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 5

Pages 587 through 696

PROCEEDINGS:	HEARING
BEFORE:	CHAIRMAN LISA POLAK EDGAR COMMISSIONER MATTHEW M. CARTER, II COMMISSIONER KATRINA J. MCMURRIAN
DATE:	Tuesday, April 3, 2007
TIME:	Commenced at 2:00 p.m. Concluded at 5:55 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.
221			590
222	Hatt's Notes	659	695
99 - 124			694

P R O C E E D I N G S

(Transcript follows in sequence from Volume 4.)

CHAIRMAN EDGAR: We will go back on the record. And I believe when we left off, we were going to call Witness Hatt.

Before we go into that, are there any other matters that we need to address? The exhibit?

MS. HOLLEY: Oh, yes. We just wanted to note for the record that we received Exhibit 221, formerly Late-Filed 221, from Progress, which was the resume of Al Pitcher, so that's, obviously, no longer late-field. And if it wasn't already, we would request that it be entered into the record.

CHAIRMAN EDGAR: Okay. So the one page that has been passed around that is headed list of officer positions held by Al Pitcher will be Exhibit Number 221, and that will be entered into the record now today.

(Exhibit 221 admitted into evidence.)

CHAIRMAN EDGAR: Okay. Mr. Burnett, your witness.

MS. HOLLEY: Excuse me.

CHAIRMAN EDGAR: Whoops, I'm sorry.

MS. HOLLEY: I believe Mr. Twomey also had an issue.

MR. TWOMEY: Madam Chair, very briefly. I have spoken to staff and the other parties. If the Commission would be agreeable if Mr. Stewart could come after lunch sometime tomorrow and be worked in when it is convenient for the other parties and the Commission, we would be appreciative. I think

only the company has questions of him, and they will probably tend to be brief given the nature of his testimony, so just --

CHAIRMAN EDGAR: Mr. Burnett, are you fine with that?

MR. BURNETT: Yes, ma'am, no objection.

CHAIRMAN EDGAR: Okay. So we will plan to take up Witness Stewart tomorrow afternoon.

MR. TWOMEY: At your convenience.

CHAIRMAN EDGAR: Okay. Thank you, Mr. Twomey.

MR. TWOMEY: Thank you.

CHAIRMAN EDGAR: We will work with you to accommodate that.

MR. TWOMEY: Appreciate it.

CHAIRMAN EDGAR: Okay. Anything else?

Mr. Burnett, your witness.

MR. BURNETT: Thank you.

ROD HATT

was called as a witness on behalf of Progress Energy Florida, and having been duly sworn, testified as follows:

DIRECT EXAMINATION

BY MR. BURNETT:

Q Mr. Hatt, would you please introduce yourself to the Commission and provide your address.

A Yes. I am Rod Hatt, and I live and work at 114 South Main Street in Versailles, Kentucky.

Q Have you already been sworn as a witness in this

matter?

A Yes, I have.

Q And who do you work for and what is your position?

A Coal Combustion, Incorporated. I am the President and Chief Technical Officer.

Q Have you filed prefiled direct testimony and exhibits in this proceeding?

A Yes, sir.

Q And do you have them with you?

A Yes, sir.

Q And do you have any changes to make to your prefiled testimony and exhibits?

A No.

Q If I asked you the same questions in your prefiled testimony today, would you give me the same answers that are in your prefiled testimony?

A Yes, sir.

MR. BURNETT: Madam Chairman, we request that Mr. Hatt's prefiled testimony be entered into the record as if read here today.

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

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

FPSC DOCKET NO. 060658

DIRECT TESTIMONY OF

ROD HATT

I. INTRODUCTION AND QUALIFICATIONS

Q. Please state your name and business address.

A. My name is Rod Hatt, and my business address is 114 South Main Street, Versailles, Kentucky, 40383.

Q. By whom are you employed and in what capacity?

A. I am the President and Chief Technical Officer of Coal Combustion Inc.

Q. What do you do?

A. I have experience in most aspects of how coal quality impacts the operation and performance of utility coal-fired steam plants. My services include teaching and consulting with utilities regarding the issues of switching types of fuel, including switching from bituminous coal to Powder River Basin ("PRB"), sub-bituminous coal. I also organize and participate in a number of classes, workshops, and conferences regarding coal quality issues.

Q. What is the purpose of your testimony?

A. The purpose of my testimony is to address the decision, from an operational and safety perspective, to consider a fuel switch at Crystal River Units 4 and 5 ("CR4" and "CR5") from bituminous coals to a blend of bituminous and sub-bituminous coals, in particular the PRB sub-bituminous coals. My testimony quantifies and summarizes the financial impacts, again from an operational and safety perspective, that burning such a coal mixture at CR4 and CR5 would have and the time required to evaluate and accomplish any such fuel switch. In so doing, I will also respond to the Office of Public Counsel's ("OPC") assertions that Progress Energy Florida ("PEF") should have been using an equal mixture of bituminous coal and sub-bituminous coal from the Powder River Basin at Crystal River Units 4 and 5 from 1995 to present day.

Q. Please describe your education background and professional experience.

A. I have a Bachelor of Sciences in Chemistry from Michigan Technical University. From 2001 to 2006, I served on the Board of Directors of the PRB Users' Group, which is a group formed to promote the safe use of PRB coal by generating companies. Prior to starting Coal Combustion Inc., I worked from 1994 to 2002 as the head of the Fuel Utilization Services section of Commercial Testing & Engineering Co. ("CTE"). This company is the largest coal testing laboratory company in the nation and specializes in providing customers with an understanding of the impacts of coal quality on power plant performance and cost. From 1995 to 2001, I organized, conducted, and presented at CT&E's PRB Technical Coal Conference, held in Gillette, Wyoming. From 1986 to 1994, I served as the Director of Technical Services for Island Creek Coal Corporation. While in this position, I specialized in test burns and fuel switching, and I helped develop and implement the

use of coal quality impact models. Before that, I served as a Combustion Engineer with the Northern Indiana Public Service Company from 1980-1986. While there, I evaluated potential fuels to predict operational effects and costs, conducted test burns of various coals, and solved various opacity and deposit formation issues at different units. I was also responsible for boiler and precipitator performance testing, fly ash sampling, and resistivity measurements of various coals.

Q. Are you sponsoring any exhibits with your testimony?

A. Yes, I am sponsoring the following exhibits with my testimony:

- Exhibit No. __ (RH-1), which is a composite exhibit of two aerial photographs of the Crystal River Energy Complex;
- Exhibit No. __ (RH-2), which is a Material Data Sheet regarding PRB sub-bituminous coal;
- Exhibit No. __ (RH-3), which is a composite exhibit of a paper on PRB Coal Degradation – Causes and Concerns and a picture of dusty PRB coal;
- Exhibit No. __ (RH-4), which is a chart reflecting the number of fires and explosions at power plants;
- Exhibit No. __ (RH-5), which is a comparison of the basic coal qualities of bituminous and PRB sub-bituminous coals;
- Exhibit No. __(RH-6), which is a composite exhibit of examples of various PRB mine fires;
- Exhibit No. __ (RH-7), which is an April 2006 article regarding PRB rail derailments;

- Exhibit No. __ (RH-8), which is a summary detailing the capital costs and ongoing operation and maintenance costs necessary to upgrade the Crystal River site to accommodate a PRB coal blend;
- Exhibit No. __ (RH-9), which is a composite exhibit of examples of various fires caused by PRB coal dust;
- Exhibit No. __ (RH-10), which is a description of fire protection guidelines for handling and storing PRB coal that were developed by the PRB Coal Users' Group;
- Exhibit No. __ (RH-11), which is a picture of a broken roller along a conveyor belt at Crystal River;
- Exhibit No. __ (RH-12), which is a power point presentation regarding the May 2002 conveyor belt fire at the Nanticoke Generating Station;
- Exhibit No. __ (RH-13), which is a composite exhibit of pictures taken along the conveyor belts at Crystal River;
- Exhibit No. __ (RH-14), which is a composite exhibit of pictures of the belts leading to the tripper floor;
- Exhibit No. __ (RH-15), which is a composite exhibit of a presentation regarding stacker reclaimer fires at the Nanticoke Generating Station and examples of other PRB coal yard fires;
- Exhibit No. __ (RH-16), which is a picture taken of the bituminous coal piles at Crystal River;
- Exhibit No. __ (RH-17), which is a picture of a stacker reclaimer at Crystal River;

- Exhibit No. __ (RH-18), which is a composite exhibit of various diagrams of the coal yard conveyor belt system at Crystal River;
- Exhibit No. __ (RH-19), which is a composite exhibit of pictures of the north coal yard at Crystal River;
- Exhibit No. __ (RH-20), which is a picture of a conveyor belt at Crystal River with an empty space;
- Exhibit No. __ (RH-21), which is a composite exhibit of a picture of the square tripper dust collector at Crystal River and pictures of the coal dust that is characteristically on the tripper floor at CR4 and CR5;
- Exhibit No. __ (RH-22), which is a composite exhibit of a CD containing a video of an explosion that occurred in a square dust collector at a power plant and pictures showing that explosion;
- Exhibit No. __ (RH-23), which is a composite exhibit of pictures of the damage caused by the J.P. Pulliam tripper floor PRB coal explosion;
- Exhibit No. __ (RH-24), which is a composite exhibit of a picture and article regarding the PRB coal explosion at the State Line Power Plant;
- Exhibit No. __ (RH-25), which is a composite exhibit of examples of PRB coal fires occurring in silos;
- Exhibit No. __ (RH-26), which is the test report from the 2004 test burn conducted at CR4;

These exhibits are true and correct.

Q. Please summarize your testimony.

A. To properly evaluate whether PEF could and should have been using any blend of PRB sub-bituminous coal at Crystal River Units 4 and 5 (hereinafter referred to collectively as "Units 4&5"), one must perform what I call a "seam to stack" analysis that addresses operational and safety issues associated with PRB sub-bituminous coal starting at the seam where the coal is actually removed from the earth and ending in the smoke stack at the plant where the coal is ultimately burned. This "seam to stack" analysis is standard utility practice for utilities considering a shift in the type of fuel procured and burned in a coal-fired generating plant and one I have performed for other utilities trying to make similar decisions. I have performed such an analysis for Units 4&5 and have come to the conclusion, to a reasonable degree of certainty in the electric utility industry, that burning a "50/50 blend" of PRB coal at Crystal River, as OPC suggests, would require a significant incremental, one-time capital expenditure in the amount of approximately $61.2 million, with ongoing incremental operational and maintenance expenses of approximately $2 million per year.

I have also concluded, to a reasonable degree of certainty, that if PEF had burned a 50/50 blend of PRB coal as OPC suggests, PEF would have lost an estimated 124 megawatts of energy production each year from Units 4&5 compared to the energy that historically and currently is being produced by Units 4&5. Finally, in the course of my "seam to stack" analysis, I have also identified certain problematic issues raised by purchasing and using PRB coal that cannot be readily quantified on a "monetary impact" basis. Thus, while such issues are not included in the financial cost of deciding to switch the types of coal burned at CR4 and CR5, they are still important factors that a potential user of PRB coal should consider.

Additionally my testimony addresses certain operational issues that OPC's expert, Mr. Sansom, addresses in his direct testimony. For each of these issues, I explain why Mr. Sansom's testimony reflects a misunderstanding of the correct set of facts and circumstances surrounding these issues.

II. "SEAM TO STACK" ANALYSIS OF USING PRB COAL AT UNITS 4 & 5

Q. Before explaining your analysis of using PRB coal at Units 4 & 5, will you please describe what Crystal River Units 4 and 5 are?

A. Of course. Crystal River Units 4 and 5 are coal-fired, base load generating plants located at PEF's Crystal River Energy Complex in Crystal River, Florida. By design specifications, Units 4 and 5 are rated for generating 665 megawatts of energy per unit. Aerial pictures of the Crystal River Energy Complex, including Units 4 and 5, are attached in Exhibit No. __ (RH-1) to my testimony.

Q. Historically, what type of coal has PEF burned at Units 4 & 5?

A. PEF has burned high-quality, high-BTU bituminous coal at Units 4&5, or a blend of this coal with synthetic fuel (synfuel), which has a base of similar quality bituminous coal.

Q. Are there any differences between bituminous and sub-bituminous coal?

A. Yes, there are several differences between bituminous and sub-bituminous coal. One significant difference between the two coals is that sub-bituminous coal -- like the

PRB coal that OPC suggests PEF should have been burning all these years -- has a significantly lower BTU content than the bituminous coal that PEF has been using. A BTU, or British Thermal Unit, is the amount of heat that a given fuel source generates when it is burned. Said simply, the higher the BTU content, the better and more efficient the fuel source. The sub-bituminous PRB coal that OPC contends PEF should have been using typically has a BTU value in the 8,500 BTU range. The bituminous coal that PEF has historically used generally has a BTU value in the 12,000 to 13,000 BTU range. This has allowed PEF to burn about 50% less coal to get the same amount of heating energy when compared to a straight PRB coal.

Q. Are there any other differences between bituminous and sub-bituminous coal?

A. Yes, several, but here, I will focus on the other major differences that are most relevant to this case. Because of its chemical composition and physical nature, PRB sub-bituminous coal is much more volatile and dangerous compared to the bituminous coal that PEF has historically used. Unlike bituminous coal, PRB coal has a tendency to "self ignite" or spontaneously combust once it is removed from the ground. In fact, PRB coal is classified as explosive by the U.S. Bureau of Mines. Therefore, as reflected in Exhibit No. __ (RH-2), the Material Data Sheet regarding PRB sub-bituminous coal, great care must be taken when dealing with PRB coal.

Similarly, PRB coal, as shown in Exhibit No. __(RH-3), is a much less physically stable coal and will break up and dust much more than bituminous coal. PRB coal dust is not only problematic from an operational level, it is also flammable and can cause explosions, equipment fires, and airborne "dust fireballs" if not properly cared for. Indeed, as shown in the attached Exhibit No. __ (RH-4), the

number of fires and explosions at power plants has increased since the 1970s. One cause of this trend could be the increased use of PRB coal at utilities.

PRB coal also has a tendency to retain more moisture than bituminous coal. Its chemical composition, and the fact that it breaks into pieces more easily than bituminous coal, make it more susceptible to gaining and holding moisture.

Finally, PRB coal has higher calcium and sodium, and lower sulfur contents, as compared to bituminous coal, and these properties present operational issues such as slagging, fouling, and boiler and precipitator performance issues, which I will explain later in my testimony. To illustrate these chemical and physical differences, I attach Exhibit No. __(RH-5), which compares the basic coal qualities of bituminous and PRB sub-bituminous coals.

Q. Earlier, you described the "seam to stack" analysis that you performed in this case. Before beginning that analysis, please describe briefly from where PRB coal comes and how it would make its way to the plant.

A. PRB coal is mined in Montana and Wyoming. For use at the Crystal River facility, the PRB coal can be shipped either by train and barge, or exclusively by train. If arriving by barge, the coal is offloaded by a large piece of equipment that takes scoops of coal from the barge, moves along a line, and drops the scoop of coal into a hopper. A hopper is a temporary holding compartment. From there the coal falls onto a conveyor belt and is transported either to a temporary storage pile just south of the barge offloader, or it is transported along the conveyor belt through various transfer points. A transfer point is an area along the conveyor belt system at which the coal can either be transferred to a different conveyor belt or sent into a different

direction. One particular transfer point turns the coal 90 degrees, so that instead of heading in an easterly direction, the coal begins to travel north, to where Units 4&5 are.

If the PRB coal were to come in by rail, each rail car in the train would be set over a hopper, and the bottom would drop out of the car, allowing the coal to fall into the hopper. If any coal remained, the car would be shaken. From there the coal travels along conveyor belts and meets up with the conveyor belts coming from the barge.

Once on the conveyor belt, the coal can either be loaded, or "bunkered," directly into the units, or it can be offloaded to one of the stacker reclaimers. A stacker reclaimer is a piece of machinery used to stack coal onto the ground and then pick it up from the ground to return it to the conveyor belt.

If the coal is headed to the plant, it must pass through a crusher and over scales before proceeding by a conveyor belt to the tripper floor inside the plant, about 14 stories high. The crusher breaks the coal into smaller pieces. The tripper floor contains devices to allow the coal to be taken off the belt and delivered to silos. Silos are large storage containers inside the plant that feed the coal to the pulverizers. The pulverizers dry and grind the coal into a fine talcum powder. This powder is then blown into the boiler through tubes connected to the boiler, where it is ignited and the flame is used to heat the water and create steam. The steam is further heated into a superheated condition in the convection pass area of the boiler. The steam is pushed through turbines, which create electricity when spinning. Once the coal dust is burned, the un-burnable ash material is collected in a variety of locations in the unit. The majority of the ash is collected by the electrostatic precipitator ("ESP"), which

controls pollution emissions by electrically charging the ash particles and pulling them to be trapped on the ESP plates.

Q. Can you also please explain how you have estimated the various capital and ongoing costs associated with bringing PRB coal on site and through the plant?

A. For PEF to safely and effectively transport, handle, and blend PRB coal at Crystal River, several upgrades are necessary. In many instances there are one-time capital charges, as well as additional on-going operating and maintenance expenses. To the extent I can identify the specific changes that are needed, I have estimated those costs. For the capital upgrades, I have contacted equipment vendors and other PRB users in the industry to obtain a high-level estimate of what those upgrades would cost. Where additional personnel are needed, on an on-going basis, I have received information from PEF as to the fully-loaded annual cost of that particular kind of employee. In some instances, though there is not an actual cost that can be quantified, I have identified it as an issue that should nevertheless be considered by a utility when deciding whether to switch to PRB coal. In addition, some capital upgrades, like dust collection devices, should be installed on several areas, like the barge offloader, the conveyor belts, and the tripper floor. In such instances, the cost I provide is a complete cost that encompasses all the devices that should be upgraded throughout the site. Finally, I have tried to be conservative in my estimates of the additional costs that would be necessary to upgrade Crystal River for PRB coal. A summary of all the capital costs and on-going maintenance expenses that I have estimated for PEF to burn a PRB coal blend at CR4 and CR5 is provided in the attached Exhibit No. __ (RH-8).

Q. Now, starting with mining, or the "seam," how does mining PRB coal compare to bituminous coal?

A. PRB is a younger coal, geologically speaking. This contributes to the PRB coal having properties associated with increased reactivity, which causes concern for increased fires and flammable coal dust. The more the coal is exposed to air, the more likely the coal dust and the coal itself will ignite. So the moment PRB coal is removed from the coal seam, there are potential problems with flammable dust and coal fires. Anyone mining PRB coal has to account for these factors and take measures to deal with them when mining the coal and placing it in silos for shipment. For example, as seen in the attached Exhibit No. __ (RH-6), there have been several reports dealing with mine fires at PRB coal mines.

Q. What issues are associated with loading PRB coal into silos at the mines?

A. The first issue is the potential for fires in the coal silo. Those mining PRB coal, and ultimately those purchasing it, have to be cognizant of and factor in PRB coals' increased volatility.

Second, because it is a younger, less stable coal, PRB tends to lose its BTU content faster than bituminous coals once the coal is removed from the earth. Because of this fact, PRB mines are usually adamant that they will measure coal BTU specifications at the mine and not where the coal is ultimately delivered. This means the potential purchaser likely will not get the amount of BTUs that it is actually paying for.

A third, and somewhat related issue at the coal silo, is the fact that the ASTM methodology for measuring coal BTU content is not effectively designed for PRB coal, thereby raising a concern with the accuracy of testing. The ASTM (American Society of Testing and Materials) is a voluntary standards development system that develops methods to test various materials, including coals. The accuracy of the BTU value is decreased because of the high moisture content nature of the sub-bituminous coal. The precision of testing the BTU value of PRB sub-bituminous coal does not measure up to that of the testing of bituminous coals, primarily because of how the labs handle the higher moisture PRB sub-bituminous coals, especially when drying the coals. This causes further concern as to whether a PRB purchaser will actually get the amount of BTUs it is actually paying for.

Q. What happens after the silos are loaded?

A. Once PRB coal is loaded into silos, it is stored there for a comparatively short amount of time until it can be loaded onto trains. Unlike the bituminous coal that PEF has historically used, PRB coal cannot be safely stored or stacked in unconsolidated piles. Imagine a stack of bituminous coal being like a stack of golf balls where the physical aspects of the balls allow space between each ball and prevent heat from concentrating in the pile. In layperson's terms, a pile of bituminous coal tends to act more like a pile of dirt with respect to volatility. However, PRB coal's unstable properties prevent such an effect, and if left in an unconsolidated cone pile for more than three or four days, PRB coal piles will begin to heat up and will catch fire due to "hot spots" that will develop in the pile. These facts have to be considered when storing PRB coal for loading.

Over a week, which is about the time from getting the coal from the mine to loading, PRB coal can lose between 100-150 Btu's. If the coal is exposed to the elements while waiting to load, and the PRB coal gets wet, water makes the oxidation and degradation process in PRB coal work faster. This counter-intuitive concept is known as the "heat of wetting." When PRB gets wet, its moisture content increases and the higher moisture content exacerbates BTU loss. There are three causes for this loss of Btu's. First, because there is more water, there is less coal to be burned as Btu's. Second, the wetter the coal is, the more it lowers the efficiency of the boiler, because more water is lost through the stack. So it takes more tons to get the same amount of electricity. Finally, water speeds up the oxidation of the coal. The process of oxidation is a slow burn, so during oxidation the coal is consumed and there is less of it, thus decreasing the Btu's.

To illustrate how water speeds up the oxidation of coal, consider the impact of water on the oxidation of iron or the formation of rust. Rust is a slow oxidation of iron. Adding water to iron speeds up the oxidation process, and increases the amount of rust.

Once PRB coal is ready for loading onto a train, the number of options available for transporting PRB coal is lower because the risk of dust and spontaneous combustion is a deterrent for transporters of coal. In fact, some purchasers of PRB coal have received train cars or barges of PRB coal that are actually on fire when they are delivered. In such cases, purchasers have few options except to let the train or barge burn out because using water on a PRB coal fire can actually make the fire worse by further breaking up and heating the coal.

Q. Why should a utility be concerned with these handling issues before it gets to their facilities?

A. A utility, when deciding what kind of fuel to purchase for use in its coal-fired generating unit, must consider whether the source of coal it is considering will be able to supply an adequate amount of coal to the unit. The dusty nature of the coal can affect the transportation, and ultimately the supply. Indeed, this occurred in 2005, when an accumulation of coal dust under railroad track beds prevented water from draining and backed up train supplies out of the PRB region. See Exhibit No. __ (RH-7). While the effect of this cannot be readily quantified, it must be a factor. In addition, anything that affects the Btu content, like moisture content, must also be considered, because it will take more coal to get the same heat output.

Q. What are the options for delivery of PRB coal into Crystal River?

A. PRB coal can either be transported directly to Crystal River by train, or it can be loaded onto barges at the Mississippi River and barged into Crystal River.

Q. Let's start with delivery of PRB coal by barge directly into Crystal River. Are there any particular issues associated with barge deliveries of PRB coal?

A. Yes, there are specific problems with offloading PRB coal from barges, as compared to offloading bituminous coal. Currently, the system at Crystal River is inadequate to accommodate PRB deliveries by barge. Several upgrades would be needed.

Q. What upgrades would you recommend to permit the safe offloading of PRB coal by barge?

A. The Crystal River barge unloading site does not have the equipment needed for controlling the dust that PRB coal would create. The barge unloader would need dust suppression and sprayers, which are considerable upgrades. Dust suppression and sprayers spray water or chemicals to knock dust out of the air. The sprays and misting agents from the sprayer systems are especially necessary when the barge unloader dumps the coal into the hopper system, as this is when the most dust is released. Increased daily maintenance and cleaning would also be required to deal with PRB dust accumulation at the barge unloader site. Examples of the daily maintenance and cleaning include wash-downs of the area with water and ensuring that all dust is removed from the floor and crevices.

Q. Why are you concerned with the PRB coal dust?

A. The main reason to be concerned about PRB coal dust is that it accumulates and self-ignites. Unfortunately, there are numerous examples within the industry of coal dust catching on fire in various parts of a plant's coal handling system or unit. For example, PRB coal dust that accumulated underneath conveyor belts was blamed for an explosion at the State Line Energy Power Plant in July 1998 that severely injured a worker at the plant. The worker sued the utility for negligence and the case settled for $13 million. At another plant, the Sooner Power Plant owned by OG&E, a PRB coal explosion occurred, creating a fireball that extended some 200 feet into the air. The likely cause of the explosion was the combination of a damaged conveyor belt and coal dust. These and similar examples of fires caused by PRB coal dust can be found in composite Exhibit No. __ (RH-9). Therefore it is essential to control and minimize the PRB dust. To control the dust, PEF should utilize improved conveyor

belt design and covering, improved chute design, new dust collection systems, and chemical dust suppression. Because even all of these measures are not 100% effective at controlling the dust, PEF must also install a water wash down system to remove any PRB dust that does accumulate. The final layer of attack is to add the fire protection and detection devices to further minimize the risk of fire from the PRB coal dust. The fire protection would include a specially-trained fire brigade to deal with PRB coal fires and the special characteristics of PRB coal dust. My cost estimates for these capital upgrades and increased operation and maintenance expenses are included in the entries on lines 1, 3, 4, 14, 16, and 17 of Exhibit No. __ (RH-8) to my testimony.

Q. Even if PEF were to install the dust suppression and sprayer systems to control the PRB dust during barge offloading, would these mechanisms be guaranteed to completely eliminate the coal dust from escaping into the air?

A. No, there are no guaranties that all of the PRB coal dust will be eliminated by use of these dust suppression devices. What I recommend is the best currently-available technology in the industry for the suppression and collection of PRB coal dust. But there is no foolproof method. Although I cannot quantify the amount of dust that will remain, there will certainly be some amount. That is why I recommend additional maintenance and housekeeping to clean the areas around which the PRB coal is present.

Q. Are there any other issues with offloading PRB coal at the barge?

A. Yes, there is also a possibility that the coal will either arrive on fire or hot, or that it

will catch on fire as it is offloaded and put onto the conveyor belt system.

Q. What should the utility do to manage or reduce the risk of hot or flaming PRB coal?

A. The utility should incorporate additional fire prevention procedures. Because of the nature of the PRB coal, the utility will need extra maintenance and preventive actions to control any potential ignition sources. These would include fire detection devices. For example, PEF should install devices that can detect heat and carbon monoxide. The heat is an indication of a fire, and carbon monoxide indicates combustion. Because the PRB coal can spontaneously combust, the carbon monoxide detection is most important. These fire detection devices should be installed along the entire system, from the barge unloader, along the conveyor belts, in the transfer points, up to and including the tripper floor, silos, and pulverizers in CR4 and CR5.

In addition, PEF should install fire protection equipment. These would include sprinklers and water deluge systems. Although Crystal River currently has a sprinkler system, this system in my opinion is not sufficient to handle the increased risk associated with the PRB coal. The sprinkler and water deluge system should be capable of automatically extinguishing the fire. PEF's current sprinkler system does not have such capability; this means that much of Crystal River's fire fighting would be done manually. PEF should also maintain a fire brigade that is specifically trained in the nature and concerns of PRB coal. For example, the special brigade must have knowledge as to what a straight stream of water can do to a PRB coal fire. At one power plant, a worker sprayed straight water onto a fire. This caused the PRB coal dust to extend into the air and create a second explosion. A description of fire

protection guidelines for handling and storing PRB coal that were developed by the PRB Coal Users' Group is attached as Exhibit No. __ (RH-10) to my testimony.

Q. What other steps should a utility take to protect from the risk of PRB coal catching on fire?

A. To start a fire, there must be fuel, oxygen, and an ignition source. With PRB coal, the fuel is the coal itself, the oxygen is provided from the air, and the coal itself has the propensity to self-ignite. So any pile of PRB coal has everything it needs to catch on fire. In addition, any heat or ignition source would more readily light a PRB coal pile than a bituminous coal pile. Given this added risk, utilities must focus their efforts on controlling ignition and heat sources. For example, the conveyor belts that are used in the offloading process are supported by hundreds of rollers that turn constantly to keep the belts moving. If a roller on the belt system is "squeaky", that means there is friction and thus a potential heat source could occur. To avoid this ignition source with PRB coal, utilities must incorporate more diligent preventative maintenance procedures. Such maintenance would include greasing and changing out the rollers on the conveyor belts whether or not they are squeaking.

During my site visit to the Crystal River complex, I observed about 30 "squeakers" and several missing or broken rollers on the belt system that moves coal from the unloading point to the coal pile. See Exhibit No. __ (RH-11). With the bituminous coal that PEF uses, this is not a problem. The plant does not have to immediately prevent squeaky wheels when transporting bituminous coal. Rather, it can wait until the plant is down for scheduled maintenance to grease and align them. Transporting PRB coal, however, requires enhanced and immediate maintenance.

The same "squeaky" wheels that I observed would need to be taken out of service and dealt with immediately if PEF uses PRB coal blends.

Another possible ignition source is when welders perform maintenance or work on any equipment in the vicinity of the coal offloading area. Even small sparks can cause smoldering and eventually fires in the coal. For example, a PRB coal fire broke out on a conveyor belt at a chute head at the Nantikoke Generating Station in May 2002. Just hours before the fire started "hot work," or a welding job, had been completed in the vicinity of the coal fire. See Exhibit No. __ (RH-12). Controlling this risk requires a change in the utility's work rules. For example, a prudent practice would be to implement a 24 hour fire watch after any welding job (or any similar job) is completed. This means that every hour, someone goes to inspect the work area for fires. This requires increased manpower. These additional maintenance and fire watch activities would require at least one additional maintenance employee. My cost estimates for the capital upgrades and increased operation and maintenance expenses for fire protection and detection are included in the entries on lines 4 and 16 of Exhibit No. __ (RH-8) to my testimony.

Q. Are there any issues with transporting PRB coal from the barge offloader area to the coal pile, or to the units themselves?

A. Yes, I see several areas of concern which would require changes to the existing conveyor system at Crystal River. First, a significant dust collection system, much like a giant vacuum cleaner, would need to be installed along all the belts, and in the transfer chutes and towers, that move coal from the unloading site to the coal pile and from the coal pile to the plants. Also, a dust suppression system that sprays water or

chemicals to knock dust out of the air would need to be installed along all of those same belts.

In addition to these changes, PEF will need to implement measures to deal with dropped coal piles along conveyor belts because such piles of PRB coal can spontaneously combust. On my site visit to Crystal River, I observed several small piles of bituminous coal along PEF's conveyor belt system that were caused by coal falling off the conveyor belts while it was being moved. See Exhibit No. __ (RH-13). With bituminous coal, this is not a problem and PEF can leave these piles in place or clean them up at PEF's leisure because they do not present an immediate safety issue. With PRB coal, however, these piles would need to be removed daily. Another option would be for PEF to install a skirting system along its conveyor belts to prevent spillage. Such measures would be critical because if the belts that move coal into the plants are disabled or burned down by a PRB fire, Units 4&5 would have to be taken offline while the fire was controlled and the conveyor belt system was rebuilt.

Finally, all conveyor belts located at Crystal River, from the barge all the way to the actual units, will require increased maintenance if PRB coal is used at the site. As the conveyor belts at Crystal River move closer to the plant, they get higher in the air, reaching a maximum height of 137 feet (about as high as a 14 story-building) near the tripper floors of Units 4&5. A picture of the belts taken from the tripper floor is attached as Exhibit No. __ (RH-14). This, of course, makes the higher belts less accessible and more difficult to fight fires and to repair and/or replace. These belts are essential to putting coal into the units to produce electricity. The loss of these belts would be financially catastrophic.

Q. Now let's discuss delivery of PRB coal by rail directly into Crystal River. Are there any particular issues associated with offloading the coal from the trains?

A. Yes. First, there have been instances where train cars filled with PRB coal have arrived on fire before the offloading even begins. When this occurs, the utility may choose to not dump it because of the risk that the coal will ruin equipment, or worse, spread the fire to other parts of the facility. The additional fire protection and detection upgrades that I refer to when discussing the conveyor belt system will be necessary for the rail offloading facility as well.

Q. Are there any other additional measures that would need to be taken to deal with PRB coal at the offloading rail site?

A. Yes, when PRB coal is removed from a train car, there is a serious problem with dusting for the reasons that I have previously discussed. To help prevent this volatile PRB dust from spreading to other areas of the Crystal River facility and from causing a fire hazard at the offloading site, I recommend that PEF install dust suppression systems and dust cleaning equipment at its train offloading facility before using any significant quantities of PRB blends. I also recommend that PEF create and initiate daily maintenance and cleaning procedures at the train offloading site.

Q. You have previously discussed the movement of PRB coal from the unloading barge point to the coal pile via Crystal River's conveyor belt system. Are the same issues present in moving PRB coal from the rail unloading point to the coal pile?

A. Yes they are.

Q. When the PRB coal gets to the coal pile from the conveyor belts either from the rail or barge delivery points, are there any issues at the coal pile?

A. Absolutely. The first issue is that the equipment that is used to transport and pile the coal must be washed down after every use. This wash down is necessary to remove the additional coal dust that handling PRB coal produces. The coal dust is settling on the hot portions of the bulldozer and could catch on fire. One such example occurred at the Nanticoke Generating Station. The power plant has had several small fires break out on or near its stacker reclaimers, which is a type of equipment used to handle coal. A particularly bad fire occurred in December 2003 and caused serious damage to the plant's stacker reclaimer. The direct cause of the fire was the accumulation of PRB coal dust on the stacker reclaimer. The plant had not consistently and regularly washed down the stacker reclaimers after use. The fire caused significant damage to the conveyor belts and the electrical components of the stacker reclaimer, and it took five months to repair the stacker reclaimer. See composite Exhibit No. __ (RH-15) for this fire as well as other fires occurring in or near coal yards.

Q. Do you have any other concerns about PRB coal piles?

A. It depends on whether a utility is going to use that coal within 1-3 days. If so, the coal can generally be kept in unconsolidated cone piles. But, if the coal is stored on the pile any longer, there is a risk of combustion. At 5-7 days, the coal may already be on fire, so after 3 days, it needs to be well compacted.

On my visits to the Crystal River site, I noticed that practically all of PEF's active coal was kept in unconsolidated cone piles. Exhibit No. __ (RH-16) is attached to my testimony and reflects a picture of Crystal River's bituminous coal pile. This procedure is fine for the bituminous coal that PEF uses, but with PRB coal blends, this procedure would not be acceptable. Also, the current Crystal River coal piles have large areas of runoff left by large ravines of water from rain which cause ridges in the pile. This is acceptable for bituminous coal, which is less volatile and can basically be treated like dirt. However, this is completely unacceptable with PRB coal as a fire will start along a 6-12 inch ridge. This means that re-leveling must be done daily whenever a PRB coal pile is changed due to use or elemental influences.

Q. Can other problems occur with the coal piles of PRB?

A. While stored in a pile, PRB coal will continue to lose its BTU content at a faster rate than that of the bituminous coal that PEF uses. With PRB coal, there is also degradation in size and wet coal handling problems, which impacts the ability of the power plant to effectively utilize PRB coal. Fine and wet PRB coal that has been stored on a coal pile plugs chutes, hoppers, feeders, and belts. Also, since PRB coal retains much more water than the bituminous coal that PEF uses, wet coal handling problems create a limitation on the pulverizers' ability to dry coal for use in the boiler. So, wet PRB coal issues created in the coal pile cause problems in the power plant because the pulverizers are adversely affected.

Regarding storing PRB coal in coal piles, there is also the issue of the increased number of tons of PRB coal that will be needed to maintain inventory as compared to the bituminous coal that PEF uses. Utilities maintain an inventory of

stored coal based on the number of days of burn for the units. Crystal River currently maintains approximately 40-50 days of burn time in its inventory for Units 4 and 5. PEF will have to buy more tons of PRB coal to get the same BTU value that it currently receives from the higher quality bituminous coal it uses. The additional tonnage requirements for PRB means that the stockpiles at Crystal River will necessarily get bigger, which in turn increases the amount of equipment, personnel, and space needed to maintain the pile. For example, Crystal River currently maintains about 500,000 tons of bituminous coal (which is 12,500 Btu). To blend PRB coal, the site would need about another 100,000 tons of coal, which is additional PRB sub-bituminous coal.

Finally, if PEF maintains PRB coal piles at Crystal River, PEF will need to install dust suppression systems, which are essentially sprinklers, around the coal piles to address the dust issues that I have previously discussed.

Q. You have discussed the movement of coal from the mines, into Crystal River, and to the coal pile. Do you have any concerns with blending PRB coal with bituminous coal at the Crystal River site?

A. Yes. The only equipment that Crystal River currently has for blending are two "stacker reclaimers" that are capable of performing a crude form of blending various types of bituminous coal. Stacker reclaimers are used to put coal on the ground and to "reclaim" it from the ground back to a conveyor belt, but they are not used to blend precisely. A picture of a stacker reclaimer at Crystal River can be seen in the attached Exhibit No. __ (RH-17). These stacker reclaimers do not do a good job of blending coal because they are basically metal buckets attached to a spinner wheel

that picks up coal at variable speeds and dumps it in a pile with other coal. Because stacker reclaimers are crude devices with high margins for blending errors, they could not be effectively used to create PRB coal blends at Crystal River from an operational perspective notwithstanding the safety concerns that I have with such a process.

From a safety perspective, PEF should not use its current stacker reclaimers to blend PRB coal because the equipment: (1) is not equipped with dust and fire suppression systems; (2) cannot be effectively and efficiently cleaned and maintained on a daily basis to prevent fire- causing dust accumulation; and (3) has the potential to cause spark fires in a PRB pile due to its metal buckets scraping against other objects. Based on these operational and safety problems, PEF should use a "reclaim hopper system" if PEF were going to attempt to blend PRB coal at the Crystal River site. A reclaim hopper system is a system that takes metered amounts of coal from independent belt feeding systems which allow exact blends of coal to be fed into and mixed in a centralized hopper. Such a system is also fitted with online computer systems that analyze coal mixtures and adjust feeder speeds to ensure proper blending percentages. Detroit Edison's Monroe Plant blends PRB and bituminous coals, and it uses this type of system. Finally, PRB-capable reclaim hopper systems are equipped with dust and fire suppression equipment and do not have the "metal-on-metal" sparking potential like stacker reclaimers.

Q. What other concerns, if any, do you have with PEF blending PRB coal at Crystal River?

A. Given the current coal delivery system at Crystal River, I have some concerns as to whether PEF would be able to blend the PRB coal fast enough to maintain full

operation of Units 4&5 and be able to perform necessary maintenance. To illustrate the issues, various diagrams of the coal handling system at Crystal River are attached to my testimony as composite Exhibit No. __ (RH-18). There are approximately six miles of conveyor belts at Crystal River. If PEF were to blend PRB coal with bituminous coal, the blending would be done at the north coal yard, which is near Units 4&5 (see Exhibit No. __ (RH-19)). There is currently only one conveyor belt that takes coal from the barge and rail up to the north yard, from transfer point 25 north to transfer point 28. Currently, when a train is being offloaded to the north yard, a barge cannot be offloaded at the same time because of the sole conveyor belt. When a barge and train arrive at the same time, the barge coal must be offloaded to a temporary coal pile located south of the barge offloader, at stacker reclaimer one, SR-1. Then, once the train has been offloaded, the coal at SR-1 is then picked up off the ground and sent to the north yard.

In addition to this double handling issue of barge coal, there are limitations to the time it takes to load or bunker the units. It currently takes about 18 hours each day to load approximately 12,000 tons of coal into the two units. This leaves about 6 hours a day for maintenance on the belts and in the yard. Each of the belts going from transfer point 28 to the units is designed to convey coal at 800 tons per hour (for a total of 1600 tons per hour). But these belts are only working at less than 700 tons per hour. Because burning a PRB blend means that more coal must be burned to get the same heating output, this means that even more time will be needed to bunker the units. In fact, so much additional coal would be necessary, under the current conditions, that loading the plant would not leave adequate time to perform maintenance.

In addition, currently, to increase efficiency, the coal coming from the barge and train is sent straight to the plant as often as possible. In other words, the coal is not double handled. But if PEF were to blend the PRB and bituminous coals, with 100% PRB coming from the barge and bituminous from the train, the coal could not be directly loaded into the units. This would also slow down the bunkering of the plants.

Given these limitations, in addition to the reclaim hopper system described above, PEF should upgrade the belts that go from the north yard to the units. The Company would also need an additional bulldozer and front loader to maintain the coal piles and handle the additional tonnage effectively. The additional handling will also require two more operators to pack the coal and ensure that the piles do not catch on fire.

Q. Do you agree with Mr. Sansom's assertions that PEF can blend on-site because it was designed to do so?

A. No. There is a difference between what was designed and what was actually built at Crystal River. The coal yard and the conveyor belt system are not currently able to accommodate blending of PRB coal. An analysis of the system, however, reveals that the system may have been designed to have an additional conveyor belt running alongside the existing belt from transfer point 24 to transfer point 25, and from transfer point 25 going north. As reflected in the attached Exhibit No. __ (RH-20), there appears to be an empty space in the tunnel next to the existing conveyor belt. It appears that another conveyor belt was planned, but never actually built. Similar space can be seen as the conveyor belt travels to the north coal yard.

Q. If you were to estimate PEF's cost of blending PRB coal with bituminous coal at Crystal River, what capital costs and ongoing costs would you include in your analysis?

A. Before PEF can even bring PRB coal onto the Crystal River site, it must make the changes to its conveyor belt and coal handling systems that I have described. Specifically, these systems need installation of dust suppression, dust collection, and fire protection and detection devices. Added to these costs would be the upgrades needed to blend, including the reclaim hopper system, the belt upgrades, and the on-line computer analyzer system. So any blending cost for blending at Crystal River would have to include capital costs of $38.7 million and ongoing O&M costs of $1.5 million. The specific break-down of the cost estimates for the capital upgrades and increased operation and maintenance expenses for blending are included in the entries on lines 1, 3, 4, 5, 9–12, 14, and 16–18 of Exhibit No. __ (RH-8) to my testimony.

Q. After the PRB coal is blended, what is the next step in its movement?

A. Next the blended coal moves by conveyor belt to the tripper floor, which is where the coal is taken from the belt and put into the hopper. When using PRB coal blends, a dust collection system is required at the tripper floor to deal with the increased dusting caused by PRB coal. The tripper floor at Crystal River does contain a dust collection system, but it is not operational and, even if it were working, it is a poor design for suppressing PRB coal dust. Experience over the years has shown that a dust collection structure should be round, rather than the square shape used at Crystal River, because PRB dust can get caught in the corners of a square structure and then

catch on fire. See Exhibit No. __ (RH-21) for a composite exhibit of a picture of the square tripper dust collector at Crystal River and pictures of the coal dust that is characteristically on the tripper floor at CR4 and CR5. Such dust would be unacceptable when burning a PRB coal blend. Modern PRB tripper floor areas are also painted white so that the dust can be seen and removed during daily cleaning. The daily cleaning consists of water washdowns, which require upgrades to the tripper floor electrical systems, so that nothing but "white walls" are seen at the end of each day.

Q. Have other utilities with dust collection housings like Units 4&5 experienced problems with transporting PRB coal through the tripper floor?

A. Yes, there have been documented cases of tripper floors exploding due to PRB coal dust in the high beams. Having problems with the tripper floor is a huge risk for a power plant, because when the tripper floor is not operational, the utility cannot put coal into the power plant thereby resulting in an outage. Exhibit No. __ (RH-22), attached to my testimony, contains footage of PRB explosions in a square dust collector similar to the ones used at Crystal River, as well as pictures depicting those explosions.

Also, when fighting a PRB tripper house fire, there is potential for secondary explosions because any sort of shock (like a little pop from the fire) could dislodge flammable dust in rafters and corners, resulting in a large airborne dust fireball. This occurred at the J.P. Pulliam Generating Station in June 1991. PRB dust within the tripper floor was ignited by a minor explosion in the bunker, which caused a massive explosion that blew out the tripper floor walls. See Exhibit No. __ (RH-23). In

another incident, the tripper and tower exploded at the State Line Power Plant as a result of accumulated PRB coal dust. This accident resulted in serious injuries to several employees, including one worker who received a $13.7 million settlement from a lawsuit against the power company. See Exhibit No. __ (RH-24). This is why proper tripper house design, operation, and daily cleaning are so important when using PRB coal blends.

Q. When the coal leaves the tripper floor and goes to the silo, what issues, if any, do you see with using PRB coal?

A. The silo is a large storage container from which coal is put into the pulverizers. As discussed previously, when using PRB coal, there are constraints as to how long the coal can be kept in the silo. Just as I explained with the coal compacted on the storage piles, PRB coal will start to smolder and burn at five days. So, for example, if there is a problem with the pulverizers that causes the unit to be shut down for five days or longer, the utility will need to remove all the PRB coal sitting in the silo to avoid fires. Also, to use PRB blends, PEF would need to make available fire fighting equipment inside the silo to "dig" into the coal to put a mixture of water and "Chemical F500" in the middle and at the bottom of the coal that is stored into the silo. PEF would also need to add additional monitors into the silo to determine the level of carbon monoxide to provide an indication when and if the coal was about to spontaneously combust.

In addition to this equipment, PEF will need to change its current silo designs to properly have the PRB coal flow from the silo into the pulverizer so there will be no "dead storage" in the silo where the coal is not moving. The importance of the

rotation of coal in the silo can be seen in the attached composite Exhibit No. __ (RH-25). Several fires have occurred in silos holding PRB coal, most notably a large fire at Plant Scherer that went on for four days before plant personnel were aware of the fire.

There are two basic means by which coal is taken from the hopper for use in the pulverizers. One is mass flow, whereby the first coal that goes into the hopper is the first coal taken out. The other is known as funnel flow, where the first coal into the hopper is the last out of the hopper, which means that the coal at the bottom of the hopper sits in the hopper for the longest period of time. Funnel flow is bad for PRB coal because the older coal gets too hot and can spontaneously combust. With a funnel flow system, personnel are needed to make sure coal goes down once every three days to ensure proper rotation of the coal. But such a practice of decreasing the level of coal in the hopper increases the time to bunker the coal, slowing the bunkering process. This increases the risk of not getting a full load of coal into the bunker. Currently Crystal River has silos that may have funnel flow method, or at least characteristics of funnel flow method, which is not proper for PRB coal. My cost estimate for the capital upgrades for the silo modifications is included in the entry on line 2 of Exhibit No. __ (RH-8) to my testimony.

Finally, I noticed on my site inspection of Crystal River that although CR 4 and 5 were designed to include an additional silo, feeder, and pulverizer unit at each plant, these additional structures were never built. 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. My cost estimates for the capital upgrades and increased operation and maintenance expenses for the additional pulverizers are included in the entries on lines 6 and 15 of Exhibit No. __ (RH-8) to my testimony.

Q. Once the PRB coal is fed into the pulverizers do you have any concerns with the pulverizer handling it?

A. Yes, there are several issues with the pulverizers being ready to handle a PRB coal blend.

First, there are the wet coal handling problems that I touched on earlier in my testimony. Before grinding coal into a fine powder, pulverizers work to dry surface moisture off the coal by running mills with hot air blowing into it which creates a proper coal outlet temperature. For bituminous coal, this outlet temperature is around 150-160 degrees. Because of the reactive nature of PRB coal, however, this outlet temperature needs to be lowered to around 125-140 degrees. By lowering this temperature, the risk of an explosion of the PRB coal is minimized. The pulverizers, however, also lose drying capacity. The irony is that due to the significantly higher surface moisture present in the PRB coal, the pulverizers need more drying capacity than they would need to dry bituminous coal. To make matters worse, additional pulverizer drying capacity is also needed due to the 20-25% increase in tons of coal that must be dried by the pulverizers because PRB coal has lower BTUs. These two factors, which significantly decrease the capacity of the pulverizers, are major constraints to maintain desired load at the plants.

Because the plant must put in more tons of PRB coal per year to account for

its lower BTU content, I am also concerned that the pulverizers at Units 4&5 may be limited as to how much blended coal can be passed through them at the capacity needed to maintain designed load at the plants. Over the years, experience has shown that plants can use larger particles with pure 100% PRB coal to maintain higher pulverizer capacity to account for increased amounts of PRB coal. Said simply, because PRB coal does not have to be ground as fine as bituminous coal, a plant can run more coal through the pulverizers faster. With a 50/50 blend, however, the pulverizer must work at a lower capacity to grind the 50% bituminous coal to a finer grade, thereby eliminating the pulverizers' ability to deal with the increased amounts of PRB coal at higher speeds. In my opinion, this will necessarily slow the fueling process at Units 4&5, which will lead to power production derates.

Q. Once the coal is processed in the pulverizers, what happens next?

A. The pulverizers shoot the ground coal dust into the boiler.

Q. Are there any concerns with use of PRB coal in the boiler?

A. Yes, I have several concerns. First is a problem called slagging. There are 2 parts of coal: components that burn and those that do not burn. Those that do not burn are mostly minerals, rocks and dirt. Slagging is a process by which those non-burning particles stick to the boiler walls, which causes deposits to form on the walls that are hard to remove.

These deposits build on boiler walls, insulate boiler tubes, and basically form a blanket of hot lava that impedes the radiation heat in the boiler from going into the boiler tubes to heat up the water in the boiler. This molten material also goes to the

superheater and reheater part of the tubes and starts building deposits there. This is a concern because it can impede heat transfer from flue gas to steam, which impairs unit efficiency and the amount of load a unit can produce. The deposits can also impede flue gas and can fall from the walls and tubes causing damage at the bottom of the boiler.

PRB coal produces more substantially more slagging than the bituminous coal normally burned at CR4 and CR5, due to the mineral components of the PRB coal. PRB coal deposits act like a "slushy snowball" in the boiler which can act like a glue on the boiler walls and pipes thereby causing slag to build up much faster. Also, the higher a unit runs with respect to megawatts produced, the more slagging take place with PRB coal. Using a 50/50 blend of bituminous and sub-bituminous coal can also be particularly troublesome with respect to slagging because solid non-burning bituminous ash particles that normally would not stick to boiler walls and tubes become trapped in the "slushy" PRB slag deposits.

Q. Are there any solutions to slagging?

A. Yes, slagging can be limited in a couple of ways. One solution for slagging is sootblowing, which is a process where air or steam is blasted into the boiler to remove the slag deposits from the walls. While the original boilers in Units 4&5 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, as we have learned over time since those units were designed. So over time, the utility may find that it needs to add upgraded sootblowers to deal with a 50/50 blend of coal.

Also during my site inspection at Crystal River, I learned that some of the

current soot blowers in units 4&5 are not functioning. This fact is acceptable with the bituminous coal that PEF used because little soot blowing is required with low slagging bituminous coal. Therefore, PEF would have to repair and maintain all presently installed soot blowers in Units 4&5 before any PRB blend could be used on a long-term basis.

One problematic issue with sootblowing, however, is that because the air or steam is blasted into the boiler at high velocities, the boiler tubes that heat the water in the boiler start to get polished down and thin. This wearing process will lead to cracks and leaks in the tubes. Such problems with tubes are a significant cause of outages and derates in these types of units. Thus the increased soot blowing needed to deal the PRB coal blends will necessarily cause boiler components and tubes to wear down faster than they would with bituminous coal.

Increased PRB slagging can also be helped by installing water cannons which spray water into the boiler to remove the deposits. This is highly recommended if a utility uses PRB coal, but, like soot blowing, this process damages the boiler tubes because comparatively cold water is put onto the hot boiler tubes, and this causes tube leaks and cracks. So again, both solutions are needed to help reduce PRB slagging, but both of them will eventually lead to increased tube leaks and outages. I have not attempted to quantify the cost of increased repairs and outages caused by the boiler damage that I have discussed above but note that those unknown increased costs must be considered in evaluating the use of PRB coal blends. My cost estimates for the capital upgrades and increased operation and maintenance expenses for the water cannons and sootblowers are included in the entries on lines 8 and 19 of Exhibit No. __ (RH-8) to my testimony.

In addition, there is a particular problem with slagging when burning a 50/50 blend, or some intermediate range, of PRB coal with bituminous coal. This is because these blends cause a liquid slag due to the formation of eutechtics. Eutechtics are the formation of low-melting ash material formed when blending coals. To illustrate eutechtics, consider the impact that salt has on the melting point of ice. Ice usually melts at 32 degrees. When salt is added to ice, however, the ice will melt at a lower temperature. The more salt you put in, the lower the melting temperature. Utility experience has indicated that these eutechtics are hard to predict, but they usually occur somewhere between 20 and 80% PRB coal blend. As a result, utility experience has shown that, to minimize slag, it is better to burn either 100% PRB coal or a small percentage blend, i.e. less than 20% PRB coal blend.

Q. Does burning PRB coal blends have any other effects in the boiler?

A. Yes, burning PRB coal also increases fouling. To explain, PRB coal has internal oxygen, which can make the coal act like a water softener resin. The PRB coal attracts sodium and calcium causing calcium that was once part of groundwater to attach to the coal. When the coal burns, this causes individual atoms of calcium and sodium in the boiler flue gas to be present in a very excited state. Then, at about 2000 degrees, the sodium and silica fly ash react to form sticky particles. And the calcium and sulfur atoms come together between 1600-1800 degrees, and the two gaseous parts combine to become solid particles. Those solid particles attach to the steam tubes and entrap fly ash causing the deposits to grow and impede heat transfer to the steam tubes. This process happens in the convection part of the boiler where the superheater and reheaters are and will eventually impede heat flow and temperature in

the boiler.

Bituminous coals can slag, but generally do not foul. This is due to the low sodium and calcium levels of the bituminous coal. With PRB coal, fouling is present in addition to the slag. Fouling is also somewhat different from slagging because fouling is more gradual and gradually impacts efficiency and load. This, in turn, results in a need to limit load in the affected unit. Fouling can also completely clog the boiler tubes causing long outages.

When Units 4&5 were designed, no one properly understood the chemistry of fouling or slagging with PRB coal. Therefore, the simple sootblowers currently installed on Units 4&5 are not enough to effectively prevent PRB coal fouling. If PEF were going to use PRB coal blends in Units 4&5 on a long-term basis, I could foresee the need to modify the boilers in Units 4&5. Types of modifications that may be necessary could include superheater and reheater tube banks spacing father apart. Such a modification would allow Units 4&5 to effectively deal with the substantially increased fouling caused by PRB coal. My cost estimate for the boiler modifications is included in the entry on line 7 of Exhibit No. __ (RH-8) to my testimony. Note that the estimate for this modification is particularly conservative.

Q. Given what the industry knew about PRB coal when Units 4&5 were designed, could those units have been designed then to effectively deal with the fouling issues caused by PRB coal?

A. No, because, as I mentioned previously, designers at the time did not understand and appreciate the way that PRB coal would actually react in the boiler. Also, the same PRB coal that is available today was not available when the boilers in Units 4&5

were designed. The types of PRB coals that were available when the boilers in Units 4&5 were designed resulted in higher slagging and lower fouling. Today, however, the PRB coals that are sold on the market are higher fouling. In fact, Mr. Sansom, in his testimony at page 13, lines 4-15, acknowledges the differences between the types of PRB coal available during these different time periods. Thus, the boiler manufacturer for Units 4&5 could not have addressed the higher calcium fouling potential of PRB coals, because they simply did not exist in the market place at the time that Units 4&5 were designed.

Q. Are there any other concerns with the boiler when using PRB coal blends?

A. Yes. Burning PRB coal also causes fouling and dust accumulation in the economizer, which is located just past the steam tubes but still in the convection pass. PRB coal also makes the air heater susceptible to additional pluggages. The pluggages result from fouling and slagging particles coming back into the boiler from the sootblowers. This causes restricted air flow into the boiler, and is a very common derate problem. 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.

Q. Are there any impacts to boiler efficiency that result from the use of PRB coal?

A. Yes. Boiler efficiency goes down with increased use of PRB coal. This means that it takes more Btu's to produce the same amount of electricity. This is due to higher moisture levels in the flue gas leaving the stack. These higher levels are produced from the higher moisture levels in the coal, and the combustion of hydrogen. Boiler

efficiency calculations reveal a drop in boiler efficiency from 1-2% when utilizing a 50/50 PRB coal blend. To illustrate the significance of the annual cost of this penalty, with any loss of boiler efficiency percentage, a corresponding increase in fuel costs will result. In other words, if boiler efficiency goes down 1%, the annual fuel bill will go up 1% because additional coal must be purchased. For example, using the present year's fuel bill of approximately $291 million, this boiler inefficiency results in an additional $2.9 million of costs per year.

Q. What is the next step in burning PRB coal blends and what issues, if any, are encountered?

A. The next area of concern would be in the pollution control device, called the electrostatic precipitator ("ESP"). The ESP controls pollution emissions by electrically charging the ash particles and pulling them to be trapped on the ESP plates. The ESP is affected by a number of factors, including the amount of ash, what the ash is made of (aluminum silicate, calcium, etc.), and whether sulfuric acid is able to condense on the particles to allow them to conduct electricity.

Units 4&5 have what are known as cold precipitators. When burning PRB coal, as compared to bituminous coal, the lower level of the PRB coal makes it difficult for the ash particles to get the necessary electric charges so that they will be trapped in the ESP. This is because there is not enough sulfur in PRB coal to create sulfuric acid which condenses onto the fly ash and creates a conduction. Ash with good conduction collects well in the ESP. Ashes that do not conduct well, meaning they have high resistivity, do not perform as well in the ESP. With PRB coal, therefore, fly ash resistivity will be high because of the lower sulfur content. In other

words, the PRB fly ash is more resistant to being attached to the ESP. This "sulfur" problem is exacerbated by the increased calcium found in PRB coal which "sucks up" sulfur and creates solid calcium sulfate. This calcium sulfate solid creates fouling-like characteristics and depositing problems within the ESP. In addition, the sulfate also acts like an antacid to remove what sulfuric acid there is in the ESP.

To deal with these problems, PEF would need to install a sulfuric acid conditioning system on its ESP system. This system burns supplementally added sulfur and converts it to sulfuric acid using a catalytic converter, which then blows the acid into the ESP to increase conductivity. My cost estimates for the capital upgrades and increased operation and maintenance expenses for these changes are included in the entries on lines 13 and 20 of Exhibit No. __ (RH-8) to my testimony.

Q. Why is it important that the ESP work properly when burning PRB coal?

A. If the ESP does not work properly, the plants would have to limit their loads due to high particulate emissions, or as measured, higher opacity, which is the amount of smoke permitted to come from the smoke stack. There are environmental regulations that limit the level of opacity permitted by each unit. If the ESP does not remove the requisite amount of particles, full loads cannot be maintained.

Q. Are there any other problems when using PRB coal blends?

A. Yes. When using PRB coal blends, the plants would have to clean the ESP more frequently. This requires that the plant be taken offline. The ESP must be cleaned with a grit blast device. Water cannot be used with the PRB coal residue because that makes a type of "plaster of paris" on the ESP when it mixes with the calcium sulfate.

Q. Were the effects on the ESP you just described known when Units 4&5 were designed?

A. No, because at the time the units were designed, manufacturers did not appreciate or know about the chemical process I just described. The effect of PRB coal emissions and particulate matters has only more recently come to light. What is clear now, though, is that ESPs are extremely sensitive to changes in coal type, especially changes to PRB coal.

Q. What effect, if any, does burning PRB coal have on the fly ash that is collected by the ESP?

A. The fly ash that is collected by the ESP at CR4 and CR5, upon the burning of bituminous coal, is Class F, which means it has more iron than calcium. Burning a PRB coal blend produces a fly ash that is known as Class C. Class C fly ash contains more calcium than iron. PEF currently sells its Class F fly ash to concrete companies, rather than disposing of the fly ash in a landfill. This change in fly ash may impact PEF's ability to sell the fly ash. Because the Company sells the fly ash and uses the proceeds to offset O&M, this is an important consideration that requires further analysis before a switch in coal types is made.

III. UTILITY'S ACTIONS IN SWITCHING FROM BITUMINOUS COAL TO PRB COAL BLEND.

Q. Considering all the issues you note above regarding the use of PRB coal, do you recommend that utilities take lightly the decision to make a switch to burning PRB coal?

A. Absolutely not. Switching to a blend of PRB coal requires thorough evaluation. Simply choosing PRB coal based on a delivered price is imprudent.

Q. What steps would you recommend that a utility take when evaluating whether to make a change to burn PRB coal?

A. Usually a utility will begin to consider PRB coal if they get a price signal that PRB coal, on a delivered price basis, may be more economical. Upon receiving this initial signal, the first step is to use some sort of modeling to roughly approximate the effects of the PRB coal on the unit.

Q. What type of modeling would you suggest be used to initially evaluate PRB coal?

A. There are several types of models. One in particular is the EPRI CQIM model. This is a fairly sophisticated model that takes inputs regarding coal specifications and calculates the expected impact of that particular coal in the unit.

Q. Does the EPRI CQIM model have any limitations?

A. Yes, there are several limitations. It is very hard to predict, using any model, how a unit will react to a new type of coal. In particular, the following three areas are difficult to approximate using models: (1) handling and combustion problems; (2) slagging and fouling tendencies; and (3) opacity/ESP performance/particulate matter. The CQIM model is a "best guess model." I also liken it to a "paper test burn."

Another limitation relates to the fact that the coal specifications that are inputted into the model come from RFP responses received from coal companies. The specifications provided in response to these RFPs may not be exactly what the specifications of the coal actually received will be. A change in such things as moisture, heating value, ash, calcium, and multitudes of other specifications, could alter the output of the CQIM model.

In addition, the model is also only as good as the experience of the plant. According to Black and Veatch, the model can and should be adjusted to account for various experiences by the plant. But if the plant has never burned PRB coal (as PEF has not), it will not have anything to add to the model.

Q. Given these limitations, how should utilities use this sort of model?

A. I recommend that utilities use this model to provide a busbar analysis to compare the new PRB coal to the specifications of the coal already being burned in the unit. In other words, the model can provide an evaluated number by which to compare the PRB coal to the coal already burned in the unit. After running the model, if the PRB coal continues to look good, I recommend that the utility consider having the handling and coal systems evaluated for the risks involved with dust, fires, and explosions. After this evaluation, the utility must decide whether the risk posed by the short-term test are high enough to warrant the changes being made before the test coal is brought onto the site and making any necessary changes. Then the utility should conduct a short term test burn. Both short-term and long-term test burns are necessary, however, because the model does not provide the utilization cost, it only provides an estimate.

Q. If the modeling outputs continued to make PRB coal look like a viable option, what should a utility do next?

A. Next, the utility should consider either short-term test burns and/or bring in recognized authorities to assist in evaluating the specific effects of PRB coal on the unit.

Q. Taking the evaluation by a recognized authority first, please explain what such an analysis entails.

A. The utility, when evaluating the use of PRB coal with a high-level report, can engage a consulting firm, usually an engineering firm, to review various aspects of the units and analyze whether the units could burn a blend of the PRB coal. Considerations can include design of the units, potential capital upgrades needed to accommodate PRB coal, and expected effects on load loss and efficiency.

Q. If the high-level study indicates that conversion to PRB coal is still a viable choice for the unit, should the utility rely solely on that and start burning PRB coal?

A. No, again, no model or high-level study is going to accurately predict how a PRB coal blend will react in any particular unit. No prudent utility would make a fuel switch unless and until it has completed actual test burns of the blends. It would be well worthwhile to bring in additional experts in the various areas impacted by the use of PRB coal. And a utility should not do long-term test burns without making the necessary changes to its coal handling systems.

Q. What sort of test burns do you recommend that a utility perform?

A. First, I suggest a short-term test burn, which is usually about 60 hours. This trial burn provides insight into whether a unit will have any major short-term issues with the PRB coal blend. In particular, the short-term test burn is helpful to assess the effects of the blend on pulverizer and boiler efficiencies. The utility can also see any initial changes in slagging, fouling, and ESP performance. In addition, the short-term test burn will provide an indication as to the level of dust in the coal yard, which can be affected by the weather experienced during the test burn period.

Q. Do you recommend anything else to assess burning a PRB coal blend?

A. If the unit responds well to the short-term test burn, then the utility should consider whether a long-term trial burn of the PRB coal should be done. A long-term test burn is usually done by burning the PRB coal blend in the unit for 3-6 months. A long-term burn, however, should only be undertaken if the utility is committed to expend capital dollars to make any upgrades necessary to effectively and safely handle and burn the PRB coal. For example, if PEF were to decide to do a long-term test burn, the capital improvements I described above, including dust suppression and collection systems, improved coal blending facilities, and the additional hopper and pulverizer, would have to be made before the test burn could commence.

Q. What benefits does a long-term test burn provide that a short-term one does not provide?

A. Only burning a PRB coal blend for about 60 hours is not sufficient to accurately

assess the effects that slagging, fouling, and potential ESP issues will have on the unit's performance. As described above, because those characteristics of PRB coal involve the build-up of ash deposits, it takes a longer-term test burn to allow for the ash deposits to accumulate and then assess whether that build-up will adversely impact the unit. In addition, the longer-term test burn will help the coal handling personnel assess the handling characteristics of the blend under a variety of weather conditions.

Q. Turning to the steps PEF has taken to evaluate PRB coal for use at CR 4 and 5, are you aware of what PEF has done?

A. Yes, I understand that PEF routinely utilized the CQIM model to obtain an evaluated" or "busbar" number. Based on this number, PEF conducted a short-term test burn of approximately 22% PRB coal in 2004, which was halted due to environmental permitting issues. I further understand that PEF then conducted another short-term burn, of about 18% PRB coal, in 2006, for approximately 60 hours. Then PEF engaged the engineering firm Sargent & Lundy to provide a high-level analysis of converting to PRB coal. Based on the results of the burn and the report, PEF is currently considering whether to perform a long-term test burn of a small blend of PRB coal with bituminous coal.

Q. In your expert opinion, were PEF's actions in evaluating PRB coal prudent and reasonable?

A. Yes, PEF basically followed the procedure I described above, first by modeling the PRB coal to obtain the "paper test burn," followed by the requisite actual short-term test burn and high-level analysis.

IV. POTENTIAL FOR MEGAWATT LOSS DERATES AT UNITS 4&5 USING PRB COAL BLENDS.

Q. Based on the operational issues related to PRB coal at Units 4&5, do you have an opinion as to whether these units would suffer a derate using a 50/50 blend of PRB coal?

A. Yes, I do, but first I must note that even if Units 4&5 were perfectly capable of burning a 50/50 blend today with no derate to their design production capability of 665 megawatts, PEF would still lose megawatts by switching to a 50/50 blend.

Q. What do you mean?

A. In his testimony, Mr. Sansom opines that Units 4&5 can operate using a 50/50 blend and each achieve the 665 megawatts of energy production per unit that they were designed for. What Mr. Sansom fails to recognize, however, is that for over the past decade, PEF's use of high BTU bituminous coal has allowed units 4&5 to consistently run at "over pressure" capacity. As described in detail in Mr. Toms' and Mr. Crisp's testimony, PEF has been able to regularly obtain a gross number of 750 to 770 megawatts of energy production per unit by using high BTU bituminous coal. I further understand that, for planning purposes, the Company expects 722 and 732 MW from Units 4 & 5 in the winter. Therefore, even if Mr. Sansom was completely correct that units 4&5 could achieve a combined 1,330 megawatts with a 50/50 blend, PEF's operations with bituminous coal has allowed for the Company to plan on a production of 1,454 megawatts which would result in a 124 megawatt loss.

Q. Do you have an opinion as to whether PEF could maintain the over-pressure load it has historically enjoyed with bituminous coal if it switched to a 50/50 blend of PRB coal?

A. In my opinion, PEF could not maintain its over-pressure load when burning a 50/50 blend of PRB coal. Keep in mind that when PEF did its first test burn of PRB coal blends in 2004, records show that PEF used a blend of only 22% PRB coal and 78% bituminous coal. See Exhibit No. __ (RH-26). Even with this low blend, records show that PEF lost around 30 megawatts of load in the unit tested. Id. While the test burn and the subsequent 2006 test burn using a similar percentage blend were too short to be conclusive on the issue of potential load loss, I find it important to note that these production problems occurred with a very low PRB blend.

Keeping in mind all the design and operational problems and constraints at Crystal River that I have previously discussed, my opinion is that PEF simply could not process and burn the necessary increased quantities of a 50/50 blend fast enough to maintain the historic over pressure load it has enjoyed through the years. At best, PEF may be able to achieve the rated production of 665 megawatts per unit with a 50/50 blend as Mr. Sansom suggests, but that would assume that PEF makes all the needed upgrades and modifications that I recommend in my testimony.

V. POINTS REGARDING MR. SANSOM'S TESTIMONY

Q. Are you familiar with the Sargent & Lundy report regarding PRB coal use that Mr. Sansom discusses in his testimony?

A. Yes, I have read the report. The October 14, 2005 Sargent & Lundy Report (hereinafter "Report") was a "high-level" coal conversion study that PEF asked Sargent & Lundy to perform regarding the possibility of using various blends of PRB coal at Units 4&5.

Q. Do you agree or disagree with the conclusions in that report?

A. I agree with many of the findings in that report and disagree with others. For the purposes of my testimony, however, I have only focused on and discussed issues that are directly relevant to the issues in this case.

Q. What are your thoughts regarding those issues?

A. First, I should make clear the fact that PEF asked Sargent & Lundy to perform a "first cut," "high level" evaluation of PRB use at Units 4&5. This fact is set forth several times within the Report itself. Therefore, my thoughts on these issues take into account the fact that Sargent & Lundy was not asked to perform an extensive and detailed analysis. I should also note that the fact that PEF asked Sargent & Lundy to do this analysis was prudent and reasonable, as I explain above in my description of the steps that a utility should take when deciding whether to make a fuel change.

With that said, I agree with the Report's conclusion that blends of PRB coal in excess of 30% tend to act like 100% PRB coal from an operational and safety

perspective (Report at page 2). I also agree with many of the performance and safety upgrades that the Report recommends on pages 2 through 4, with the caveat that those upgrades, where not the same as those detailed in my testimony, would be incremental and in addition to the changes that I recommend. I also agree with the Report's ultimate conclusion that a 50/50 blend of PRB coal should not be used in Units 4&5. Additionally, I agree with the finding on page 11 that a greater quantity of coal with have to be used and handled if PEF switches to a PRB blend, and that PRB coal has "poor handling characteristics."

Q. Do you disagree with any major relevant findings in the Report?

A. Again, focusing only on major issues in the Report that are relevant here, I disagree with the conclusion at page 7 that it is "probable" that full overpressure load can be achieved with PRB blends less than 30%. While it is "possible" that such loads could be maintained, the only two actual test burns in Units 4&5 to date with blends less than 30% proved to be inconclusive, and the only way to reliably say whether or not full overpressure load can be maintained on a long term basis is to conduct a long term test burn with those blends.

I also disagree with the finding on page 7 that a seventh mill will be required at each unit for blends of PRB at 70% and above to the extent that the Report is intending to say that the seventh mill would not also be needed for blends between 50% and 69%. As the Report goes on to say on page 7, the boiler and mills at Units 4&5 were designed for a 50/50 blend with seven mills, and not just the six mills that are present today. Therefore, to logically obtain the design basis of a 50/50 blend, the originally designed required equipment would be needed.

In addition, the Report indicates that certain capital upgrades are only necessary for higher percentages of PRB coal blends, but those same upgrades would not be necessary for a 30% blend. I would recommend that most, if not all, of the suggested upgrades for a 70% blend, like water cannons, fire protection and detection systems, dust suppression at the barge unloader, and carbon monoxide detection in the silos, would also be needed for a 30% blend. These changes are necessary to minimize the risks associated with bringing PRB coal onsite, as explained in detail above.

Q. Please explain why the differences between the numbers you estimate for the capital and maintenance costs, and those provided in the Report.

A. The main difference between my numbers and those in the Report is that the capital improvements and O&M costs provided in the Report do not include the costs to blend on-site. Indeed, page 1 of the Report clearly indicates that on-site blending was not considered. I have included costs to account for the capital upgrades and additional maintenance necessary to do on-site blending, as Mr. Sansom alleges PEF should have been doing.

Q. Are there any other sections of Mr. Sansom's report that you would like to address?

A. Yes, there are several. I will address them in the order that they appear in Mr. Sansom's report.

Q. Please proceed.

A. On pages 6 and 7 of Mr. Sansom's report, he provides an ultra-simplistic explanation of the differences between handling and using PRB coal from an operational and safety perspective. Specifically, when asked to describe the differences between units that are designed to burn PRB coal and units that are designed to burn sub-bituminous coal, Mr. Sansom, in a single sentence, simply states that PRB units have larger equipment and upgraded dust controls. On page 7, he goes on to describe the differing operation and maintenance protocols, again in a single sentence, by stating in cursory terms that "more care" is taken with handling and storing PRB coal. As can be seen in my testimony here and the exhibits hereto, Mr. Sansom's testimony on these issues is, at best, simplistic and incomplete, and his testimony misleads the reader into thinking that there are not substantial and critical differences between units that do and units that do not use PRB coal.

Q. What is the next point you would like to address from Mr. Sansom's report?

A. On pages 7 and 8, Mr. Sansom contends that Units 4&5 were "designed" to burn a 50/50 blend of PRB coal. First, I reiterate the fact that even if these units were designed to burn a 50/50 blend, they were designed at a time when the industry knew comparatively little about PRB coal and, as I also mentioned before, at a time when many of the PRB coals used today were not yet discovered. Additionally, the only portions of Units 4&5 that were even arguably "designed" to burn a 50/50 blend are the boilers and the pulverizers, and even with that equipment, two of the design-required pulverizers on the units were never built into Units 4&5.

Q. On page 9 of his report, Mr. Sansom discuss two plants that he calls "sister units" to Units 4&5. What are your thoughts on this?

A. There are no such things as sister units in reality. There are only units that are similarly designed. In comparing the units, only one small area may be similar, like the boiler. For example, the coal yard situations at these so-called "sister units" are completely different from that at Crystal River. In addition, just because the units are the same model does not mean they will operate the same way. To illustrate, consider two cars of the same make and model. Sometimes even the exact same Chevy Impala, with the same motor and drive train, could have performance and maintenance differences. This is why some cars are lemons, and there are Lemon Laws to address them. The same is true for so-called "sister units."

Q. Starting on page 15 of his testimony, Mr. Sansom discusses several non-PEF generating units that have burned some percentage of PRB coal. Do you have any comments regarding these units?

A. Yes I do. It is difficult and not helpful to compare specific plants to other plants. For example, TECO's Gannon plant was designed for high-slagging coal. It is very difficult to find such coal, with low sulfur, in the East. This explains the premium prices TECO paid for Blue Gem-type coal from Kentucky. Given this narrow coal specification that was required for Gannon, TECO was more inclined to consider other options, including PRB coal.

Q. What is your next point regarding Mr. Sansom's testimony?

A. On pages 43-45 of his testimony, Mr. Sansom draws several conclusions regarding

the short term PRB blend test burns that PEF conducted in 2004 and 2006. On page 44, Mr. Sansom suggests that the 60-hour test burn that PEF conducted in 2006 is conclusive that PEF can successfully burn a 30% blend of PRB coal. First, I note that Mr. Sansom's testimony is factually incorrect. At page 44, lines 16 and 17, he states that "It cannot be surprising that Crystal River 5, designed to burn 50/50 PRB/CAPP coal, was successful in burning a 30/70% PRB blend." As can be seen in Exhibit No. __ (SAW-16) to Sasha Weintraub's testimony (portions of which are confidential), the 2006 test burn at Crystal River 5 consisted of an 18/82% PRB blend, which is, of course, substantially lower than the 30/70% blend that Mr. Sansom suggests.

Additionally, even if Unit 5 was able to maintain full load with an 18/82% blend of PRB in a 60-hour test burn, such a short burn is completely inadequate to determine whether or not a unit will be able to sustain load over time, and only a long-term blend of at least six months will provide meaningful data in this regard. As I mentioned previously in my testimony, records show that PEF used a 22/78% PRB blend in its 2004 test burn and lost around 30 megawatts of load in the unit tested, but this test burn was also too short to be conclusive. Finally, I note that even if PEF were able to show through proper long-term test burns that Units 4&5 could burn a 30/70% blend of PRB coal as Mr. Sansom suggests they could (which PEF has not yet done), that fact would mean absolutely nothing because Mr. Sansom's theory is that PEF should have been burning a 50/50% blend for the past decade and not a 30/70% blend.

Q. Do you have any other points regarding Mr. Sansom's testimony?

A. Yes, on page 53, lines 6-11, Mr. Sansom suggests that he has "mooted" any issue or

contention that a 50/50 blend of PRB coal would cause operational problems or derates at Units 4&5 because the units have a "50/50 design basis." As I have previously discussed, this statement is either intentionally misleading or shows a complete lack of understanding and experience with issues related to operational and safety issues associated with PRB coal use.

VII. CONCLUSION

Q. Does this conclude your testimony?

A. Yes, it does.

BY MR. BURNETT:

Q Do you have a summary of your prefiled testimony, Mr. Hatt?

A Yes, I do.

Q Can you please give it now?

A Yes.

My name is Rod Hatt, and I am the President and Chief Technical Officer of Coal Combustion, Inc. As part of my job, I teach and consult with utilities regarding the issues of switching types of fuel, including switching from bituminous to PRB subbituminous coal. I have experience in most aspects of how coal quality impacts the operation and performance of utility coal-fired steam plants. I have also served as a combustion engineer, and I have evaluated coals to predict operational effects, and I have used test burns to solve various opacity deposit information and deposit information issues.

I'm here to tell you that if PEF wants to make a fuel switch to burn any significant amount of PRB subbituminous coal at Crystal River, it must make some changes to its current site and units. As designed and constructed, CR4 and 5 are just not ready to safely, efficiently, and effectively handle, blend, and burn the vastly different PRB coal. Specifically, PRB coal is dustier, it has a higher spontaneous combustion potential, and it causes ash deposit problems like slagging and fouling

when burned, among other issues that I have detailed in my testimony.

Now, I'm not implying that utilities should never burn PRB coal in their units. What I'm saying is that it is foolish and dangerous to start burning this coal even in a blend on a long-term basis without ensuring that the entire site from the unloading systems all the way through the smoke stacks have been properly upgraded to safely handle this PRB coal. I have been consulting and advising utilities for years on how to accommodate PRB coal, and years of experience in the industry have proven that fires and serious damage can occur if this coal is not properly handled.

To illustrate, here are Pages 3 and 4 of 11 of Exhibit RH-6. This is a fire that occurred at a coal mine on one of the conveyor belts. And here is a similar picture of a similar type of disaster that both occurred on Powder River Basin type coals. And they show the extensive damage done to the conveyor belts. These conveyor belts are similar to the ones used at utilities, including those at the Crystal River site.

Next are Pages 56 and 57 of 83 of my Exhibit RH-9, again, showing fires and resulting damage. These pictures show a conveyor belt at the Monticello plant in Texas. This belt was severely damaged by a PRB coal fire that happened in 2003 after the plant started blending and burning PRB coal without

making the necessary safety upgrades like dust collection and fire protection.

So you can see that the PRB coal, while it can be safely handled and used, must be handled with proper care and respect for its high volatile characteristics. For PEF and its Crystal River Units 4 and 5, these concerns must be especially weighted given the proximity of a nuclear unit.

After two visits to the Crystal River site, extensive discussions with plant personnel, review of documents and information, and discussions with other persons in the utility industry, I was able to identify and price a number of capital upgrades and increases in maintenance that would be necessary for PEF to safely and efficiently use a 50/50 PRB coal blend at CR4 and CR5. Such upgrades include, among others, dust suppression, dust collection, devices throughout the site, fire protection devices, a reclaim hopper system for blending, and improved water cannons for boiler performance. These changes are detailed in my testimony, and I estimate that these changes require a one-time capital expenditure of approximately $61.2 million and ongoing operational and maintenance expenses of approximately $2 million per year.

While others may disagree how safe a utility should be, I contend that the safety of employees in these base-load generating plants is priceless. I should also note that while OPC witnesses allege that PEF was designed to blend PRB coal

on-site, in my opinion blending cannot be done without major changes. Given the layout of the conveyor belts and the speeds of those belts, the plant would not be able to get enough coal blended and transported into the units. Additionally, no one disagrees that the silos at CR4 and 5 are only designed with the ability to store about eight hours' worth of coal. And so no matter how fast various belts can move in the coal yard, the real choke point is with the silos and the pulverizers and their ability to process the needed tons per hour.

Because of the major difference between PRB and bituminous coal, switching to PRB coal is a major fuel switch that PEF nor any utility should undertake lightly. It requires several layers of evaluation, from using a paper test burn on how to get a rough idea on how the new coal will perform in the units, to performing high level engineering analyses, and then on to doing both short and long-term test burns. PEF, since it has started evaluating the use of PRB coal at CR4 and 5, has followed this analysis, and in my opinion, has acted responsibly and prudently in this evaluation.

Another major factor to consider is that if PEF were to burn a 50/50 PRB coal blend suggested by OPC witnesses, PEF would have lost an estimated 124 megawatts of energy production each year from Units 4 and 5, compared to the historical energy and currently produced by these units.

My review of the relevant design documents shows that

the only arguable guarantee made by the unit manufacturer beyond unit efficiency is for a steam ouput which produces 665 megawatts, or the nameplate rating of the units. The unit guarantees were based on a 50/50 subbituminous coal design blend.

As I understand from plant personnel and my personal observations of the units in action, because PEF has been using a high quality, high Btu bituminous coal at CR4 and 5, it has been able to operate at overpressure and produce gross 750 to 770 megawatts, or net that would be 722 and 732 megawatts of energy.

Given my experience with PRB coal, and for all the reasons outlined in my testimony, I can say that PEF would be lucky to get the 665 megawatts of energy output with the 50/50 coal blend. Certainly, there is no way that PEF could obtain the 722 or 732 net megawatts that it has been producing. This expected derate is a serious consideration for PEF to consider in deciding whether to switch to a 50/50 PRB coal blend. Another PEF witness values those lost megawatts during this time period, but I understand it is quite costly to replace that many megawatts over such a long period of time.

Another problem with relying on the original design of these units is we did not know then what we now know about the best ways to deal with PRB coal characteristics. Learning how to best handle and burn PRB coals has been an ongoing

process as utilities learn from each other's experiences.

CR4 and 5 were designed without the benefit of today's knowledge, and this fact necessarily causes operational and safety concerns. There are also several components which are part of the design of CR4 and CR5 which were never actually built. Most notably is an additional pulverizer, feeder, and the silo at each unit. At the very least, these additional components would be needed to achieve the guaranteed 665 with a 50/50 blend and proper pulverized coal sizing. But, again, PEF would not be capable of achieving the overpressure output of gross 750 and 770 megawatts if it burned the lower Btu 50/50 PRB coal blend that is suggested by OPC's witnesses, even with the changes that I suggest in my testimony.

Thank you.

MR. BURNETT: We tender Mr. Hatt for cross-examination.

CHAIRMAN EDGAR: Thank you.

Mr. McGlothlin.

CROSS EXAMINATION

BY MR. McGLOTHLIN:

Q Mr. Hatt, let's begin with your RH-4.

A Yes, sir.

Q This is captioned Number of Fire/Explosion Events, but it is not limited to Powder River Basin or subbituminous coal events, is it?

A This chart is for the entire U.S. electric utility industry. And after discussions with the author of the paper, his feeling, and my feeling also, is that the increase in the fire and explosions over this time frame corresponds pretty closely with the Powder River Basin. In fact, unfortunately, the author of this paper had a death or a fatality at his plant because of some of his equipment that is associated with prior old type designs before the new one. And so, one of his reasons for preparing this chart is to show that the utilities' experience with fires and explosions does correlate with the increase use of the Powder River Basin coal.

Q And with respect to the increase, do I read this correctly to say that between 1990 and 1999 fires increased from 10 to 13, is that correct?

A Yes. It looks like 13 or 14 there.

Q And explosions increased from 5 to 6?

A Yes. These are explosions that the author was able to find. Not all of these get reported, and what is not listed here are the injuries, fatalities, also the liabilities incurred with lawsuits afterwards if people get hurt, and also the monetary damages.

Q And --

A So -- go ahead.

Q You indicated -- are you through with your answer?

A I could just indicate that although these numbers

appear small, when it happens to your plant, the significance can be extremely big, particularly concerning the fact that Units 4 and 5 are large base-loaded units and very important to the electric generation in Florida.

Q Now, you did say that there was a correlation between the increase here and the increased use of Powder River Basin coal, did you not?

A That is my belief, yes.

Q Were you here yesterday?

A Yes.

Q Did you see the bar chart, the exhibit from Mr. Sansom's testimony that was displayed during the opening statement?

A Yes, that is what I'm saying looks so similar to this chart here.

Q Yes. And would you accept, subject to check, that between 1992 and 1999 that showed an increase of from 200 million tons per year to more than 350 million tons per year?

A Yes. We have definitely increased the amount of PRB coal being utilized.

Q And that is the increase to which this should be correlated, correct?

A That is why this is in the chart, or in my testimony.

Q Mr. Hatt, you do not have an engineering degree, do

you, sir?

A I have a Bachelor of Science or a BS degree in chemistry.

Q And you have never designed a boiler, have you?

A No, but I have worked as a performance engineer at a boiler trying to operate. In fact, almost all of my experience is with operating units and trying to overcome some of the design deficiencies that the original designs of the units were incorporated in.

Q And you have never designed a precipitator for the boiler, have you?

A No, I have never designed a piece of equipment for a power plant, but I have tried to get them to work properly. And because of the nature of coal, it's physical and chemical in its nature, it is really the mineralogy of the coal, and the fact that it is a fossilized swamp material, basically, has -- or my chemistry background has allowed me to more completely understand the impacts of coal types on power plant performance and cost.

Q Would you agree with me that a cycling unit, and by that I mean one that goes to the high load in the day and low load at night, is better able to handle a slagging coal than a unit that is not cycled?

A Slag, which is the molten material is --

Q If you could answer that question first.

A Okay. Cycling a unit does help remove slag, which is the molten material in a unit. Fouling deposits, which are more predominant with the Powder River Basin coal, are not removed by cycling units.

Q My question went to slagging, sir. At Page 8 of your testimony.

A Yes, sir.

Q You refer to the Btu content of the bituminous coal at Lines 6 and 7. Then you say this has allowed PEF to burn about 50 percent less coal to get the same amount of heating energy when compared to a straight PRB coal. By straight PRB coal, do you mean 100 percent PRB?

A Yes. That's referring to the tonnage level handled when I say 50 percent less coal. So, yes, that is compared to a straight PRB coal. With a 50/50 blend, it would work out to be about 25 percent less coal.

Q And you understand that is the proposal or the position of our office with respect to the fuel that we contend should have been burned over time, that is a 50/50 blend and not the 100 percent PRB?

A Through the entire time frame this unit was operated, is that -- why don't you ask that question again, maybe I will better understand it.

Q I asked if you are aware that our position, our office's position in this case is that between 1996 forward the

utility should have been burning a blend consisting of 50 percent PRB coal and 50 percent bituminous coal?

A My understanding is that is your position.

Q If you will turn to RH-8, Mr. Hatt.

A Yes, sir.

Q This exhibit lists those additional facilities and additional O&M expenses that you contend would be necessary to burn the 50/50 blend, is that correct?

A Yes.

MR. McGLOTHLIN: I'm going to ask Mr. Poucher to distribute a document.

CHAIRMAN EDGAR: Mr. McGlothlin, do we need to mark and label?

MR. McGLOTHLIN: Yes, please.

CHAIRMAN EDGAR: Okay. I'm on 222. Title?

MR. McGLOTHLIN: Hatt's Notes is sufficient, I think.

(Exhibit 222 marked for identification.)

BY MR. McGLOTHLIN:

Q Do you have Exhibit 222 in front of you, Mr. Hatt?

A Yes, sir.

Q Would you agree that this constitutes the work papers underlying your analysis of the items and expenses listed on RH -- Hatt, that were provided to us during discovery?

A Yes, these are the notes that I took during sometimes lengthy conversations with individuals that are either familiar

with the CR4 and 5, familiar with these types of systems that I'm suggesting, and/or familiar with the costs associated with those in addition to people operating units CR4 and 5 today.

Q Now, one of the -- let me back up.

MR. McGLOTHLIN: I apologize, may I have a couple of minutes in place?

(Pause.)

MR. McGLOTHLIN: I'm going to pass that question until I can find the note that relates to it.

BY MR. McGLOTHLIN:

Q Mr. Hatt, do I understand correctly that in opining that when burning the 50/50 blend, Crystal River Units 4 and 5 would not be capable of operating at overpressure sufficiently to generate the same 750 megawatts it has generated over time you rely in part on the fact that during the 2004 test burn the units realized what was called a Btu runback?

A Primarily, my opinion on whether the units can reach the overpressure load on a 50/50 blend is from the way the unit operates today. The test burn '04 showed some indication of that, but the particular situations, you know, of that particular runback or something like that, certainly seemed to have derated the units. Some things can be fixed over time, but I'm here to tell you that the equipment that I saw operating at the power plant in the condition that it is in

right now would not allow that unit to operate anywhere near the full load condition, even the 665, yet alone this overpressure load on a 50/50 blend of PRB coal.

Q Do you know whether during the 2004 test burn the unit achieved a maximum continuous rating?

A I'm going to say that it got close to that, but that percentage was how much, like 15 percent PRB coal, so it is not anywhere near a 50/50 blend.

Q And do you know whether the decrease in megawatt output -- do you know what analysts attributed that decrease in megawatt output to during their evaluation of the test burn?

A The question is the decrease of the output during the test burn was caused by some sort of feeder or control runback is my understanding.

Q Yes. And do you know more precisely what the problem was?

A I'm going to suggest that it is in the nature of the feeders which feed the coal to the pulverizers, and the control system that controls those, and some logic associated with that.

Q Would it be fair to say that the settings were fixed in such a way that the feeders were not able to adjust the quantities of coal to match the needs of the unit at MCR?

A At that particular time that appears to be the case, but I'm here to tell you that no way at the 50/50 level can we

get that. So maybe at 15 percent with adjustments of the power plant on a very short-term they were able to achieve that.

Q All right.

A But long-term and/or with the 50/50 blend, I do not believe they will get those megawatts.

Q And what else do you base your opinion on?

A Observations of the units and extensive discussions with Mr. Wayne Toms, who operates the units presently.

Q What did you observe about the unit that leads you to conclude that it is not capable of the output?

A I noticed that they were operating at near maximum pulverizer capacity with six pulverizers operating on the 12,000 to 12,500 Btu coals that were presently being burned at the times I was there, and so there did not appear to be much room for either Btu degradation on these pulverizers.

Q What indicated to you that they were near maximum pulverizer capacity?

A The speeds of the feeders and the amps and the air flows and the temperatures associated with those pulverizers with the bituminous type coals. When we go to subbituminous coals -- and, remember, I'm suggesting that they should not bring any more Powder River Basin coal onto the site until they make these coal handling and safety changes. I think what you will find is that the pulverizers need to be lower in temperature, which decreases their drying capacity, and that

and in conjunction with the lower Btu is going to limit the amount of coal that can go into these power plants. In addition, the bituminous coal, the low sulfur bituminous coal is extremely low slagging and low fouling. And I'm going to suggest that my experience in working over 25 years of dealing with slagging and fouling problems with units, is when you start putting in the mineralogy associated with Powder River Basin coals, you are going to get additional problems there. And there is even more problems that we can discuss further on into this that could restrict load like opacity and operations of the electrostatic precipitator.

Q Yes. And with respect to the precipitator, isn't it true that you believe that more should be known about the actual operation of the unit before you can conclude that the upgrades to the precipitator would be required?

A I have worked extensively with precipitators across the nation burning this type of coal, and over and over and over again we have had to put in additional sulfuric acid or SO3 to get these precipitators to operate properly, no matter what size they are. In addition, there was a little note or a little paragraph in the test burn report indicating that the opacity seemed to be trending up towards the end of the test. So if your question is, is do I feel that they need to put some coal in there to test it, I'm going to say that that will be the final answer, the actual answer to this. But you are going

to have to spend quite a bit of upfront money to be able to bring that coal onto site in terms of the safety and the handling characteristics of it.

Q You spoke of an uptrend in the opacity, are you speaking now of the 2004 test burn?

A It would be -- I think the 2004 when the percentage increased from the 15 up to the 22 percent level, they did have a little subnote there that they seemed to see that the opacity was increasing. And my experience with people test burning Powder River Basin coals is that this is true and necessary. I also don't believe that there is not too many people that are going to disagree with me on that.

Q If you know, to what did the analyst's post-test burn attribute the increase in opacity at the time?

A I don't know that he specified anything, or I am unaware of what he exactly specified.

Q Okay. Before you prepared your testimony, sir, did you review the design criteria applicable to the pulverizers for this unit?

A I have reviewed a lot of documents before this, and that included the original design documents for Unit 4, I believe it was.

Q Would you agree that based upon the design capacity of the pulverizers, that the units are designed to be able to achieve the 5 percent overpressure condition with even one of

the six pulverizers out of Commission?

A Absolutely not.

Q You don't agree that the design --

A No, that design document clearly shows that you have to make performance changes on those pulverizers that would completely destroy the combustion process, cause all sorts of problems in the combustion process, which leads to additional slag. And so the design numbers associated on that paper referred to the pulverized coal outlet sizing, and they make the size much bigger than I or anyone in the combustion industry would ever recommend. And so it was kind of like a sliding something underneath to let people believe that they could do this.

But if we want to review those documents, I will be able to point out exactly what I am talking about and describe some of the concerns associated with the slag, the increased carbon, and the deterioration of the electrostatic precipitators that would occur if you made those changes. So I'm going to disagree that those units were ever designed to efficiently and properly operate anywhere near six or five mills at that overpressure condition on the 50/50 blend.

Q What is the capacity of each pulverizer, if you know?

A It would vary on many things, including outlet temperature of the pulverizer, the properties, the tonnage. I guess your question is what is the tonnage limit of the

pulverizers?

Q Yes.

A It's going to vary on the operation conditions of those pulverizers, including the outlet particle sizing. And I'm also going to suggest that my experience in working with pulverizers is these design numbers are convenient to start with, but they do not necessarily represent actual operating experience, and that is most of what my background exists in.

Q Mr. Hatt, looking again at RH-8?

A Okay.

Q You have an item called reclaimed hopper system, and it is shown to be a range of 15 to $20 million in your estimate. Is the reclaimed hopper system the term that describes your proposed blending mechanism?

A Yes. This does several things for a utility to replace the existing stacker reclaimer type devices that are there now. It significantly reduces the dust. In other words, if you understand the stacker reclaimer, it is a big wheel that is going to dig off of a pile. And when that digging occurs, it creates dust. With Powder River Basin coal you don't want that.

With the hopper reclaim system you are feeding out from the bottom, and you can better control the blending with this, and do it more safely, particularly in concerns of dust in that. And I received that number from somebody that

actually was very familiar with the CR4 and 5, and this is the type of equipment that he was recommending based on his experience with Powder River Basin coal as a coal handling designing engineer.

Q My question really goes to this. In your testimony you say that the blending changes that you recommend would cost $38.1 million. I'm trying to square that with the 15 to 20 shown here.

A Okay. Well, I'm going to suggest, or I'm going to tell you that that 38 million -- and maybe we should turn to what you are specifically referring to here. In my testimony, I believe, is what you are saying.

Q Yes.

A I can help you. It's Page 29.

Q Yes. The reference to the $38.7 million, how does it square with what is on your RH-8?

A Okay. Well, I'm suggesting that the dust suppression, dust collection, fire protection and detection devices are all part of this system.

Q All right.

A So you include the cost of those with the 15 to $20 million, and that is where that number comes from, along with some operation and maintenance costs of about one and a half million dollars per year.

MR. McGLOTHLIN: Those are all my questions.

CHAIRMAN EDGAR: Mr. McWhirter.

MR. McWHIRTER: I have no questions.

CHAIRMAN EDGAR: Mr. Twomey.

MR. TWOMEY: Yes, ma'am.

CROSS EXAMINATION

BY MR. TWOMEY:

Q Good afternoon, Mr. Hatt.

A Hello.

Q Mr. Hatt, on Page 8 of your prefiled testimony, Line 17, you say, in fact, PRB coal is classified as explosive by the U.S. Bureau of Mines, is that correct?

A I make that statement to help support the dangerous characteristics associated with the subbituminous Powder River Basin type coal.

Q Okay. It is not classified -- just to be clear, it's not classified as an explosive, is it?

A No. I would say it has explosive properties if not treated properly.

Q Right. In fact, when we refer to your page -- your Exhibit RH-2, which you say -- is that a classification by the U.S. Bureau of Mines that appears on RH-2?

A No. This is a material safety data sheet for people at the power plant that want to try to understand the characteristics of any chemical or material that is at the power plant. These sheets are made available to people there

so they can understand the hazards and risks. So whether it is sulfuric acid or coal, that is what this sheet here is for.

Q Okay. Would you turn to that page, please?

A Yes.

Q Page 1 of 2.

A Yes.

Q So the product we're referring to here is coal subbituminous, correct?

A Yes, sir.

Q Chemical name. And what are the synonyms or cross-references listed, anthracite, bituminous, subbituminous, lignite, peat, those are the --

A Those are different types of solid fuels or coals maybe.

Q Now, in Section 2, which is where I assume you took the phrase or the word explosive, is that correct?

A This is one of the things, but I take the explosive nature of PRB coal from discussions and experiences with the electric utilities and coal mining people. Okay, we have blown up things in the industry because we haven't been careful.

Q Pardon me?

A We have blown up things in the industry because we haven't carefully treated the nature of this coal. So this is one of the things that would lead me to believe that it is explosive, but it does list it as the nature of the hazard here

on this sheet as explosive.

Q Right. And what they are talking about, if I understand this, is that there are hazardous ingredients contained in this coal that include cold dust, methane, and CO2, correct?

A The explosive materials are cold dust, methane and CO. CO2 is there again as a potential thing that --

Q Hazardous?

A -- is a hazardous ingredient in there, but CO2 in itself is not an explosive.

Q It would be an asphyxiant, right?

A Yes.

Q So this document that you put in as your exhibit to your testimony --

A Yes.

Q -- lists the hazardous ingredients and then describes the nature of hazards, which includes irritant, explosive and asphyxiant, right?

A Yes.

Q Now, I want to ask you, if you know, because as I understand your testimony, you know about bituminous coals as well as subbituminous, is that correct?

A Yes.

Q There presumably is an identification of product sheet for bituminous coal that describes its hazardous natures,

as well, right?

A Yes.

Q Okay. Would it include, if you know, for hazardous ingredients would bituminous coal list the material as coal dust?

A Yes.

Q And methane?

A Actually, I'm going to suggest that it would, although I don't have one of these in front of me, so I can only infer. But, yes, all coals have coal dust, methane, and CO as potential hazardous ingredients. The point of this particular document in here, more than anything, is some modifications made to it by a group that I was on the board of the directors with, the Powder River Basin Users Group. And the important part on this particular sheet, I would say, is where it says that, try not to use water to put out the fire because it makes it worse, because the coal dust is also an explosive material.

Q Yes, sir.

A Although --

Q I'm sorry.

Sir, are you saying that that was your addition to this document?

A No, I'm saying that this document, this particular document here, I pulled off the Powder River Basin Coal Users

Group, and I remember when we were deciding on what to put in or how to modify this document from a bituminous type coal document that we wanted to include the fact that if you have smoldering coal, that putting water on it makes it worse than spreading it out and letting it burn.

So there are some other parts of this document that were specifically listed, or the changes that the Powder River Basin user group, as a group, made to this particular document so that utilities could recognize that if you have some smoldering coal not to go put water on it to try to extinguish it.

Q Yes, sir. That sounds like good advice. But, first -- again, I want to be clear. This document that is your RH-2 is industry, Bureau of Mines information and cautions as modified by your users group, is that what you are saying?

A No, I don't believe that this material safety data sheet is from the Bureau of Mines. It's actually pulled off from the Fisher Scientific Company, but I do not specifically know the history of this document, where it comes from.

Q Okay.

A It's useful for people that work with the coal to recognize the hazards.

Q Yes, sir. And to your point about the use of water, the appropriate use of water in a fire situation, that would also be true, that caution would be true with respect to

bituminous coal fires, as well, would it not?

A No. Our experience has been that the bituminous coals tend to behave better than the subbituminous coals in that particular aspect. They also don't have the spontaneous combustion potential, and so the smoldering coal issue is not nearly as bad, particularly on this CAPP coal, the Central Appalachian coal that we are referring to as the coal that is presently burned. That coal in relatively inert and more like dirt. And so when people switch to the Powder River Basin type coals they don't recognize this as a hazard. And part of my job, and the Powder River Basin Users Group, was to help educate people going through this process, because people that work at power plants typically know their coal very well, but they are somewhat unfamiliar with the characteristics of new fuels.

Q Okay. Now, let me be clear, though, are you saying that on your use of water caution, are you saying that you would advise using water in bituminous coal fires --

A No.

Q Let me finish my question, please -- or that you would advise that it be used with caution, but it is not as important a cautionary measure as with subbituminous?

A I am suggesting that when you obtain smoldering coal that is subbituminous not to put water on it, that is specifically what I'm saying. Bituminous coal, particularly

CAPP coal, does not suffer from some of these same problems to near the degree, and it acts much more like dirt or an inert material, and that is the type of coals that CR4 and 5 use today.

Q I see. Now you mentioned just a second ago that the bituminous coals weren't subject to the tendency to self-ignite or spontaneously combust, and that, in fact, is what you say at Page 8, Line 15 of your prefiled testimony, right?

A I'm sorry. Now, let's go back to that.

Q Page 8, Line 15, where you were shown the saying unlike bituminous coal, PRB coal has a tendency to self-ignite or spontaneously combust once it is removed from the ground.

A I'm not finding that, but as soon as I do, I'll -- what page and number?

Q Page 8.

A Okay. That's my problem.

Q Page 8 and Line 15, if I've got Rod Hatt.

A I say because of its chemical composition and physical nature, PRB coal, subbituminous coal, is much more volatile and dangerous compared to the bituminous coal that PEF has historically used. That's what I have tried to say several times now.

Q Yes, sir. My point is you go on to say, do you not, at the end of that sentence, unlike bituminous coal, PRB coal has a tendency to self-ignite or spontaneously combust once it

is removed from the ground?

A Yes.

Q And that is not exactly true, is it, Mr. Hatt?

A No, I believe that is true.

Q You do?

A Yes. Do you want to explore it?

Q Yes. Let's look at Page 3 of 11 of your Exhibit RH-3. Are you there?

A Yes.

Q In the middle of the page there is the title self-heating characteristics, and I will read it. It says spontaneous combustion of coal is a well-known phenomenon, especially with PRB coal. Do you see that?

A Yes.

Q So spontaneous -- is it or is it not true that spontaneous combustion of coal is a well-known phenomenon to include bituminous coal?

A Yes, sir. I am going to say that bituminous coal can spontaneously combust, particularly -- and keep in mind there are several different types of bituminous coal. There is high grade and low grade bituminous coals. An Illinois Basin coal would be an example of a bituminous coal because of its higher oxygen content. And, again, the Bureau of Mines based its spontaneous combustion index on the oxygen content of a coal. The higher oxygen content of the Illinois coal versus the CAPP

coal would lead one to believe, and experience has shown, that high sulfur Illinois Basin coal does have some more spontaneous combustion, even though it is a bituminous coal, than the CAPP coal, even though it's a bituminous coal.

So, yes, we have had problems with spontaneous combustion with coals, but the potential associated with Powder River Basin coal is significantly different than bituminous coal. And it is particularly significantly different than CAPP coal.

Q Yes, sir. And that's fine, but going back to Page 8 of your testimony, Line 15, you say unlike bituminous coal, PRB coal has a tendency to self-ignite or spontaneously combust once it is removed from the ground. And I took that to mean, when I first read it, that you are suggesting that bituminous coal has no tendency to self-ignite or spontaneously combust.

A Well, let me say that it has a much lower tendency. This is all about risk management and the behavior of these various coals and those sort of things. So unlike bituminous coal, and particularly in this part of the document I'm probably -- or I am referring to the CAPP type coal that Units C and 4 -- 4 and 5, I'm sorry -- use. The CAPP coal has a very low tendency to spontaneously combust. And so when you use CAPP coal and you switch to Powder River Basin coal, it's a much more drastic problem there.

Q Okay. Just to sum up, then, if I may, you're saying

that all coals will self-ignite, and it is a greater problem for subbituminous coal?

A Okay. So please ask that question again, and I'll try to answer it without interrupting.

Q Yes, sir. If I could try and sum up your position on this, you tell me whether I am right or wrong, you concede that spontaneous combustion is a problem for all coals. In fact, you say as the co-author of RH-3, which you are a co-author, right?

A Yes, I am.

Q You say as the co-author of RH-3 that spontaneous combustion is a well-known phenomena of all coals, but you are saying here that it is a greater problem with subbituminous coal, is that right?

A With what coal?

Q The --

A Subbituminous?

Q Subbituminous.

A Yes. Subbituminous coal has a much higher tendency to self-ignite than most other coals.

Q Okay. Now, on the same page of RH-3, you concede, do you not, apparently that for bituminous coals that bunker fires are not uncommon, right?

MR. BURNETT: Mike, where are you reading from?

MR. TWOMEY: The last sentence on Page 3 of 11 of

RH-3.

BY MR. TWOMEY:

Q While fires prior to this were not uncommon with bituminous coal in the bunker, this was the first serious dust explosion.

A I'm going to say that that is referring to the fact that we have had fires in bunkers before. It is a known phenomena, particularly with the high sulfur Illinois type basin bituminous coals. That is not clearly identified here, but that's the intent, is that we have had problems with some spontaneous combustion with high sulfur Illinois coals. But the dusty nature of the PRB coal makes it a much more difficult material to handle.

Q Okay. Now, help me understand something in my own experience. On the occasion, years ago, I think visited one of this company's coal mines or maybe TECO's, but I was told that one of the reasons for having a high level of ventilation in the -- this was an underground mine.

A Yes, sir.

Q One of the reasons for having a high level of ventilation, in addition for respiratory purposes of the miners, was to reduce the risk of a coal dust explosion. Was I told correctly?

A I am going to suggest that in underground coal mining methane is released when you do that. And so the ventilation

is primarily to remove the explosive methane gas, although coal dust is explosive in the proper conditions.

Q Okay. Thank you. Now, I want to briefly clarify. I want to be clear on what you told Mr. McGlothlin with respect to your exhibit on RH-4, so if you would turn there for a second. This will just take a second.

A Okay.

Q You acknowledged to Mr. McGlothlin, did you not, that from the period 1990 to 1999, that the increase in the number of fire events was either three or four, is that correct?

A If we are looking at this chart on my Exhibit Number 4, the increase from 1970 to '79 --

Q That's what I meant, yes, sir.

A -- to 1990, '99, it looks like it's more like about ten.

Q Right. But, I mean -- I think he asked you, I made a note on it, from -- I gave you the wrong dates. From 1979/80 to 1990, if you look at the red columns there, it goes from 10 to 13 or 14, right?

A Yes.

Q And for the explosive events, it was an increase of one event?

A These are the reported incidences that we were able to find using this as an educational tool to help people understand that the industry has been experiencing more

trouble, and that the increased use of Powder River Basin coal is one of the primary things with this. And further evidence that is in my exhibits in here I talk about fires and explosions since 1999 that have caused significant problems. So this problem has not gone away.

Q Right. And what I want to be clear on is I thought you -- I thought in response to Mr. McGlothlin's questions that you acknowledged that you didn't know that the increase in the number of fires and explosions from 1979/80 to 1990 period that changed there were, in fact, due specifically to fires and/or explosions associated with facilities using the PBR -- PRB?

A Okay. On this particular chart I have not clearly identified which explosions are from which things, or the author of this paper did not clearly identify that. But the author of this paper had a fatality using Powder River Basin coal, and so this is part of his attempt to educate the industry of some of the hazards associated with Powder River Basin coal. And if you want to say that, well, only an increase of three is bad, what if that three was at your plant, or at Crystal River 4 and 5, and the unit was shut down for weeks or months, or both of those units were shut down for weeks or months.

So this particular chart here is trying to illustrate that the industry has experienced more problems, and it is correct to say that we have not identified whether these are

Powder River Basin coal explosions. But my experience in working in the utility industry is that the Powder River Basin coals do increase the risk of fire and explosion. Because when we see people convert to the Powder River Basin coal for years they operate without potentially big significant problems. And now they are coming out and telling us that after they've switched over to the Powder River Basin coal they have had these problems, and so they have to take capital expenditures and procedures, modifications, to be able to minimize the risk associated with the Powder River Basin coal.

Q Yes, sir. But, you acknowledge, do you not, and I'm not sure I am getting a clear answer on this. You acknowledge, do you not, that the increases -- the increases in the fires and the explosions shown on your Exhibit RH-4, you don't know what they were related to except that they were in the coal industry, and don't, in fact, know that they were directly related to bituminous coal fires and explosions or to subbituminous --

A These are from the utility industry, and I do not know whether the specific incidences are Powder River Basin or bituminous.

Q Thank you. Okay. I am about finished. You live in Kentucky you said, is that correct?

A Yes, sir.

Q Which coal region do you live in?

A I live in the Blue Grass region. We are known for stud horses.

Q Good. Okay. Lastly, I want to ask you -- I assume, that you are being compensated for your testimony here, and I wanted to ask you what your hourly rate was and what you expect your total projected compensation to be?

A I have two rates, one is 187.50 an hour for preparation, and then it is a 50 percent higher rate for actual testimony. And my total expenditures I don't have in front of me, but I would estimate them to be over $20,000.

MR. TWOMEY: Thank you, Mr. Hatt.

CHAIRMAN EDGAR: Mr. Brew.

MR. BREW: May I have one moment?

CHAIRMAN EDGAR: Sure.

CROSS EXAMINATION

BY MR. BREW:

Q Good afternoon, Mr. Hatt.

A Hi.

Q Referring to your Exhibit RH-4 again.

A Okay.

Q With respect to the explosions in 1990 and 1999, do you know if any of them were unrelated to coal? Gas explosions, for example.

A No, I have not clearly identified whether these are associated with coal or gas. These are industry. And,

remember, that this paper was not prepared by me. This is an exhibit I pulled from a paper from a gentleman that had a fatality at his plant due to PRB coal, and this is part of his way of communicating to us as an industry that the risks appear to be increasing.

Q But you have no idea as to the causative events of the explosions that are listed or charted?

A Right. These are just utility industry events.

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

CHAIRMAN EDGAR: Ms. Bradley. No questions.

Are there questions from staff?

MS. BENNETT: A few.

CROSS EXAMINATION

BY MS. BENNETT:

Q Mr. Hatt, you stated you assist utilities in switching coals, is that correct?

A I'm sorry. Could you more clearly define that?

Q Part of your testimony was that you assist or help utilities evaluate switching coals, types of coals?

A Yes.

Q Do you also assist utilities in evaluating different coal types?

A Yes.

Q In evaluating coal types, isn't it true that a utility must consider the mine from which the coal is removed?

A The exact characteristics of a coal are very important, and they can vary from mine to mine or even within a mine.

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

CHAIRMAN EDGAR: Commissioner Carter.

COMMISSIONER CARTER: Thank you, Madam Chairman. Just one itty-bitty question.

Mr. Hatt, is it cost prohibitive, or did I mishear you? Is it cost prohibitive to utilize the PBR (sic) coal at CR4 and CR5, is that what -- is that your testimony? Is that what you are saying?

THE WITNESS: No, I'm suggesting that you want to spend some upfront money that might be significant or is significant before you should do that conversion. But, you know, you have to spend that money upfront because -- and then the risk is, is that the coal prices don't shake out how you might believe them to be. So you spend money upfront in hopes of utilizing a fuel, but you can't necessarily predict fuel price changes. So it's tough to sometimes justify spending millions of dollars to that. But I'm not suggesting that it is not, you know, it's not feasible.

COMMISSIONER CARTER: Follow-up.

CHAIRMAN EDGAR: Yes, sir.

COMMISSIONER CARTER: And as I understand it, you said it costs about $38 million upfront capital to retrofit or

equip the plant?

THE WITNESS: To get the coal handling system safe. I truly believe 0that I want every employee at a power plant to go home to his family. And when we make economic decisions because something is cheaper, and then we forget about the safety of the employees, I'm suggesting that that number is to be able to safely handle this coal. Then once you get it into the boiler and you start experiencing maybe some of the problems that most other people have experienced, you may have to spend, or I'm predicting that you will spend these additional dollars. And most of my numbers are relatively conservative to solve some of the other problems to get you back to the operation and performance that maybe you were at if you were using some sort of high quality coal before.

COMMISSIONER CARTER: And that's the roughly 2 million a year is what you're saying.

THE WITNESS: The two million a year was just the changes in operating costs. The difference between the 38 million and the 61 million are the potential upgrades in the boiler and the inside of the plant to get you back to where you want to be. And I'm not even sure if we do that at CR4 and 5 if we get that luxury of going back up to the 750 and 770 megawatts at a continuous output.

COMMISSIONER CARTER: Thank you, Madam Chairman, for your patience.

CHAIRMAN EDGAR: Okay.

COMMISSIONER CARTER: I'm just trying to get a -- so you are saying it's roughly, for CR4 and CR5 it's roughly 60 million, then?

THE WITNESS: Total cost to convert to a 50/50 blend of PRB coal is in the neighborhood of about $60 million is my conservative estimate as to what you would get to get you back up so you can run at 665 or the nameplate rating on this unit. The fact that they have used these high Btu coals in the past have given them this luxury. Most people don't get that luxury of being able to produce and run at consistent overpressure. So they get this 770 or -- they get the higher megawatts because of the high Btu coals. What the $60 million does is kind of get you back to the 665 number in my estimate.

COMMISSIONER CARTER: And that's not -- in your view, that's not totally optimal.

THE WITNESS: No, not at CR4 and 5. The optimum to me appears to be utilizing the Powder River -- or, I mean, the bituminous type coals that have very -- these are some of the premium fuels in terms of the slagging and characteristics, burning characteristics that allow you the luxury of being able to do things with your units that you might not be able to do or you probably won't be able to do with lower quality coals.

COMMISSIONER CARTER: So just by way of wrapping up, Madam Chairman, thank you. So 60 million for the conversion of

the facilities and then about two million a year.

THE WITNESS: Ongoing.

COMMISSIONER CARTER: Ongoing. Thank you.

CHAIRMAN EDGAR: Commissioner McMurrian.

COMMISSIONER McMURRIAN: Thank you.

My question relates to the safety of the workers. I will start by saying, unlike Mr. Twomey, I haven't visited a coal mine, but I have visited a few coal plants. And one thing they have in common, and I don't mean to offend any plant operators in the room, is that they are all dusty. And I want to get a better handle on what are the dangers to the workers or visitors of a plant from just simply walking around a plant if you were to use PRB coal, for instance? And I guess the second part of that would be -- and, perhaps, that's if the proper housekeeping isn't done. I know that was a term used earlier. And exactly what kind of activities are included in that housekeeping? And if it helps to refer to your Exhibit RH-8, then that may be helpful, as well.

THE WITNESS: Okay. And I heard a lot of questions there, but the first one was if you don't do some things and you switch over to Powder River Basin coal, okay, you get dust accumulations. And those dust accumulations have the potential to catch on fire just sitting there. And maybe you have heard of that same phenomena with grass clippings or oily rags, but things like that, there are some things that spontaneously

combust. And, unfortunately, for Powder River Basin coal that occurs at about room temperature. With bituminous coals it's much higher temperatures, like 150, 200 degrees, and those types of neighborhood of temperatures. Okay?

So at room temperature, Powder River Basin coal can spontaneously combust. And it's usually piles of dust that have accumulated. And what happens is when someone goes to fight that fire, so now we are going to put out the fire, if you hit it with a dose of water, you tend to make a puff. And then, and some of my exhibits show the dust buildup in some places. When you knock that dust off the pipes and the beams and the rafters, then you have an explosion. So, the concern is there.

So one of the differences that you would see like in a power plant that I feel has done a good job at minimizing risk, for example, is we paint everything in the coal handling system white, so we can clearly see whether there is any dust or not. And so that would be one of the criteria that I would see someone minimizing the risk with Powder River Basin coal is you would see white when you walked in as opposed to dark and steel-colored. So that was -- I think one of the questions was what is just some of the hazards associated with that. So, you know, those -- not that just someone walking around would fight a fire, but those are some of the concerns that we see and some of the experiences that people have had with the Powder River

Basin coal.

If we go inside the plant, like to the pulverizers, the pulverizers are the big machines that grind the coal. If they continue operating those pulverizers at the temperatures that you can operate it with bituminous coals, the explosion potential of those pulverizers go up. And, indeed, the industry has had fires and explosions in those pulverizers. And so if you were taking a tour of a Powder River Basin plant that had recently converted and not adjusted temperatures on the pulverizers, I would recommend that you walk briskly past that equipment.

Now, you had another question referring to my Exhibit 8, and maybe you should ask it again or --

COMMISSIONER McMURRIAN: I was just saying -- I actually asked about the housekeeping activities.

THE WITNESS: Okay.

COMMISSIONER McMURRIAN: And I think that might have even been referenced in another witness' testimony, but what kind of housekeeping activities would need to be done in order to protect, I guess, just even workers and visitors from just walking around the plant. What kind of activities, and if it would be helpful to refer to RH-8 in answering that.

THE WITNESS: Okay. Dust collection, which is like a giant vacuum cleaner, and one of the concerns that I saw with the present dust collection systems, besides them not

necessarily being operational, is that they are square in nature, and that's -- the Powder River Basin Users Group, we blew one up on purpose to show you what a dust collector -- what happens when one blows up. And they blow up typically when someone goes and opens the door inside of them. And that is how one of the fatalities occurred was someone opening up the door of a dust collector. So this concerned us.

So what happens is the dust builds up in the corners of the square one. So round ones tend to be better. So even the manufacturers of the square ones now make round ones based on experience. So the dust collection system, I believe, is important. Dust suppression is where we spray chemicals, or water, or foams, or things like that to try to knock down any dust that isn't getting collected. The wash down system is the system that includes the ability to use water to clean all the dust off of everywhere in the whole coal handling system.

So the fire protection system and detection system is there in case a fire does -- after all of these things you have done, all you have done is minimize risk. And so because this equipment and people's safety is so important, we would also like to see a fire protection system. In other words, some sort of automatic system that you can fight fires with without sending people there. An example of a mistake that was made in the design of a unit was they put the valves to open up the fire protection system inside the coal handling system. Well,

if it is on fire, you don't go in there to open those valves. So now we recommend you take the valves out of the coal handling system, so that you can turn on a fire system even -- or even better, it turns on automatically without that.

Those are the things, at least these first four things here which are the type of things that would really help minimize the risk associated with those. The reclaim hopper system helps not only to better be able to handle the coal, but it also minimizes airborne dust. When you operate these stacker reclaimers, we get additional dust generated from them.

And then most of these other ones here, other than maybe the upgrades to the conveyors belts, see Number 9, the 8 to $10 million, again, we can have a chute that just plops down on the belt. And what happens, when that coal hits the belt, it makes a cloud of dust. So now we would try to make these chutes very gradual, so that they almost lay the coal onto the belt. And that would be a chute modification.

There are belts now that if you can imagine an air hockey table, well, instead of all the rollers that we typically have on belts now where every time that coal goes over one of those rollers, it creates a little puff of dust. We would now suggest that you explore the ability to put in, at least in dusty situations, where the belt runs on like an air hockey table, and so it doesn't have the bumps to do that. And so that's the Number 9.

So, 1, 2, 3, 4, and 9 are there to address those types of things. The reclaim hopper system, 5, is also there. And then the pulverizers, boiler, and the precipitators are the types of things that once we get the coal in the boiler, you know, we are now into the trying to make electricity side of the plant. Does that help you?

COMMISSIONER McMURRIAN: One follow-up that you reminded me. We have heard evidence that Crystal River 4 and 5 were designed to handle the Powder River Basin coal. Are your modifications that you suggest would be necessary as we have gone through, are you saying that these are things that, based on experience since the design of this plant, that the industry has suggested need to be done because of the nature of PRB coal, or is it that it really wasn't designed to handle PRB to begin with?

THE WITNESS: There are a few design characteristics of the boiler that appear to me to be incorporated to try to handle some Powder River Basin coals. But the nature of the Powder River Basin coals in the '70s and early '80s is different than this 8800 Btu coal that we are suggesting to be used now that was developed more in the '90s. So there are still some characteristics with the boiler that might be a concern.

There's a lot of things that suggest that the unit was constructed with the knowledge that it was going to be

primarily using bituminous coal. And, you know, the paperwork is relatively sketchy from that era, so I don't know exactly what happened in that thing. But I certainly think that many of the things or most of these things that I'm saying here are attributed to the fact that we have learned.

Like, for example, water cannons we really didn't use those in the '70s and '80s. We used steam and air to remove the slag and deposits. And now we have learned that those aren't as effective as water. The water not only cools and shocks the material, but it has more physical force to remove it. So those have been developed through the process of learning about the Powder River Basin coals, as is most of these dust and wash down and painting white and those types of things. Those are things that we have learned since that time.

And the Powder River Basin Users Group, which I am an advocate of, is primarily put together because the designers didn't appreciate the nature of this coal. So, yes, they could build a unit. Now, I can't always blame the designers because, remember, the utilities don't want to spend a lot of money. So if you say, well, I want, you know, the lowest cost things. Let's cut some, you know, cut that out or cut this out, maybe they didn't appreciate what they were doing. And so the Powder River Basin Users Group is trying to say, hey, just because it was maybe designed, or put together, or constructed this way, there might be some modifications to make your life safer, more

reliable or easier. Does that help?

CHAIRMAN EDGAR: Commissioner Carter.

COMMISSIONER CARTER: Thank you, Madam Chairman.

Just a follow-up. And based upon your review of CR4 and CR5, still, notwithstanding what they may have built it for in the -- prior to where we are now, in order to get it to the status to where it could actually safely handle PRB coal, you still would have to spend the 60 million in upgrade and the two million annually, right? Is that what you're saying?

THE WITNESS: Yes.

COMMISSIONER CARTER: Okay. Thank you.

CHAIRMAN EDGAR: Mr. Burnett.

MR. BURNETT: No questions, ma'am, and I would move Exhibits 99 through 124 into evidence.

CHAIRMAN EDGAR: Exhibits 99 through 124 will be moved in.

(Exhibits 99 through 124 admitted into evidence.)

MR. McGLOTHLIN: I move 222.

CHAIRMAN EDGAR: Hold on, let me get there.

Mr. McGlothlin, the document that we marked 222, did you use this?

MR. McGLOTHLIN: I had him identify it as his work papers underlying his analysis, yes.

CHAIRMAN EDGAR: I'm sorry, I didn't catch that.

MR. McGLOTHLIN: I had the witness identify this

exhibit as the work papers underlying his analysis of recommended additions and O&M expenses.

MR. BURNETT: I would be happy for the Commission to consider them.

CHAIRMAN EDGAR: Okay. Then the exhibit marked 222 will be entered into the record.

(Exhibit 222 admitted into evidence.)

CHAIRMAN EDGAR: The witness is excused.

MR. BURNETT: May he be dismissed from the proceeding, and may I go to the bathroom? (Laughter.)

CHAIRMAN EDGAR: The witness is dismissed from the rest of the proceeding, and we will take a break for us all to have a stretch and come back about ten minutes till.

MR. BURNETT: Thank you.

(Recess.)

(Transcript continues in sequence with Volume 6.)

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 12th day of April, 2007.

JANE FAUROT, RPR
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