuels activities, not just direct tax credits. A PE press release of June 16, 2004 on the sale in two transactions of 49.8% of its interest in Colona SynFuel Limited Partnershp LLLP stated: "These transactions will add incremental pre-tax income of $15 to $20 million per year." This statement shows PE/PFC's income could be increased with reduced ownership of synfuels machines. PE's 100% owned affiliates Black Hawk Synfuel, 10% affiliate New River Synfuel, and 100% owned Kanawha River terminals were all in the supply chain to provide bituminous coal to synfuel machines and ultimately synfuels to PEF. According to an October 15, 2004 PEC filing at FERC: "Black Hawk holds ownership in, and provides operational, supply and marketing services to New River Synfuel, LLC. Black Hawk owns 10 percent of New River Synfuel." Why were so many PE employees at the March 2005 meeting (see Rebuttal Exhibit No. ____ (RS-46)) if PE had so little at stake?

Q. Is there other evidence of the importance of synfuels to PFC/PEF?

A. Yes. The asset value of PE's docks used in moving coal to CR4 and CR5 via IMT was dependent on synfuel flows. This was proven in 2006 when a sharp rise in oil prices caused PE to reduce the value of its assets. (See PE's 2nd Qtr 2006 SEC Form 10-Q report pp. 69-71 and PE's May 22, 2006 press release.) While neither the profits of nor

the relationships among these PE synfuel entities have been disclosed, if the synfuel had not been sold to PEF from 2000-2004, the profits of these affiliates and the asset value of PE's docks would have been adversely affected.

Q. Why did PFC-shipped synfuels to PEF decline in 2004 and 2005 as described by Witness Weintraub at the bottom on p. 26?

A. The decline in synfuels shipments to IMT in 2004 and 2005 can be attributed, in part, to: (1) the April 2004 water route transportation settlement, which removed a large profit stream to PFC from its shipments to PEF via IMT, and (2) better economic access to synfuels markets closer to the Kanawha River area.

Q. Did PFC's synfuels selling entities quit marketing to PEF in 2004?

A. No. As late as August 2004 PFC's Marketing & Trading provided an "indication of product availability for 2005 and 2006" (provided in response to Citizen's Sixth POD and shown herewith as Rebuttal Exhibit No. ____ (RS-48)) and expected to ship a "synfuel product". This "indication" was not a qualified bid and should have been rejected; instead it led to a 2 year, 480,000 tons per year bituminous coal contract at a high price from an undisclosed coal source which was not a PFC producing company.

Q. Ms. Davis at the bottom of p. 50 describes a "twist arrangement" which she contends benefited ratepayers. Do you agree?

A. No. I reiterate that the assertions of Davis, Pitcher, and Weintraub that the ratepayer benefited from PFC synfuels shipped via New Orleans conflicts with the fact that PRB (and imported) coal via Mobile would have been the appropriate and more economical arrangement had PFC procured coal prudently. I have provided an analysis which, with interest, shows that PEF's ratepayers have paid at least $143 million for this imprudency.

Q. Does this complete your rebuttal testimony?

A. Yes.

BY MR. McGLOTHLIN:

Q And, Mr. Sansom, did you also prepare the exhibits that were preliminarily designated RS-30 through 48 that are attached to the rebuttal testimony?

A Yes. Now, there is one question on whether the -- I understand RS-35 is now no longer confidential by the agreement of the parties, just to point that out. Originally I thought it might be confidential.

Q That's correct. There is no longer a confidential claim on 35.

Did you prepare a summary of your rebuttal testimony, Mr. Sansom?

A I have a brief summary.

Q Please proceed.

A My rebuttal testimony addressed the testimony of PEF Witnesses Pitcher, Davis, Weintraub, Hatt, Heller, Dean, Kennedy, Fetter, and Frank. To summarize, I'm just going to stick to the big issues here to facilitate the review of my rebuttal testimony. One of the big issues in response to Heller, Davis, and Pitcher is the waterborne proxy. It is my position that they have improperly applied the waterborne proxy to Powder River Basin bids, and that is contrary to the Commissions orders, which don't address Powder River Basin coal. It is contrary to common sense in that the Powder River Basin transportation route to Crystal River, the most

economical route, would entail a 1,600-mile rail haul to Mobile, Alabama. And in the exhibit that is now no longer confidential, you will see the rail, the indicative rail bids of 15.95 per ton, and then there be would a transloading charge of approximately $1.50 a ton, and then the only involvement of any PEF affiliate would be the ocean barge transportation from Mobile to Crystal River.

Applying an affiliate waterborne proxy to that route of movement of $4 to $6 FOB Mine Powder River Basin coal would make no more sense than applying it to the rail rate for Central Appalachian coal for the 1,000 mile rail haul from Central Appalachian direct to Crystal River. And I think that the gist of my testimony here is that instead of using affiliate economics and proxies, that the imprudent behavior of this utility was that they assumed that in their bid analysis, that is the proxy, rather than relying on the market and, therefore, denied the ratepayers the benefit of market forces through the application of a methodology.

Now, my key exhibits here are RS-33, which I give you specific market versus proxy numbers; RS-20, which addresses my via Mobile estimates; the Powder River Basin bids at RS-35; and the applicable mileages at RS-34. And I would point out that on Page 39 of my direct testimony, I address the favorable economics of the Mobile route. And, I used the Davant route for a damage estimate to be conservative, and had I used the

Mobile route, the savings, the additional savings that I would have estimated to the ratepayers would have been $33.5 million on top of the 143, which includes interest. My estimate was 134, somebody else did the interest calculation.

Now, let me explore a little bit more detail. The methodology, a prudent utility that buys coal looks at the coal supply regions that produce a product that qualifies to be burned at the utility. They look at the transportation options to get that coal to the utility; they conduct a solicitation of the carriers to find the least-cost way of delivering that coal; evaluate that on a cents per MMBtu basis and select the low-cost coal subject to busbar analysis, any investments, et cetera. That wasn't done here and that is imprudent not to do it.

Now, the Mobile line -- at RS-35 you will see a bid from the UP and BNSF on BNSF letterhead for movement of coal to Mobile, Alabama. And you will also see a letter on BNSF letterhead for a single BNSF rail rate to Mobile, Alabama. The reason for that is very clear. The UP was bidding with the BN for this movement because the UP originates Colorado coal, and apparently in 2003 PEF had asked for a bid of Colorado coal transportation. The BNSF can't originate Colorado coal, so they got together with the UP and provided two bids. One, the transportation of Colorado coal to Mobile, the second a transportation for the Powder River Basin, where both the UP

and BNSF originate coal. But separately.

The BNSF, which has a single-line haul from the Powder River Basin to Mobile submitted a bid, and not surprisingly -- now that this is no longer confidential, we can discuss it -- the BNSF single line bid of Powder River Basin coal was less than the bid they gave with the UP for moving Powder River Basin coal to Mobile, and it was $15.95 per ton.

The methodology then of prudence is that you test the market with those kinds of bids. What was imprudent here is in the 2000 evaluation -- 2003 evaluation by Mr. Pitcher, they ignored those bids. They evaluated Powder River Basin coal using the waterborne proxy. This is a set up. This is not using the market information, but rather assuming something that makes Powder River Basin coal uncompetitive. And in my view that's imprudent.

You heard today about a poor line to Mobile, Alabama. Well, it is a poor line because the volumes weren't contracted to move on. The BN would have upgraded the line. The other day I was in Northern Alabama looking at the line to Sharer, which BN moves coal to Sharer on, it's an NS line, and it has been upgraded because they bid the dollars per ton to upgrade the line to move the coal if the customer accepts their bid. But in this case the customer didn't accept their bid, so the line wasn't upgraded.

You heard today as well that BNSF has divested this

line to a private carrier. That is true only to reduce the cost of that line, but the BNSF has a binding contract with the other carrier to have exclusive use of that line to move Powder River Basin coal to Mobile, Alabama.

So the fundamental imprudency here was the use of the waterborne proxy with no basis, with no approval by you, and ignoring a proper methodology of soliciting least cost delivered transportation of the coal qualified for the unit, because in this case the unit was designed to burn 50 percent Powder River Basin coal.

Now, let me move to the period prior to the solicitations, and we have discussed this so I can be very brief. It is categorically imprudent in the market from 1996 to 2000 for this utility to be unable to get a bid for Powder River Basin coal and Power River Basin coal transportation. The incremental production out of the Powder River Basin over this period was 150 million tons. And we have heard the number today in 2006, 440 million total tons was produced in the Powder River Basin. But during this period, all this utility had to do was find a willing producer and a willing transporter to transport 1.5 percent of this increment. And during this period the Power River Basin producers had excess capacity. Their productivity was skyrocketing. They had so much production they had to shut two mines because they didn't have enough business.

Now, why would those producers not be willing to bid to Progress Energy Florida, or Florida Power Corporation? The two railroads involved were in tense competition providing very low rates and were knocking down doors to get additional business during this period. The fact that this utility couldn't get a bid is imprudent.

Now, I want to go back, again, to the 2003 procurement, and mention a couple of things that I think are important. The most fundamental flaw was the application of the waterborne proxy in that bid evaluation.

CHAIRMAN EDGAR: Mr. Sansom, you have one minute left in your summary.

THE WITNESS: One minute left. Okay. Well, I think that the -- all right, I would like to cover one other thing then quickly, and that is the air permit situation. You are going to have another witness on that -- no, let me backtrack. In Mr. Carter's questions, the question is not just the delivered price in cents per MMBtu, you have to look at an evaluated cost.

The bottom line here, evaluated cost, no penalty because the units were designed for 50 percent Powder River Basin coal. Then you have a discussion of whether there is capital investments required. You are going to here a witness subsequent to me, and I only have a minute, he will summarize that in full detail. I defer to him, but my testimony was

based on the engineering work of Sargent & Lundy, Babcock & Wilcox, Black & Veatch, and the own internal operation of Progress Energy called Strategic Engineering. All of those engineering groups looked at the engineering cost to burn Powder River Basin coal at Crystal River and concluded something 180 degrees in opposition to what Mr. Hatt has presented to you here. Those documents are in the record. They conclude as I conclude that the cost of burning Powder River Basin coal at Crystal River are minimal and adjustments to the cents per MMBtu are unnecessary.

And, finally, I did adjust my damage calculation. I didn't formally, but in the course -- between my direct and my rebuttal I discovered the coal yard manual and the detailed design of the coal yard at Crystal River was designed for blending. I had assumed a four cents per MMBtu penalty for additional blending costs at Crystal River. That is 13.2 million. It is still in my damage calculation, but it is unnecessary because it is very clear, and you are going to hear Mr. Barsin, that facility was designed in the early '80s with the full knowledge of all the problems of Powder River Basin coal that had been experienced from the late '60s through '78, to blend coal.

That concludes my summary.

MR. McGLOTHLIN: He's available for cross examination.

CHAIRMAN EDGAR: Thank you. Mr. McWhirter.

MR. McWHIRTER: No questions.

CHAIRMAN EDGAR: No cross. Mr. Twomey?

MR. TWOMEY: No, ma'am.

CHAIRMAN EDGAR: No. No. Mr. Walls.

MR. WALLS: Thank you.

CROSS EXAMINATION

BY MR. WALLS:

Q Mr. Sansom, I was sitting here looking through your rebuttal testimony and exhibits, because you mentioned that you had done a calculation of $33.3 million more money for Mobile to Crystal River. Could you point me to the page in your rebuttal testimony and your exhibits where it says $33.3 million?

A That is not in my rebuttal testimony, but it comes from the use of RS-20 in my direct testimony.

MR. WALLS: No further questions.

CHAIRMAN EDGAR: Are there questions from staff?

MS. BENNETT: Yes, Madam Chair.

CROSS EXAMINATION

BY MS. BENNETT:

Q Mr. Sansom, you previously stated that PFC did not receive bids from Powder River Basin coal suppliers prior to 2001, is that correct?

A There is no record of those bids. Those records may

have been destroyed. I can't say categorically that there were no bids. But I asked for the bids and received none, so there is two possible explanations. No bids were received, or bids were received and destroyed. There is one letter that I addressed extensively in my testimony and we have talked about here, the Kennecott letter, which I read in a way I describe in my rebuttal testimony, I would be glad to repeat here, but to me it says clearly Kennecott had the coal, but PEF wasn't asking for it.

Q You testified that it was imprudent for PEF not to obtain bids for PRB suppliers, is that correct?

MR. WALLS: I'm going to object. This sounds more like direct testimony than cross-examination or impeachment, so I would like to make that objection.

CHAIRMAN EDGAR: Ms. Bennett.

MS. BENNETT: I am just following up on a statement that he made in his direct summary that PEF was imprudent. I wanted to follow up with a couple of questions. I'm sorry, in his rebuttal summary.

CHAIRMAN EDGAR: All right. I'll allow.

THE WITNESS: Could you ask the question again, I have lost my train of thought here.

MS. BENNETT: Sure.

BY MS. BENNETT:

Q You testified that it was imprudent for PEF not to

obtain bids from PRB suppliers, is that correct?

A That's right. And this is in the period prior to 2001, and my basis was everybody else did it, why couldn't they.

Q If a utility does not receive bids for a particular type of coal, what steps does it need to take to obtain those bids?

MR. WALLS: I'm sorry, can I have a standing objection then to this line of questioning if it's --

CHAIRMAN EDGAR: The standing objection is noted for the record.

MR. WALLS: Thank you.

A Yes. Here is what you do; and I have done this for utilities and I have told utilities how to do it. You, first of all, call up the people. And, secondly, you do the following, you say can I visit the Powder River Basin. And you will get the royal treatment. You will get to see all the mines. I have done this. I have done it with the utilities. They will bust their tails to show you what they do in the Powder River Basin. And you can get the same treatment from the railroads, and it is very easy to get a bid from the producers that produce 440 million tons a year now.

So, I think the answer is -- it was revealed yesterday when Mr. Pitcher testified. He didn't even know where the Spring Creek mine was. The Spring Creek mine, he and

Mr. Walls moved from Montana to Colorado in a colloquy yesterday. In other words, it was clear Mr. Pitcher didn't know anything about the Powder River Basin because he never would have said, oh, Spring Creek is located in Colorado. So you have got to familiarize yourself with the region and contact people, but you are readily -- you are treated hospitably.

Q I'm going to ask you to turn to Page 16 of your rebuttal testimony, at Lines 8 through 10. Are you there?

A Yes.

Q You state the experienced PRB companies have been told by PEF that only CAPP coal would be purchased in 1996 and 1998. However, Kennecott had just acquired PRB mines and its salesmen had not figured out PEF's exercise. Is that a correct statement?

A That's my interpretation of the Kennecott letter in the absence of any bids from Arch and Peabody who produced both eastern and western coal.

Q Can you explain the word exercise in that sentence, please?

A Well --

MR. WALLS: Can I object here again? I mean, this is direct testimony. This is not cross-examination or impeachment, and this is unfair to allow the witness to now come back and basically get to provide another set of direct

testimony questions which we did not have an opportunity to do with our witnesses.

CHAIRMAN EDGAR: Ms. Helton, Mr. Harris, who wants to respond, or comment, advise, et cetera?

MR. HARRIS: Chairman, I am of the impression that cross-examination is to flesh out the witness' position. I have been listening, I'm not inclined to think this is bolstering his direct testimony in any way. It sounds like, at least at this point, the questions staff are asking are intended to sort of flesh out the witness' testimony, and I think that is an appropriate purpose of cross-examination.

I would say if it gets to the point where staff is trying to either rehabilitate the witness or elicit supportive testimony, you know, testimony designed to support his testimony, then I would think that would go too far, beyond cross. But at this point, if staff is asking questions to try to understand where the witness is coming from or what he means in his testimony, I believe that's an appropriate use of cross-examination.

CHAIRMAN EDGAR: Ms. Bennett.

MR. WALLS: Could my objection just be noted for the record, please?

CHAIRMAN EDGAR: Standing objection noted for the record, Mr. Walls.

MS. BENNETT: Would you like me to --

THE WITNESS: I think I remember the question. Do you want to restate it?

BY MS. BENNETT:

Q No, I was just curious as to what the word exercise means.

A Well, a coal salesman, they are contacting many customers and they are busy. And if somebody, if they contact a customer once, and they don't -- they are not buying, or they might even have been told we are not buying Powder River Basin coal, keep in mind this is after they actually filed a permit that would have precluded them from burning Powder River Basin coal, then they don't waste their time sending in bids or responding to solicitations for somebody that's not going to use their product.

And my clarification there was the two major producers in the Powder River Basin, Peabody and Arch, have eastern and western mines. They have got PRB mines and they have got Central Appalachian mines, so they were regularly bidding CAPP coal to PEF. So they obviously knew PEF was buying CAPP coal, so why weren't they bidding their western coal? My deduction is they had figured out that PEF wasn't buying western coal.

And then I state that Kennecott had recently acquired three Powder River Basin mines. They had a new salesmen who didn't know this, so he sent in the letter saying that is our

portfolio. We have it, but there wasn't a bid.

Q Can you tell me -- as the first part of that statement you say the experienced PRB companies had been told by PEF that only CAPP could be purchased. What is the source of that statement?

A Well, actually, the source of that, there is a document that I quoted in an earlier -- in my direct testimony. I think it was an Arch award where Dennis Edwards wrote back on an award for a Central Appalachian coal contract, he said, "P.S. Not PRB," in quotes.

Q One final question. You state in your rebuttal that your calculation of 134.5 million in overcharges, you have had no reason to change. Does that include any reduction for any capital or O&M expenses PEF may make or need to make to handle PRB coal at the Crystal River site?

A What I'm saying is, and once you hear Mr. Barsin, you are going to see that the fact that I had in there four cents a million Btu for blending on the Powder River Basin coal, or 13.2 million, will be more than adequate to cover what Mr. Barsin estimates would have been required, and it's more than adequate to cover what Sargent & Lundy and Mr. Dichad (phonetic) of PEF's own strategic engineering group estimated would be required after the Sargent & Lundy study of July, August, September, and issued on October 14th, 2005.

MS. BENNETT: That's all the questions I have.

CHAIRMAN EDGAR: Commissioner Carter.

COMMISSIONER CARTER: Thank you, Madam Chairman. Just a statement and then a question.

Mr. Sansom, you heard my discourse with Mr. Lawton this afternoon, right?

THE WITNESS: Yes, sir.

COMMISSIONER CARTER: And he based his opinion based upon the information that you provided, and he led us to believe -- well, he left me with a question, and the question that arises in my mind, based upon his analysis of your work is saying that -- the question in my mind is how did the Florida Public Service Commission staff miss a $143 million overcharge for fuel and transportation for a ten-year period. In essence, that is what you are saying, right?

THE WITNESS: That's what I'm saying.

COMMISSIONER CARTER: How is that possible?

THE WITNESS: Well, I have some very -- we do prudency audits for utilities all over the United States. In some cases in the employ of the commissions. I was recently in Texas testifying in a fuel case, not with the gentleman who went before me, but with somebody else, and I think there are several very serious problems here if I were a Commissioner I would be very disturbed about.

One issue that is fundamental to your problem is confidentiality. The fact that these things are -- affiliate

transactions are treated confidentially does not bring the antiseptic light of public scrutiny to those transactions until they are beyond the interest of anybody who is skilled enough to understand what is going on.

The second thing is I just went through a Swepco (phonetic) case and looked at the three-year true-up in Texas as an expert for an intervenor group of cities. The degree of documentation that the utilities are required to produce with regard to whether or not their fuel expenditures were properly conducted in their procurements is very substantial. And I have five volumes on my floor of one of those utilities. I haven't seen that down here.

Now, other commissions handle it differently. We work for the Ohio Commission, they supplement the staff resources by hiring not accounting auditors, but fuel prudency auditors to come in. And then there is a division line under that in two directions. Some utilities do that and we only do what we call constructive audits; that is, come in, you are working for the Commission, you are paid by the utility, you criticize constructively the utility, and that's going forward.

The other method is to hire us or others, our competitors and so on, to supplement the staff expertise to do a looking back prudency audit. And in those audits, we do exactly what I did in this case. I was led into this case very simply. Mr. McGlothlin called me up and said what about the

2005 fuel costs, and my first question is I want to see the 2004 solicitation. And that is what you do in an audit. You work back, where was the solicitation, where are the bid evaluation results, and you are not satisfied and you cannot be satisfied with the bid evaluation results produced by the utilities. You demand to see the bid letters from the coal companies and the railroad companies.

And that's what a prudency audit -- that is how you engage in a prudency audit with that kind of detail and that kind of perseverance until you get the answer. And if somebody says I didn't get a bid from the Burlington Northern Railroad, and my unit is designed for Powder River Basin coal, and there are only two people that ship coal out of the Powder River Basin, they are in a heap of trouble. Because how can you buy coal from the Powder River Basin for a unit designed for Powder River Basin coal without getting a bid for transportation.

And if somebody said, well, I have a waterborne proxy. I want to use a waterborne proxy in my bid evaluation. You say, you don't use a waterborne proxy; you get the bid. You use the market to get the least cost fuel for the ratepayers.

COMMISSIONER CARTER: Also, you heard my discourse with Mr. Stewart.

THE WITNESS: For who, I'm sorry?

COMMISSIONER CARTER: Mr. Stewart. You remember him?

THE WITNESS: Yes.

COMMISSIONER CARTER: And he uses your information as a basis for a 10 percent punitive -- I call it -- these are my terms, punitive damages award. Do you remember that discourse I had with him?

THE WITNESS: Yes, sir.

COMMISSIONER CARTER: And I think I heard you say this afternoon in your rebuttal that an additional 34 million. What did you mean by that 34 million?

THE WITNESS: Well, what I'm saying here is if you take out the four cents blending that I had, which I have subsequently discovered the coal yard was designed exquisitely for blending. I didn't know that at the time of my direct testimony when I did the 43 million. That is 13.2 million. I did the damages analysis based upon delivery through New Orleans because I had year-by-year purchases of Powder River Basin coal. But had I done it -- and I noted all of this in my direct testimony -- through Mobile, that would have reduced the cost 10 cents per MMBtu lower at least, and that's another 33.5 million.

Now, I didn't put that in, but I am just saying that is the concern. When I do these overpayment things, I like to be conservative. I like to leave something on the table, because I want the most defensible position I can stake out.

COMMISSIONER CARTER: Madam Chairman, just one

follow-up. I was kind of scribbling as you were talking and you add that 34 to the 143, you are at 177.

THE WITNESS: That's right.

COMMISSIONER CARTER: And that's conservative?

THE WITNESS: Yes.

COMMISSIONER CARTER: Excuse me for interrupting you, but that is just the amount of the damages, not including the 10 percent punitive damage award?

THE WITNESS: I'm not getting into the 10 percent penalty. I don't --

COMMISSIONER CARTER: You heard my discussion with Mr. Stewart, right?

THE WITNESS: Yes.

COMMISSIONER CARTER: You heard him say that the basis for his decision on that was your report.

THE WITNESS: Oh, yes. But, I mean, the whole law, you know, whether a 10 percent penalty is within the legal purview of the Commission is not something I know anything about.

COMMISSIONER CARTER: But that is not my question to you.

THE WITNESS: Okay.

COMMISSIONER CARTER: My question to you, and you said you have been here the whole time and I have seen you here all three days. I asked Mr. Stewart specifically the basis for

the 143 million and the 10 percent punitive damages, and he said that it was based upon information that was provided by you in your report.

THE WITNESS: Okay. Well, here is what I heard him say, and I think you heard him say this, too. He said there is a case, was it the Maxine mine case, involving one of the utilities under the jurisdiction of this Commission, where how do you deter people from doing this in the future. The concept of the penalty is simply making the ratepayer whole isn't adequate enough to provide deterrence. I'm just telling you that is an area outside my expertise.

COMMISSIONER CARTER: Excuse me, Madam Chairman. I heard him specifically say that the basis for his punitive damage claim was your report. That's what he said.

THE WITNESS: Yes.

COMMISSIONER CARTER: He was very succinct. He didn't and, ifs, or buts. He didn't skip, he didn't hop, he didn't fudge, or anything. He was specific. He said the basis for that was your report.

THE WITNESS: Right. And what I think he's saying is the following: If a utility has an opportunity to save a huge amount of money to its ratepayers to burn a coal the unit was designed and paid for by those ratepayers to burn, meanwhile many other utilities have taken advantage of this coal and saved their ratepayers hundreds of millions of dollars and a

whole lot of SO2 emissions, and this utility didn't, then simply making these customers whole is not sufficient for the enormity of the imprudence. And then he also mentioned deterrence, but the 10 percent number is his number, not my number.

CHAIRMAN EDGAR: Commissioner McMurrian.

COMMISSIONER McMURRIAN: Thank you, Chairman. Noting Mr. Walls' standing objection along this line of questioning, I am going to go ahead and add a couple more to it. The thing you said in your summary also struck me, I guess, the same way it struck staff about it was imprudent that they didn't get bids on PRB coal.

And I guess the question, the first question I have is it fair to go to those lengths to get a bid from one entity as opposed to going to those same kind of -- and when I say those lengths, I'm not trying to pass judgment on that one way or the other, but I am talking about when you characterized it as calling up the people and visiting and getting the royal treatment and roll out the red carpet, that sort of thing, is that fair to go to those lengths to try to get a bid from PRB coal providers as opposed to doing that with the others?

Because as I understood from the testimony, it sounds like that they just send out a bid letter, put it in publications, and they get bids from all over, but that they don't seek out any particular bids from any particular sources.

THE WITNESS: My answer to that would be I'm sure they were very familiar with, and had been visited by and visited the Central Appalachian producers. They just ignored this region. Now, let me give you an example. I was asked by Texas Utilities in the late '80s to introduce them to Powder River Basin coal. They burned all lignite. And here is what Texas Utilities did. They hired me to come down, and they had a whole auditorium full of people, and I went through the whole Powder River Basin, who produces, what quality, what burnability problems, et cetera, et cetera, in 1989. And I got questions from the people out -- as I would have gotten if PEF had hired me, except there it was lignite is reliable, what about this terrible stuff from the Powder River Basin. It spontaneously combusts and all of this stuff. And I answered those questions, and then all you have to do is call one producer and you say, look, we are coming to Gillette and we want to see everybody's mines, not just your mines, and you will be given a tour of each mine.

Now each mine, some of these mines produce 200 million tons of coal a year. They are huge. Two of them produce more than Central Appalachian produces. So it's not as if you have to go knocking on a whole lot of doors to get a thorough understanding of what's going on.

COMMISSIONER McMURRIAN: One follow-up to that. Our RFP procedures and rules have been mentioned earlier in the

proceeding. Is it consistent with those rules and guidelines of the Commission as far as RFPs for fuel procurement to seek out certain providers, or inconsistent, or is it just not addressed?

THE WITNESS: Well, let me be clear here. I do not believe that a direct letter to all of the Powder River Basin producers would not get a bid response, and the 2003 and 2004 solicitations show that. I think you're implying that I'm saying you have to coddle these suppliers to get a bid out of them. And I think you are going to hear from somebody who has bought tens of millions of tons from them that you don't. Something was wrong with that procurement, and I can't tell you because I don't have the powers to do the proper investigation as to what was wrong. I think I've gone as far as I can go.

CHAIRMAN EDGAR: I think so. Ms. McMurrian.

COMMISSIONER McMURRIAN: No, sir, I'm not implying that you are saying that at all. I'm just saying that from your testimony, I heard you say that it was imprudent because they didn't receive bids in certain years, and I'm just following up on that for my edification. But I'm not implying that you have said anything, I just want to be clear.

THE WITNESS: Okay. That is imprudent, yes.

CHAIRMAN EDGAR: Mr. McGlothlin.

MR. WALLS: Before we start, could I just mention that I wasn't directing my standing objection to the

Commissioners' questions.

CHAIRMAN EDGAR: No, I think it was to my ruling.

(Laughter.)

Mr. McGlothlin.

REDIRECT EXAMINATION

BY MR. McGLOTHLIN:

Q Mr. Sansom, in response to some questions you indicated that had you based your calculations on a route through Mobile, you would have added $33 million to the damages calculation. Would you explain more fully the differences between the assumptions on the methodology you did use and the differences between that methodology and what was available through Mobile that led to that difference?

MR. WALLS: I'm going to object as outside the scope of cross.

MR. McGLOTHLIN: It's in response to a Commissioner question.

CHAIRMAN EDGAR: I'll allow.

THE WITNESS: Well, when I did my original analysis, I was covering the period 1996 through 2005. I only had rail bids in May and I think in June of 2003 for the BNSF to Mobile. I didn't have yearly transactions of delivered Powder River Basin coal through Mobile. And as I said in my direct testimony, it was a tough choice not to do the damages based on Mobile, but I had yearly procurements of Powder River Basin

coal to New Orleans as procured by TECO for the Gannon plant in Florida. So I elected to use that data, which means I was taking the Powder River Basin coal 600 miles further than I had to take it if I had done a direct Mobile delivery.

Q Is there any relationship -- what is the relationship, if any, between the availability of the Mobile route and the validity of the waterborne proxy that Progress Energy used in its calculations?

MR. WALLS: If I could just have a standing objection to this one, as well, I would appreciate it.

A I don't think the waterborne proxy applies to either route moving Powder River Basin coal. And the only component of affiliate pricing that might be even conceptually related to the waterborne proxy that I utilized was the ocean barge transportation segment from New Orleans to Crystal River, because I did not have a market price for that and by default that is what I had to use to deliver the Powder River Basin coal from New Orleans to Crystal River.

Otherwise, the market -- and I have already mentioned the exhibit that I have, the market does give you prices. In fact, this Commission has established a river price down the river from the Cook terminal to New Orleans, and I used that in an exhibit which I can identify very quickly here. It's Exhibit RS-33.

MR. McGLOTHLIN: Those are all my questions.

CHAIRMAN EDGAR: And we have Exhibits 166 through 184.

MR. McGLOTHLIN: I move Mr. Sansom's rebuttal exhibits.

CHAIRMAN EDGAR: Exhibits 166 through 184 will be entered into the record as evidence.

(Exhibits 166 through 184 admitted into evidence.)

CHAIRMAN EDGAR: Mr. Sansom, you're excused. Thank you.

THE WITNESS: Thank you.

CHAIRMAN EDGAR: Let's take just a short break. I'm going to say and mean about ten minutes. Stretch and then we will come back and we will move through our remaining witnesses.

(Recess.)

CHAIRMAN EDGAR: We will get started again here in just a moment.

MR. McGLOTHLIN: We call Joseph Barsin.

JOSEPH BARSIN

was called as a witness on behalf of the Citizens of the State of Florida, and having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. McGLOTHLIN:

Q Please state your name and business address for the record, sir.

A My name is Joe Barsin. My business address is Charlotte, North Carolina, 5500 Five Knolls Drive.

Q Mr. Barsin, were you present when other witnesses were sworn earlier in the proceeding?

A I was not present for any swearing today.

CHAIRMAN EDGAR: That would have been Monday morning.

THE WITNESS: No, I was not here.

CHAIRMAN EDGAR: Only Monday morning, though it may have seemed longer ago than that. If you would stand with me and raise your right hand, please.

THE WITNESS: Yes, ma'am.

(Witness sworn.)

BY MR. McGLOTHLIN:

Q Well, let's start again. Mr. Barsin, please state your full name and business address.

A My name is Joseph Barsin. I live in 5500 Five Knolls Drive, Charlotte, North Carolina.

Q Mr. Barsin, did you prepare and submit on behalf of the Office of Public Counsel rebuttal testimony and exhibits in this proceeding?

A Yes, I did.

Q Do you have the rebuttal testimony document before you?

A Yes, sir, I do.

Q Do you adopt the questions and answers contained in

that document as your testimony in this proceeding?

A Yes, sir, I do.

MR. McGLOTHLIN: I request that Mr. Barsin's prefiled rebuttal testimony be inserted into the record at this point.

CHAIRMAN EDGAR: The prefiled rebuttal testimony will be inserted into the record as though read.

BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION

DOCKET NO. 060658-EI

REBUTTAL TESTIMONY OF JOSEPH BARSIN

ON BEHALF OF CITIZENS OF THE STATE OF FLORIDA

Q. Please state your name and your business address.

A. My name is Joseph A. Barsin. My address is 5500 Five Knolls Drive, Charlotte, NC 28226.

Q. By whom are you employed?

A. I am President and the principal of Technocrats, Inc., a consulting engineering firm.

Q. For whom do you appear in this proceeding?

A. I am testifying on behalf of the Florida Office of Public Counsel, representing the Citizens of the State of Florida.

Q. Please describe your educational background and professional experience.

A. I hold a BS in Marine Engineering degree awarded in 1964 from the State University of New York Maritime College located at Fort Schuyler, New York. I hold a MDP from Northeastern University awarded in 1985. I have held US Coast Guard Licenses as a 3rd Assistant Engineer for Steam or Diesel, any size vessel oceans unlimited. I am a FELLOW of the American Society of Mechanical Engineers, an awardee of the George Westinghouse Silver Medal for eminent achievements in the field of mechanical engineering, and most recently the 2005 awardee of the Beloit Prize issued by the Technical Association of Pulp and Paper Industries for technical excellence. Prior to my

consulting practice I worked with Babcock & Wilcox for 28 years. While with Babcock & Wilcox I held positions of ever increasing responsibility, starting in Field Engineering. I became Manager of Combustion Systems. In that capacity my responsibilities included evaluating specific coals and the associated ash effects to set slagging and fouling indexes (which in turn set the minimum size of the furnace), evaluating all fuels (including coal), sizing equipment such as burners, designing pulverizer systems, determining the number, location and design of deslagging devices such as sootblowers applied, and approving the guarantees associated with the achievement of any Maximum Continuous Rating (MCR) with a specific design fuel. I retired from a Babcock & Wilcox subsidiary, Diamond Power International, as General Manager Boiler Cleaning Equipment –this is the company that designed and manufactured deslagging devices such as sootblowers, water blowers and water cannons.

I have attached as Exhibit __ (JAB-1) a more detailed resume' of my professional experience.

Q. What is the purpose of your testimony?

A. In my testimony, I will rebut certain assertions by PEF witnesses Rod Hatt, Clifford Toms, Sasha Weintraub, and J. N. Heller.

Q. Please summarize the principal points of your rebuttal testimony.

A. In my rebuttal testimony I will develop and prove the following points:

- PEF witnesses Hatt and Toms are mistaken when they assert, without any factual support, that PEF would have lost 124 megawatts of capacity had PEF burned a 50/50 blend of Powder River Basin subbituminous and Eastern

bituminous coals in Crystal River Units 4 and 5 during the period 1996-2005. Mr. Hatt, in particular, begins with a recitation of the combustion properties of PRB coal and leaps immediately to the conclusion that the boilers would not be capable of generating at this level on a sustained basis. Incredibly, his "seam to stack" analysis omits any recognition of, much less consideration of, the unit operating capabilities that were specified by Florida Power Corporation, designed and contracted for by the designers of the units, and built into and *guaranteed* by the vendors. From the outset, PEF's predecessor, Florida Power Corporation specified, and the CR4 and CR5 units were engineered, designed, and constructed, to produce the same maximum number of megawatts on a sustained basis when burning a 50/50 blend of Powder River Basin (PRB) subbituminous and Eastern bituminous coals as the utility produced during 1996-2005 when burning bituminous coal. In fact, Babcock & Wilcox, the manufacturer of the boilers for CR4 and CR5, *guaranteed* that the boilers would deliver to the turbine generator the steam quantities and steam pressures necessary to operate at the same maximum steam overpressure condition noted by PEF's witnesses, with no limitation on the number of hours the units could be called on to produce at this level. This guarantee, enforceable by Florida Power Corporation, went beyond the usual industry practice and explains, in part, why the boilers of CR4 and CR5 were so massively and conservatively designed. It is only because PEF's predecessor, Florida Power Corporation, elected to test perform CR4 and CR5 with bituminous coal rather than the 50/50 blend that was the subject of the guarantee that Mr. Hatt can even speculate about the units' capabilities.

- Because the assumption of a difference in megawatts of output between the 50/50 PRB/bituminous blend scenario and the 100% bituminous scenario provided to him by Mr. Hatt and Mr. Toms was fallacious, PEF witness Crisp's calculation of replacement power costs to be associated with operations of CR4 and CR5 based on burning a 50/50 blend of Powder River Basin subbituminous and Eastern bituminous coals is entirely bogus. As the units were specified, designed, constructed, and *guaranteed* to operate at the same maximum rating claimed by PEF for the all-bituminous scenario, without limitation as to the number of hours, the differential of the output of CR4 and CR5 between the 50/50 PRB/bituminous and all-bituminous scenarios is zero.
- PEF witnesses Mr. Hatt and Mr. Wayne Toms are mistaken when they assert, without factual basis, that a seventh pulverizer would have been necessary to enable each of CR4 and CR5 to produce the same output when burning the 50/50 blend of PRB and bituminous coals that PEF produced from these units with 100% bituminous coal. Mr. Hatt appears to have observed a spot left for the addition of a seventh pulverizer for each unit and to have leaped to the conclusion that the seventh pulverizer was essential to the operation of the units at high output, without recognition of, much less consideration of, the design capacity of each pulverizer. The information was readily available in contract documents and design manuals maintained by PEF, which I have reviewed. Each unit was designed, constructed, and *guaranteed* by Babcock & Wilcox to generate the same level of maximum output that PEF experienced with 100% bituminous coal when burning the 50/50 PRB/bituminous blend and operating with the *six*

pulverizers supplied by Babcock & Wilcox under its contract with PEF's predecessor. In fact, Babcock & Wilcox designed the boilers to be capable of generating this high, maximum output level using the 50/50 blend when only *five* of the six installed pulverizers were operational.

- Mr. Hatt is mistaken when he asserts that little was known about the slagging and fouling properties of PRB subbituminous coal at the time CR4 and CR5 were designed. He is therefore mistaken when he asserts, based on this false premise, that the boilers of CR4 and CR5 would need to be modified before the boilers could be expected to burn PRB coal successfully. I know, because I was involved in both the research of PRB coal properties and their impact on boilers prior to the design of CR4 and CR5, as well as the actual designing of these units. The properties of PRB coal were well known and understood when CR4 and CR5 were designed, as were the design parameters needed to anticipate and accommodate those properties and burn PRB coal successfully. Severe slagging and fouling coals can be and are burned successfully in boilers that are sized, configured, and designed to burn them. All design considerations and parameters necessary to address the slagging and fouling tendencies of PRB coal were incorporated in the design and construction of CR4 and CR5. In fact, Babcock & Wilcox *guaranteed* that the boilers would burn the 50/50 blend of PRB and bituminous coals without interference from slagging or fouling.
- Mr. Hatt is mistaken when he asserts that PEF would need to purchase expensive new equipment with which to blend PRB coal and bituminous coal on site. In his testimony, Mr. Hatt omits any reference to the existing components

and systems that answer fully his questioning of the ability of the existing mechanisms to blend coals successfully. At the outset of the project, PEF's predecessor, Florida Power Corporation, directed Black and Veatch, who provided the design and engineering services for CR4 and CR5, to provide for on-site blending of two different coals. Black and Veatch provided a system of equipment and storage areas for blending that is flexible, redundant, and fully capable of providing the blending function. The existing system needs only modest and inexpensive enhancements to provide washdown capabilities. The cost of such improvements is insignificant. On the other hand, to throw away equipment that was well designed for the purpose and replace it unnecessarily would be wasteful and imprudent in the extreme.

- Mr. Hatt is mistaken when he asserts, without factual basis, that the precipitators of CR4 and CR5 would need to be modified before the units could burn the 50/50 blend successfully. Again, Mr. Hatt begins with the properties of PRB coal and leaps to the conclusion that the existing precipitators are inadequate, without any recognition, much less consideration of, the capabilities that were designed and built into the existing precipitators. Those design parameters and capabilities are readily available in contract documents and design manuals maintained by PEF. Again, Mr. Hatt's testimony begins with the faulty premise that the properties and chemistry of PRB coal were not understood when the precipitators were designed. The properties of PRB coal were understood well at the time the precipitators were designed, as were the precipitator design parameters (size, configuration, design) needed to deal with them. The

precipitators were designed, constructed, and *guaranteed* to be able to remove particulate from the stack emissions sufficiently well to meet the emission standards applicable to CR4 and CR5 when burning the 50/50 PRB/bituminous blend of coals. It is only because PEF's predecessor elected to test perform the units with bituminous coal rather than the 50/50 blend that Mr. Hatt can even speculate about the precipitators' performance.

- Mr. Hatt is demonstrably mistaken when he speculates that the existing coal conveyors may not be adequate to deliver the quantities of the 50/50 PRB/bituminous blend of coals to the boilers that would be necessary to sustain generation at the same level of maximum output that PEF experienced with 100% bituminous coal. As with all other design parameters, Black and Veatch started with the assumption that CR4 and CR5 would be burning the 50/50 blend of coals, and specified the capacity and speed of the coal handling and conveying equipment accordingly. When one traces through the technical capabilities and relates them to requirements for maximum output, it becomes evident that the existing coal handling and conveying systems are more than adequate to support the same levels of maximum output when burning the 50/50 PRB/bituminous blend that PEF experienced with 100% bituminous coal.

- Mr. Hatt is mistaken when he asserts that CR4 andCR5 were not built with dust control, fire suppression, and other safety measures. I have studied the design details for CR4 and CR5, and I recently inspected the units. Black and Veatch's written design standards specified elaborate dust control and fire suppression measures that clearly were based on the assumption that PEF would be burning

the 50/50 PRB/bituminous blend. Upon inspection, it is obvious that all of those systems were installed. It is equally obvious that over time PEF has removed many of the systems, and has allowed many others to deteriorate to a state of disrepair. While dust control, fire suppression, and housekeeping measures therefore would need to be provided now, in many instances the items needed would be replacements of those that were specified, designed, and constructed when the units were new. In any event, the costs of such measures are insignificant in relation to the fuel savings identified by OPC witness Robert Sansom. More importantly to this case, there would have been little need for any expenditures if PEF had maintained the original equipment and shifted to the 50/50 PRB/bituminous blend in 1996 with those original systems intact.

- In my review of the testimony, contract documents and actual designs applied that together serve to define CR4 and CR5, it is evident that the entire plant was permitted, specified, designed and constructed to generate 5,239,600 pounds of 1000F / 1000F steam at 2640 psi burning a 50/50 CAPP/PRB fuel containing 10,285 BTUs/pound, which in this plant with the turbine provided results in a gross generation of 770 MW -- and sustain this design loading 24 hours per day, seven days per week. The fuel supply system was designed to support the burn rate of 330 tons per hour of the specified fuel blend to insure 100% redundancy was provided.

Q. **Please describe how you have organized your testimony.**

A. To evaluate the testimony of PEF's witnesses, it is necessary to understand the manner in which the utility's choice of fuels impacts the design and construction of the power plant

in which the fuel will be burned. To provide context for my comments, I will begin with a brief overview of the manner in which major power plants, such as CR4 and CR5, are specified, designed, and built. In this overview, I will identify and define several terms that will appear later in my testimony. I will then identify the statements by the PEF witnesses to which my testimony is directed, and respond to those statements.

OVERVIEW OF DESIGN AND CONTRACT PROCESSES

Q. Beginning with the overview, describe the process through which a utility and contracting vendors specify, design, and construct a major power plant project.

A. The process begins when the Utility projects future growth, reserve margins, asset retirements and projects a need for additional generation capacity. The decision is made to build a new power plant. The utility will write a general RFP (Request for Proposal) describing approximate size, location, specific fuel(s), and approximate date of operation to Architect Engineer (AE) firms with expertise in the area.

Q. What happens when the AE is selected?

A. Eventually one AE is selected and the contract is finalized. See Exhibit _____ (JAB 4) Agreement for Engineering Services for Crystal River #4. The contract contains a general project statement constructed from the PEF RFP and the numerous clarifications issued during the negotiations of the contract.

The project manager will delegate engineering for specific design/specification creation to those departments within the AEs firm with the proper expertise, for Steam Generators, Coal Handling, Controls, Turbine Generator etc. The AE team immediately

goes into the project and starts engineering and creating the associated detail specifications for the plant. The most critical specification in this case is the Boiler Specification. That document contains the desired stream flow, final steam temperatures, design basis fuel, alternative fuels, emission limits, and other details including schedules and in this specific construction was to be included. Once these specifications are created, reviewed by Black and Veatch management and approved they then are released to PEF for their approval and once that is received the specifications are released to the steam generator potential suppliers.

Q. What happens when the steam generator vendors receive the RFPs?

A. Proposal level engineering is initiated and since the boiler suppliers have been working informally with the AEs for several months on this potential project much of the early work has been completed. The design zeros in on the specified design fuel, and the require output at the specified maximum continuous rating.

Q. How important to the design process is the specified fuel?

A. The design basis fuel along with the maximum continuous rating (MCR) rating is the entire basis for the detailed design and the proposal. The design basis fuel is evaluated using experience with similar fuels, or, if unique, by creating laboratory samples and creating ashes so that the ash performace can be evaluated. Once evaluated, the ash resulting from a specified fuel or a blended fuel similar to that specified would be compared to other ashes within which the vendor had actual field experience and the performance of which it had been able to evaluate. The vendor would then index the fuel slagging and fouling potential.

Q. What do you mean by indexing?

A. Through experience, categories have been developed into which coals fall based on characteristics of combustion ash, and the propensity of that ash to form slag or create problems of fouling. Also through experience, design criteria have been developed which address the means that can be employed to accommodate and neutralize the slagging and fouling potential of each category. In other words, as soon as the AE accurately indexes a particular coal, the design criteria applicable to that index are invoked.

Once set, the index would dictate the entire steam generator required box size. The ash index impacts every major piece of equipment: Furnace box size, number of burners, number of pulverizers, Furnace Exit Gas Temperature (FEGT), clear side spacing (CSS), in the convection gas path, the number and location of sootblowers, and gas side permitted velocities. The fuel is the most critical component to understand as completely as possible to correctly design a heat transfer machine that is specified, as in the case of CR4 and CR5, to be capable of running 100% of the time at a specified MCR. See Exhibit __ (JAB 5), "Boiler Design Considerations."

Q. How important to the design is the specified steam flow?

A. This specification is as important to the design as the fuel. The specification for CR4 and CR5 directed that there be a performance point at FULL LOAD (Turbine Name Plate) and at the MAXIMUM CONTUNIOUS LOAD (MCR). MCR was defined as turbine valves wide open with 5% overpressure steam provided by the steam generator. The required heat input to design for would be the "that maximum" that is MCR point and all

heat exchange equipment would have to meet that requirement as well as satisfy the fuel ash indexes.

Once the fuel and MCR were known and classified, the detail design could then commence. It is an iterative process composed of getting enough heat transfer surface in the steam generator to make the heat balance required at the specified MCR without violating the fuel ash indexes. "Full Load" performance would be achieved using the operational tools provided, such as Gas recirculation fans and spray attemperators --both as aids in controlling final steam temperatures over the load range. Boiler heat transfer surface typically is set to achieve the MCR load with the design FEGT, no attemperation in the reheater and a minimum load on the gas recirculation fan.

Q. What Happens Next?

A. Proposals were submitted to Black and Veatch containing the performance guarantees, such as MCR achievement on the specified fuel blend, schedules and the costs required to provide a system that would successfully achieve the specified performance on the PFP. The proposals would be reviewed, approved and provided to PEF who would evaluate and one vendor would be selected by PEF. A contract would be constructed typically by taking the RFP (1), the vendor response proposal (2), and any specific correspondence clarifying (3), and identifying specific items that might have been cloudy-these documents together are the CONTRACT. The contract must contain the guarantees, and those in this case included Emissions (NOx), performance at specified loads, a maximum continuous load, when firing a specified fuel (The Design Fuel). The guarantee

document with specific guarantees for CR4 and CR5 is shown in Exhibit _____ (JAB 9).

Q. Was this process followed in the cases of CR4 and CR5?

A. Yes. PEF's predecessor issued a request for proposals. Black and Veatch, which incidentally has earned a reputation as a premier company in the design of coal-fired units, submitted a proposal that became the basis of the contract under which the project went forward.

Q. What did PEF's predecessor, Florida Power Corporation, specify as the "design basis" fuel?

A. FPC chose as the "design basis" fuel for CR4 and CR5 a 50/50 mixture of Powder River Basin ("PRB") subbituminous and bituminous coals containing 10,285 Btus per pound and reflecting a specific profile of ash, moisture, and other characteristics.

Q. What are the implications of the choice of the 50/50 blend as the "design basis" fuel?

A. The fuel selected impacts every part of the design of the plant except for the turbine generator and feedwater systems. Once the planners at the PEF had decided to specify a blended fuel of 10,285 BTUs/pound and a specific output this would then set the tons of fuel required per hour to provide the output.

The initial impact is the amount of coal to be handled. If BTUs per pound are reduced, then the total pounds will be increased to meet the same specified output. All the fuel equipment from conveyer belts, relaimers, crushers, silos, feeders, and pulverizers would have to be larger and consume more power.

The specified fuel has a unique ash characteristic. That ash characteristic will impact the furnace design due to their propensity to slag or foul. If the ash is indexed as a Severe Slagging vs High Slagging, the physical plant will have to be larger to permit control and removal of the slag deposits. The same reasoning applies to the fouling index applied; if higher, it would impact the arrangement of convection pass surface and sootblowers, affecting the "box" size as well as platforms and building sizes and air heater surface arrangements.

The specified fuel's ash will determine allowable gas side velocities thus also impact the size of the "box". The elements in the ash will also effect pulverizer wear life and thus impact maintenance costs of the plant.

The specific fuel will have a specific ash content and that will set the size of the ash removal system, and the size of the electrostatic precipitators.

The specific fuel impacts the combustion air requirements thus fan sizing.

The specific fuel contains a specific moisture which will affect gas weights and thus plant efficiency, air heater sizing and pulverizer capacity.

Q. Please discuss the capacity ratings of CR4 and CR5 that bear on the issue of output using different fuels.

There are two capacity ratings of the boilers and related equipment that are relevant to the issues raised by PEF's witnesses. Unfortunately, the distinctions are blurred by them to the point that their testimony is unclear and misleading.

Q. What is the first capacity rating?

A. There is the full load rating corresponds to the turbine nameplate rating with standard conditions. The total plant heat balance will be made using these conditions. In most cases this also the MCR rating. There is always some margin above the full load rating within the boiler and turbine designs in most cases just to insure that FULL LOAD performance can be made and guarantees met. This is a standard rating where the boiler operates at the its operating pressure and temperatures specified and the turbine operates with its control valve open only enough to produce the full load nameplate rating.

Q. Please describe the second capacity rating to which you referred.

A. On occasion some utility clients will request a "peak" or Maximum Continuous Rating which vendors respond to with the special "100% wide open control valves" at the turbine and 5% over pressure from the Boiler vendor. Typically that is a short term rating used by the utility to match its peak generation period of several hours per day. The most common manner in which this condition is met is to increase the steam pressure to the turbine. The standard is to raise the operating pressure of the boiler to 5% over the full load operating pressure. The increased pressure in turn increases the steam flow to the turbine and thus the heat input to the steam generator must be increased to keep the heat balance in balance. This level-turbine valves wide open, 105% of operating pressure and a new higher steam flow-all together are referred to as MCR. MCR is not fuel specific: it is heat input specific. To make MCR one must input the required quantity of

BTUs. This then is the TRUE maximum or full load condition even if referred to as MCR because the steam generator must be designed to meet this peak "heat input" condition. In the case of CR4 & CR5 the MCR specified was not several hours per day to meet peaks; it was specified as continuous, and thus becomes the design full load guarantee point for the vendor.

Q. **Given the "cap" or limitation of 5% overpressure are the units as capable of maintaining 5% overpressure on a sustained basis when burning the 50/50 blend as they are with 100% Bituminous Coal?**

A. The design basis for these CR4 and CR5 was the specified 50/50 Blend and the steam generator is capable of sustained MCR and in fact has been guaranteed to maintain on a sustained bases MCR with that specified fuel.

Q. **Could a unit exceed MCR output with either bituminous coal or the 50/50 blend?**

A. As a practical matter, the answer is no. There are several bottlenecks in a complex assembly such as a power plant that could acting separately be the load limiter or CAP once above the MCR point. The most common and immediate of these limiters is typically the safety valve set points on the steam generator's drums. If a load higher than MCR is attempted, more steam flow would be required. As steam flow is increased in a pipe, the pressure drop increases exponentially and thus the drum pressure required to "push" more steam through the superheaters would most likely exceed the popping set points on the drum safety valves. The choice of fuel burned has no effect on this type of mechanical limitation.

RESPONSES TO SPECIFIC ASSERTIONS BY PEF WITNESSES

Q. **Mr. Hatt (see page 7, line 13) and Mr. Toms (see page6, line 19) state that CR4 and CR5 are rated for generating 665 megawatts of energy per unit. Do the PEF witnesses accurately portray the capacity ratings of CR4 and CR5?**

A. No, they do not.

Q. **Please explain.**

A. There is a name plate turbine rating of 665 MW, which is a nominal full load rating that corresponds to a certain steam flow of 4,737,900 pounds of steam per hour at a steam outlet pressure of 2500 psig. This is the nominal full load rating of Units 4 & 5 at Crystal River. The second and governing rating, as it is more demanding, is the MCR rating, which includes elements of turbine valves wide open, boiler overpressure of 5%, and a higher steam flow of 5,239,500 pounds of steam per hour, of all of which required greater heat inputs to sustain. These are major differences.

Q. **Mr. Hatt claims, at pages 6 Line 17, that PEF would have lost 124 megawatts of output (combined) from CR4 and CR5 if it had burned the 50/50 blend of PRB and bituminous coals during the period 1996-2005. Mr. Toms makes a similar claim at page 8 line 22, How do you respond?**

A. The witnesses speculate that, while CR4 and CR5 generated at MCP (that is, at 5% overpressure, turbine valves wide open and higher steam flow), the units could not have performed above the normal rating of 665 MW when burning the 50/50 blend. To answer them, I must divide my response into two parts, because Mr. Hatt purports to attribute this claim to shortcomings in the design of the boilers and also to limitations on the ability of the coal handling system to supply the necessary quantities of the 50/50

blend to sustain the output of CR4 and CR5 at the level that PEF experienced with bituminous coal. Each "leg" of Mr. Hatt's claim is demonstrably false.

Q. **Let's begin with Mr. Hatt's discussion of the boiler. At page 38 lines 8, 9, Mr. Hatt asserts that CR4 andCR5 could not have been designed to accommodate PRB coal, because at the time they were designed the combustion properties of PRB coal were not known. Is he right?**

A. No. Mr. Hatt is mistaken. The boiler vendor, Babcock & Wilcox, through experiments in its coal research laboratory, provides the industry's technical basis for using a solid fuels ash analysis to predict boiler slagging and fouling potentials from indexes derived from those data. Indexes have been developed using both experimental data obtained in the laboratory and in the field on real units burning real fuels from hundreds of steam generators and thousands of fuel/ash samples collected over the past 85 years. These indexes, created over many years, have proven to be quite accurate and in fact provide the confidence for offering guaranteed performance. It is believed these indexes are the bases upon which most commercial offerings, world wide, are available today. These indexes have been created for many fuels including Sub Bituminous, Bituminous, and Lignites, have all been published, are in the public domain, and are used widely. Babcock & Wilcox's Book, "Steam Its Generation and Use," is the generally accepted technical "bible" on this subject.

The operational issues on Slagging, Fouling, i.e. the ash issues have been well understood since the early 1970s for the Sub-Bituminous fuels, the early 1960s for lignitic fuels, and from the 1930s for Bituminous coal. The design and materials provided for construction

of CR4 and CR5 acknowledged these issues and designed accordingly. Due to the desire to have maximum conservatism, the units were designed for Severe/Severe-- the most conservative design index that could have been applied.

Q. The timing of this knowledge of Sub Bituminous fuels and ash has been raised and how it might relate to being applied to CR 4 and CR5.

A. Exhibit __ (JAB 7) "Experience with High Sodium Subbituminous Coals," and Exhibit __ (JAB 8) "Experience with High Sodium Lignites," provide examples of test burns of subbituminous blends in units designed only for Bituminous Coal as early as 1973. Those units were designed in 1951. There were test burns of blends prior to 1973 in units designed for only Bituminous Coals that are not covered in the exhibit. There are also units designed for 100% PRB prior to 1970 not included in the exhibit. Exhibit 8 provides 1960 history with high sodium lignitic ash, from which boiler designers have learned much to prepare them for design of Sub-bituminous units.

Q. When were CR4 and CR5 Designed?

A. CR4 and CR5 were designed in 1978/79 and thus benefited from all prior experience, test burns and laboratory advances on the subject of blends.

Q. What is a high-slagging coal?

A. In steam generator design the furnace is the zone where ash deposits that are laid down via various mechanisms such as slag impact and that will retard heat transfer. If heat transfer is retarded, the flue gases get hotter and the slagging rate increases-raising the FEGT (Furnace Exit gas Temperature) which will impact fouling and *if uncontrolled* will result in a forced derate (to shed slag) or shut down to remove fouling deposits. All fuels except natural gas will lay down slag deposits that can retard heat transfer. The slag must

be removed. Deposits cannot be removed if molten-- thus the gas temperature the slag deposit "sees" is the deposit temperature. The designer must make the furnace as large as possible to permit cooling of the flue gases. The easy way to evaluate the degree of conservatism is to review the Furnace Exit Gas Temperature (FEGT) at MCR. The lower it is, the better-- and the only way to get it lower is to increase the size of the furnace for the same heat input...a most expensive cost impact and a step not taken lightly. The designer, however, by controlling flue gas temperatures (how tall is the furnace), the number, location, and elevations of furnace wall sootblowers (devices to remove slag), input per burner (amount of heat per square foot where lower is better, burner spacing (where wider is better), depth of furnace (where deeper is better) and load reductions (reduces furnace temperatures and thus slag temperatures) are all tools designers can apply at the time of design to permit slag removal. The load reduction tool would be seen by the client as a peak load limit-2 hours per day or 4 or whatever but there would have been a limit which would have been invoked by the supplier if the slagging index was rated as severe because that ash from the specified fuel was not predictable and there was uncertainty. In that situation a peak load requested/demanded by the client would be met with "Limits" of time, never would it be continuous.

Q. Please discuss "fouling."

A. Fouling is once again related to the ash properties in the coals being fired. At the high furnace temperatures where slagging is a problem the ash components that create fouling problems are vaporous and in the gas phase will not be a problem until they condense. When it condenses (Sodium, Potassium etc) typically upon convection pass heat transfer surfaces (tube metal temperatures at 1100F or below being well below the gas

temperatures) such as superheaters and reheaters it forms a glue like base to capture other solid particles in the gas/ash stream. These condensed salts can sinter over time as they remain at a high temperature and become hard to remove. They also have great tensile strength and can bridge across to parallel surfaces. As they bridge and are not removed, the gas temperatures will increase pushing fouling back further into the horizontal convection pass. In extremes they can close off the free flow path of the flue gases restricting load or forcing a shut down. Fouling can be controlled in several way first and foremost by controlling slagging and the resulting increased FEGT. The designers can provide flexibility by increasing the side spacing of parallel surface such as Platens or pendants that contain superheater or reheater steam internally. For example, these side spacings could be as close at 12 inches or as wide as 60 inches. The depth of the pendant (direction of gas flow) could be 12 feet or as short as 6 feet. The design of "wraparounds" (devices to keep pendant surfaces in alignment) could be intrusive (into the gas clear side spacing) or non-intrusive. The leading edge material of the pendants could be any material as required by the ASME Pressure Part codes or upgraded to an austenitic SS which has demonstrated reduced bonding strength between the fouling deposit and the tube. The number of sootblowers (long retractables) could have an effective cleaning radius of 24 feet or 4 feet. All the slagging /fouling design tools described above are made more conservative with a higher index.

Q. **What is the index?**

A. There are two-one for predicting the difficulty of removing slag, and one for predicting the difficulty of removing fouling deposits for each major fuel type-Bituminous, Sub-Bituminous and Lignite. The Index see Exhibit_____ (JAB 5), "Boiler Design

Considerations," is a relative scale that predicts the difficulty the boiler designer will have in removing a deposit from the boiler heat transfer surface during normal operation. It requires an analysis of the components of the ash resulting from combustion of the specific coal. It is not the ash analysis of the material in the coal-- it is the ash that is formed when the coal is combusted. Most vendors now have laboratory ashing furnaces that permit sample quantities of coal to be combusted under controlled conditions and the ash created to be collected and analyzed. The components of that ash can be reduced to ratios of various components, and the test ash ratios can be compared to actual experience obtained both in the field and laboratory from thousands of coal ash samples and experiments conducted over time. The ratio can be used to make predictions with a great deal of confidence on which certain ashes are rated as higher slagging potentials or higher fouling potentials. A "high" slagging coal is one that is more difficult to remove than a low slagging coal and less difficult to remove than a "severe" slagging or a severe fouling coal-the index that the industry recognizes as the worst possible ash. There are many severe slagging bituminous coals, there are many severe slagging lignite coals, and there are many severe slagging sub-bituminous coals.

Q. **What index was applied to the design of CR4 and CR5?**

A. The ash produced from the specified blend for CR4 and CR5 was not rated as severe, either from fouling or slagging standpoints. It was rated high/medium. Thus if the blend had been the only coal Babcock & Wilcox had been directed to use for the design basis, the reduced FEGT, the large furnace, the increased side spacing, the extra complement of soot blowers and all the extra conservatism added for SEVERE/SEVERE would not have been provided. The reason CR4 and CR5 are so conservative from a slagging/fouling

design point could have been the requirement for MCR at the blend. The supplier, Babcock & Wilcox, elected to add an additional degree of conservatism to the design index by raising both to the highest (Severe/Severe) when the ashes from all fuels considered (Design 50/50% PRB Blend and 100% Illinois) would have suggested a Medium Fouling index be applied.

Q. **Does the designation of a coal or blend of coals as high slagging and high fouling mean that boilers cannot operate successfully with it?**

A. No. It means the boiler must be designed to accommodate such properties.

Q. **Were the boilers of CR4 and CR5 designed to accommodate these properties? If so, how?**

A. Emphatically, yes. The boiler island is composed of several major sub-systems. I will answer by providing a response to the effect on each of the major subsystems

Furnace Sizing

The specified 50/50 blend carried a Bit coal (CAPP) analysis such that if the unit was designed and guaranteed for that fuel only it would have resulted in a furnace and all associated auxiliaries sized for a design index related to a medium fouling, high slagging ash rather than what the blend required. The blend, for all the reasons provided in Mr. Hatts testimony, and those in the S&L report, demanded that the designers apply the utmost in conservatism in the design. The designers applied the most stringent criteria to the design by using a design index of Severe Fouling/Severe Slagging...the highest level in the Babcock and Wilcox design book. For the same MCR (guarantee point) fuel input, the more stringent index requires many physical increases that directly relate to such

things as building size, both height and footprint; increased structural steel, both to support the greater load but also to overcome the greater wind loading with a taller structure. Why the increase in building size? Several reasons, but prime is that the furnace would have to be made larger in depth, in width and in height. For example the "furnace exit gas temperature" (FEGT) is a critical design element and for severe slagging fuel it must be at the lowest possible point. The same heat input is required no matter what slagging or fouling index is applied to make the MCR, thus the only way to decrease this critical slagging related design control tool is to make the furnace larger. A larger Furnace will increase the amount of particle residence time and the amount of water cooled surface the products of combustion (including ash) have (and "see") to cool down before they impact convection pass heat transfer tube surfaces and furnace sidewalls. Once cool (below its softening temperature (T250) the ash can be removed by sootblowers. However the ash, if not cooled, can still be hot enough to exist in the molten/semi liquid state where the slag cannot be removed and additional deposits will continue until the point, load (guaranteed MCR) would have to be decreased to "shed slag". Decreasing load, is in essence, reducing the FEGD, making the furnace cooler and is an effective way to control slag. It would have required a load shed to achieve, which was not permitted by the continuous MCR specification. In this case the designers had to design into the steam generator a lower FEGT. This lower or more conservative FEGT was then available at the guaranteed MCR with the blended fuel and could meet the heat balance requirements required to meet the thermal performance guarantees.

A severe slagging rating would also require more furnace sootblowers and more elevations of furnace sootblowers along with the associated piping, platforms and stairways to provide maintenance access to them.

Convection Pass Sizing

Severe Fouling as an applied index impacts the arrangement of the convection pass heat transfer surface and thus impacts (increases) height, width and depth of the convection pass in the steam generator and thus the building. The amount of clear side spacing between furnace pendants and convection pass platens (heat transfer surface for superheaters and reheaters) typically hung from the roof are critical to being able to control the fouling of ash particles in this zone. Also bank depths (direction of gas flow) are decreased because the effective cleaning radius of retractable sootblowers is reduced with severe fouling fuel. If uncontrolled the fouling will result in the unit not attaining final steam temperatures (effecting MW output, Turbine efficiency, guaranteed performance) and eventually reducing gas flow to the point where a forced shut down is required for ash shedding. The severe fouling index fuel (i.e. the guaranteed 50/50 blend connected to MCR) required the designers to be guided by conservatism and maximize the clear side spacing, minimizing the back spacing (had been found to reduce ability for fouling desposits), and redesign the method of alignments utilized. These design tools took advantage of the lessons learned from Babcock & Wilcox extensive fuel blend/fuel burn/fuel-ash analyses history.

The horizontal convection pass (primary superheater, primary reheater, economizer) all would have increased clear sidespacing and thus require more volume for the same heat transfer. Here again, more sootblowers would be installed with the associated requirements for piping, platforms and access.

There are gas side velocity limits and these would have been reduced which would impact due to the greater gas weights and change in ash composition (ash with higher silica/alumna ratios are known to be more erosive). Thus, the allowable velocities had to be reduced for the 50/50PRB blend (ash weight, gas flow) and erosion concerns which in turn would have an impact on the width and height of the horizontal convection pass.

Q. **What about Mr. Hatt's prediction, at page 37, of the effect of "eutectics"? Did the designers of CR4 and CR5 provide for this phenomenon? If so, how?**

A. Yes, they were anticipated and dealt with. Once both ashes were well known, the combination or formation of harmful higher fouling potential eutectics was reviewed. Our review indicated that, while eutectics would be expected to form, they would not further degrade the potential for slagging or fouling already established by the base coals in this case. The point here is that these units were designed for the blend and the ashes resulting from those blends. This design would not have been possible without the extensive PRB blending tests the vendor had carried out for years before these CR4 and CR5 units were designed.

Q. **At page 37, lines 9-10, Mr. Hatt says utility experience has shown that, to minimize slag, it is better to burn either 100% PRB coal or a small percentage blend. In your opinion, given the design of CR4 and CR5, is it necessary to burn either 100% PRB**

or a small percentage blend in these units to avoid eutectics, or any other of Mr. Hatt's predictions?

A. It is not necessary to do so in the case of CR 4 and CR 5. The design objective has to be to burn the fuel that is specified and to understand that fuel and its ash effects in sufficient depth so as to provide the trained operator with the tools to minimize slag/fouling effects upon maximum load carrying capability. Once you are at that point, then, and only then, can you guarantee an MCR with a blend fuel. Mr. Hatt, I believe, refers to trial burns where the steam generator was designed for only one fuel, in this case a CAPP type fuel only, and made trial blends with other coals. Those trials in some cases limited loads because the boilers being tested were never designed for the alternative fuel. In JAB exhibit 8 extensive detail is provided on blends and their effect on boilers not designed to handle them. Whether it was a 50/50 blend or 100% PRB used at CR4 and CR5, by all the knowledge we possess today those units would meet their MCR guarantee.

Q. Is there a place for the 30%/70% rule of thumb?

A. The situation is analogous to an oil fired unit claimed to be coal capable for limited periods of time and at some reduced maximum load, (such as I think either Bartow or Higgins were designed to be), or oil designed and fired units that would burn a combo of Venz Oil and Indonesian Oil where one oil might dominate and at what load. Utilities have many examples of units firing blends they were not designed to handle, such as PEF firing Pet Coke blended with Capp Coal, or Synfuel with CAPP OR VENZ, CAP COAL, SYFUEL. On units designed to fire dual fuels such as oil and gas it is important to be able to predict when one will dominate since heat absorption is drastically effected. It is

generally accepted as true that one fuel will become dominate but no one can predict with any reasonable degree of certainty at what blend point that might occur-other than a guess at somewhere between 30 and 70% in those units *not designed for the blend.* Thus, a boiler vendor will/has invoked the 30-70 rule of thumb to provide guidance to users.

CR 4 and CR 5 were designed for, guaranteed for MCR with a 5050% PRB blend. These were not "trial" designs and could therefore and did evaluate the fuels' slagging/fouling potential in total as a blend and design for it.

Q. **At page 35, Mr. Hatt says that even if CR4 and CR5 may have been "nominally" designed for a 50/50 blend, the older sootblowers in those units "may not be suitable to effectively deal with PRB slagging." Were these units only "nominally" designed for the 50/50 blend?**

A. Mr. Hatt is badly mistaken. These units were extensively and expensively designed for the blend see Exhibits ____ (JAB 5 and 7). The Slagging/Fouling indexes applied in the design stage are the most conservative that could have been applied. However, in any mechanical system a prudent designer would leave space for additional Operational tools to be added to control slagging and/or fouling if experience proved it necessary. In this case the tools are sootblowers to be added if experience proved it necessary. The provisions for these "futures" can be seen by any casual observation of Crystal River Units 4 & 5. A ten inch capped pipe nipple protrudes from the lagging in the upper furnace and horizontal convection pass area. Provisions were also made in the design phase for the additional piping, valves and controls necessary for these "adds" if and when they are ever required. This indicates that the pressure parts have been designed and hardware provided for the addition of more soot blowers should actual experience

with the design fuel or even an off design fuel prove they are needed. It should be noted these provisions come with a cost and the benefit is to the client as he can add them without suffering a forced shutdown...because these were foreseen in the design.

Q. **Please comment on Mr. Hatt's statement that the older sootblowers of CR4 and CR5 may not be suitable to deal with PRB coal effectively.**

A. Mr. Hatt is wrong again. The sootblowers provided are manufactured by the Diamond Power International Company and are the IK 500 series for retractables and the furnace blowers are of the IR design. They are still in utility service all over the world for fuels indexed as severe slagging/severe fouling. The blowers were at the time state of the art for PRB fuels on units designed for PRB fuels and had proved their adequacy for Bituminous fuels for over 30 years. The vendor of course guaranteed adequacy for the blended fuel and provided additional locations for futures as and if required. The total numbers of blowers and their locations were set once a Severe/Severe ash index had been applied to the design. One factor that was learned in the early 70s was that the sootblower control system, not the blowers per se, had to provide more flexibility for simultaneous operation of several blowers. The application of these devices to these units did not occur until almost 10 years after the initial PRB test burns on units designed for bituminous coals had been completed and design information integrated within vendor design manuals. Increased flexibility in control systems was immediate.

Q. **At page 38, Mr. Hatt discusses the fouling properties of PRB coal. He asserts that at the time CR4 and CR5 were designed no one understood the chemistry of fouling, and consequently the "simple sootblowers" currently installed are inadequate to deal with fouling. He also predicts that PEF would need to space superheater and**

reheater tube banks farther apart to contend with fouling. He estimates the cost of boiler modifications necessary to deal with fouling to range from $5 million to $ 10million, and calls this estimate "particularly conservative." Is he right?

A No. He is wrong. There would be no capital required to modify the convection pass, because the modifications he suggests are already designed into the units. Exhibit ____ (JAB 7), the operational issues on Slagging, Fouling, i.e. the ash issues have been well understood since the early 1970s for the Sub-Bituminous fuels and from the 40's for Bituminous. The design and materials provided for construction acknowledged these issues and designed accordingly. The blend did present an operational issue challenge relating to slagging/fouling-which is the more demanding fuel since no one could have or can predict even now the "worst" and thus the answer was to design for the most demanding and that was to apply the Severe/Severe Index.

Let's review the Fouling approach:

For example the side spacing on the furnace platens (the first convection pass surface) for CR4 and CR5 is 60 inches compared to St. Claire (a 1973 test burn on a bituminous design unit) at 10 inches. This difference recognizes the difference in fouling potential between a fuel designed for bituminous and one designed for a blend. These differences carry on through out the convection pass.

The second design tool concerned with fouling control is bank depths. It is recognized that a sootblower's effective cleaning radius is reduced with Severe fouling fuels. The platens scale at approximately 4 feet depth (using the 6 foot standard man located at the

bottom of the side sectional elevation view of CR4 or 5 (CWT2 page 4 of 13) compared to St Claire approximately 12 feet. This difference recognizes the difference in the effective clearing radius for the severe fuel ash index applied to CR4 & 5

Q. **At page 39, Mr. Hatt predicts that burning the 50/50 blend in CR4 andCR5 would lead to fouling and dust accumulation in the economizer and pluggages of the air heater, which in turn would cause deratings. He concludes, "Even as designed with all the sootblowers operating, the air heaters in Units 4 &5 would still have these problems when burning the PRB coal. This would cause more unit down time for boiler repair." What are your comments?**

Once again Mr. Hatt is referencing a result expected from a test burn on a unit not designed for the blend. He has not analyzed these specific designs.

A. Economizer-This surface is part of the convection pass heat transfer surface and the vendor had addressed this area by noting three impacts were expected in this zone from the blend. They were as follows: 1 pluggage, 2, erosion and 3, ash removal. Each of those were addressed by the designers: (1) increased clear side spacing between elements and decreased back depth, recognizing the reduced effectiveness of the sootblowers, (2) Gas side velocities were reduced to 65 ft/sec to reduced erosion potential, and (3) hopper size under the economizer was increased to aid in creating a reduced gas velocity zone, which would assist in ash drop out and increased storage capacity (larger hopper) to capture that dropped out ash.

AIR HEATERS

Regenerative air heaters were provided both for primary and secondary service.

The Secondary air heaters (SAH) were designed for the blend (per W Toms exhibit 2 Exhibit PEF FUEL 004091) and thus had the surface and the spacing to process the specified fuel.

The Primary (PAH) which provides air to the pulverizers would have had to be sized for the requirements imposed by the 50/50PRB blend at MCR guarantee as well. The PRB fuel is a lower BTU/# fuel, thus requiring more of it (more tons per hour) than if designed for 100% BIT. The increased moisture also impacts design, because the primary air heater would have to have more heat transfer surface in it to (1) evaporate the higher moisture in the coal and (2) heat more air. As an example of the magnitude of the differences, the outlet hot air temperature needed for the guaranteed MCR 50PRB case is 541F and the units were so designed-if designed only for the Bit coal the required air temperature would have been 441F (23 % more temperature required for the PRB SUB BIT). In addition, the total heat required would be higher as the airflow is higher. In addition fouling concerns would tend to favor more open heat transfer spacing to insure clearance. The seventh mill add (future) would have required more primary air, thus the provision for the seventh mill future had an impact on the primary air heater as well. It should be noted that this is a system, and thus all components, the flues, ducts, control dampers were impacted (became larger), which affected all the steel layouts and sizing to provide access-these are massive conveying ducts. The primary air fans would have had to be increased in volume and static capability to handle the higher tonnage resulting from the PRB 50% blend, and also for the potential 7^{th} mill addition.

Q. **At pages 39-50, Mr. Hatt predicts that the burning of the 50/50 blend would cause a decrease in boiler efficiency and a corresponding increase in fuel costs. Does he make a valid point?**

A. If the 50/50 blend were burned, the boiler would be at its guaranteed efficiency of 87.6% (10,285). The heat balance method utilized to calculate the steam generator efficiency could provide a slightly higher efficiency for the straight non specified CAPP Coal (12,822) (Acceptance Test) was 88.8%, or 1.1% differential and that difference would translate directly to an added fuel requirement and added costs. Recall the Blend PRB was a low BTU 8200. Off setting any efficiency difference calculated on the original blend would be the present 1996 PRB 8800 BTU fuel. Thus, the differential in efficiency between what was purchased and what could be achieved with a non design fuel (CAPP) would be less than ½ of 1%. While these numbers are important, one should realize that in this efficiency number is a 1.5% manufacturers margin, which overshadows any of the efficiencies we are thinking about.

Q. **At page 46, Mr. Hatt says that PEF would have to invest in new blending facilities, additional pulverizers, and dust suppression facilities before even undertaking a test burn of the 50/50 blend. How do you respond?**

A. I have shown the new blending facilities and additional pulverizer are unnecessary. Putting that proof aside for a moment, I cannot comprehend why anyone would want to invest that amount in a 20 day test burn and not apply, as all others have who have undertaken test burns, a better way that involves the operational staff of the unit. In general test burns will tell all one needs to know in three weeks or less. The only question is, Are the units going to slag or foul uncontrollably? Additional attention to house

keeping would be required, and extra maintenance personnel would be required during the test burn to insure accepted housekeeping levels are maintained for the PRB and blend fuel. Let me try to provide specific answers in three parts.

1- The Black & Veatch design manual for these units, sets out in the greatest of detail the design fuel, a 50/50% PR Blend, and basis of the fuel handling system-it would be designed for 50 % PRB coal delivered by barge with 3 deliveries per week. The CAPP coal would be delivered by rail. All new conveyor systems would be designed for dust suppression at transfer points, fire deluge systems and dust collection. Wash down systems were not provided universally but at strategic locations. Burn rate with the design blend fuels were 330 tons per hour at MCR. The blending was to be accomplished with two stacker reclaimers and two separate coal piles, one CAPP and the other PRB. The live pile would be created by the stacker reclaimers taking weighed quantities from both piles and blending them to reach whatever % was desired, but capable of the 50/50 design point.

2-Pulverizers were sized to produce MCR with the PRB blend fuel using only 5 mills. The 6^{th} is a spare for the blend fuel.

3- Dust suppression was provided for in the initial design, the initial construction and initial operation. Our inspection indicates those systems have not been used and in most cases have been removed. Dust collection is a good practice for any solid fuel, even

bituminous, and Crystal River Operations would be prudent to reactivate the dust collectors provided for any solid fuel.

Q. **How does Mr. Hatt incorporate these and other design elements into his "seam to stack" analysis?**

A. Mr. Hatt ignores them. In fact, his entire testimony seems to be geared toward a scenario in which a conversion of equipment that was not designed for PRB coal is taking place. This is not surprising, given his erroneous assumption that CR4 and CR5 were designed before the PRB combustion properties were understood, but this failure—and one more gap in his approach—skew his discussion and lead him to wrong, unsupported conclusions.

Q. **What is the other omission in Mr. Hatt's approach?**

A. Incredibly, nowhere does Mr. Hatt mention the design specifications of the boilers or other equipment that Black and Veatch specified, that Babcock & Wilcox designed and constructed, and that Babcock & Wilcox guaranteed. The information is readily available in contract documents and unit design manuals maintained by PEF. To ignore such information is to say, "Don't bother me with the facts."

Q. **What do the contract documents and the design manuals reveal?**

A. They reveal that from an early point the objective of PEF's predecessor, and the commitment of the design firm and Babcock & Wilcox, was to have units capable of maintaining 5% overpressure on a sustained basis when burning the 50/50 PRB/bituminous blend of coals. In fact, Babcock & Wilcox guaranteed that the units would be capable of maintaining 5% overpressure without limitation.

Q. **Is such a guarantee typical in the industry?**

A. No. The guarantee went farther than is typical of the industry. The Industry typically looks to cover peak periods (4 or 6 hours per day) with peak generation and thus a typical guarantee at MCR is for 4 or 6 hours. PEF demanded and received a sustained 24h/day guaranteed MCR with the specified fuels.

Q. What are the implications of this guarantee?

A. The guarantee obligated Babcock & Wilcox to stand ready to remedy any shortcoming of design or installation that prevented the units from operating at 5% overpressure on a sustained basis. Had Babcock & Wilcox provided units incapable of such operation, Babcock & Wilcox would have been liable for expensive re-engineering and physical modifications to honor their contract. In fact, Babcock & Wilcox experienced such a situation when Florida Power Corporation settled with Babcock & Wilcox to enforce Babcock & Wilcox's contractual guarantees with respect to Babcock & Wilcox's participation in the design and construction of Crystal River 3. Because Babcock & Wilcox had committed to a high level of output of CR4 and CR5 on a sustained basis, and was aware of the implications of that commitment, Babcock & Wilcox came up with what were probably the most conservatively designed boilers that came across my desk during my tenure with Babcock & Wilcox.

Q. Do you have any exhibits that illustrate this was the case?

A. Yes. Throughout the process of contracting for the plant, PEF was consistent in the vision or concept of buying a plant firing blended western and eastern coals, blended at the plant site with a base loaded turbine that would operate consistently at 5% overpressure with valves wide open at some MCR initially estimated by Black and

Veatch at 700,000 kW and later when the plant was better defined at 770,000 kW. To support this statement I have several exhibits.

I have attached as Exhibit _____ (JAB-2) Florida Power's RFP to Black and Veatch dated March 10th where in Appendix A Pages A-2 and A3 I excerpt certain quotes to demonstrate the design concept of the owners at inception: "Boiler will be capable of burning a wide range of coals," "Unit is to be designed to operate at 5 % overpressure continuously without time limit considerations", "Unit shall be designed for cyclic operation", "coal blending and beneficiation facilities are (to be sic) included", and in the main letter page 7 (J V Maloney to Black and Veatch) "coal selection for design purposes will be supplied to A/E on or about 1 May 1977. For quoting purposes the coal will be predominantly Eastern Coal with some blending of Western Coal. Coal will be sized and washed at the mine and blending will be handled at the power plant. Recrushing will be performed at the power plant prior to pulverizing"

- Exhibit _____ (JAB 3) (Black and Veatch letter to J Maloney dated April 15, 1977 transmitting Black and Veatch Proposal Section 11 Project Description Section 3 Mechanical Equipment where I extract "turbine generator shall be designed to operate satisfactorily at 105 per cent normal throttle pressure (2520 psig 1000F 1000F) with valves wide open and ..... The expected turbine capacity at this condition will be approximately 700,000 kW. The steam generator and all auxiliary equipment will be designed for continuous operation at this condition" 3.2 Steam Generator maximum capacity will include sufficient pulverizers to supply the unit at maximum capacity (4,750,000 at 2620 psig 1005F) when firing

a range of low sulfur coals. The unit will be capable of operating at maximum capability with worn pulverizers and one pulverizer out of service" "The furnace will be designed for continuous operation at maximum capability without excessive slagging"

Black and Veatch Engineering Contract with PEF dated 24th June 1977, where the Black and Veatch proposal is made part of the contract along with the FPC RFP.

Babcock & Wilcox Proposal Response to Black and Veatch Request for Proposals Exhibits _____ (JAB 9) I quote from the Babcock & Wilcox Unit Description as follows:

> "The maximum continuous rating is 5,236,900 lb/hour of main steam flow at 2640 psig and 1005F....." "Fuel The guarantees for this unit are based on firing a 50/50 blend of eastern bituminous and western sub bituminous coal" "The furnace and convection pass are designed for a severe slagging and severe fouling coal" "Higher heating value for performance (guarantee) is 10,285 Btu/pound"

Summarizing included documents: Proposal summary Sheet P12-4657-16y0-1s0 provides the detailed guaranteed performance at various loads with the specified 50/50 coal blend. CIS Sheets 101.4 and 101.3 show pulverizer capacity as designed and as provided for the specified fuel blend and the alternative Illinois deep mine.

- All the above are irrefutable facts of the concept and actual design provided to PEF to achieve their vision-continuous operation at the 105% pressure turbine valve wide open on a blend of 50/50 PRB/CAPP coals.

Q. **How did the contract contemplate that the parties would implement the contractual guarantee?**

A. A guarantee that would be good for a year after declaration of commercial operation. PEF had the opportunity to test performance and either accept the components or demand the components be made right. The second unit provided a two year gap if the performance of the first unit was in any doubt.

Q. Did PEF's predecessor claim that the unit did not meet contractual requirements?

A. No. Florida Power Corporation accepted the units.

Q. Did Florida Power Corporation burn the 50/50 blend during performance testing?

A. No. Florida Power burned only bituminous coal during initial performance testing. I am attaching as Exhibit ___ (JAB 10) an excerpt from the results of the original performance testing. Having exacted an expensive guarantee from the vendor, having paid considerably more than a bituminous-only power plant for a unit designed to burn the 50/50 blend, and having accepted the units and released the vendors from contractual obligations based on tests performed with bituminous coal, PEF now proposes to bootstrap its own questionable decision not to fully test the units by speculating on what the units could or could not do when burning the 50/50 blend they were designed to burn.

Q. You mentioned that PEF paid more for CR4 and CR5 than it would have paid for units that are designed to burn only bituminous coal. Please elaborate.

A. There are several areas within the fuel transfer, blending and boiler island that were impacted by FPC's decision to specify performance and require guarantees of MCR at a 50/50 PRBV blend. I will take them in order of financial impact on the PEF.

Boiler Island

Steam Generator Sizing as a function of: FUEL ASH PROPERTIES

Furnace Sizing

The specified 50/50 blend indexed at Severe/Severe carried a Bit coal (CAPP) analysis such that if the unit was designed and guaranteed for that fuel only it would have resulted in a furnace and all associated auxiliaries sized for a design index related to a medium fouling, high slagging ash. The blend, for all the reasons provided in Mr. Hatt's testimony, and those in the S&L report, demanded that the designers apply the utmost in conservatism in the design. The designers applied the most stringent criteria to the design by using a design index of Severe fouling/Severe slagging...the highest level in the Babcock and Wilcox design book. For the same MCR (guarantee point) fuel input the more stringent index requires many physical increases that directly relate to such things as building size, both height and footprint; increased structural steel, both to support the greater load but also to overcome the greater wind loading with a taller structure.

Q. Why the increase in building size?

A. Several reasons, but prime is that the furnace would have to be made larger in depth, in width and in height. For example the "furnace exit gas temperature" (FEGT) is a critical design element and for severe slagging fuel it must be at the lowest possible point. The same heat input is required no matter what slagging or fouling index is applied to make the MCR, thus, the only way to decrease this critical slagging related design control tool is to make the furnace larger. A larger Furnace will increase the amount of particle residence time and the amount of water cooled surface the products of combustion (including ash) have (and "see") to cool down before they impact convection pass heat transfer tube surfaces and furnace sidewalls. Once cool (below is softening temperature (T250) the ash can be removed by sootblowers. However the ash, if not cooled, can still

be hot enough to exist in the molten/semi liquid state where the slag cannot be removed and additional deposits will continue until the point, load (guaranteed MCR) would have to be decreased to "shed slag".

Q. Is there any other way to decrease FEGT?

A. Decreasing load, is in essence, is reducing the FEGD, making the furnace cooler and is an effective way to control slag, but since it would have required a load shed to achieve, the designers had to design into the steam generator a lower FEGT. In fact the CR4 and CR5 units are not always at MCR and thus load reduction is an operational tool the operators could apply when and if required. This lower or more conservative FEGT was then available at the guaranteed MCR with the blended fuel and could meet the heat balance requirements required to meet the thermal performance guarantees.

Q. Does a unit rated for severe slagging require more sootblowers?

A. A severe slagging fuel would require more furnace sootblowers and more elevations of furnace sootblowers along with the associated piping, platforms and stairways to provide maintenance access to them.

Q. What happens to Convection Pass Sizing?

A. Severe Fouling as an applied index impacts the arrangement of the convection pass heat transfer surface and thus impacts (increases) height, width and depth of the convection pass in the steam generator and thus the building. The amount of clear side spacing between furnace pendants and convection pass platens (heat transfer surface for superheaters and reheaters) typically hung from the roof are critical to being able to control the fouling of ash particles in this zone. Also bank depths (direction of gas flow) are decreased because the effective cleaning radius of retractable sootblowers is reduced

with severe fouling fuel. If uncontrolled the fouling will result in the unit not attaining final steam temperatures (effecting MW output, Turbine efficiency, guaranteed performance) and eventually reducing gas flow to the point where a forced shut down is required for ash shedding.

Q. What did the Severe Fouling index used impact at CR 4 and CR 5?

A. The severe fouling index fuel (i.e. the guaranteed 50/50 blend connected to MCR) required the designers to be guided by conservatism and maximize the clear side spacing, minimizing the back spacing (had been found to reduce ability for fouling desposits), and redesign the method of alignments utilized. These design tools took advantage of the lessons learned from their (Babcock & Wilcox) extensive fuel blend/fuel burn/fuel-ash analyses history.

The cost impact here includes building volume. If the clear sidespacing is increased, the width of the unit will be impacted, while the change in "backspacing" reduces the heat transfer effectiveness and thus requires more surface to compensate for that loss – thus more volume and weight impacting structural steel requirements.

Decreasing the depth of each pendant (recognizing effectiveness of cleaning radius reduced with severe fouling fuels) creates more cavities where sootblowers could be placed to control the fouling. Thus more cavities, the more horizontal length required to pack in surface, the more sootblowers, more piping and platforms and stairways and building volume.

The horizontal convection pass (primary superheater, primary reheater, economizer) all would have increased clear sidespacing and thus require more volume for the same heat transfer. Here again, more sootblowers would be installed with the associated requirements for piping, platforms and access.

There are gas side velocity limits, and these would have been reduced, which would impact due to the greater gas weights and change in ash composition (ash with higher silica/alumna ratios are known to be more erosive). Thus the allowable velocities had to be reduced for the 50/50PRB blend (ash weight, gas flow) and erosion concerns which in turn would have an impact on the width and height of the horizontal convection pass.

Q. What would be the impact to the Combustion System?

A. As designed, five pulverizers could have carried MCR with the CAPP fuel only and had some spare capability. This would have meant only five rows of burners, five rows of burner pipes, five levels of ducts for windbox air supply and five sets of controls. As provided, five pulverizers could just meet the guaranteed MCR when burning the specified 50PRB blend (8,125 BTU/#) with no spare capacity; but, with 1990s PRB fuel at 8800 Btu/,# there is spare capacity in the 5 mill PRB50% condition. The pipes themselves had to be increased in diameter to handle the higher tons/hour fuel load and higher moisture PRB Blend. It was considered prudent by the supplier to provide 6 pulverizers that would meet the guarantee MCR 50% PRB Blend and have spare capacity-in fact, one spare mill at the guaranteed MCR load point. This reserve is normal utility practice, and going to 6 mills is not an incremental cost for the base Bit case Vs the

guaranteed MCR50%PRB blend, but the larger pipes and the clearance space required for them are.

Adding the 7th mill would be called for only if PEF desires to have the capability for an additional spare in the event the utility want to increase PRB coal beyond the 50% in the blend, or if the BTU value per pound dropped from the design basis. In fact, however, the PRB BTU values per pound have increased, thus providing more spare milling capacity with only the 6 mills provided. The 7th mill addition would have provided pulverizer capability to go to 100% PRB and/or provide future additional spare capacity. However, it was a condition of contract with the 50% PRB Blend that space, etc, be made available for a 7th mill and its associated system requirements.

Engineering the space into the building, and actually providing the space and associated clearances for the fuel handling equipment such as: coal tripper, silo, feeder, pulverizer, hot and cold air supply ducts, coal pipes to burners, burners, windbox, secondary air supply, control and measuring, pressure part openings in the furnace, structural load allowances for all the added loads to be added to the existing steel, controls, motor control centers, breakers, burner igniters, burner scanners, burner and coal pipe platforms result in a major impact on the design, space allowances and anticipated structural loads that would have to be designed in the support steel even though the loads were future the steel had to be sized, rooms had to be sized, auxiliary power systems sized, primary air heater, primary air fans all had to be purchased and sized, the buss bars as well control systems expanded and capability all purchased at the original start.

Q. Would the fuel specified have impacted the cost of the air heaters?

A. Regenerative air heaters were provided. The Secondary air heaters would have had to be sized for the air requirements of the blend at MCR and the expected fouling potential of the blend. The Primary (PAH) would have had to be sized for the additional requirements imposed by the 50/50PRB blend at MCR guarantee. The PRB fuel is a lower BTU/# fuel, thus requiring more of it (more tons per hour) than if designed for 100% BIT. The increased moisture also impacts design because the primary air heater would have to have more heat transfer surface in it to evaporate the moisture and heat more air.

Q. How large is the heat load difference between the design basis blend and the CAPP?

A. This is an example of the magnitude of the differences. The outlet hot air temperature needed for the guaranteed MCR 50PRB case is 541F, and the units were so designed. If designed only for the bituminous coal, the required air temperature would have been 441F (23 % more temperature required for the PRB SUB BIT). In addition, the total heat required would be higher, as the airflow is higher. Fouling concerns would tend to favor more open heat transfer spacing to insure clearance. The seventh mill add would have required more primary air, thus the provision for the 7^{th} mill future had an impact on the primary air heater as well.

It should be noted that this is a system and thus all components, the flues, ducts, control dampers were impacted (became larger) which affected all the steel layouts and sizing to provide access-these are massive conveying ducts. The primary air fans would have had to be increased in volume and static capability to handle the higher tonnage resulting from the PRB 50% blend, and also for the potential 7^{th} mill addition.

Q. What cost impact would the design have on the electrostatic precipitator?

A. The precipitator design was specified for ash and gas flows resulting from the 50 PRB fuel blend MCR guarantee requirement. For his reason, it physically is larger than one required for CAPP Bit only fuel. Hatt's testimony pointed out that the resistivity of the ash is lower and thus the "space velocity" (a design criterion used by vendors and AEs to insure conservatism) must be reduced to insure particulate capture. In addition, more frequent cleaning would be required; thus each ESP (2 per unit) was oversized to permit one to be removed for cleaning without forcing a shutdown. The specifications were so tight that it is obvious the design fuel was the PRB 50/50 Blend. The Spec included such requirements as: space velocities 3 fpm under all normal operation, number of fields (5), Aspect ratios 2.0, 55 degree minimum hopper angle, required hopper heaters (relates to concerns with the high PRB calcium ash plugging the removal system), isolation dampers and the design coal table 2-2 indicating that any coal with the properties within the range outlined on Table 2 were performance guarantee fuels and coverage by their broadness the PRB Blend MCR design case. The number of hoppers, the size of ash removal equipment, and storage capability would all be impacted as the guarantee 50%PRB Blend required a higher tonnage of coal. The ESP provided for CR4 and CR5is a most conservative design, suitable for the guaranteed conditions. The oversizing to meet guaranteed performance (Blend at MCR) impacts the housing sizing, number of ash hoppers, hopper heaters, ash removal system, power supplies, rigid plate design, rapper system employed, the size of flues to and from, the dampers at exit and entrance, support steel and the foot print required for the units.

Q. How did the blend impact the fuel transfer system?

A. Black and Veatch clearly were directed by PEF to design for two separate fuels that had to be keep segregated and were to be blended to achieve an as "fired" heat content of 10,285 BTU/# Exhibit _____ (JAB 10) Black and Veatch Document Summary Important Information 7645.41.0601.22. 7/15/80. Per this document it was projected (designed) that half the fuel (CAPP) would arrive by 70 unit car trains and half (PRB) by barge resulting in a requirement of about 3 barge unloadings per week at the barge unloading design rate of 1500 tph. Our site visit indicated that the barge unloading facility appeared to be only working at half the design rate-their estimate was 700 tph at the time of design (7/15/80).

Q. Were the barge unloading facility upgrades in the scope of Black and Veatch for the CR 4 and CR 5 project?

A. The Barge unloading facility and associated transfer conveyors would have been necessary in any case for two reasons (1) to fuel Units 1 and (2) PEF elected to receive CAPP coal via barge as well as train. However, Black and Veatch had no scope in the unloading facility and did not take design responsibility until transfer point 24, providing coal to Units 4 and 5 only. Dust suppression, Fire protection, Deluge system and wash down capability were required for either fuel and were provided in the Black and Veatch scope area. The incremental cost impact on these systems would have related to the capacity issue (tonnage) and served to require an increase the system to provide the required 50% CAPP/50% PRB BLEND and obtain the equivalent BTUs. This corresponds to an approximate 28% increase in tonnage from the PRB coal to match the 50% of total BTU input required. Can be quantified by the added requirements for larger belts, larger transfer stations, larger motors, more support steel and foundations

Q. Did the concept of on site blending have an impact on cost?

A. The Black and Veatch concept and the design that was followed was to use two stacker/reclaimers with two separate piles to blend to a third pile, and then reclaim from that third. The impact here included the additional real estate, the second stacker reclaimer, the associated belts (32 or 33) (35a or 35B), tracks, transfer points, motor controls, auxiliary power sizing to the redundant reclaimer, and the second reclaim belt to the crusher house feed belt/transfer station. Black and Veatch warns in their design that if "operators" were required for the two stackers it would add the equivalent of $2,960,000 in capital costs to the $16,022,000 they estimated the cost of the system to be at the time of design. Blending would require operators. 100% crushers were provided with 100% redundancy, and with the higher tonnage the crushers were both 56% larger (with no margin) than required for CAPP coal only-- along with their motors, motor control centers, auxiliary power supplies, housing, foundations, dust and fire suppression systems and foot prints.

Q. What do you mean by "with no margin"?

A. It would be normal practice for Black and Veatch to add some capacity factor to the base burn rate required for the crushers, but I do not know what it might have been. I might be overstating the % larger than required vs actual (CAPP) for the crusher at 56%.

Q. Could you provide an approximate cost estimate of these additions to have the ability to burn PRB 50/50 Blend specified?

A. On the sub systems described above, obtaining detailed cost estimates is not possible in the time permitted. However, we have provided an estimate of the incremental cost

additions/deductions the PRB blend would have had added as a percentage of the total "as purchased" costs.

Q. Would you provide these estimates?

A. Yes. Boiler Island: The impacts identified above, if *not* included in the CR 4 and CR 5 designs, would have resulted in decreased cost to FPC. Our estimate of the incremental cost increase due to the required and guaranteed PRB 50% MCR blend is 18% on the D & E total costs and most probably higher as a percentage of the original design (Black and Veatch engineering costs), equipment (where excess design costs had to be included with the material), and construction costs of the boiler island. Per Precipitation: The cost estimate impact to make this suitable for the design fuel would be a 35% increase in the total cost (material and construction), as the volume had to be larger to achieve the lower space velocities, the 5 fields rather than 3, affecting the footprint and the hopper angle at 55 degrees affecting the height, more steel, foundations, ash removal systems and isolation dampers.

Fuel Transfer System: The conveyor system had to have dust suppression, fire protection, and deluge potential in any case, but tonnages were higher by 28%. The two/stacker reclaimers were provided for blending, and thus represent almost 60% of an additional incremental cost required for blending. No blending would have meant no secondary conveyers (32 or 34) and (35A or 35B), with no central reclaim pile required, the footprint decreases by 66%, along with auxiliary power, motor control centers, operators control room-- as well as the operators for only one stacker/reclaimer.

The overall cost increase associated with having to provide for blending would amount to 40% of the original fuel transfer system.

Q. **At page _7_, lines 18 & 19, Mr. Toms asserts that the larger "box" necessitated by the plan to burn a mixture of PRB and bituminous coals enabled PEF to generate at 5% overpressure with bituminous coal. How do you respond?**

A. The units were designed to operate at overpressure on a continuous basis with a specified fuel-they would operate at that point with many non-specified fuels, such as some of the blends PEF tried during the past 17 years. Mr. Toms, like Mr. Hatt, fails to mention that the maximum capability rating of CR4 and CR5 when burning the 50/50 "design basis" blend of coals is the same maximum output that PEF achieved with bituminous coal. Either Mr. Toms is unaware of the design standard and corporate guarantee applicable to CR4 and CR5 when burning the design fuel, and is also ignorant of the limitation of 5% overpressure that caps the generation of the boilers regardless of fuels being burned, or he chose to ignore these factors.

SEVENTH PULVERIZER

Q. **At page 32, Mr. Hatt states, "Finally, I noticed on my site inspection of Crystal River that although CR4 and 5 were designed to include an additional silo, feeder, and pulverizer unit at each plant, these additional structures <u>were never built.</u> So the design features needed to burn a 50/50 blend of PRB and bituminous coal that Mr. Sansom speaks of in his testimony are missing very critical pieces of equipment. Building and operating these additional structures would be inherently necessary to**

burn a 50/50 blend under Mr. Sansom's theory which depends on the design basis of the units." Is he correct?

A. No, he is incorrect. With 6 miles, there is, no shortage of the equipment needed to operate at the MCR guaranteed rating, and that includes a full complement of pulverizers with one spare unit....and that was spare when the specified blend was at a 10,285 BTU/# level. The higher BTU levels currently available would increase the "amount" of spare capacity at the guaranteed MCR. Exhibit _____ (JAB 9).

Taken from Babcock & Wilcox Unit Description (PEF-FUEL-)004090 BOILER I am quoting "The unit has 54 Dual registers burners, arranged in three rows of nine burners each on both the front and rear walls." From Scope of Supply: "Six MPS pulverizers size 89G and piping to burners", from FUEL "guarantees for this unit are based on firing a 50/50 blend of eastern bituminous and western sub-bituminous coal", "Performance fuel higher heating value is 10,285 BTU/#", CIS Sheet 101.01 Pulverizer Design Curves labeled "50/50 Blend Coal" all confirm that the boiler was designed and built to maintain MCR with 5 mills and the sixth is a spare on the performance design specified coal.

Exhibit _____ (JAB 11) consist of Black and Veatch Coal Handling Documents 7645.41.0601.22, 7645.42.0605.12, 7645, and 7645.42.0602.12, all of which pertain to the coal handling system at CR4 &5. Mentioned through out these official specifications for this plant are references to the specified blend, 50/50 PRB, the specified Btu/# values of 10,825 and all tonnage rates at 330 t/hr, which is the MCR burn rate with the blend with margin. In addition, 6 silos are the number for 6 pulverizers, with six weight scales

and six vibrating feeders. Black and Veatch as well as PEF believed 6 mills was the correct number for the specified PRB 50/50 Blend at MCR.

Exhibit _____ (JAB 12) is FPC's specification to Conveyer Bidders Dust Abatement "Eliminating of Dust resulting from coal transfers is of paramount importance," indicating all involved were knowledgeable of the importance of eliminating dust with the PRB coals.

Exhibit _____ (JAB 13) is FPC's specification to conveyer Bidders-FPC 61-4220 040779 provides the specified fuel analysis range, which includes eight different 50/50 PRB blends. The #4 column matches the final selection for the specified design fuel.

Exhibit _____ (JAB 14) (OPC Locator CR4 Coal Conveyor Equipment 2-2-4) Section 21 Coal silo unloading conveyors are specified under 21-2 Design Conditions Material Temperatures 800F "Smoldering Coal".

There is simply nothing in the available documentation that would support the position that the 7th mill is needed for the 50/50 blend MCR specified load point. In fact, it becomes evident, as one reviews the design documents, that the designers were well informed concerning PRB fuel and the need for careful dust control. Also in plain view is the plan to blend on site.

Q. **At page 34, Mr. Hatt opines that, because the pulverizers must work at a lower capacity to grind the 50% bituminous coal to a finer grade, "this will necessarily**

slow the fueling process at Units 4 and 5, which will lead to power production derates." Is his concern valid?

A. No, it is invalid. Again, Mr. Hatt starts with a recitation of properties of PRB coal and leaps to an unwarranted conclusion—one which he would have known to be unwarranted had he bothered to consult the design parameters and design capacities of the pulverizers.

I do not understand why he would think the fueling process would slow down-I assume he means load up to produce the required heat to the boiler for the heat balance. More tons are required if each ton has less heat in it to make the required guaranteed heat balance. If his point is that capacity falls off in a mill as you change to the design blend, it does, of course, and less tons of coal can be milled; so, some of the design reserve capacity is utilized, as the mills must process more pounds of the specified coal to make the heat required. This decrease in capacity was known and taken into account by the designers of the pulverizers.

The pulverizers had to be increased in size for two reasons – the drying required with the higher moisture fuel adds to the recirculation load within the pulverizer and the increased tonnage. The increased tonnage is offset somewhat by the lower HGI (an index used to predict power required to achieve a certain fineness in the product output). The maximum mill capacity for these MPS 89 G pulverizers 140,100 pounds of CAPP coal per hour (70t/hr). The maximum mill capacity of the Blend in the same mill is 127,000 pounds per hour or 63,500 Ts/hr. This relates to a 10% reduction in mill capacity, which

was not sufficient to force an additional pulverizer to be added. The unit was designed for 6 mills, 6 miles are ample to achieve MCR, and 6 mills were provided.

- Please see Exhibit _____ (JAB 9) Cis 101.03 Mr Hatt also raises the issue of coal pipe sizing. He asserts the present pipes would be undersized for the 50/50 design blend. This not the case, as they have been sized for MCR and the specified design 50/50 blend.
- A similar alert issued by Mr. Hart concerns the adequacy of the regenerative air heaters and raises two issues- (1) how the requirement for higher primary air temperatures with 50% PRB and (2) the potential for fouling/pluggage of the surface would increase with PRB coal. Here again, the designers were aware of the issue and would met the guaranteed performance of 5050%PRB blend at MCR with equipment designed for the intended purpose.
- Mr. Hatt asserts the lack of an inerting system on the pulverizers, and his capital estimate includes one, but, in fact, one was provided within the initial pulverizer scope. It required external hook up, and that was deferred by PEF.

Therefore, Mr. Hatt'ss prediction of deratings based on inadequate pulverizer capacities is completely bogus. However, Mr. Hatt could have mentioned, but chose not to mention, that a diet of 100% bituminous coal will result in faster wearing of pulverizer components than would the processing of the 50/50 PRB/bituminous blend that the units were designed to burn.

Q. Please explain.

A. Pulverizer wear elements are an expensive maintenance item. The average PRB wheel life (3 per pulverizer) on sub-bituminous coal is projected to be in excess of 35,000 (PS

of Colorado Comanche #2) hours, while wheel life on eastern bituminous coals are in the much shorter 18-20,000 hour range (AEP GAVIN). The abrasive elements in bituminous coal ash are the silica, alumna and iron. An index has been proposed for Silica alumna ratio that could be tied to wear life, but it is still being developed. It is interesting to note that one can get almost twice the wear life with PRB coals than with eastern Bituminous.

COAL HANDLING AND CONVEYING SYSTEM

Q. **At page 27, lines 14 through 24, Mr. Hatt worries that the coal conveyors from the coal storage area to the units would not be capable of supplying the increased quantities of blended coal that would be necessary to sustain full output and also leave time for maintenance. How do you respond?**

A. Please see Exhibit _____ (JAB 11). The systems were designed for the 10,825 Btu/# specified blend and can manage to deliver those tons that correspond to the demand heat input. Let's look at the actual situation and determine if there is a problem.

- How many tons of the specified fuel are required per hour?

The initial impact is the amount of coal to be handled. The input required to meet the output specified is 6,398,000 MBTUs per hour at MCR. This equates to a required fueling rate of 523,000 pounds per hour of CAPP Coal at 12450 BTUs per pound. If 50% of the input required is to be contributed by PRB fuel at 8125 BTU/# then 393,335 pounds of PRB would be required per hour.

- This contribution plus 50% of the CAPP coal of 257,000 pounds per hour would be the required fuel rate of 650,700 pounds of coal per hour. In fact, if the blended BTU/# value given is at 10,285 that BTU value would require 622,000

pounds of coal per hour to meet the specified output. Let's use the 50/50 calculated number, as it is higher. This is 26 % higher than a 100% CAPP specification would have required. All coal unloading, conveying, storage, reclaim, crushing, surge and storage silo system sizing would have had to be increased by at least 26% and most likely something larger would have been utilized to provide a safe margin. This corresponds to a 325 ton/hour fueling rate to maintain MCR at the guarantee level. The reclaim system is designed with two 800 tph conveyors to feed two 800 tph crushers to feed two 800 tph conveyors to the surge bin with 4 x 400 tph outlets to two boilers. To keep two units at MCR with the specified fuel requires 325 tph x 2 or a 650tph feed rate. Available capacity using only *one* of two systems available is 800 tph, or 23% greater capacity than is needed to maintain MCR. 123% redundancy provides for lots of maintenance time. In fact, the plant operates both of the systems in parallel, and thus in 24 hours the unit will require 325 x 24 or 7800 tons of specified blend fuel. With one system dedicated to one unit this could be accomplished in 9.75 hours, leaving 14 hours for maintenance. The silos, however, are only sized for 8 hours of fuel, so the fueling has to done over two shifts and the limit would seem to be-not the transport system-but the size of silos.

IMPLICATIONS OF TEST BURNS ON FULL LOAD CAPABILITIES

Q. **At page 47 lines 1`2-14, Mr. Hatt refers to the 2004 effort to conduct a test burn, and notes that capacity suffered during the aborted test. He also alludes to a 2006 test**

burn, then states the two exercises were "inconclusive." How do you respond to his characterizations?

A. There were two test burns and in my opinion they were conclusive. I believe they were also conclusive to Strategic Engineering (Raligh PEC), who recommended proceeding, in several areas. See Exhibit _____ (JAB 15) and Exhibit _____ (JAB 16).

The PRB Blend, not the specified blend but at something between 18% - 22% PRB, had been transported and off loaded using the existing conveyor systems, transfer houses, crushers, surge bin and coal silos-all without any mention of additional housekeeping or hosedowns, and experienced no explosions. Observations during the handling indicated little dusting.

In addition, on the 2004 test it was learned that several "hammers" were not functioning in the Electrostatic Precipitator on Unit 4 and dust emissions were a problem. In the 2006 Test on #5, the blend dust emissions were reduced as compared to CAPP and non spec (Venz/Syn) blend coal only situation.

Both tests confirmed in the emission area what everyone knew-NOX emissions were reduced, SO2 emissions were reduced and opacity, if the precipitator was maintained, would remain same or be reduced.

The 04 test indicated that LOI was high on Unit #4, but a sample taken from Unit #5 at the same time confirmed it was not from the PRB fuel but most likely from the Venz/syn

coal in the blends. Typically the industry would expect a lower LOI from PRB fuels if the mills/burners are set for the fuel.

The tests confirmed that if you have soot blowers that are operational, they clean the surface; and, conversely, if soot blowers are not functioning, you would permit slag deposit to form.

In 2004 the feeder controls functioned as designed, and limited load to the mills to a preset value-the CAPP heat/tonnage value. They had not been reset to match the lower heat value of the test blend, thus acting to limit load.

The plant staff proved capable of managing the blends and the only inconclusive portion to me was that plant management opted to blend offsite and not use the on site facilities and learn how good they are.

BLENDING TWO COALS AT THE CRYSTAL RIVER SITE

Q. **Are you aware of any indication that the original plan of PEF's predecessor, Florida Power Corporation, was to blend the PRB and bituminous coals at Crystal River?**

A. Yes. The contract documents and design manuals maintained by PEF are replete with evidence that Florida Power Corporation directed Black and Veatch to provide the means to blend the PRB and bituminous coals on site.

Q. Please identify the documents that establish that the plan of Florida Power Corporation was to blend the two coals at Crystal River.

A. The vision and concept of blending at site a PRB and CAPP coal was in place from the very beginning, as well as at the final design. I use these excerpts to support that statement:

- The RFP from PEF dated March 10, 1977 to Black and Veatch clearly calls out in the Main body of the letter and the attachment A "Scope of Work" that blending is to be done at Crystal River. I extract quotes from the letter: Coal selection for design purposes will supplied to the A/E on about May 1, 1977. For quoting purposes, the coal will be predominately Eastern Coal with some blending of Weston Coal. Coal will be sized and washed at the mine and blending will be handled at the power plant" From Attachment A: "Boilers will be capable of burning a wide range of coals. The fuel to be burned will be determined later"

  Exhibit_____ (JAB 2)

- Black and Veatch Proposal response to the PEF RFQ states in the cover letter that the "proposal responds directly to your Request for Proposal and is intended to include the complete Scope of Services you have specified as required for the project" Exhibit_____ (JAB 3)

- Black and Veatch Contract (Agreement for Engineering Services dated 24 June 1977) incorporates the PEF RFP letter and Attachment A as a portion of the project description. Exhibit_____ (JAB 4)

- Black and Veatch System Design Specification 7645.42.0602.12 on page 1-6 states that "Blending for Unit #4 and #5 will be accomplished as follows: During coal unloading, coal directed to TTP 26, Coal A, will be split to both conveyor No's 32 and 33. Coal on conveyor no 32 will be stocked out in the active storage piles of stacker reclaimer No 3. Coal on conveyor 33 will be blended with Coal B reclaimed by stacker reclaimer No2 and directed into the units....when a barge or train is unavailable, blending will be accomplished in the same manner, but with Coal A being supplied by Stacker Reclaimer No 3. Exhibit_____ (JAB 17)
- Black and Veatch System Design Specification 7645.41.0601.22 Page 6 Section 3.0 Analysis Coal Handling System states under 3.2 Requirements paragraph 3 "The stock out and reclaim systems will provide for the handling, storage, and blending of at least two types of coal. Complete segregation of the two coals is required prior to blending" Exhibit_____ (JAB 18)
- The fuel specification issued to all conveyor vendors by PEF Exhibit_____ (JAB 13) indicates all fuels to be designed for with 8 specific blends indicated. The final specified design blend is included

Q. What did Black and Veatch do in response to Florida Power Corporation's directive?

A. Black and Veatch planned and designed a sophisticated system for blending on site that provides flexibility and redundancy. The detailed design excerpt provided above Exhibit _____ (JAB 18) details exactly what the "blend on site" concept was and how to execute the blending for all barge/ train variables, as well as the no train and/or no barge, and how

they designed for each variable. The Black and Veatch Design Specifications also include details for weighing each stream accurately (Black and Veatch 7645.42.0605.12); on the need for 100% redundancy (Black and Veatch 7645.42.06.04.12); on the need for accurate sampling (Black and Veatch 7645.42.0601.12); Control (Black and Veatch 7645.42.1207.12); dust control, and fire protection through out the detail specifications.

Q. **At page 25, line 18, through page 26, line 19, Mr. Hatt questions the ability of the existing two stacker reclaimers to blend PRB and bituminous coals adequately. How do you respond?**

A. The two stacker reclaimers are the centerpieces of the system. When Mr. Hatt asserts that they are not accurate enough, he overlooks two important points: (1) the weigh scales that are part of the blending system, which he fails to mention and which provide the means to ensure ongoing accuracy of blending; and (2) the operating systems of CR4 and CR5 that would sense any discrepancies in the ratio of coals and adjust the splitter gates if directly fueling from either barge or train or automatically, with no loss of output.

Q. **Please describe the location and function of the weigh scales that Mr. Hatt overlooked, and their significance to the blending operation.**

A. Blending with coal received on Conveyor 31 is accomplished by belt scales No 31 and 32, indicating to the control system that a specified amount of coal is being split off to stacker reclaimer #3. Simultaneously, Belt scale Nos 31, 32, and 34 will provide data to the control system for controlling the reclaim rate of stacker reclaimer No 2 . In the event no coal is being delivered by Conveyor #31, then blending takes place using only the two stacker reclaimers. Data from belt scale No 32 and 34 to the control system will enable the reclaim rates to be set on both machines. If stockpiled blended coal (pile 3) or

non blended coal from either pile 1 or 2 is required from a single stacker reclaimer, then the belt scale on the respective yard belts will enable control of the reclaim rates.

Q. Earlier you mentioned the capability of systems within CR4 and CR5 to detect any variations in blend ratios and make adjustments without any diminution of output. Please explain.

A. In the large view the steam generator is a heat machine. It senses immediately when the heat input is reduced while at a constant output. The controls call for more coal. This would be an indicator that the Btu/# value has dropped off. If it calls for less coal, this is an indication to the operators that the Btu/# value has increased. As PEF discovered during test burn #4 with the 22% PRB Surge, the coal feeder speeds are adequate to feed sufficient coal to maintain load if the alarm limits placed on them during initial set ups are readjusted for actual fuel heat levels. In my opinion, the controls are capable of handling a + or – 20% variation in fuel Btu/# heat content over some reasonable period of time. This is about what they were required to do in 2004as the 22% PRB test blend was introduced to the silos-it did not arrive at the burners all at one time and thus the controls adjust automatically as the heat demand is reduced or increased. As one would expect, with a scale out of calibration, the change would not be instantaneous.

Q. Mr. Hatt contends that PEF would need to spend some $37.8 million on a different type of machinery to blend the two coals. Is he right?

A. No, he is mistaken. Because of the manner in which weigh scales have been incorporated into the blending scheme, and because of the ability of the unit control systems to adjust for any discrepancies even in the unlikely event they occur, to scrap the stacker reclaimers and replace them with a different type of equipment would be to waste

customers' money. The *only* valid point that Mr. Hatt made concerning the stacker reclaimers is that PEF should add washdown capability. However, this is easily and inexpensively done. Rather than the $38.7 million that Mr. Hatt says PEF should spend on new and different blending apparatus, the appropriate value is approximately $50,000 for the two units.

Q. **At page 27, Mr. Hatt asserts that because there is only one conveyor from the barge unloading point to the north storage area, a barge and train cannot be offloaded at the same time. At page 28, Mr. Hatt adds, "The coal yard and the conveyor belt system are not currently able to accommodate blending of PRB coal," and alludes to indications that provisions were made for an additional conveyor belt from Transfer point 24 to a point north of transfer point 25. Does the space allotted on the ground for an additional conveyor belt prove that the existing conveyor belt is inadequate for on-site blending?**

A. No. Mr. Hatt should have consulted the original design before concluding that a second conveyor was designed but not built. I have reviewed the original design documents. The original plan provides only for the one conveyor belt from the barge unloading point to the north storage area, the one that was built, and it is fully adequate to serve the on-site blending function. Returning to fundamentals, let's start with the actual fuel required to maintain MCR with the specified blend and then determine what additional capacity was designed in by Black and Veatch to handle stocking and reserves and maintenance downtimes. Input for MCR with the specified fuel is 6,398,000,000 BTUs per hour/per unit.

Exhibit_____ (JAB 9). The specified coal has a heat content of 10,285 BTUs/#. 622,000 pounds per hour/unit therefore are required to maintain MCR. This reduces to 311 tons/hour of the specified coal x 2 (for two units) or 622 tons per hour. Black and Veatch System Analysis Coal Handling 7645.41.0601.22 used a design burn rate of 660 tons/hour for the design bases of all the conveyor, crusher, surge bins, transfer point, silo feeds etc with variations only to provide either a higher capacity or 100% redundancy.

Exhibit_____ (JAB 18). A new transfer point 23 was created to serve train only, and conveyor 11 was modified. Train coal could then go to several points, including Transfer Point 24 for fueling Units #4&5. Thus, the coal yard people could unload a train and have that fuel isolated from the barge fuel. Barge unloading for PRB would eventually arrive at transfer point 24 via conveyor 29.

TP 24 feeds conveyor 30, and 30 feeds TP25 and then 31, which is the only north bound conveyor that can fuel CR4 and CR5. Since it was desirable to segregate the two fuels, they could not be co-mixed on Conveyor 30. Both 30 and 31 are designed to carry 2,500 tph of the specified fuel. Requirement is 622 tph; actual provided is 2,500 tph. Daily fuel rate required is 14,928 tons, daily capacity is 60,000 tpd. Thus, it would appear that 24% or 6.0 hours of the available capacity of one day is required to provide fuel for MCR for both units. Designers were aware of the difference in angle for repose for PRB vs CAPP, but provided variable speed drives where prudent to provide flexibility in delivery rates. On those drives that are fixed, it is a simple and low cost modification to change the gear

set and increase the capacity that way, but it appears unlikely to ever be necessary with the spare capacity built in.

- The stacker/reclaimers have similar redundancy (100%), Page 8-2 of JAB Exhibit 20 shows a 2,500 tph stack out rate and a 1600 tph reclaim rate for the specified blend. The requirement for MCR atboth units is 622 tph vs 1600 provided, or, stated differently, the system is 153% oversized. There are two stacker reclaimers; thus, if required, there is over 300% spare capacity. Downtime for maintenance 38,400 tpd available (not counting second stacker) vs 14,900 tpd for MCR or 0.38 of a day or 9.33 hours, leaving more than 15 hours available for stacking or maintenance.
- The crushers and associated conveyors are sized for 800tph with 100% redundancy. The requirement to fuel MCR with blend fuel is 622 tph, vs the 800 tph provided. This is 28% more capacity than required, plus another 100% available. Down time for maintenance at 19,200 tpd vs the 14,900 or 29% spare capacity. 0.77 of the day or 18.6 hours. 100% spare provides all the time required for maintenance. Path is then from surge bid to silos and each unit has two 400 tph feeders to fuel the silos. Again 100% redundancy plus the 311/400 or another 28% oversized conveyor. Please note I am calculating Actual – Required/Required to determine the spare percentages.

I can find no specified blend coal feed constraint in any of the systems provided. In fact they all have a healthy margin for additional capacity.

ADEQUACY OF COAL STORAGE CAPABILITIES

Q. **At page 25, Mr. Hatt worries that to blend PRB coal, PEF would have to increase the quantity of coal in storage from 500,000 to 600,000 tons. Is his concern warranted?**

A. Again, Mr. Hatt should have consulted the original design parameters of the CR4 and CR5 projects. I did. Black and Veatch provided for 850,000 tons of reserve storage, along with 43,000 tons of active storage. I don't believe his concern is warranted. PEF apparently agrees, as they have elected to reduce stockpiles to the 40-50 day requirement. See Exhibit ___ (JAB-18). PEF would need to compact the pile of reserve PRB coal as they are presently doing for the CAPP and would need only to supply rubber-tired equipment for the purpose of replacing steel tracked, or trading them to the south CAPP reserves. However, any incremental costs associated with maintaining the larger inventories in this fashion would be approximately $300,000 for equipment and the existing staff would not have to be increased.

TRIPPER FLOOR DUST COLLECTION

Q. **At page 29, lines 20-24, Mr. Hatt criticizes the dust collection system of the tripper floor because its shape is not round. Does he have a point?**

A. I agree that a round housing cover for the system is preferable to a square one. However, to change the shape from square to round involves only the fashioning of a small quantity of sheet metal and welding it in place. I also agree that I beam flanges should have slopes installed to minimized dust hide out during wash down. Both of these suggestions

reflect best practices and should be installed. The cost of these modifications, undertaken as part of the required maintenance, would be insignificant.

PRECIPITATOR

Q. **At pages 40-41, Mr. Hatt opines that PEF would have to add a sulfur conditioning system, at a cost of $2.4 million, to counteract the high resistively of PRB coal and enable the electrostatic precipitator to function effectively. How do you respond?**

A. It is true that precipitators *not designed* for PRB fuels (those test burns again on Bituminous fired/designed units) did have problems with collection and sulfur had to be added to improved performance. At CR 4 and CR 5 the precipitators were designed for the PRB ash. All the criteria, such as number of fields, space velocity, collection area, angle of ash hoppers, heaters installed in the hoppers, would indicate to anyone familiar with the art that these precipitators were designed for a western PRB type fuel. Again, Mr. Hatt fails to recognize, much less consider, the excellent design that BV specified and implemented. The high resistivity of PRB ash was known at the time and provided for at the time. This resulted in precipitators that differ from those that would be built for bituminous-only operation. The number of fields, collection surface and space velocity permitted the vendor to guarantee that the precipitators would enable the units to operate at specified MCR; (the 5% overpressure, turbine valve wide open and a steam rate of 5,239,600 lbs steam per hour condition)and meet on a sustained basis the emission standards applicable to CR4 and CR5. Exhibit_____ (JAB 19) Black and Veatch System Design Specification 7654.42.0701.12 Table 2-4 provides design specs and page 2-5 provides the tabulation of all the fuels it had to be designed to handle-...7 of the 8

total fuels provided were western fuels. It is only because PEF's predecessor chose to test perform the units with bituminous coal rather than the 50/50 blend the units were designed to burn that Mr. Hatt can speculate regarding the performance of the precipitators.

SILO MODIFICATION

Q. **At pages 31-32, Mr. Hatt contends that PEF would need to spend $1-3 million to ensure that blended coal moves from silos to the pulverizers properly. Is he right?**

A. No. Mr. Hatt describes the difference between "mass flow," in which the first coal to arrive in the silo is the first to leave, and "funnel flow," in which the first coal to arrive is the last to leave for the pulverizer. He says only that the arrangement at CR4 and CR5 *may* have characteristics of funnel flow. We did not agree but even if that is the case, there is a simple, readily available, and inexpensive measure with which to ensure the blended coal does not stay in the silo too long. Vibrators, rappers, pipe pokes and other state of the art devices could be attached to each silo. These measures would cost much less than the$1-3 million entry on Mr. Hatt's Exhibit __ (RH-8). Observing the Silo's during my plant visit it is obvious that the Black and Veatch design people knew about the PRB potential for flow problems. They utilized a stainless steel outlet right circular section of a cone, and they used an amazingly steep angle of discharge. Units not designed for PRB fuel did not use stainless outlets and minimized the discharge angle (some even used rectangles) to minimize the overall system height required. The steep angle pushes the eight hour capacity silo higher in the building since other distances, feeder to mill are fixed. Another feature of the design was that the downsprouts (from

cone outlet to coal feeder) are fitted with removable half pipe sections to permit removal of coal from the silos during an outage. In addition, the deck just to the outboard of the coal feeders has been fitted with a bulkhead that can be removed so as to permit a truck to be below each silo on the ground floor and receive silo coal without the typical mess of dumping through a feeder. On Bituminous coal fired units that emergency discharge spout, if fitted, is below the feeder deck above the pulverizer. Placing it above the feeders on CR 4 and CR 5 is just another indication of a design for PRB coal. If the coal was on fire you would not want to ruin a feeder belt getting it out and thus would want to use a higher level dump. The coal feeders also are fitted with large inlets-17 inches, however larger would be better, but again leading one to the inescapable conclusion that this part of the coal feed system for sure had to be taking advantage of all that had been learned in the late 60s/early 70s about PRB coals.

ESTIMATES OF CAPITAL AND O&M NEEDS

Q. **Please turn to Mr. Hatt's Exhibit __ (RH-8), which is his compilation of the additional capital and O&M costs that he contends would be necessary if PEF were to switch to the 50/50 blend. How do you respond to his contention that these expenditures would be necessary?**

A. I suggest we go down his list and look at each item. I will make a brief comment on those that I have already touched upon in earlier testimony. If you note a BN this stands for something that would "be nice" but is not required initially.

- Wash down system – this is needed and was provided in most locations by Black and Veatch. The only area I did not see wash down capability was on the

stacker/reclaimers. Since water is available in that area I would estimate that the addition would not cost more than $50,000 for both.

- Silo Modifications- I do not believe at this time anything is required. Test burns did not indicate a problem, design seems to have taken the lessons learned from PRB fuel to heart and applied them so this item, if required at all would consist of addition of poke holes and a upgrade of the existing CO sensors.

Future if needed larger silo cone outlets $50,000

- Dust collections Systems-were provided in the original design and have not been maintained. It would not be a allowable capital item but must be a maintenance item. $0 Capital
- Fire Protection Systems-Again extensive Fire Protection was provided in the original design on all conveyors, transfer points, surge bins, silo feeders etc. They perhaps have to be maintained but no capital should be permitted as the capital has already been expended. $0 Capital
- Reclaim Hopper System-not required as present blend system has been designed, and engineered well enough to still represent the state of the art

$0 Capital

- Additional Pulverizer-not required for specified coal at MCR
- Boiler Modifications-none required as original design suitable for MCR on specified fuel $0

Capital

- Water Cannons, Sootblowers BN $1.0

million

Not likely but water cannons could be required and this would be a delivered installed price for two units worth along with some furnace temperature acoustic monitoring to permit evaluations of usefulness.

- Upgrades to conveyor belts-None required $0

Capital

- Online computer analyzer-one of those nice things but is not (BN)

  Required with the Weighting system already provided $0

  Capital

- D10 Bulldozer – trade off existing to south yard net capital $300,000
- Front loader-not required

  $0 Capital

- Upgrades to electrostatic precipitator-was designed for MCR $0

Capital

- O&M COSTS
- Dust suppression-ok as everything we know indicates this is $1 million

a Good thing and should be the shelves for I beams, dust collector shields

- Power for two additional mills $0
- 1 additional person for fire watch $1K
- 2 Additional People for Wash downs $2K
- 2 Additional People to work piles-assume tripper $2K
- 20,000 gallons per day water for cannons $0

don't know if needed

sulfur needed for ESP flue gas conditioning $0

not needed

We have covered most of these capital additions and the need for them in our testimony earlier. My capital estimates amount to $1,400,000 for some things that are necessary (wash down), rubber tired bulldozer and one state of the art system such as fitting the furnaces with acoustic pyrometry. That system along with a water cannon or two would let you monitor your actual furnace temperatures and if required use the cannon; is not necessary but would be an excellent tool to have if ever needed. The O&M side needs more cleaners and dust suppression chemicals so I can support $1,500,000 in additional operational costs. Maintenance budget would take a major hit getting the dust collection and dust control systems back into shape. I think I would add an item not on Mr Hatt's estimate and that is the complete clean up of the existing tripper floors on both #4 and #5. The drains here have to be improved, the vacuum system if not operable should be made operable and the walls painted white with the enforced rule that the maintenance person responsible for the floor not go home until that floor is spotless. I would add $500,000 for the clean up, painting and drain improvements required

Q. **Putting aside for a moment the issue of whether the expenditures are needed, please comment on the quality of Mr. Hatt's estimates.**

A. They seem somewhat inflated perhaps due to the lack of time to get any industry estimates on the capital side. Much of the material (capital items) Mr Hatt recommends seems to be from a 1970's conversion wish list and does not reflect what is here. The O&M estimates look reasonable. I am puzzled as to why PEF did not use the Sargent and

Lundy high level Study they commissioned and paid for as the basis for estimated costs to convert to +50%- 100% PRB coal.

Q. Mr. Hatt criticies the S & L study because it simplicity states that CR4 and CR5 could burn the 50/50 blend without major expenses. How do you respond?

A. The Sargent and Lundy work product is a good assessment of the present state of the units. Their analysis supports the units' suitability for burning the design blend of 50/50% PRB specified. I agree on most everything on the technical side of the evaluation. These conclusions are well founded. The furnace is sized even more conservatively than present designs going out for PRB fuels, the horizontal convection pass is conservative and the downflow convection with a bare tube economizer is the current way to go for PRB designs. The fans are adequate for the MCR along with the electrostatic precipitator design. Their recommendations for 30% blend, would, if implemented, improve pulverizer performance, the rotating screen suggestion, but is not required to meet MCR with the specified fuel. Adding belt scales they suggest to 35A, 35B etc is redundant as they are already fitted with scales. S & L recognizes no additional pulverzers are necessary below a 70% blend. The other suggestions even though described as technical are in fact safety related and putting the mill inerting system back into operational shape is a good suggestion.

The other engineering evaluation that unlike Mr. Hatt, seemed realistic was that prepared by the Strategic Engineering Group (Raleigh) PEC who were charged with evaluating the PRB technical and economic benefits that might occur if applied at Mayo and CR.

Quoting from one of the Power Points used by PEC Raleigh group in answering the question "WHY CRN?" The presenter bullets indicated that:

"Units were designed for 50% PRB Coal" and

"had a large boiler box",

"large ESP","

"Sprinkler systems",

"dust collectors",

"mill inerting exists",

"Fuel handling can support with few mods".

The PP goes on to state competitive advantages,

- Gulf allows easy access from IMT,
- Can barge down the Ohio River and
- Supplier diversity

Sargent & Lundy Report see Exhibit_____ (JAB 12) PAB at CRN2207.02.19

CONCLUSION

For all of the reasons I have stated, all systems of CR4 and CR5 were designed and constructed to perform at 5% overpressure when burning the 50/50 design basis blend selected by FPC.

BY MR. McGLOTHLIN:

Q And did you prepare the exhibits that are attached to the rebuttal testimony document?

A Yes, sir, I did.

Q Do you have a summary of the rebuttal testimony for the Commissioners?

A Yes, I do.

Q Please proceed.

A Thank you. Madam Chairman, Commissioners and staff, my name is Joseph Barsin. I'm here today as a person with extensive background in fossil fuel combustion and associated operational experience in power plants, field correction, and also the operational side.

At the time Crystal River Number 4 was being designed, I happened to be working for Babcock & Wilcox with the position as a responsible design engineer for the combustion systems for those particular boilers. B&W was the selected steam generator vendor who supplied the steam generators to, at that time, Florida Power Corporation for Crystal River 4 and 5. Other details on my experience are contained in my resume under Exhibit 1.

Florida Power Corporation set out two criteria for a new power plant. One, they specified a fuel, 50 percent Powder River Basin, 50 percent CAPP, bituminous from Appalachia. They also specified a steam flow, a sustainable continuous maximum

continuous rating at a pressure and temperature without any operational constraints. These two criteria fixed the design of the steam generator. Black & Veatch took that direction from Florida Power Corporation and wrote specifications, and equipment was eventually purchased, installed, and sustained operation achieved over the past 25 years indicate that those objectives have been met.

Now, there are some claims that the unit is not capable of generating 5,230,000 pounds of steam per hour, which is equivalent to approximately 770 megawatts on a cold day using the specified design of 50 percent Powder River Basin blend 50 percent CAPP coal. This derate is -- this claim for a derate is wrong. It's based upon some mistaken premises. I would like to go through those with you.

One of the mistaken premises was that not enough was known about Powder River Basin coal at the time of design. This is flat wrong. Lots was known. Field, laboratory, and retrofits all occurred in the late '60s and early '70s that I personally was involved in, and I could spend a lot of time going through that with you. But I suggest if you have an interest in the historical significance, please look at my Exhibits 5, 7, and 8. In those you will find detailed histories of test burns on more than ten selected units from the hundreds that were tested at that time.

The designed blend was not the worst fuel from a

designer's standpoint. Florida Power Corporation had asked us to look at another fuel, not the specified design fuel, but in the event they decided to use Illinois Basin fuel, they wanted to make sure that their design was capable of handling that. If we had just tried to fix the slagging and fouling characteristics of the specified Powder River Basin blend fuel, we would have rated it or indexed it for high slagging, medium fouling. These terms relate to relative indexes that go from low, medium, high, and severe. Each step requires the designer to put another degree of conservatism into the design of the steam generator.

The actual index that we used was the most conservative that we had within the corporation at that time. We used severe/severe. How would this impact the steam generator design for Crystal River. Well, initially, foremost, the box itself, the structure gets 20 percent larger. It gets higher, it gets deeper, it gets wider. And this impacts the entire building because the building has to get wider and deeper and higher.

It also impacts the arrangement of convection pass surface in the gas passages. They are spread further apart to make it more difficult to foul, again, impacting the building and the amount of steel required to support the structure. It impacts the pulverizers. We have heard a lot of testimony in the last couple of days about the additional tonnage that

someone has to put through a pulverizer because the Btu, the heat content of the fuel is reduced. So it impacts the sizing of the pulverizers, the sizing of the coal pipes, the number of burners, and really it affects just about everything on the combustion side of the steam generator, which impacts the entire plant.

The number of soot blowers had to be increased to the maximum possible because of the severe/severe designation that we had put on the fuel. The aerators had to be larger because the spaces between them had to be increased to avoid the fouling situation that might occur with a severe/severe rating.

The precipitator was absolutely designed for a Powder River Basin lower resistivity ash, and it is 35 percent larger than a bituminous precipitator that would have been provided at that time if the coal had just been a single bituminous. So we think -- in summary on that point, we just know that the furnace is conservative and could absolutely handle that fuel.

Another mistaken premise I heard yesterday was insufficient mill capacity was provided. This is flat wrong. The capacity curves were provided on performance summary sheet, it's in the exhibits as JAB Exhibit 9, Page 7 through 9, and look at it when you would, and they indicate that the pulverizers are capable of producing 127,000 pounds of ground coal designed and specified Powder River Basin coal per hour per mill. This is more than ample required with five mills and

certainly very generous for a six mill operation.

The same performance summary sheet in our view contains the values that must be met to achieve the guarantee and sustainable MCR that has been specified from the client.

The coal feeders. We heard a little bit about that yesterday. The coal feeders were designed to pass through them to feed coal at a rate of 140,000 pounds per hour, exceeding the base rate of the pulverizer. So there was no blockage on the design side from getting the tons of coal to the pulverizer required to contain MCR.

Another mistaken premise that we heard a lot about yesterday is the seventh mill. This is flat wrong. A seventh mill wasn't required for MCR. Six mills are ample. The space for the seventh mill was provided in the event that Florida Power Corporation, or PEF now, elected to go to 100 percent MCR on only Powder River Basin coal. The same thinking went into leaving space for a parallel coal conveyor parallel to Coal Conveyor 31, which brings coal from the south field to the north field. There's space there, and it is in the event that Florida Power Corp opted to go to 100 percent Powder River Basin coal. Just forethought, good thinking on the part of the company at that time.

Another premise that's mistaken is that the precipitator was not satisfactory for the specified blend. This is flat wrong. The velocity design for a precipitator was

four feet per second, extremely conservative. That was a maximum. Actual less than 3.5. The number of fields for a bituminous fueled unit in those days was three standard. This precipitator has five fields. Again, making it extremely conservative.

The collection area for bituminous fuels in the late '70s would be about 450 square foot. The collection area for this unit is 700 square foot. Again, markedly conservative. Even little things, like the hopper angles, recognized that the fuel was calcinatious and steeper hopper angles were required, specified, and provided even to the extent of having heaters placed in the bottom of each hopper to avoid allowing moisture to entrain because the ash would be cementitious, not similar to bituminous ash.

Another premise that is completely wrong. The material handling system is inadequate for the tonnage associated with the Powder River Basin design blend fuel. The oversizing ranges from 130 to 150 percent of the designed fuel. The burn rate for the designed fuel, the blend fuel is 311 tons per hour. There is nothing in the conveyance system that is anywhere near that. The crushers, for example, are 800-tons per hour each, more than twice the requirement, and there are two of them. So not only do you have a 56 percent capacity overage on one crusher, you have got another one sitting there that is not even operated, but could be.

The same kind of redundancy and overcapacity was designed into the system and provided by Black & Veatch. The main conveyor from the south to the north, 2500 tons per hour. Remember, the units can only burn, two of them, both of them 622 tons an hour, so it is a factor of four oversized.

CHAIRMAN EDGAR: Mr. Barsin, I have you at almost 11 minutes and you had ten minutes for your summary, so I'm going to ask you to conclude.

THE WITNESS: All right. Thank you.

MR. McGLOTHLIN: Mr. Barsin, if you would turn to the capital and O&M and give them your --

THE WITNESS: Yes. And one other thing I wanted to hit, then. Thank you for letting me finish, Madam.

The one big item that came up yesterday was the Hatt Exhibit 8 that states 60 million in capital and two million in O&M is required. This is flat wrong. I'm planning to discuss each one, time permitting. But, bottom line, if I am cut off, if I'm cut off, the capital number we estimate from our side is 2.4 million for the capital and an annual -- decreasing annually 1.5 million to start, and expected to decrease annually. I'll stop there.

Thank you, Madam Chairman.

CHAIRMAN EDGAR: Thank you.

MR. McGLOTHLIN: We tender the witness.

CHAIRMAN EDGAR: Mr. McWhirter.

CROSS EXAMINATION

BY MR. McWHIRTER:

Q Mr. Barsin, what is the normal useful life of a plant such as CR4 and CR5?

A An excellent question. I know that the useful life is something that is a movable feast depending on repairs, depending on upgrades, and depending on what kind of investment you want to make to prolong life. But, for an example, one of the projects I worked on recently was taking a 1924 power plant and rejuvenating it so that it could sustain a new life of another 20 years projected. Right here in Florida, for example, Florida Crushed Stone. I moved a 125-megawatt power plant from Northern Michigan that was built in 1949. It is now down in Brooksville and producing, I think, 150 megawatts daily. To try to answer your question, it depends on the economics and what your objective is.

Q So would it be fair to say that it's normal over the useful life of a plant to make repairs and upgrade that plant to improve efficiency?

A Yes. But many of the motivations aren't really directly concerned with efficiency. It would be fuel changes, it would be perhaps adding a combined cycle, a gas turbine where you want to exhaust the heat. So it would be an upgrade of sorts, but not necessarily directed at efficiency.

The thermal efficiency of Crystal River at

87.5 percent is -- unless you go combined cycle, you're not going to improve it.

Q One final question. When you upgrade a plant to extend its useful life or otherwise modify it, is that normally considered a cost of fuel or a capital cost invested in a capital facility?

A I'm not qualified to answer that question.

MR. McWHIRTER: All right. I have no further questions.

CHAIRMAN EDGAR: Mr. Twomey, no questions. Ms. Bradley. Mr. Brew, no questions. Okay. Mr. Burnett.

MR. BURNETT: Thank you, Madam Chairman.

CROSS EXAMINATION

BY MR. BURNETT:

Q Good afternoon, Mr. Barsin.

A Good afternoon, John.

Q Do you have your deposition with you?

A Yes, I do.

Q You have a copy with you?

A Yes, I do.

Q Okay, great. Thank you.

Mr. Barsin, you would agree with me that if Btus per pound in coal are reduced, the total pounds of coal a plant needs to burn will need to increase to meet the same specified output, correct?

A Yes, sir.

Q And you also agree that almost no one nowadays uses a 50/50 blend of PRB coal and CAPP coal like OPC recommends in this case, correct?

A Yes, sir.

Q You would also agree with me that a full load rating corresponds to turbine nameplate rating with standard conditions when we are talking about Crystal River 4 and 5, correct?

A Could you say that again a little slower.

Q Sure. You would agree with me that when we are talking about Crystal River Units 4 and 50, full load rating, the term full load rating corresponds to the turbine nameplate rating under standard conditions?

A Yes, sir.

Q You would also agree with me that to make maximum continuous rating, one must input the required quantity of Btus, correct?

A Yes, sir.

Q In fact, there is a direct relationship between the amount of Btus that are supplied to the boiler and the megawatts that can be realized from the turbine, right?

A Yes, sir.

Q And if one reduces the number of Btus to the boiler, the output from the generator is reduced, correct?

A Yes, sir.

Q You would agree with me that slag deposits can retard heat transfer, correct?

A If they are not removed, yes, sir.

Q And you would also agree that fouling, if not removed, can restrict load and possibly cause a shut down at --

A Yes, sir.

Q With respect to controlling slagging and fouling in a coal plant, you agree with me, too, that if experience proves necessary, a company may want to add more tools over and above what the designer felt was necessary, right?

A No. The designer has provided many tools to the operating company that may or may not be utilized by them, but the known tools include soot blowers, load shedding, and other items such as that that are already installed and in place.

Q Could I get you to turn with me to Page 7 of your deposition?

A Uh-huh.

Q We had a similar conversation during your deposition and ultimately there at Line 20, I say, "Right." And you say here on Page 28 of your testimony that "If experience proves it necessary, you may want to add some more of those tools, correct?" And you say, "Yes, that's true."

I'm sorry, I didn't see you weren't there yet, sir.

A No, I thought it was -- what page, could you tell me

again?

Q It's Page 7, I'm sorry.

A Page 7, that's what I thought.

Q I have a copy handy here if you would need it. You may have a --

A No, my printout on my pages is half a page. And what subline is it, John?

Q It starts right around -- the conversation starts at 12 and then we go down to 23.

A Okay. So the answer is similar and --

Q I just wanted to confirm that when we had this similar conversation during your depo, and I asked you if experience proves it necessary you may want to add some more of those tools, talking about tools up top there to reduce slag, you say if experience proves necessary, yes, that's true?

A Yes, that's true.

Q Okay. You also agree with me that Powder River Basin coal is a lower Btu coal, thus requiring more tons of it to burn when compared to bituminous coal?

A Yes, sir.

Q You agree with me that when burning PRB coal blends, additional attention to housekeeping will be needed, right?

A Yes, sir.

Q And you also agree with me that extra maintenance personnel are needed during PRB use, correct?

A Yes, sir.

Q You agree that PRB coal has more moisture than CAPP coal, correct?

A Yes, I do.

Q And you agree with me that increased moisture in PRB coal impacts generating unit performance?

A It impacts boiler performance, yes, sir.

Q You agree with me that PRB coal piles need to be compacted regularly?

A Yes, I do.

Q And you also agree that it's preferable to have rubber-tired equipment to work on PRB coal piles?

A Yes, I do.

Q You agree with me that the round housing cover on the tripper floor is preferable to a square one when burning PRB coal?

A Yes, I do.

Q You also agree with me that PRB coal should not remain in the silo for too long due to fire safety concerns?

A Yes, I do.

Q You agree also that a washdown system is needed for a plant that burns PRB coal?

A Yes, I do.

Q And you agree with me that a dust collection system is needed for a plant that burns PRB coal?

A Yes, I do.

Q Similarly, you agree that fire protection systems are needed for a plant that burns PRB coal?

A Yes, I do.

Q And you agree that it would be nice to have water cannons or water injectors at a plant burning PRB coal?

A If operation proves necessary, they're a good tool.

Q Soot blowers are also nice to have at a plant that burns PRB coal, correct?

A Soot blowers are absolutely necessary for anybody burning any kind of coal.

Q And you agree that an on-line computer analyzer is nice to have at a plant that burns PRB coal blends, correct?

A I believe that there is already an on-line computer analyzer for the blending purpose. We discussed the possibility of acoustic pyrometry to actually look the furnace conditions temperature-wise, if indeed slagging became a problem. That pyrometer would be a handy tool to have, yes.

Q And I'm glad you brought that up, because I really didn't want to try to pronounce that. I can mark that question off.

You would also agree with me that additional personnel will be needed at Crystal River for fire watch if Crystal River uses PRB coal, correct?

A Yes, I do.

Q You also agree that additional personnel will be needed to accomplish washdowns if Crystal River uses PRB coal?

A Yes, I do.

Q And you agree with me that Crystal River will need to buy dust suppression chemicals if PRB coal is used there?

A I agree that dust suppression has to be undertaken, and there are several ways to do it, and chemical surfactants is probably the most expensive. There are fogging systems, there are others. I would imagine that the operations folks at Crystal, if and when they actually did get involved with Powder River Basin coal, would examine all the options.

Q Just to be clear on that, though, if you could turn over with me to Page 12. I just wanted to show you that question when we talked about it in your depo. If it is easier, I would offer this one to you. It's paginated the same.

A Good. Thank you.

Q It's double-sided, but I'm on Page 12.

A Thank you. Yes, sir, I'm there.

Q And I just wanted to reference that question there again at 20. "Okay. And you would agree with me, wouldn't you, that Crystal River would need dust suppression chemicals if CR uses PRB coal? Yes, I do."

A Yes, I agree that dust suppression is important, and chemicals is one of the tools that you could use to suppress

them. Also, you could use water.

Q Okay. Thanks. Mr. Barsin, you would also agree with me that if Crystal River uses PRB coal, that the tripper walls of Units 4 and 5 should be painted white?

A This is best practice, yes.

Q Right. And the people responsible for those floors shouldn't go home each day until those white walls are white again, correct?

A Absolutely.

Q You agree with me that a coal plant should test burn a type of coal that has never been burned there before, correct?

A Yes, I agree.

Q And with respect to Mr. Hatt's O&M expenses in his prefiled testimony, you agree with me that those expenses for using PRB coal, quote, look reasonable, correct?

A Well, I believe that they are in the ballpark. I believe they are high.

Q Could you turn over to Page 13 for me of your deposition?

A Yes. Let me get there. Okay, I'm there.

Q And just to cover that question one more time, beginning at Line 8 of Page 13, "And with respect to Mr. Hatt's O&M expenses in his prefiled testimony, you would agree with me that Mr. Hatt's O&M expenses, quote, look reasonable, correct?"

A They did at first blush, at the time I talked to you; but looking at them again, I think they are about half a million high. But certainly they are only two million.

Q Okay. Thanks. You would agree with me that the desire of most utilities in America is to have a spare mill and pulverizer in their coal plants, correct?

A Really it's not a spare mill, it's one that they have to have down to replace the wear elements. So it's not spare. I believe we heard Mr. Toms yesterday say he repairs mills or he repairs rare parts on a periodic basis.

Q Can I reference you to Page 97 of your deposition?

A Sure. I'm there.

Q On Line 13, your answer there, "The desire of most utilities in this country is to have a spare mill. So Crystal River has a spare mill, the sixth mill is a spare mill." Did I read that properly?

A Yes, you read it. But, in fact, if you can take it, it is not a spare mill. It needs to have a spare mill to repair the wear elements.

Q I would like to turn you to Page 56 of your prefiled testimony, please. Just let me know when you are there, please, sir.

A Yes, I'm there.

Q I would like to show you a statement there that says, you're speaking about the silos at Crystal River 4, and you

say, "The silos, however, are only sized for eight hours of fuel, so the fueling has to be done over two shifts. And the limit would seem not to be the transport system, but the size of the silos." Did I read that properly?

A Yes, you did.

Q And based on your recent inspection of Units 4 and 5, you believe that the statement I just read is still true and accurate, correct?

A Yes, I do.

Q Now, I would like to ask you some questions about some of the cost estimates that you discussed in your prefiled testimony. In coming up with the cost percentages you discussed in your testimony, and I believe you start around Page 49, you would agree with me that the only notes to support those calculations are, quote, the notes inside your head, right?

A No, I think I gave you a couple of paragraphs on the background on how those biometric relationships were developed. If you look further up in the discussion that we had on that.

Q Well, can you take a look at Page 104 of your deposition with me?

A Yes, sir. Okay.

Q And I would like to draw your attention there when I ask you, talking about these costs, "Any notes or anything like that you have taken over the years," at Line 3; and your

answer, "Only the notes that are still in my head." Did I read that properly?

A You read it accurately. Let's back up a little bit and let me look over the context. It seems like it is a little loser than I would be.

I think if you look at page -- I don't know where -- 102, Line 17, for example, I tried to give an explanation for those in the previous section on what was impacted. I don't know if you followed that description, but if you want to talk boiler island, what we did not include, I identified that fairly clearly. I went through each of the items trying to describe what the biometric relationships were and how I got dollars to tack onto the estimates.

So if you take the context, the totality of that questioning line, you will find that more than just my head, my 38 years of experience, my position at Babcock, which was to generate estimates, all of that went into coming up with your answers.

Q Sure, I appreciate that clarification. But certainly I can't print out your 39 years of experience or the notes in your head and read them, can I?

A You can't print them out?

Q No, sir.

A I guess not.

Q Thanks. Also, in coming up with the costs in your

prefiled testimony, you didn't use any manuals to come up with those numbers, correct?

A No, I did not.

Q And you didn't have any conversations with anyone, as well, to verify those numbers, correct?

A Not at that time. I have since.

Q In fact, the cost estimate numbers that you have used in your testimony are what you describe in your deposition as, quote, a good guess, correct?

A No, that was the term you forced out of me after hours of badgering me. (Laughter.) No, what I was trying to tell you was that it was based on years of experience on a position within Babcock that insisted I generate proposals that were financially responsible and returned a profit to the corporation. Based on that, I generated numbers, yes.

Q I'm a bad man, aren't I, Mr. Barsin? (Laughter.)

Let me show you a couple of deposition cites just so I can clear that up for the record, though. If we could turn to Page 111 of your deposition.

A I'm there, yes, sir.

Q I would like to reference there when we are talking about the cost of a rubber-tired loader. I asked you there and, again, as you stated, that is a guess, and you say at Line 18 there, "That is a guess." Did I read that properly?

A It was a guess. It has been confirmed by Caterpillar

of Charlotte.

Q Okay. And, again, I would like to take you to Page 116 of your deposition where we are talking about another $1 million figure there. And I say, "And that one million, again, is your best guess based on your experience?" And you say, "Yes, and doubling it." Did I read that properly?

A Yes, sir.

Q And, again, on Page 115 of your deposition, we're talking there about some O&M costs, and I asked you, "So 50,000 there is a good guess?" And you say, "We think so. I think so." Did I read that properly?

A Yes. And the reason, and I tried to explain it to you at the time, and you caught it back on page 116, Line 16, no, doubling it, because I don't know, again, how you, or Florida Power Corporation, or Progress Energy Florida is going to go about it. Are you going to use a contractor, in-house maintenance people, or in-house control people. This would affect the cost. So I can't know your costs.

Q Okay. I would like to ask you about some of the data and information you relied on in preparing your testimony. Mr. Barsin, you agree with me that all the documents you relied on to prepare your testimony in this case, with the exception of the B&W book titled steam, are attached to your prefiled testimony as exhibits, correct?

A Yes, sir.

Q Okay. And with respect to all the documents that you relied on to prepare your testimony, again, that are exhibits, you agree with me that all of those documents predate 1984, correct?

A Yes, sir.

Q Now, you would also agree with me that some of the information in those pre-1984 documents that you relied on to prepare your testimony has become outdated and is no longer accurate, correct?

A We went through this on deposition, and the response is that they were accurate at the time they were written. And do things change over time? Yes, they do.

Q Well, certainly if we reference your JAB-3, Page 13 of 67, regarding unit specifications, you told me in your deposition that some of the data reflected in that document was preliminary and it ultimately changed when the units were built, correct?

MR. McGLOTHLIN: Could I have the reference again, John?

MR. BURNETT: Sure thing. It is JAB-3, Page 13 of 67, and the question in this deposition is Page 41.

A Yes. And the explanation, of course, is that the fundamental principle of Florida Power Corporation at that time was to get an MCR, continuous, 24-hour-a-day power plant. But they had not yet finalized on the exact megawatts, so the

megawatts have changed from concept to final heat balance.

Q Okay. And also to your JAB-2 at Page 4, you agree with me that the information in that document regarding how many megawatts CR4 was going to produce is no longer accurate and changed when the plant was actually built, correct?

A Yes.

Q And, Mr. Barsin, you recognize as I believe you just stated that until final decisions are made, information and proposals and responses like the documents you relied on to prepare your testimony can change throughout the construction process, correct?

A Once there is a contract there is a very, very solid procedure for changing a contract, and there is usually a paper trail attached to it. On discovery when I was in your offices, I could find the complete paper trail for the turbine generator, for example; but the boiler, the paper trail was strangely open.

Q But back to my question, though, nonetheless, that information and requests for proposals can change during the process, could they not?

A During the proposal period, yes, but on contracts, as I said, it is a formal procedure.

Q And you also agree with me that as to your JAB-3, Page 41 of 67, the information in that document that you relied on regarding the amount of steam the boiler in CR4 was going to

be able to produce and the resulting amount of megawatts has changed, and is no longer accurate, correct?

A I'm at JAB-3, Page 47, was it?

Q 41 of 67.

CHAIRMAN EDGAR: Mr. Barsin, I need you to either pull closer to the microphone or pull it over, if you would. Thank you.

THE WITNESS: I'm sorry.

A I'm on 43, John. I don't see it.

Q It is 41 of 67.

A Pardon me.

Q Of your JAB-3.

A Yes.

Q And, again, we talked about this one in your depo?

A Yes. We were looking at the agreement for engineering services between Black & Veatch and Florida Power Corporation.

Q Sure.

A And they, of course, are feeding back to Florida Power Corporation, their potential client, exactly the data that they were given by them, yes. So, yes, it was what it is.

Q Sure. And you don't disagree with me that the data there in your exhibit to your testimony has changed and is no longer accurate?

A Yes, but this is not a contract.

Q And my last one of these. Page 12 of 67 of that same JAB-3 there, you would agree with me as well that the steam and megawatt specifications for CR4, again, differ from those on Page 41?

A Yes. Again, this is the proposal, not a contract document.

Q And those are exhibits to your testimony, correct?

A That's correct.

Q Now, you consider your recent site inspection of CR4 and CR5 to be, quote, superficial, correct?

A Could you say that word again. Was it superficial?

Q That's right. You consider your recent site inspection of CR4 and 5 to be superficial, correct?

A No. Whatever the opposite of superficial is. It was ficial. We did, we saw, we went there to examine, we came back learning, so I think it would be the opposite of superficial.

Q Well, let me ask you about Page 171 if you would go with me right there to your deposition. I'm sorry, 171. Let me let you get there, I'm sorry.

A Okay, John.

Q Ms. Bennett was asking you some questions about how you knew the units were designed and actually constructed to certain standards, and you say in your answer, "I don't know what was designed. I don't know what was designed was that which was constructed other than the superficial voyage around

the plant, looking at the fact that there are certain equipment." Did I read superficial voyage correctly?

A Absolutely, but not visit. Voyage. Please, get the terminology correct.

Q Good catch, sir. You are keeping me honest.

You would agree that you were only at the site on that inspection for about three hours, right?

A Yes, John.

Q And about two hours outside of the plant and about one hour inside the plant?

A Yes, sir.

Q I'm scared to say superficial anymore, but during that superficial visit as you called it, you weren't actually able to determine whether or not CR4 and 5 were actually built to the specifications listed in the pre-1984 documents that are part of your exhibits, correct?

A I was restricted even in the control room from looking at the control panel, but what I did observe on the superficial voyage around the units was that the number of pulverizers that were specified were there, the number of burners that were specified were there, the number of silos that were specified were there, the number of coal feeders that were specified were there, the air heaters that were specified were there, the forced draft plans were there, the precipitators were there, the ID fans were there. Did I go

inside the furnaces? No, I could not because there were fires in them. But, externally, I did examine and did note that what was promised was delivered.

Q Okay. Switching from documents that have changed to other things that have changed over time. Mr. Barsin, you would agree with me that since 1980 new things have been learned about PRB coal every day especially in the area of housekeeping, correct?

A Not every day. Certainly the major events were learned between 1970 and 1980 when people were playing close attention on the retrofit test burns on units not designed for Powder River Basin coal. In the '80s, people started to get sloppy, and that is when housekeeping and safety items became learned in a better way.

Q Mr. Barsin, let me take you to Page 60 of your deposition.

A Yes, sir, I'm there.

Q There I asked you the question on Line 12, "Have things been learned since 1979/1980, is that the question? Yes. Indeed, every day things are learned. I would say the most important thing learned about Powder River Basin coal probably in the last 25 years, in my opinion, would be the degree of housekeeping required to keep it under control."

Did I read that accurately?

A You did.

Q Okay, thanks. And, Mr. Barsin, after some, what you call PRB catastrophes, in the 1980s, information on PRB safety was learned, but was slow to get out and was finally well known in about the 1990s, correct?

A Yes, sir.

Q You would agree with me, also, that dust chemical sprays that are available today were not available in the 1980s, correct?

A I'm not aware of them being available in the 1980s.

Q And the 1980's vintage CO2 monitors for PRB coal have become more solid state and reliable since CR4 and 5 were built, correct?

A Yes, sir.

Q There is that acoustic pyrometry device, again. I had promised I would try not to say it, but those weren't utilized by utilities until about 1989, correct?

A That's correct, but they were utilized by other power generators. Specifically in the pulp and paper field.

Q In fact, the state of the art in PRB safety and housekeeping is continuously evolving, isn't it?

A Yes, it is.

Q And you agree with me that some of the PRB coal in use today was not even mined in the late 1970s when CR4 and 5 were being designed, correct?

A That's correct.

Q I would like to turn now about some of the documents you have called guarantees in your testimony. Mr. Barsin, you feel like the guarantee documents you have seen in this case present a complete picture of what the guarantees for Units 4 and 5 are, correct?

A No, I don't.

Q I would like to take you to Page 18 of your deposition, please.

A I'm there, John.

Q I asked you starting there at Line 8, "So the guaranteed documents seen, you feel, present a complete picture to you of what the guarantees for these units are?" And your answer, "Yes, sir." And I go on to say, "And that is irrespective of the fact that you haven't seen the BW proposal or the docs used to clarify that you just mentioned?" And you answer, "Based on the information seen, I can speak to the guarantees."

Did I read that correctly?

A You are really out of context. Could you back up to Page 17, John. Look at question, I guess, on Line 5. You can read your part and I will read my part.

MR. McGLOTHLIN: Could we see that on the screen, as well?

MR. BURNETT: Well, you are free to read it, sir, but this is my time to ask the questions.

A The Babcock & Wilcox proposal to Florida Power Corporation is absolutely required.

Okay. John, so as we sit here today, can we define JAB-2, 3, 4, and 9 as the guaranteed documents that you have seen as of today. Answer, yes, sir.

Okay. What other documents, if any, do you think you would still need to see to get a full picture of the guarantees? The B&W proposal to Florida Power Corporation is absolutely required.

Okay. Anything else? Yes. I'm mistaken. Also any letters that are attached to that, Part 3 of the contract documents I mentioned. That's it, those two things.

And earlier, if we want to go back even further, I said I've got to see the Black & Veatch specification for the boiler. This is the kind of thing that you put together and you make a contract out of, the specification, the response proposal, and any clarification letters issued by the parties to come to an agreement. That's the total picture of the guarantees.

I think the context was based on what I have seen. Not what I have not seen, but what I have seen. Can I make the assumption that I have seen guarantees? And my answer was yes.

Q Well, let me be clear, Mr. Barsin. You are giving testimony in this case about what contractual guarantees are, is that correct?

A I'm giving an interpretation of what I think guarantees are, yes.

Q Oh, so it is an interpretation. You can't say -- that is something that someone may disagree or see differently, correct?

A I think people can disagree on any matter. But in my school contracts are made up of three pieces: A specification, a response to the specification, and any letters that dwell on that agreement.

Q And so, as you sit here today, are you testifying to this Commission that you haven't seen enough documents to determine what the guarantees are in fact, and you are only offering an interpretation of what you consider to be an incomplete set of documents?

A I have an incomplete set of documents. I have explained that at great length, but what I have is the contract performance summary sheet that in my experience we have used as the guarantee sheet.

Q Well, there has been suggestions that my client has waived causes of action and would have had rights to sue people based on guarantees. I thought until now we knew what that guarantee was, but is there a document you can point me to that my client could take into court and sue people over, then?

A I'm sure your client is more familiar with suing vendors than I am. But, again, you can't make a court case,

and I'm certainly feeling stupid telling a lawyer what you need for a court case. You have got to have contract documents, and we have partials. We have requested on discovery the totals. Discovery says we got all we are going to get, ain't gonna get no more. What I have seen, I've looked at a performance summary sheet and that, in our house, would be a guarantee sheet.

Q Well, let's talk about that. That would be JAB-9, Page 7 of 7, correct?

A Yes, sir.

Q Now, you told me in your deposition that JAB-9, Page 7 of 7, was considered by B&W's lawyer to be the guarantee document, and that it was the contract document for performance, guaranteed performance, is that right?

A This sheet is the commitment of the company to a buyer, but it can be modified. In my testimony, if you look, it can be modified by the other documents I've mentioned. But having only this to go on, this would be my guarantee guidance.

Q But, again, you told me in your deposition that at Page 20, if you would go there with me.

A Yes, sir.

Q When I asked you can you highlight on Page 7 of 7 of JAB-9 anywhere where the word guarantee appears, you told me the whole document. At the time I was employed by B&W this document was considered by counsel to be the guarantee

document. Did I read that correctly?

A Yes, sir.

Q Did counsel for B&W at that time ever talk to you about the doctrine of contract interpretation that states that the plain language of the contract will dictate?

A No, sir.

Q Did he ever, he or she, I'm sorry, ever talk to you about the parole evidence rule?

A No, sir.

Q Did he or she ever talk to you --

MR. McGLOTHLIN: I'm going to object to any questions that call for any conversations between the gentleman and the persons who were his lawyers at the time.

MR. BURNETT: Madam Chairman, I would only note that he has represented in his deposition that his basis for calling this document a guarantee document was what he was told by counsel. There is no objection in the deposition as to any privilege to it. It is his basis for calling this a guarantee document. It is at issue in the case, and I don't think we could use the shield of privilege as a shield and a sword when he is asserting on the one hand that this is a guarantee document because counsel told him so, and on the other hand I can't drill down on that with questions.

CHAIRMAN EDGAR: Mr. McGlothlin.

MR. McGLOTHLIN: I'll withdraw my objection.

BY MR. BURNETT:

Q Did he or she ever explain the doctrine of exclusio unius expressio alterius (sic) to you, sir?

A I don't even know how to spell it, no. But what this is is you have to recognize that my experience as a field engineer made it imperative to me close jobs, which means obtaining final payment. This happened around the world, not just in the U.S. contract tort law system, but in India, Japan, Spain, Italy, as well as the USA. And this sheet was the sheet that I was guided to meet the performance on, and once it was met, then we could go and collect the final payment. If it wasn't met, we had to come up with the mechanical engineering or the steam engineering fix to make the performance.

Q Well, I would like to talk to you about JAB-9, and we went through this with Mr. Toms, so I'm not going to belabor this point. But during your deposition, you were only able to find one column in this document that had guarantee on it, correct?

A No, there are several columns that have guarantee, or they have at least G-U-A-R, if that means guarantee, in it.

Q Well, sure, and those are the columns that I have highlighted here, right? I'm sorry, let's zoom in on it.

A I think you need to go -- there is another guarantee column, I think, three or four to the left. You got one of your witnesses yesterday to mention it, I think Mr. Toms.

Q Sure thing. And you are exactly right, we went over that with Mr. Toms yesterday, associated with the 2500 psig nameplate rating, correct?

A Exactly.

Q No other places on there where we see guarantee or G-U-A-R, correct?

A I'm really having trouble seeing everything on there, but I will accept it if you don't see it.

Q Okay. Well, we certainly didn't find it in your depo, either, correct?

A No. And you should note that there is a specified fuel for design, which would also be in the -- that would be the fuel you would have to worry about for the actual guarantee.

Q Well, in your deposition you stated that it would be unusual for a utility to ask for a guarantee for continuous overpressure, correct?

A I said it's not typical. I think if you quote me exactly, you would find use the word atypical.

Q I've got unusual and atypical actually.

A Well, we are both right.

Q Now, going back to this JAB-9, there are not any guaranteed megawatts listed anywhere on this sheet, are there?

A Not any megawatts, because as you realize, the boiler is a steam generation machine, not a megawatt producer.

Q Right. And let me address one more on this one. These numbers down here, this number that I have highlighted, 87.70, that is a heat efficiency percentage, correct?

A Thermal efficiency, yes, sir.

Q Now, I'd like to talk to you about the acceptance test that was done for Crystal River Unit 4. You agree with me that an acceptance test was, in fact, done, correct?

A Yes, sir.

Q And you agree with me that the purpose of that test was to test unit efficiency, correct?

A No. I think the purpose of that test was to accept the unit and check all the performance factors, not just the efficiency.

Q Well, let's take a look at that.

A I guess if it was to check efficiency, it would have flunked.

Q I would like to reference you to JAB-10 of your prefiled testimony. Just let me know when you are there.

A Yes, I'm there.

Q Turning to Page 2 of 4, I would like to draw your attention, first, to the intent of what's titled there as the Steam Generator Acceptance Test Summary Report.

A Yes, sir. The primary intent of this testing effort was to verify the boiler manufacturer's performance-related guarantees. That's everything on that sheet that we were

talking about.

Q Well, let's go over to what this document says those guarantees are. If you would flip the page for me.

A All I see is an untitled, no steam flow whatsoever. You mean the efficiency box on the top of 3 of 4?

Q I'm sorry, it's on Page 3 of 4 of your JAB-10. Do you see that there?

A I'm not seeing -- oh, that chart. Yes, I see that, excuse me.

Q Okay. And you would note that the column I have highlighted there is called Babcock & Wilcox design guarantees?

A Yes. That is only one element of the guarantee. Since the -- you're right, that is what the column says, but the acceptance test was to check all the performance, not just the thermal efficiency, which is one item.

Q But you nonetheless don't disagree with me that that actually does say the words Babcock & Wilcox design guarantees, correct?

A Yes, I do. I agree with you, yes.

Q And you would note that there are numbers there that ultimately result in a boiler efficiency percentage, correct?

A Yes. I do note that, yes.

Q You would agree with me that there is not one thing in this chart that talks about overpressure, correct?

A There's not one thing that talks steam flow, there is

not one thing that talks steam temperature, exit gas temperature, all the things that you need to try to do a performance test, yes.

Q And megawatts aren't mentioned either, correct?

A No, I would not expect them to be there.

Q I want to talk to you about one more of your exhibits, please. It's Page 5 of 7 of your JAB-9. I believe this is a document that you even addressed in your opening summary. Tell me when you are there, sir.

A Page 5 of 7. Yes, sir, I have it.

Q This is a document dealing with some pulverizer information that you mentioned in your summary, correct?

A Yes, sir.

Q I would like to draw your attention to what we lawyers love to call the fine print.

A The disclaimer.

Q And I want to know if I'm reading this accurately. "These curves are submitted for the purchaser's convenience and the performance indicated thereon shall not be offered by the company or construed by the purchaser as a proposal or contract obligation." Did I read that correctly?

A Absolutely, right on. May I draw your attention back to Barsin 7 of 7. Could you find a similar disclaimer on that sheet for me?

Q Once again, this is where I enjoy the luxury of

asking the questions, Mr. Barsin.

A I withdraw the question. (Laughter.)

CHAIRMAN EDGAR: Mr. Barsin, please let Mr. Burnett work his way through the small remainder of his cross.

MR. McGLOTHLIN: While I make a note.

MR. BURNETT: I've got some final questions for you, Mr. Barsin. I'll move it along.

BY MR. BURNETT:

Q You have never been a manager of a coal plant, correct?

A No, I never have.

Q You have never worked as a supervisor in a coal plant, correct?

A I was puzzling over that question when you asked that the first time, John. And in my job as a field engineer, I had to direct operators to operate my equipment. And though I have never been employed by a power company as an employee manager, I have been employed by Babcock & Wilcox, though, to direct operators on how to operate our equipment. I could be standing behind one of your operators at Crystal River in the power plant in 1982 directing them to change feeder speed or whatever. But, no, I have never been employed by a power company.

Q Let me go back to that deposition again, though. Page 46, Line 14, when I asked you, "Have you ever worked as a

supervisor in a coal plant?" And Line 16 where you tell me, "No, I have not."

Did I read that correctly?

A I have never been employed by a power company as a supervisor in a coal plant, that's true.

Q And you have never worked as an operator in a coal plant, correct?

A No, but I have worked as a person who directs operators.

Q Mr. Barsin, you can't say one way or another how CR4 and 5 will act when they burn coal with Btu values between 11,300 Btu per pound and below because you don't know what kind of coal was burning the day you were there, correct?

A I can say exactly how the predicted performance will be for lower Btu coal. Can I be with absolute divine certainty, no.

Q You have never observed Units 4 and 5 when the mills have been flooded with coal, have you?

A No, I have not.

Q You have never operated the controls at CR4 and 5, correct?

A No, I have not.

Q You have never operated the stacker/reclaimer at CR4 and 5, correct?

A No, I have not.

Q You have never studied PEF's historical experience with receiving train deliveries at CR, have you?

A Who is PES (sic)?

Q Progress Energy Florida and C-R, I'm sorry, is Crystal River. Progress Energy Florida, the defendant in this case.

A Oh, PEF. No, I have never operated their railroad facility.

Q Sorry about the acronyms. And you have never studied PEF's historical experience with receiving barge deliveries at Crystal River, have you?

A No, I have not.

Q You have never studied any rules or regulations as to what kind of trains can come onto Crystal River because there is a nuclear plant there, have you?

A No, I have not.

Q You have never studied any rules or regulations as to what kind of barges can come onto Crystal River because there is a nuclear plant there, have you?

A No, I have not.

Q You have never studied whether there are any physical constraints regarding what kind of barges can come onto Crystal River, have you?

A No, I have not.

Q You didn't have enough time to get a lot of detailed

information regarding this case given the amount of time you had after OPC retained you, correct?

A Yes, that's correct.

Q And OPC retained you February 8, 2007, correct?

A That's correct.

Q You began your work on February 20, 2007, correct?

A Yes, sir.

Q And you completed your work on March 6th, just about two weeks, correct?

A No, I'm still employed.

Q Well, you completed your direct testimony, I'm sorry.

A Yes, sir.

Q Got me on that one. A few more questions and I'm almost done.

You take the position that Crystal River has a redundant blending system, correct?

A Yes, I do.

Q And redundant means that if one part breaks you can have a backup you can use, correct?

A Yes, sir.

Q Tell me if you agree or disagree with the following statement, please. I would not call the CR system a redundant system if you were blending. As it is being used now, feeding only one coal, one quality coal, then it's redundant. Do you agree or disagree with that statement?

A It is a redundant system for feeding two coals and designed to be such.

Q Let me ask you that one more time. Would you agree or disagree with this statement. I would not call the CR system a redundant system if you were blending. As it is being used now, feeding only one coal, one quality coal, then it is redundant. Would you agree or disagree with that statement?

A I disagree.

Q Would it change your mind to learn that the statement I just read was from Mr. Putman, your co-expert's deposition?

A It would surprise me beyond all measure.

Q Well, let me show you Page 26 of Mr. Putman. "I would not call that a redundant system if you were blending. As it is being used now, feeding only one coal, one quality coal, then it is redundant."

A I believe it is redundant.

Q You would agree with me that PRB coal back in the 1980s was a lousy coal, correct?

A No, it was never a lousy coal. It was an exciting coal for people that had to reduce sulfur and didn't want to install scrubbers. And that's why so many people jumped on to use Powder River Basin coal.

Q Well, at Page 161 of your deposition, if I could draw your attention to Line 16 and 17.

A Well, let's get it in context. That was 1971's PRB

and we know that it has improved through 1978. So, relative to the '78, yes, the '71 PRB at the low Btu was a lousy coal.

Q And that low Btu was 8200 Btus per pound, correct?

A Yes, sir.

Q And today it is 8800 Btus per pound, correct?

A Yes, sir.

Q And that's not significant, is it?

A It depends, again. To the heat input machine, to the pulverizers, to the furnace a difference of 8 to 10 percent is not considered significant.

Q Right. And just to reference Page 195 where I say, "Well, I'm just trying to understand. It is the difference between 8200 Btu pound and 8800, is that significant in your mind with respect to Btu value?" And you say, "It is a difference of less than 10 percent. No. It is interesting, but not significant."

Did I read that properly?

A Yes. We almost said the same thing.

MR. BURNETT: Thank you. No further questions.

CHAIRMAN EDGAR: Further questions from staff? No questions.

Commissioners, any questions? No.

Mr. McGlothlin.

MR. McGLOTHLIN: Commissioner Carter, I would simply note that the division of labor among our witnesses, that this

gentleman is the one who rebuts the company's position on capital costs and O&M costs in case you wanted to inquire. If not, I'll go ahead with my redirect.

REDIRECT EXAMINATION

BY MR. McGLOTHLIN:

Q Mr. Barsin, I will refer you back to Exhibit JAB-9, Page 7 of 7.

COMMISSIONER CARTER: Excuse me, Madam Chairman.

CHAIRMAN EDGAR: Commissioner Carter.

COMMISSIONER CARTER: I did have one question, but I think in your response you said that the significant costs for -- if there were any upgrade, it would have been about $2 million total and maybe a million and a half a year. Am I close to what you said?

THE WITNESS: Yes, Mr. Carter.

COMMISSIONER CARTER: Thank you very much.

BY MR. McGLOTHLIN:

Q Mr. Barsin, looking at JAB-9, Page 7 of 7. When Mr. Burnett was asking you about the subject of guarantees, I believe you pointed him to an additional column that contained the initials G-U-A-R, did you not?

A Yes, sir, I did.

Q Why did you point him to that particular reference?

A Well, he was searching on the page for G-U-A-R, or what he thinks means guarantees, and I pointed that out as a

second place where he could find them, find it listed. But in that case, the Illinois fuel that that covers is not the designed specified fuel, so that column couldn't be, by definition, guaranteed. So the word G-U-A-R is a simple designator by the design engineer who filled out these sheets as a load point.

Q Again, with respect to Page 7 of 7, you referred Mr. Burnett to this page when the topic of disclaimers was discussed, and why did you refer him to this page?

A Well, this page does not have a disclaimer. In fact, this has the threat of law if you loan it, or copy it, or loan it, or give it to a competitor. The disclaimer it has is quite different on the left side, which would be considered, I imagine, giving out secret information to a potential competitor, so they're trying to protect this sheet that I look upon as the guarantee commitment.

Q In his earlier questions, Mr. Burnett asked you to agree that PRB coal contains fewer Btus than other coals. Do you recall that?

A Yes, sir.

Q Was that fact known at the time Crystal River 4 and 5 were designed and built?

A Yes, sir, it was, because the Btu level of the contributor, the PRB contributor is clearly laid out on what I term the guarantee performance summary sheet.

Q He asked you to agree that Powder River Basin coal has more moisture than bituminous coal. Do you recall that question and answer?

A Yes, sir.

Q Was that fact known at the time Crystal River Units 4 and 5 were designed?

A Yes, sir.

Q And was it taken into account in any way?

A Yes, sir. The most obvious example of that is that the primary air heater is oversized. If you look at sizing for the bituminous Illinois performance, and then you look at the performance column for the Powder River Basin blend, you will note that the air outlet temperature going to the pulverizers is 100 degrees hotter for the Powder River blend case than for the Illinois case. The higher temperature is required to evaporate the moisture in the higher Powder River Basin 50 percent contributor to the fuel.

Q He asked you to agree that slagging and fouling of boiler parts could effect megawatt output. Do you recall that question and answer?

A Yes, sir.

Q Was that fact known at the time Crystal River Units 4 and 5 were designed and built?

A Absolutely.

Q Were they taken into account in any way?

A Yes, sir. As I did on my summary, the severe/severe indexes were utilized, which is the most stringent index we could use for predicted fouling and predicted slagging. All the design tools at our disposal were put into Crystal River 4 and 5.

Q Mr. Burnett pointed you to some items in your exhibit that changed as the project evolved toward the complete contract document. Do you recall that?

A Yes, sir, I do.

Q Did the specification regarding the client's expectations as to the capabilities to produce continuous -- maximum continuous rating change at any point?

A It never varied from their first RFP letter.

Q Mr. Burnett referred you to the statement in which you used the word PRB catastrophe. Do you recall that?

A Yes, sir.

Q In what sense were you using the word catastrophe in that statement?

A Can someone refresh me and tell me where I used it so I can get the context.

Q If you don't recall, I'll move on.

A I do not.

Q Mr. Burnett asked you to agree that certain measures are necessary to ensure safety in plants that burn Powder River Basin coal or blends of Powder River Basin coal. Do you recall

that?

A Yes, sir.

Q Can you tell the Commissioners whether you have incorporated expenditures designed to provide any safety means that are needed in your own estimate of capital costs and O&M costs that would be appropriate for the use of the blend at Crystal River 4 and 5?

A Yes, I can; and, yes, we did. We included -- the Black & Veatch people when it designed this plant did extensive dust suppression engineering and material, extensive fire prevention, and extensive water wash. During my superficial voyage of the plant, I noticed that there was no water wash capability on the stacker/reclaimers, and that the tripper floor, the place where the coal comes into the boilers and is fed to the silos, are in drastic need of some upgrading and some repair. The dust collectors that had been put on by Black & Veatch had been allowed to rot and corrode and were out of service. So we have put money into the fixing of those items that were not initially designed into the system by Black & Veatch, and those things that would reflect what has been learned on housekeeping safety from the time of 1980 through today.

Q Mr. Burnett asked you to agree that more has been learned about Powder River Basin coal since the 1980s. Do you recall that statement?

A Yes, sir, I do.

Q In your opinion, have we learned anything about the properties of Powder River Basin coal since 1980 that would change your opinion regarding the ability of Crystal River 4 and 5 to burn a 50/50 blend successfully and at MCR continuously?

A No. The mineral characteristics are within the boundaries that describe and characterize something called subbituminous coal. The mineral content, the Btu content all are within those boundaries. What has been learned is when people started to get careless in the '80s and not treat the Powder River Basin coals with respect, and these are primarily external to the boiler, these are transfer points on conveyor belts and other external dust raising situations.

Q Now, you were asked about a statement by Mr. Putman during his deposition regarding the blending system. Mr. Burnett did not provide to you, did he, what Mr. Putman was including in his definition of what constitutes a blending system?

A I'm sorry, I didn't understand you clearly.

Q Let me rephrase.

A Thank you.

Q Will you tell the Commissioners what you regard to be the blending system at Crystal River 4 and 5, the components of the system, and why you believe, as defined by you, it is a

redundant system?

A Yes. There were three -- thank you. There were three possibilities considered by the designers. As initially conceived, the Powder River Basin coal was always going to arrive by barge, and the CAPP coal was always going to arrive by train. So the Powder River Basin coal, in those moments, when it was being unloaded from the barge, would be sent directly to fuel Units 4 and 5 on Conveyor Belt 31.

The stacker/reclaimer Number 2 would take the CAPP coal from the active storage pile and with variable speed motors be able to match the weight of the Powder River Basin coal and vary the belt speeds so that an exact 50/50 weight could be pushed, or could be placed on the conveyor belt, bringing the mixture then to the crushers and then from the crushers to the surge bin in the boilers.

In the event that the coal being unloaded was railroad coal or bituminous coal, the same conveyor belt, 31, would go north to Crystal River 4 and 5. And when it arrived at the transfer point for stacker/reclaimer Number 3, stacker/reclaimer Number 3 would be taking Powder River Basin coal from its storage pile onto the variable speed conveyor belt with weight scales automatically looking at the weight required to make a 50/50 match to the combined fuel and then it would proceed on to the crusher.

In the event that there was no rail or no barge being

unloaded, there was a third pile located between the stacker and reclaimers Number 2 and Number 3. That had been created when fueling was not in progress, and that was already a preblended pile of CAPP coal from the northern end of the stationery pile and Powder River Basin coal from the south end and pre-mixed. That would be reclaimed by one of the stacker/reclaimers and put into the fueling situation to the crushers.

So the three possibilities were covered. Automatic scales were provided on each of the variable belts, and a process controller in the coal handling would automatically control the weight ratios to ensure that the mixture would arrive at approximately 50/50 percent.

Did I confuse you or did I --

Q Mr. Barsin, based upon your description of the blending system, if Progress Energy Florida were to begin utilizing the 50/50 blend that Public Counsel has advocated they should have been using, do you see any reason to scrap that system and spend tens of millions of dollars to replace it?

A No, no reason whatsoever. And in 1979 dollars it was an $18 million system, and there's no reason to scrap it.

MR. McGLOTHLIN: No further questions.

CHAIRMAN EDGAR: Okay. We have exhibits.

MR. McGLOTHLIN: I move Mr. Barsin's rebuttal

exhibits.

CHAIRMAN EDGAR: Exhibits 185 through 203 will be entered into the record as evidence.

(Exhibits 185 through 203 admitted into evidence.)

CHAIRMAN EDGAR: The witness can be excused. Thank you, Mr. Barsin.

THE WITNESS: Thank you.

CHAIRMAN EDGAR: Okay. About an hour ago I had high hopes that we might finish today, but, alas, it is not to be so.

MR. BURNETT: Madam Chairman, if I may?

CHAIRMAN EDGAR: Mr. Burnett.

MR. BURNETT: During this last bit I have tried to eliminate a lot of my cross-examination for Mr. Putman on the redundant material. I know that we only have ten minutes maybe with Mr. Bohrmann, we maybe have five to ten at most with Mr. Smallwood, and I believe I could probably do Mr. Putman, with witness cooperation, in twenty or less. I just wanted to advise Madam Chair.

CHAIRMAN EDGAR: You beat me to it, because I was going to ask you for an estimate, which I will not hold you to, but an estimate, and so I appreciate that.

Realizing that estimates usually are under rather than over, generally, not just you, Mr. Burnett, but generally. And, quite frankly, I'm a little tired, so I'm thinking that we

break here in a few minutes and come back tomorrow afternoon.

There is a prior scheduled meeting in this room tomorrow morning. Commissioners, I'm thinking 1:30, maybe. Think about that for a moment and let me know. And the parties, too. Let me know if that seems workable, and I would think that in an hour to an hour and a half we could get through.

MR. BURNETT: Subject to no friendly cross and witness cooperation, yes, ma'am.

CHAIRMAN EDGAR: I fully expect that we will all cooperate together. And upon second thought, how about 2:00 o'clock? Does that work, Commissioners, staff? Two o'clock, Commissioner?

MR. BURNETT: Yes, ma'am.

MR. McGLOTHLIN: We will be here.

CHAIRMAN EDGAR: Okay. Any other matters before we break for the evening with the understanding that we will come back at 2:00 o'clock tomorrow, and at that point take up Witness Putman, then Smallwood, then Bohrmann, then any closing housekeeping matters and then be done, I think.

Any other matters this evening with that understanding? No. Okay. Then thank you all. We are on break until 2:00 o'clock tomorrow afternoon, and we will see you then.

(The hearing adjourned at 5:15 p.m.)

(The transcript continues in sequence with Volume 10.)

STATE OF FLORIDA)

: CERTIFICATE OF REPORTER

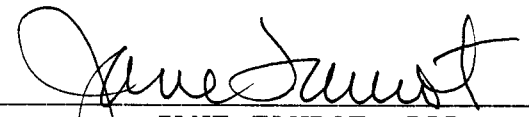
COUNTY OF LEON)

I, JANE FAUROT, RPR, Chief, Hearing Reporter Services Section, FPSC Division of Commission Clerk, do hereby certify that the foregoing proceeding was heard at the time and place herein stated.

IT IS FURTHER CERTIFIED that I stenographically reported the said proceedings; that the same has been transcribed under my direct supervision; and that this transcript constitutes a true transcription of my notes of said proceedings.

I FURTHER CERTIFY that I am not a relative, employee, attorney or counsel of any of the parties, nor am I a relative or employee of any of the parties' attorney or counsel connected with the action, nor am I financially interested in the action.

DATED THIS 16th day of April, 2007.



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