Schumaker & Company

A Management/Performance and Financial Audit of the Fuel and Purchased Power as Well as the System Reliability Tracker Riders of Duke Energy Ohio, Inc.

for the
Public Utilities Commission of Ohio

Case No. 09-974-EL-FAC

Case No. 09-975-EL-RDR

PUBLIC VERSION

May 2010

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I. Introduction

Schumaker & Company was hired by the Public Utilities Commission of Ohio (PUCO or Commission) to conduct a management/performance and financial audit of the fuel/purchased power and system reliability tracker riders of Duke Energy Ohio, Inc. (Duke Energy Ohio). Specifically, Schumaker & Company was selected to conduct an audit of the company's fuel costs (including any renewable energy costs) as well as its system reliability costs.

This audit was conducted in accordance with the standards set forth in the Generally Accepted Auditing Standards (GAAS) – as contained in the U.S. General Accounting Office's standards related to issues of management economy, efficiency, and effectiveness as applicable to public utilities (the "Yellow Book"). It will also be performed in accordance with the standards defined in the request for proposal and set forth in the National Association of Regulatory Utility Commissioners' "Consultant Standards and Ethics for Performance of Management Analysis," dated November 15, 1989. Schumaker & Company's working paper system provides an audit trail that attests to our application of these standards. Our work plan was designed to meet the responsibilities for submitting a report that is based on the guidelines set forth in *Section L* of *Appendix D* and *Section M* of *Appendix E* to former Chapter 4901:1-11, O.A.C.

Schumaker & Company performed this review as an independent contractor. Any conclusions, results, or recommendations formulated may be examined by any participant to the proceeding for which this report was generated.

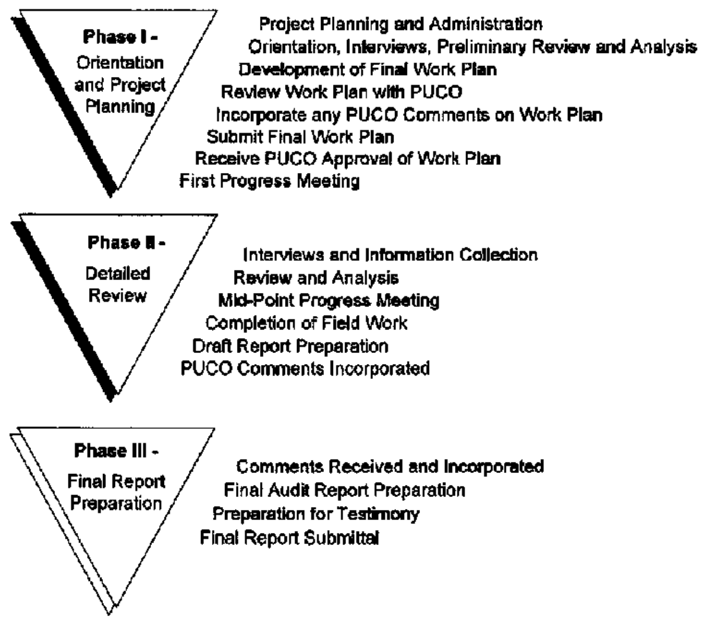
A. Approach and Methodology

Our approach to this review was based on a three phase review process , specifically, the three phases will be as follows:

- Phase I – Orientation and Project Planning
- Phase II – Detailed Review
- Phase III – Final Report Preparation

These phases, and the individual sub-steps that are included therein, are shown in *Exhibit I-1*.

Exhibit I-1
Project Phases



B. Work Plan Tasks

Our review included all items identified in the RFP, with some items being covered in more depth and some less based upon our preliminary observations within the area. Ion addition, there were several items that cannot be fully addressed until the next audit cycle in that they are currently in process and not yet completed. These items have been identified for review in the next audit.

Although no specific statutory or administrative requirements exist for auditing fuel, purchased power, and related costs for electricity in Ohio, we used the general guidance contained in the previous *Appendix D* and in *Appendix E* to Chapter 4901:1-11, O.A.C., which were attachments to the RFP. In performing the financial review, we selected two random months from which we chose transactions, MISO invoices, and other bilateral transactions, etc. to trace the charges through to the individual FPP and SRT filings the occurred within 2009. Schumaker & Company analyzed, interpreted, and make specific recommendations with respect to the structure, policies, and procedures of the Duke Energy Ohio's fuel procurement, fuel utilization, power purchases, capacity purchases, and related functions.

II. Utility Industry Perspective

Schumaker & Company will include in the audit report a discussion of the current dynamics of the industry in which the company operates. We will also detail the impact these dynamics have on Duke Energy Ohio's practices regarding fuel procurement, fuel utilization, power purchases, and capacity purchases.

A. Background

"Over 6,000 companies in the US are involved in the wholesale trade and retail distribution of electricity, with combined annual revenue of more than $220 billion. Companies include owners of high voltage transmission lines, retail distribution systems, and intermediaries like energy dealers and brokers. The US consumes close to 4 billion megawatt-hours (MWh) of electricity per year, about 50 percent of which is bought and sold on the wholesale market."[1]

The energy industry has changed significantly in the last ten years. With the advent of deregulation, energy companies have been forced to rethink and restructure their business models. Previously vertically integrated companies have had to separate their business into individual components with generation assets being put into separate entities or divested altogether, the creation and, in many cases, dissolution of energy trading operations, the control of transmission assets being ceded to some form of independent system operator (ISO), the energy distribution and customer service operations of the utility being restructured, and the unbundling of rates into individual generation (or supply), transmission, distribution, and customer service components.

Currently the electric energy industry is in state- and federally-sponsored transitions, or electric restructuring. The traditional electricity industry consists of large investor-owned utilities; municipal utilities; rural cooperatives; and government entities, like the Tennessee Valley Authority (TVA), that owns the generation, transmission, and retail distribution facilities within a limited area, and serves all customers within that area as tightly regulated "natural monopolies." Under restructuring, the generation, transmission, and distribution operations are carried out by separate companies, and the owners of local distribution lines make their lines available to competitors. About half the states have adopted restructuring legislation, but only a third is actively engaged in restructuring.

The intended purpose of moving toward a less regulated electricity market is to decrease the cost of electricity by fostering competition among producers. The practical effect of federal and state legislation has been the divestment of generation facilities by local utilities in state which have undergone deregulation. These changes have also brought about the formation of larger utilities (whether adjacent to each other or distant) through company mergers, such as American Electric Power and Central and

[1] Hoovers (http://www.hoovers.com/austin-energy/--ID__54262--/free-co-competition.xhtml) 4/1/2008

Southwest, Duke Energy and Cinergy, MidAmerican and PacifiCorp, Commonwealth Edison and PECO Energy Company, and others. Despite restructuring, many local electricity distributors are owned by utility holding companies that also own power generation facilities, wholesale transmission lines, and wholesale power trading companies.

Although much has changed in the electric utility industry, some basics remain – such as electricity must still flow through wires. The actual operations of retail electricity distributors consist of generating or acquiring wholesale power (often under long-term supply contracts), maintaining and extending a line network, and billing and collections. The facilities and equipment needed to provide this energy must be built and maintained, meters must be read and bills generated, and storms must be addressed. New technologies have been developed in the last ten years that have changed the way that a utility can perform some of these functions, but they all still revolve around having an adequate trained workforce to meet the day-to-day needs of the customer. How well the utility is organized and managed to address these basic business requirements, including its interactions with affiliates, is of interest for this audit.

B. Duke Energy Ohio, Inc.

Electric utilities within the State of Ohio have been deregulated to a certain extent. Power generation facilitates have been placed in separate unregulated affiliates or completely sold to unaffiliated third parties[2]. In the case of Duke Energy Ohio, the responsibility for power generation, fuel and purchased power activities are located in the unregulated affiliate. The Commercial Asset Management (CAM) organization of Duke Energy Ohio is responsible for managing the power, fuel, and emission allowance positions for Duke Energy Ohio's operating units, including its Ohio generation portfolio. The CAMS organization is responsible for establishing and implementing the multi-commodity risk management strategy for power, fuel, and emission allowances by monitoring and adjusting the contract mix all the way through physical delivery. These adjustments result in the purchases or sales of fuel, emission allowances, and power for the approved term if the forward market allows them to transact.

Previously, Duke Energy Ohio, like other Ohio electric utilities, was required to submit and follow a rate stabilization plan (RSP). Then in July 2008, Duke Energy Ohio filed a three-year electric security plan (ESP) to comply with Senate Bill (SB) 221. A settlement with the intervening parties was reached in October 2008. A hearing was held during November 2008 and the Public Utilities Commission of Ohio (PUCO) approved the ESP in December 2008. The ESP rates became effective January 1, 2009 through December 31, 2011.

[2] / Ohio law provided this as an option and it is one in which the PUCO approved for Duke Energy.

III. Fuel Procurement/Management and Coal Prices

A. Background

Duke Energy Ohio is a member of the Midwest Independent System Operator (MISO) organization, as summarized in *Exhibit III-1* below. As a member of MISO, Duke Energy Ohio sells into the wholesale market administered by MISO and obtains its electricity to serve its load from MISO at market rates.

Exhibit III-1
MISO Summary
as of December 31, 2009

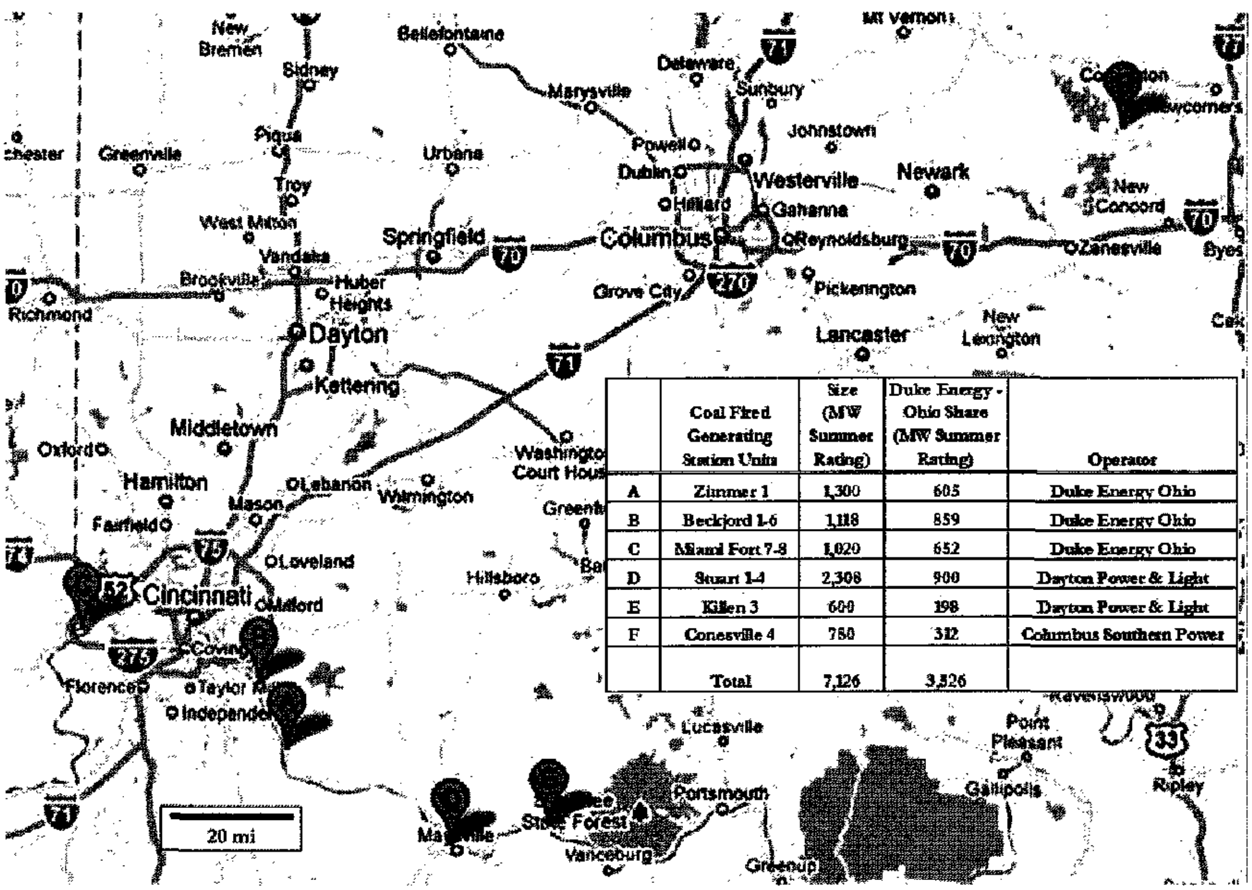
Who Is the Midwest ISO

- MISO is an Independent, non-profit organization responsible for transmission of high voltage electricity via security constrained economic dispatch
- Footprint covers all or part of 15 states and one Canadian Province
- 920,000 square miles
- 93,600 miles of transmission
- 163,000 MW generation capacity
- 137,000 MW peak load
- First Regional Transmission Organization (RTO) approved by the Federal Energy Regulatory Commission (FERC)

Source: Interview 7 and Presentation

Duke Energy Ohio has ownership interest in fifteen (15) coal-fired generating units applicable to the Fuel and Purchased Power (FPP) rider. The fifteen units have a total summer capacity of 3,526 megawatts (MW), as shown in *Exhibit III-2* below. Nine (9) of the units (2,117 MW) are operated by Duke Energy Ohio. Five (5) of the units are operated by Dayton Power & Light (DP&L) and one (1) unit is operated by Columbus Southern Power (AEP-Ohio).

Exhibit III-2
Locations and Capacity of Duke Energy Ohio Coal-Fired Units
as of December 31, 2009



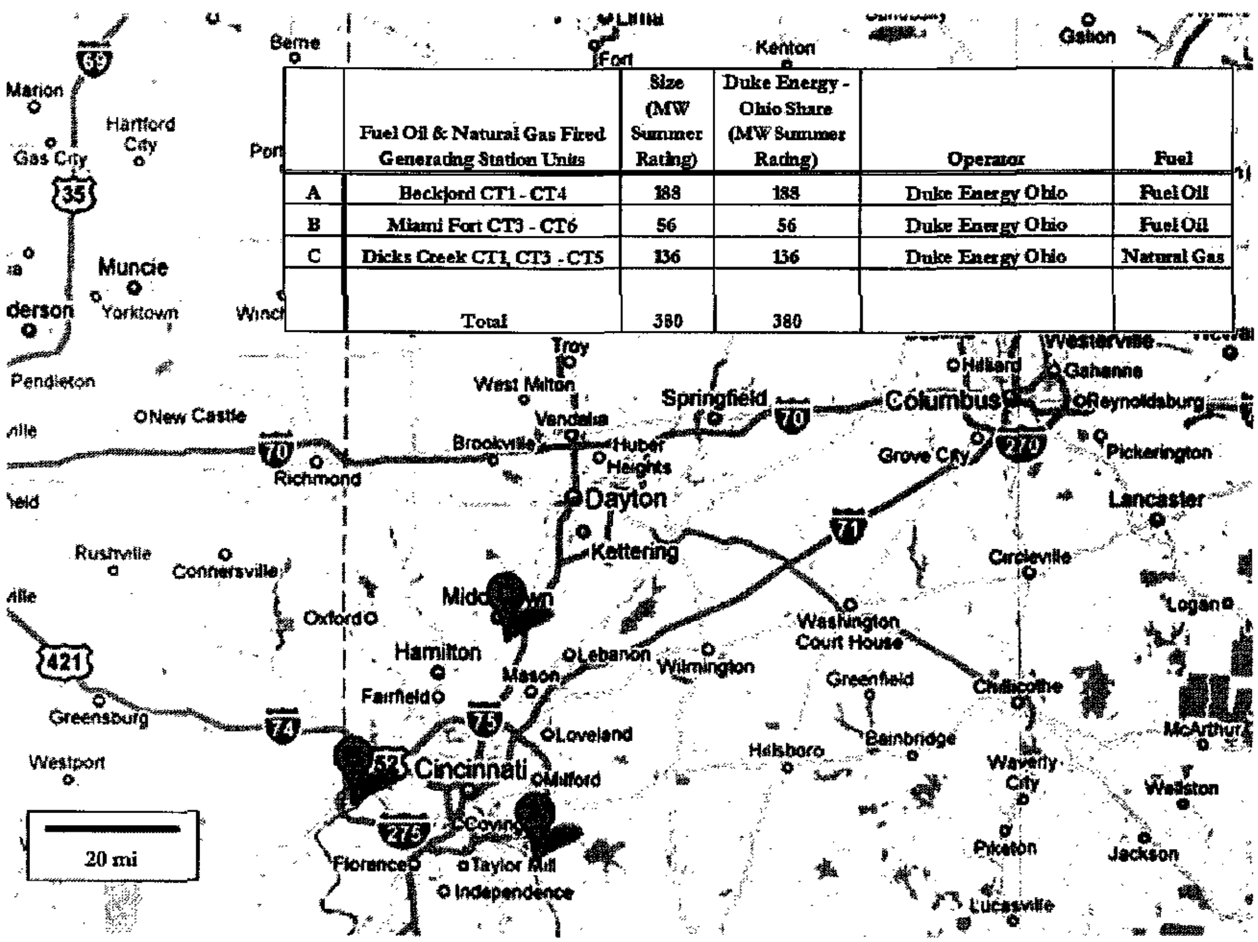
	Coal Fired Generating Station Units	Size (MW Summer Rating)	Duke Energy - Ohio Share (MW Summer Rating)	Operator
A	Zimmer 1	1,300	605	Duke Energy Ohio
B	Beckjord 1-6	1,118	859	Duke Energy Ohio
C	Miami Fort 7-8	1,020	652	Duke Energy Ohio
D	Stuart 1-4	2,308	900	Dayton Power & Light
E	Killen 3	600	198	Dayton Power & Light
F	Conesville 4	780	312	Columbus Southern Power
	Total	7,126	3,526	

Source: Information Response 40 and Google Maps

Duke Energy Ohio has twelve (12) fuel oil and natural gas-fired generating units that are included in the FPP and generally used as peaking units. These units are 100% owned by Duke Energy Ohio and have a total summer capacity of 380 megawatts. *Exhibit III-3* below gives the locations and capacity of the units.

Exhibit III-3
Locations and Capacity of Duke Energy Ohio Fuel Oil and Natural Gas-Fired Units as of December 31, 2009

	Fuel Oil & Natural Gas Fired Generating Station Units	Size (MW Summer Rating)	Duke Energy - Ohio Share (MW Summer Rating)	Operator	Fuel
A	Beckjord CT1 - CT4	188	188	Duke Energy Ohio	Fuel Oil
B	Miami Fort CT3 - CT6	56	56	Duke Energy Ohio	Fuel Oil
C	Dicks Creek CT1, CT3 - CT5	136	136	Duke Energy Ohio	Natural Gas
	Total	380	380		



Source: Information Response 40 and Google Maps

Duke Energy Ohio uses long-term (1 to 3 years) coal contracts to assure adequate supply for its coal-fired units. In addition, Duke Energy Ohio uses a process it calls "Active Management." Duke Energy Ohio believes that by actively managing any future period to a flat position (supply matches demand) for fuel, purchase power, and emission allowances, native customers will be provided with a reliable, low-cost, and market-based supply of electricity.

The main tool used for "Active Management" is the Commercial Business Model (CBM). The CBM provides numerous organizations with forward-looking information that is used in Duke Energy Ohio decision-making.

Our evaluation of Duke Energy Ohio fuel procurement and coal costs will focus on:

- The Duke Energy Ohio organizations with a stake in fuel procurement
- The role of the CBM in fuel procurement decision-making
- The policies and procedures used for fuel procurement
- 2009 coal costs
- 2009 coal inventories
- A comparison of Duke Energy Ohio 2009 coal costs with market prices

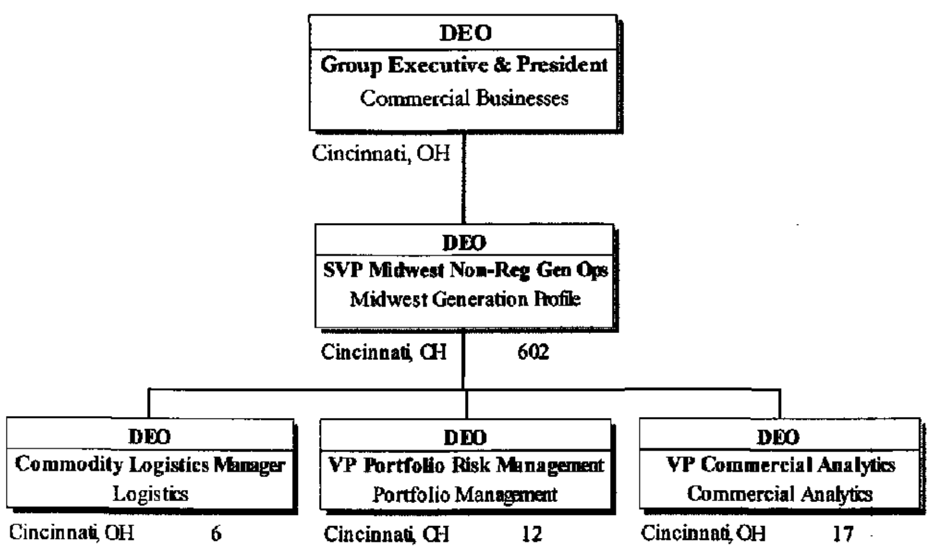
B. Findings and Conclusions

Fuel Procurement Organization(s)

Finding III-1 **Duke Energy Ohio has an organizational structure that is focused on procuring and delivering an adequate supply of fuel to its generating stations.**

Three (3) Duke Energy Ohio organizations have a stake in the procurement of fuel for the coal-fired generating units included in the FPP. *Exhibit III-4* below shows the reporting relationship of the three organizations' Commercial Analytics forecast fuel requirements. Portfolio Risk Management acquires the fuel from suppliers. Commodity Logistics coordinates the delivery of the fuel from the suppliers to the generating stations.

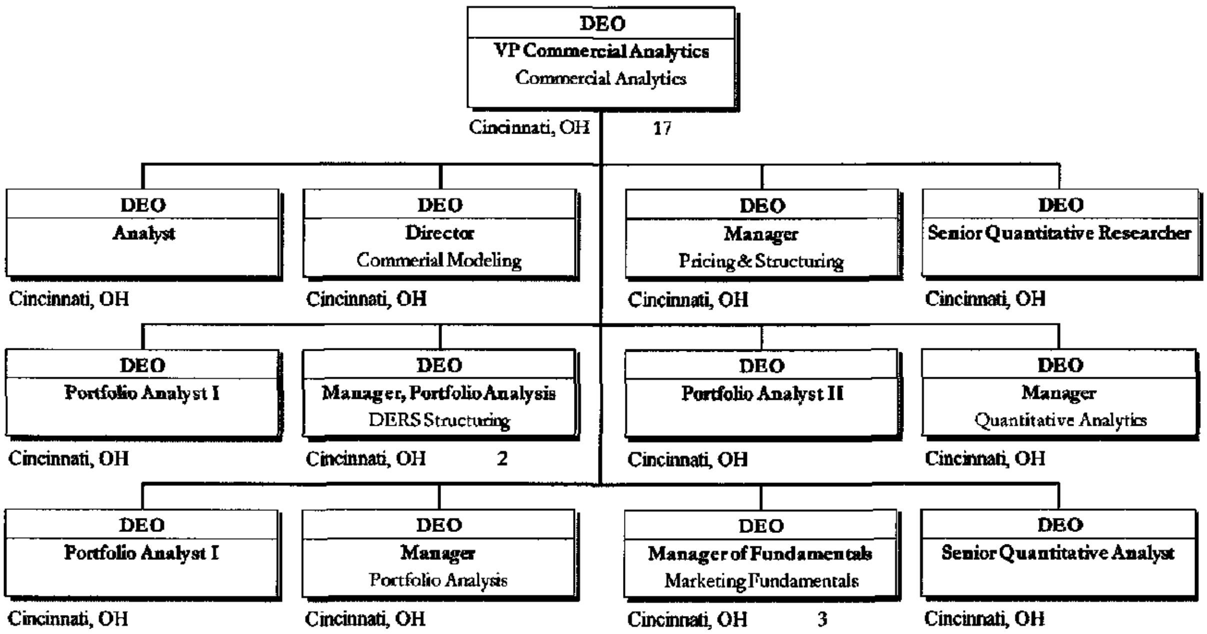
Exhibit III-4
Duke Energy Ohio Fuel Procurement Organizations
as of December 31, 2009



Source: Information Response 1 and Interviews 8, 11, and 14

Information required to determine the future coal needs originates from the Commercial Analytics organization, as shown in *Exhibit III-5* below. This organization is responsible for the CBM discussed below.

Exhibit III-5
Commercial Analytics Organization
as of December 31, 2009



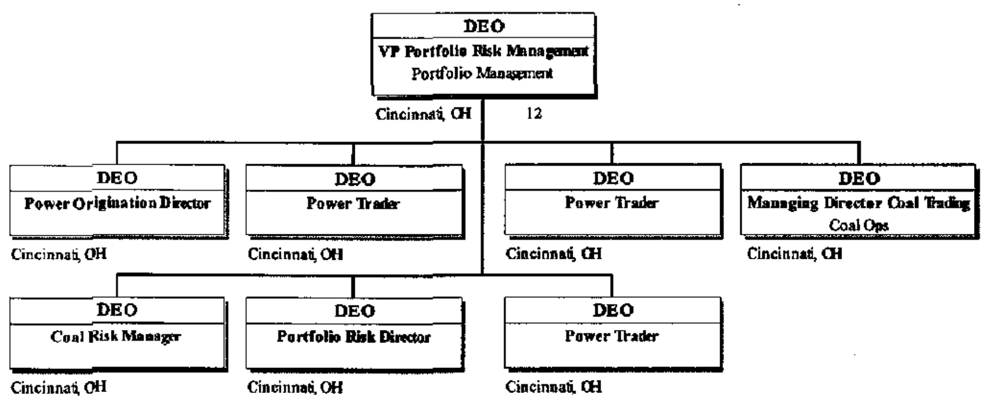
Source: Information Response 1 and Interview 11

Specific responsibilities of the eighteen (18) full-time equivalents (FTEs), including the Vice President of the Commercial Analytics group, include but are not limited to:

- Operation, maintenance, and improvement of the Commercial Business Model
- Coordinating and managing model development projects
- Designing database structures
- Managing load information databases and long-term load forecasting models
- Conducting weather and load analysis
- Developing models in support of risk management and portfolio optimization functions
- Presenting fundamental information/analysis/views on power, gas, coal, oil, and emission allowances markets

The Portfolio Risk Management organization, *Exhibit III-6* below, has thirteen (13) FTEs, including the Vice President Portfolio Risk Management. The Portfolio Risk Mmanagement organization is responsible for long-term fuel procurement and forward trading of power, coal, gas, and emission allowances.

Exhibit III-6
Portfolio Risk Management Organization
as of December 31, 2009



Source: Information Response 1 and Interview 8

Specific activities of the Portfolio Risk Management organization include but are not limited to:

- Procurement of the appropriate type of coal for each generating station
- Coal contract administration
- Managing the coal portfolio as part of the Active Management process
- Managing the real-time power position in response to operating conditions
- Managing the day ahead (DA) through three (3) months out and three (3)+ months out through December 2011 power positions as part of the Active Management process
- Managing the capacity position to maintain a reliability reserve margin of 5.35%[3]
- Managing the daily and annual emission allowance positions for sulfur dioxide (SO_2), and nitrogen oxide (NO_x)
- Managing the Annual Revenue Rights (ARR) and Financial Transmission Rights (FTR)
- Manage the REC position for Duke Energy Ohio load obligation
- Managing the natural gas position for the gas-fired combined cycle and peaking units

The Commodity Logistics organization, as shown in *Exhibit III-4* above, is responsible for coordinating the movement of coal from the supplier to the generating stations. This organization has seven (7) FTEs, including the manager. Organizational accountabilities include but are not limited to:

- Scheduling barges with two (2) contract barge companies

[3] / This number changes slightly per MISO. Current reserve margin has been established by MISO at 5.35%

- Coordinating barge loading at the Big Sandy River docks
- Performing quality control observations for barge loading and unloading processes
- Scheduling delivery of power and gas from legacy contracts prior to Duke Energy Ohio's participation in MISO

Commercial Business Model (CBM)

Finding III-2 **Duke Energy Ohio has developed and uses a robust computer model that simulates future operations (day ahead plus) based on forecasted interdependent variables, including market prices for fuel procurement decision-making.**

Duke Energy Ohio uses the output of a proprietary "Monte Carlo Simulation-Based" model in numerous processes, including decision-making for fuel, power, gas, and emission allowances procurement. This simulation is run every night with updated information and takes about 1.5 hours of computer processing time. Basic knowledge of the CBM will contribute to the understanding of the Active Management fuel procurement processes used by Duke Energy Ohio.

Duke Energy Ohio uses the model to value and quantify risks for:

- Structured contracts
- Load-following deal
- Generation dispatch

Outputs of the model are contingent on the interdependence among:

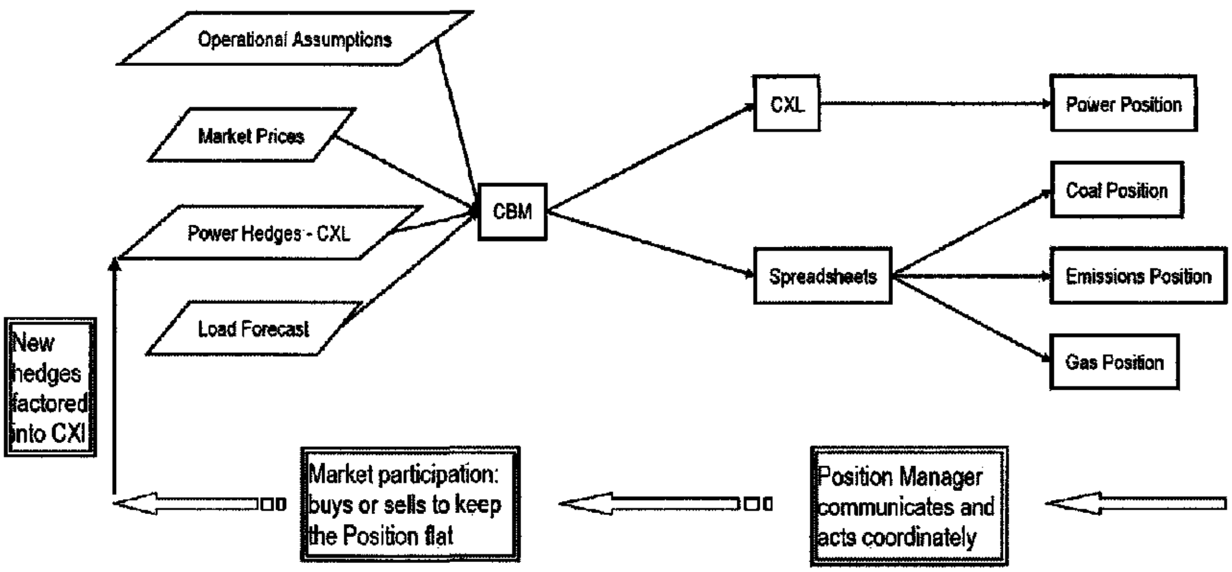
- Weather
- Load
- Fuel
- Power prices
- Emission prices
- Operational characteristics

The CBM produces standard outputs for:

- Commodity positions
- Annual budgeting
- Five-year planning
- Power operational plans

Exhibit III-7 below provides a pictorial representation of the inputs and outputs of the Commercial Business Model that are related to commodity positions. Commodity XL (CXL) is a multi-commodity platform (including Power XL and Coal XL) that integrates all front-to-back office procedures (trade capture, confirmation, scheduling, settlement, and accounting) into a single next-generation, highly scalable, and customizable platform.

Exhibit III-7
CBM Data Flow to Produce Position Reports for Power, Coal, Emissions, and Gas as of December 31, 2009



Source: Information Response 2

The model has the ability to provide sensitivity analysis and stress testing for:

- Market risk factors such as commodity price and volatility
- Non-market risk factors such as weather and outages

The CBM has also been adapted to provide:

- Curve models used in coal blending enhancements
- Adjustments for new MISO unit ordering
- Reports for utility and non-utility splits
- Various emissions reports

Finding III-3 **Duke Energy Ohio has established control procedures for any changes to the Commercial Business Model.**

All major changes to the CBM must have approval from:

- Senior Vice President – Commercial Asset Management
- Vice President – Commercial Analytics
- General Manager – Production Services – Non Regulated

Finding III-4 **Duke Energy Ohio uses a structured process called "Active Management" for its commodity trading decision making.**

Exhibit III-8 below shows the "Active Management" commodity trading process used by Duke Energy Ohio. A change in position of one commodity may trigger a change in position of other commodities.

EXAMPLE

The CBM indicates Duke Energy Ohio will be short on power because of an unscheduled outage of a coal unit. This scenario would trigger a BUY for power and may trigger a SALE of coal and a SALE of emissions allowances because the coal unit would not be running.

Exhibit III-8
Active Management Commodity Trading Process
as of December 31, 2009

[redacted]

Source: Interview 8 and Information Response 2

Fuel Procurement Policies and Procedures

Duke Energy Ohio, as a result of Stipulation 4 from the 2008 Liberty Audit, formally documented its procedures and guidelines for the management of fuel during 2009. This documentation is contained in "Commercial Asset Management (CAM) Portfolio Risk Management Policy and Procedures." Duke Energy Ohio provided a draft of the documentation as shown in *Exhibit III-9* below.

Exhibit III-9
Title Page of Draft of CAM Portfolio Risk Management Policy and Procedures as of January 2010

CONFIDENTIAL PROPRIETARY TRADE SECRET

CAM Portfolio Risk Management Policy and Procedures

~~December 15th, 2008 Update~~
January 2010 Draft

Source: Information Response 2

The draft of the CAM Portfolio Risk Management Policy and Procedures manual contains the processes used for power, emission allowances, and FTRs with power, EAs and coal being the primary drivers.

Coal Management

Finding III-5 **Duke Energy Ohio has a well-defined fuel procurement process for the coal-fired generating units it operates.**

Exhibit III-10 below illustrates the process used by Duke Energy Ohio to procure a supply of coal for its nine (9) coal-fired generating units operated by Duke Energy Ohio. Six (6) units at Beckjord use low-sulfur Central Appalachian coal. The one (1) unit at Zimmer and the two (2) units at Miami Fort use high-sulfur coal from the Illinois and Northern Appalachian regions because they have sulfur dioxide (SO_2) scrubbers and nitrogen oxide (NO_x) controls.

Exhibit III-10
Coal Procurement Process
as of December 31, 2009

[redacted]

Source: Interview 8 and Information Response 2

Long- and Short-Term Coal Contracts

Duke Energy Ohio solicits offers for long- and short-term contacts from a list of pre-approved suppliers. Duke Energy Ohio currently has a catalog of twenty-one (21) producers with sixty-seven (67) different types of coal. To make the approved list, a producer has to first meet Duke Energy Ohio's credit criteria and must be formally approved by the Enterprise Credit Risk Management group. An approved coal type has to be run through a Vista™ analysis. Vista™ is a Black and Veatch software product that quantifies the cost and performance impacts associated with burning alternate coals in a power plant. A description of the Vista™ software product is given in *Exhibit III-11* below.

Exhibit III-11
Description of Black & Veatch Vista™ Software Product
as of March 2010

What Vista Does

Vista quantifies the cost and performance impacts associated with burning alternate coals in a power plant. Vista uses equipment-specific engineering models rather than generic correlations to evaluate performance impacts, with predictions based on equipment configuration and component information coupled with detailed calibration data supplied by the user. Economic results are calculated from the Vista performance predictions using costs (e.g., fuel, waste disposal, replacement power) input by the user. Vista provides a detailed comparison of the key performance and economic results for each of the alternate coals evaluated.

Vista incorporates detailed predictive performance models for all equipment affected by coal quality, including a detailed steam generator heat transfer model. Maintenance and availability costs are determined with a detailed component/failure model sensitive to coal quality effects on performance and failure rates. Derates are analyzed using a Monte Carlo simulation. All models employ calculations based on engineering principles rather than empirical formulas and include the impacts of changes in performance of one system or component on another.

The primary benefit of Vista evaluations is to provide the user with total fuel-related costs for alternative coals, on a system-by-system basis, via a summary of projected performance. These cost predictions consider the following impacts for the combustion of each coal supply:

- Plant efficiency effects.
- Equipment system capacity.
- Auxiliary power requirements.
- Steam attemperation requirements.
- Propensity for slagging or fouling.
- Maintenance costs.
- Waste disposal costs.
- Replacement power costs resulting from predictions of differential unit availability and capability.
- Fuel and fuel transportation costs.

Source: http://myvistasource.com/

In addition, test coal burns and station experience with the coal may be evaluated before a coal type makes the approved list.

Duke Energy Ohio's long-term and short term contracts are negotiated and recommended by a team composed of:

- An originator (either Central Appalachian, Northern Appalachian, or Illinois Basin)

- The Managing Director Coal Risk Management
- One member from the legal staff
- One member from credit

Characteristics of one- to three-year supply agreements are:

- Tonnages of between 200,000 and 3 million per year
- Subject to a long form agreement
- Requirement of significant legal participation
- More thorough credit approval process
- "White Paper" approvals prepared if Transaction Review Committee (TRC) approval is required

Characteristics of short-term and 12-month contracts are:

- Normal tonnages of less than 500,000
- Subject to short form agreement
- Requirement of legal and credit approval
- Deals targeted to get closed in one (1) to fourteen (14) days

Offers are evaluated based on:

- Price (adjusted for MMBtu, SO_2, and freight)
- Compatibility at all Duke Energy Ohio stations
- The involvement of station managers to ensure compatibility
- Global Risk Management (GRM) approval (credit)
- Legal (acceptance of Duke Energy Ohio terms by the counterparty)
- Coal basin balance and diversity

Active Management of Coal

As noted previously, the CAMS organization is responsible for establishing and implementing the multi-commodity risk management strategy for power, fuel, and emission allowances by monitoring and adjusting the contract mix all the way through physical delivery. These adjustments result in the purchases or sales of fuel, emission allowances, and power for the approved term if the forward market allows them to transact. Coal is the primary fuel used by Duke Energy Ohio.

The majority of the coal used by Duke Energy Ohio is purchased via long-term and short-term contracts negotiated as a result of long-term load forecast (*Exhibit III-10* above). Actual operations do not always match forecast because factors affecting loads are constantly changing unit operations.

Duke Energy Ohio uses the CBM (*Exhibit III-7* above) to evaluate the effect of the continuous changes and to determine how those changes affect the future need for coal. Duke Energy Ohio refers to this process as "Active Management" (*Exhibit III-10* above). Duke Energy Ohio coal traders try to maintain a flat position (demand equals supply) for future coal purchases and delivery. Generally, changes in Duke Energy Ohio's future coal positions are dependent on whether Duke Energy Ohio's coal-fired generating units are forecasted to be "in-the-money." The Active Management decision process for coal trading is shown in *Exhibit III-12* below.

Exhibit III-12
"Active Management" Decision Process for Coal Trading
as of December 31, 2009

[redacted]

Source: Interview 15 and Information Response 2

Currently, position periods for coal trading are monthly for the next three months and quarterly thereafter through December 2011. A yearly position may be used for 2011 and beyond. *Exhibit III-13* below provides an example of the moving graphical representation of the position periods as they would exist in June 2009.

Exhibit III-13
Example Position Periods for Active Management Coal Trading
as of June 30, 2009

[redacted]

Source: Interview 15

Natural Gas Management

Finding III-6 Duke Energy Ohio has policies and procedures for natural gas procurement.

Duke Energy Ohio has one generating station (Dicks Creek shown in *Exhibit III-3* above) with 136 MW (four (4) units) of capacity included in the FPP that uses natural gas as its fuel. In addition, these units are used as peaking units. When needed, natural gas for these units is purchased from the Local Gas Distribution Company (Duke Energy Ohio CGE Citygate). *Exhibit III-14* below illustrates the Natural Gas Fuel Procurement Process used by Duke Energy Ohio.

Exhibit III-14
Natural Gas Fuel Procurement Process
as of December 31, 2009

[redacted]

Source: Interview 8 and Information Response 2

Long- and Short-Term Natural Gas Contracts

Duke Energy Ohio has no [redacted] for the Dicks Creek generating station.

Active Management of Natural Gas

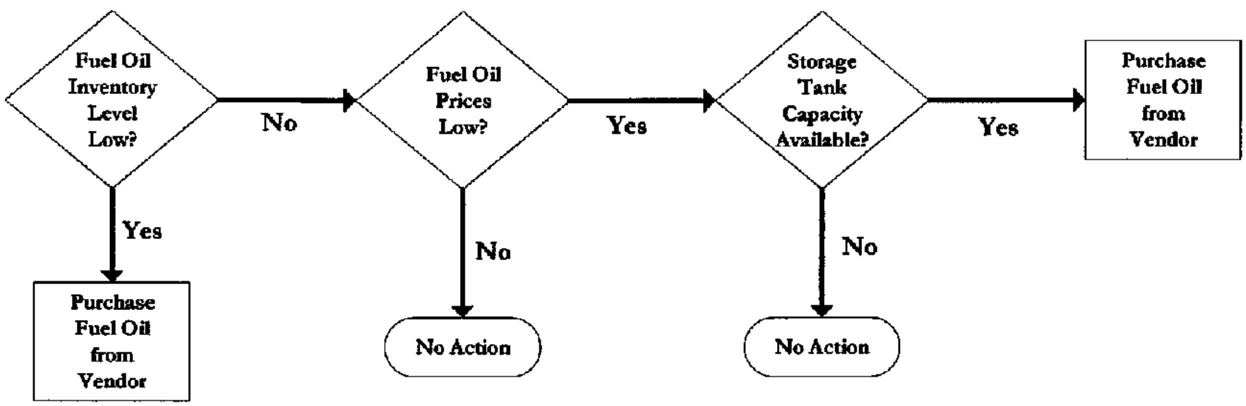
Duke Energy Ohio only performs [redacted] units when they are included in Duke Energy Ohio's list of generating units to be dispatched the next day.

Fuel Oil **Management**

Finding III-7 Duke Energy Ohio has policies and procedures for fuel oil procurement.

From *Exhibit III-3* above, Duke Energy Ohio has eight (8) fuel oil-fired units included in the FPP. Four (4) of these units (186 MW) are located at Beckjord and four (4) units (56 MW) are located at Miami Fort. All the units are used for peaking. Each site has fuel oil stored onsite in tanks. The Fuel Oil Procurement Process is shown in *Exhibit III-15* below.

Exhibit III-15
Fuel Oil Procurement Process
as of December 31, 2009



Source: Information Response 2

Long- and Short-Term Fuel Oil Contracts

Duke Energy Ohio has a contract for fuel oil [redacted]

Active Management of Fuel Oil

Duke Energy Ohio does not use the "Active Management" process for fuel oil supplies.

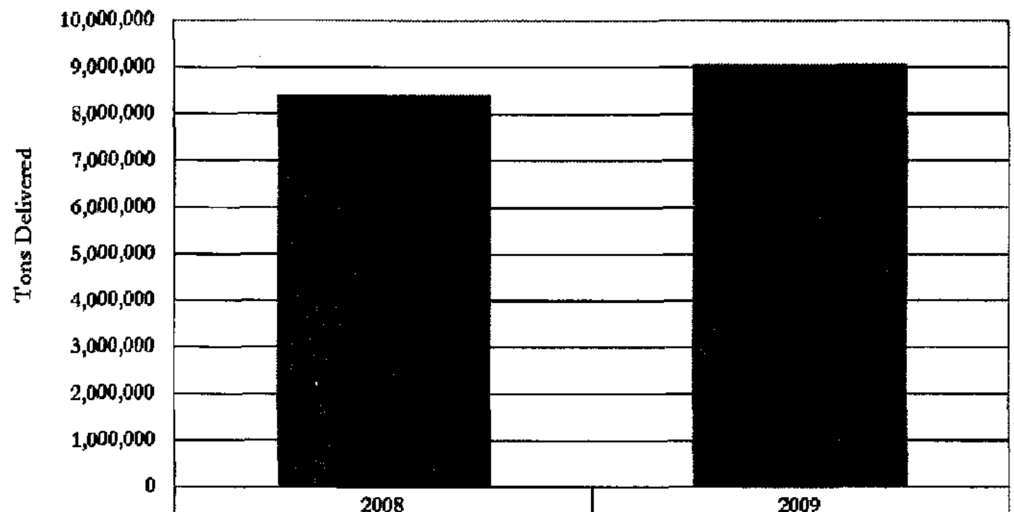
2009 Coal Costs

All coal cost analyses below are based on coal delivered to the three coal-fired generating stations operated by Duke Energy Ohio (Beckjord, Miami Fort, and Zimmer).). Duke Energy Ohio follows FERC classifications for coal purchases. "Contract" purchases are for contract periods greater than 12 months. Likewise, it is considered "spot" if the contract period is 12 months or less. While FERC delineates coal purchases based on term-length, CAMS active management of coal is applied uniformly across the product term. In addition, year over year increases or decreases in coal costs must also be viewed in conjunction with corresponding changes to purchased power and emissions allowance costs.

Finding III-8 Coal deliveries to Duke Energy Ohio increased by 7.5% from 2008 to 2009.

A comparison between the 2008 and 2009 tons of coal delivered to Duke Energy Ohio generating stations is shown in *Exhibit III-16* and *Exhibit III-17* below. There was a total increase from 2008 to 2009 of 640,855 tons (7.5%) Beckjord increased 839,359 tons (55.8%), Miami Fort increased 437,520 tons (13.8%), and Zimmer decreased 636,024 ton (–16.9%). Zimmer had a 10-week outage in the spring of 2009 and had no coal delivered in the month of April.

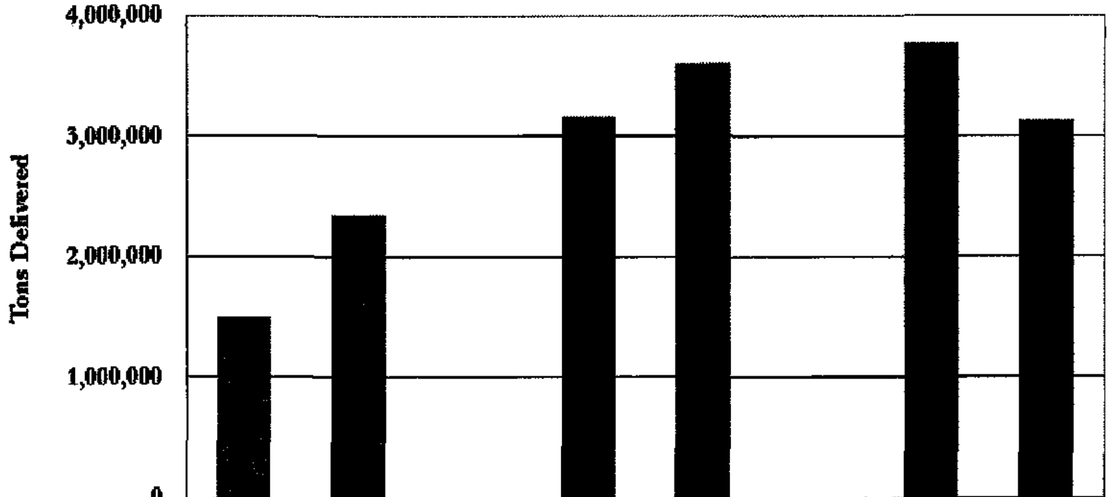
Exhibit III-16
Total Annual Coal Delivered
2008 to 2009



	2008	2009
Total Tons Delivered	8,439,016	9,079,871

Source: Information Request 15

Exhibit III-17
Annual Coal Delivered by Generating Station
2008 to 2009



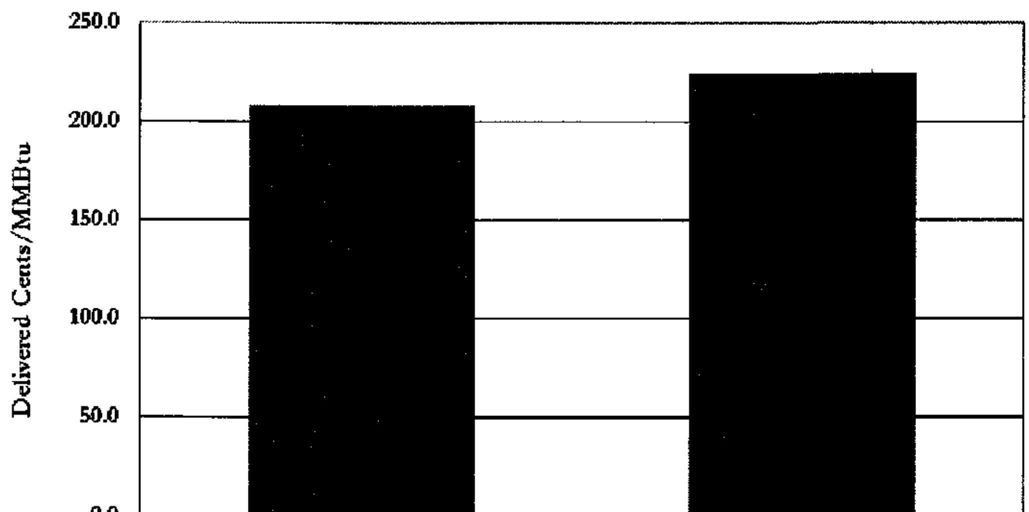
	2008 Beckjord	2009 Beckjord		2008 Miami Fort	2009 Miami Fort		2008 Zimmer	2009 Zimmer
Total Tons Delivered	1,503,277	2,342,636		3,166,203	3,603,723		3,769,536	3,133,512

Source: Information Request 15

Finding III-9 **The price of coal at the terminal increased 10.3%, and the transportation costs decreased 15.3% from 2008 to 2009.**

Exhibit III-18 and *Exhibit III-19* below provide cents per MMBtu and dollars per ton pricing respectively for Duke Energy Ohio for 2008 and 2009. The 2009 cents per MMBtu cost increased 16.7 cents (8.1%) over 2008. The 2009 total delivered dollars per ton increased $4.03 per ton (8.1%) from 2008. The actual commodity price of coal increased $4.70 per ton (10.3%). The transportation (barging) cost decreased $0.67 per ton (15.3%). Transportation cost were 8.8% of total delivered cost in 2008 and decreased to 6.7% in 2009.

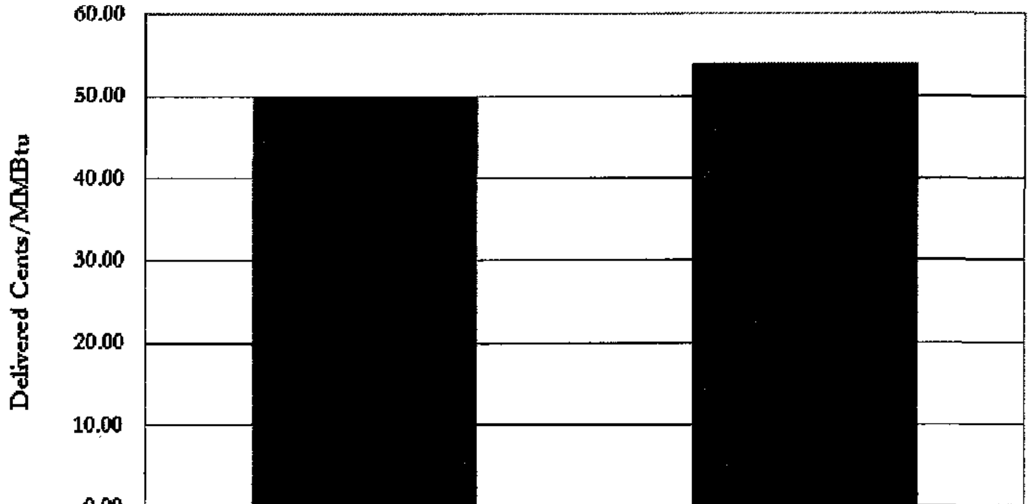
Exhibit III-18
Cents per MMBtu Cost of Total Coal Delivered
2008 to 2009



	2008	2009
Total Delivered Cents/MMBTU	208.3	225.2

Source: Information Request 15

Exhibit III-19
Dollars per Ton Cost of Total Coal Delivered
2008 to 2009



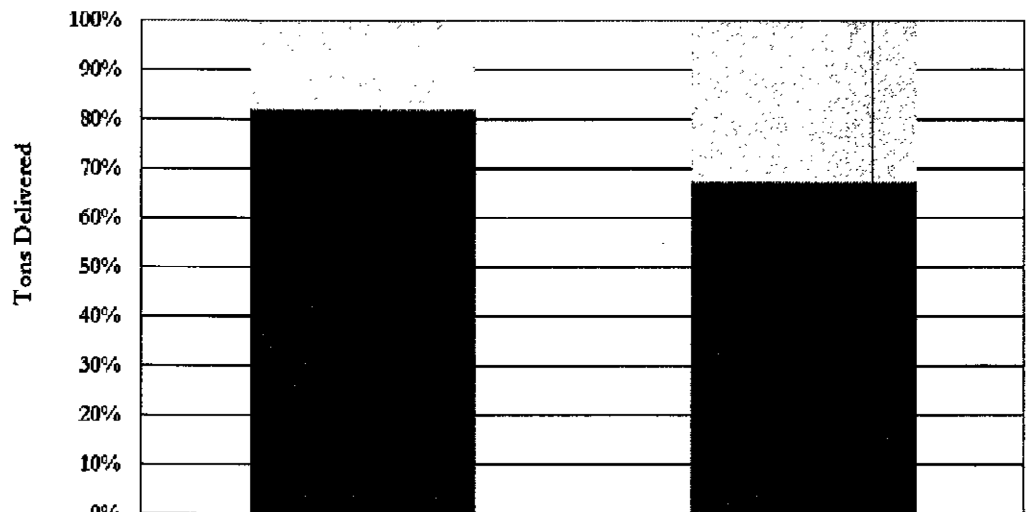
	2008	2009
■ Coal Cost at Terminal	45.33	50.33
■ Transportation Cost	4.69	3.71

Source: Information Request 15

Finding III-10 **The "spot" market share of tonnage of coal delivered to Duke Energy Ohio increased by 14.5% from 2008 to 2009.**

Exhibit III-20 and *Exhibit III-21* below provide "contract" versus "spot" purchases for 2008 and 2009. Total "spot" purchase tonnage as a percent of total tonnage increased from 18.1% to 32.6% (a 14.5% increase) from 2008 to 2009. "Spot" purchases for Beckjord Station increased 34.8% (30.1% to 64.9%), for Miami Fort they increased 12.4% (15.2% to 27.6%), and for Zimmer they decreased 4.5% (18.7% to 14.2%).

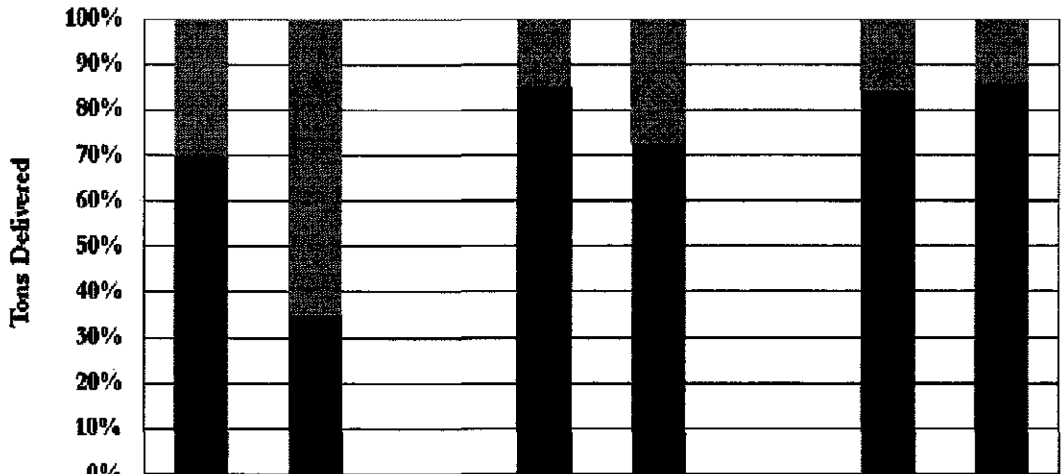
Exhibit III-20
Total Tons Delivered from Contract vs. Spot Purchases
2008 to 2009



	2008	2009
Spot	1,530,404	2,959,705
■Contract	6,908,612	6,120,166

Source: Information Response 15

Exhibit III-21
Cost of Coal Delivered from Contract vs. Spot Purchases
2008 to 2009



	2008 Beckjord	2009 Beckjord	2008 Miami Fort	2009 Miami Fort	2008 Zimmer	2009 Zimmer
Spot	453,904	1,520,540	480,099	993,521	596,400	445,644
Contract	1,049,372	822,096	2,686,103	2,610,202	3,173,136	2,687,868

Source: Information Response 15

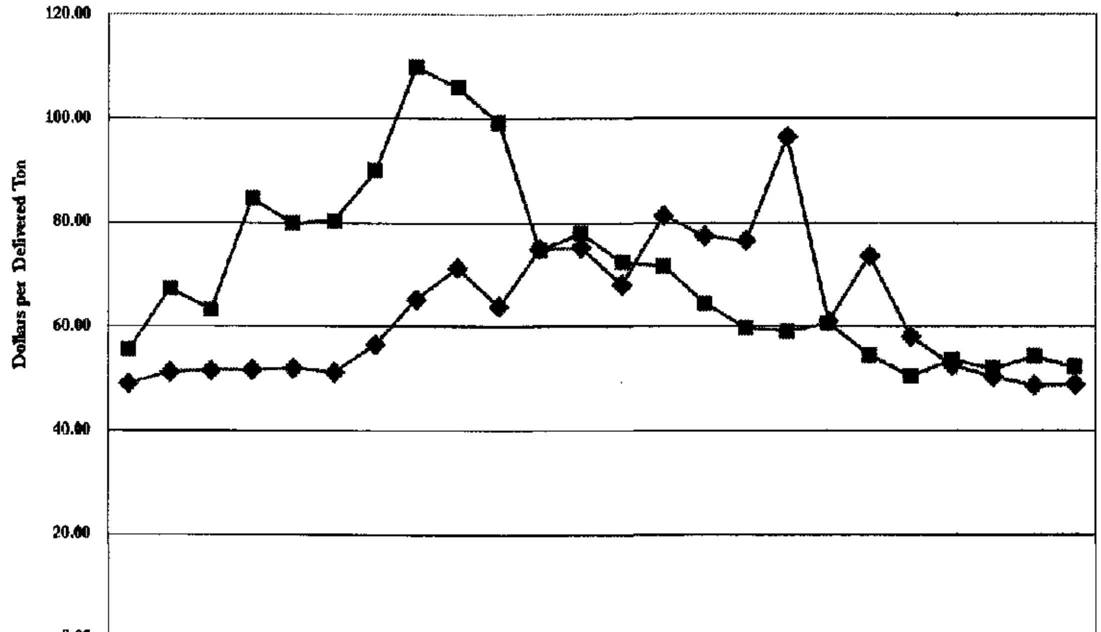
Beckjord

Finding III-11 **Duke Energy Ohio had a [redacted] in coal cost for Beckjord Station in 2009, which resulted from a significant increase in the percent of spot purchases between 2008 and 2009.**

Exhibit III-22 below provides the "contract" and "spot" per ton cost for Beckjord Station. "Spot" costs per ton were equal to or less than "contract" cost for eight (8) of the twelve (12) months in 2009.

Exhibit III-23 below details the derivation of the [redacted] in coal cost.

Exhibit III-22
Beckjord Generating Station Contract vs. Spot Delivered Coal Cost
2008 to 2009



	2008 Jan	2008 Feb	2008 Mar	2008 Apr	2008 May	2008 Jun	2008 Jul	2008 Aug	2008 Sep	2008 Oct	2008 Nov	2008 Dec
Spot Cost	55.49	67.35	63.27	84.73	79.85	80.46	89.97	110.0	106.1	99.23	74.75	78.03
Contract Cost	49.09	51.27	51.62	51.72	51.97	51.23	56.53	65.26	71.31	63.88	74.95	75.27

	2009 Jan	2009 Feb	2009 Mar	2009 Apr	2009 May	2009 Jun	2009 Jul	2009 Aug	2009 Sep	2009 Oct	2009 Nov	2009 Dec
Spot Cost	72.42	71.53	64.51	59.72	59.04	60.62	54.51	50.40	53.58	51.92	54.22	52.22
Contract Cost	68.05	81.33	77.46	76.55	96.54	60.96	73.57	58.01	52.89	50.45	48.74	48.96

Source: Information Response 15

Exhibit III-23
Projected Coal Cost Resulting from Increased Spot Purchases for Beckjord Station
2009

[redacted]

Source: Information Response 15 and Schumaker & Company Analysis

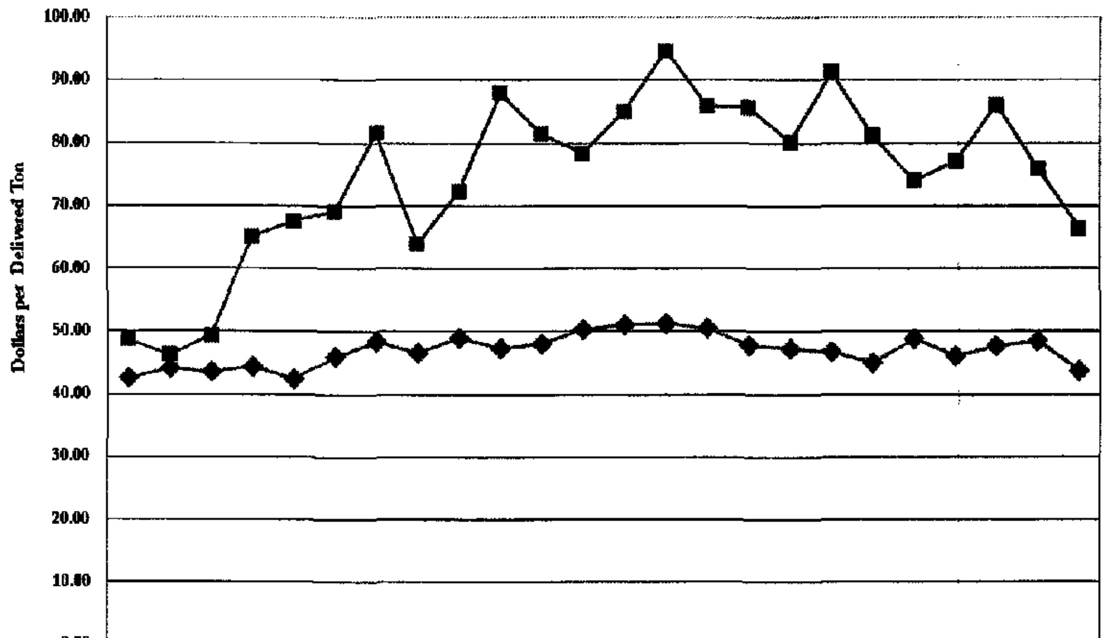
Miami Fort

Finding III-12 Duke Energy Ohio incurred [redacted] for Miami Fort Station in 2009, which resulted from an increase in the percent of spot purchases between 2008 and 2009.

Monthly "contract" and "spot" costs per ton for Miami Fort coal deliveries are given in *Exhibit III-24* below. Monthly "contract" costs for 2009 demonstrate a stable to slightly declining trend for 2009.

The derivation of the [redacted] is given in *Exhibit III-25*.

Exhibit III-24
Miami Fort Generating Station Monthly Contract vs. Spot Delivered Coal Cost
2008 to 2009



	2008 Jan	2008 Feb	2008 Mar	2008 Apr	2008 May	2008 Jun	2008 Jul	2008 Aug	2008 Sep	2008 Oct	2008 Nov	2008 Dec	2009 Jan	2009 Feb	2009 Mar	2009 Apr	2009 May	2009 Jun	2009 Jul	2009 Aug	2009 Sep	2009 Oct	2009 Nov	2009 Dec
Spot Cost	48.74	46.34	49.41	65.14	67.53	69.18	81.64	64.01	72.29	87.99	81.46	78.39	85.01	94.74	85.93	85.61	80.24	91.33	81.19	74.06	77.15	86.07	75.96	66.50
Contract Cost	42.63	44.15	43.61	44.41	42.46	45.99	48.41	46.58	48.98	47.29	48.03	50.30	51.07	51.27	50.56	47.81	47.26	46.75	45.05	48.80	46.08	47.67	48.49	43.76

Source: Information Response 15

Exhibit III-25
Projected Increased Coal Cost Resulting from Increased Spot Purchases for Miami Fort Station
2009

[redacted]

Source: Information Response 15 and Schumaker and Company Analysis

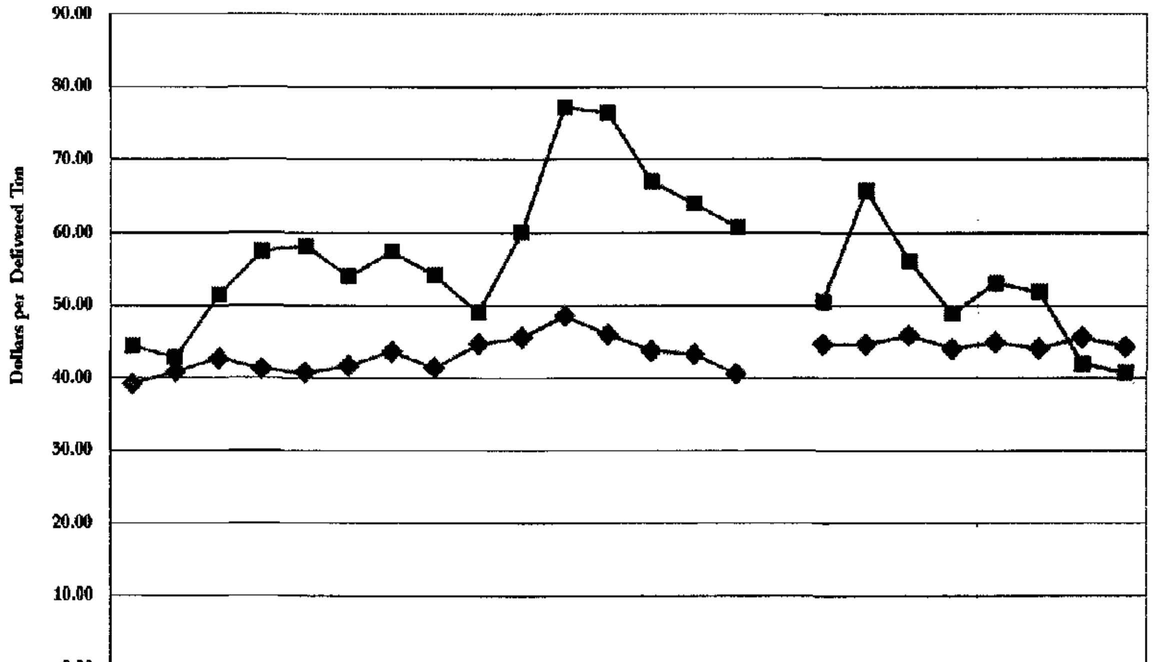
Zimmer

Finding III-13 Duke Energy Ohio had a [redacted] for Zimmer Station, which resulted from reduced "spot" prices in 2009.

The monthly "contract" and "spot" cost per ton for Zimmer Station given in *Exhibit III-26* below indicates that "contract" cost has remained fairly stable for 2008 and 2009. Zimmer did not purchase any coal in April 2009 because of a multi-week outage for maintenance.

Exhibit III-27 provides the derivation of the [redacted] in 2009 if Zimmer had maintained the 2008 percent of spot purchases in 2009. Zimmer's "spot" percentage actually decreased [redacted] from the 2008 level.

Exhibit III-26
Zimmer Generating Station Monthly Contract vs. Spot Delivered Coal Cost
2008 to 2009



	2008 Jan	2008 Feb	2008 Mar	2008 Apr	2008 May	2008 Jun	2008 Jul	2008 Aug	2008 Sep	2008 Oct	2008 Nov	2008 Dec
Spot Cost	44.39	42.91	51.49	57.45	58.19	54.02	57.44	54.17	48.98	60.10	77.24	76.45
Contract Cost	39.15	40.84	42.67	41.22	40.75	41.68	43.63	41.42	44.68	45.62	48.59	46.04

	2009 Jan	2009 Feb	2009 Mar	2009 Apr	2009 May	2009 Jun	2009 Jul	2009 Aug	2009 Sep	2009 Oct	2009 Nov	2009 Dec
Spot Cost	67.05	63.95	60.75		50.61	65.77	56.13	48.90	53.13	51.85	42.01	40.71
Contract Cost	43.75	43.29	40.57		44.67	44.65	45.91	44.04	44.92	44.11	45.62	44.30

Source: Information Response 15

Exhibit III-27
Projected Reduced Coal Cost from Spot Purchases for Zimmer Station
2009

[redacted]

Source: Information Response 15 and Schumaker and Company Analysis

2009 Coal Inventories

Finding III-14 Duke Energy Ohio has a documented policy for coal inventories at its coal-fired power plants.

Duke Energy Ohio has established the inventory target at each station to be a [redacted] if the station were running at full load. Inventory targets are based on:

- Duke Energy Ohio's experience in inventory management
- Duration of the longest river freezes
- Barge unloader outages
- Inventory of critical unloader parts
- Experiences of other utilities and industrial coal users
- Availability of off-system power purchases at times of low coal inventory

The inventory level is tracked for each station as Maximum Days Burn on a monthly basis.

Exhibit III-28 below provides Duke Energy Ohio's inventory targets for each station.

Exhibit III-28
Duke Energy Ohio Inventory Targets by Generating Station
as of December 31, 2009

		[redacted]
	Maximum Daily Burn	
Zimmer	[redacted]	
Beckjord		
Miami Fort		

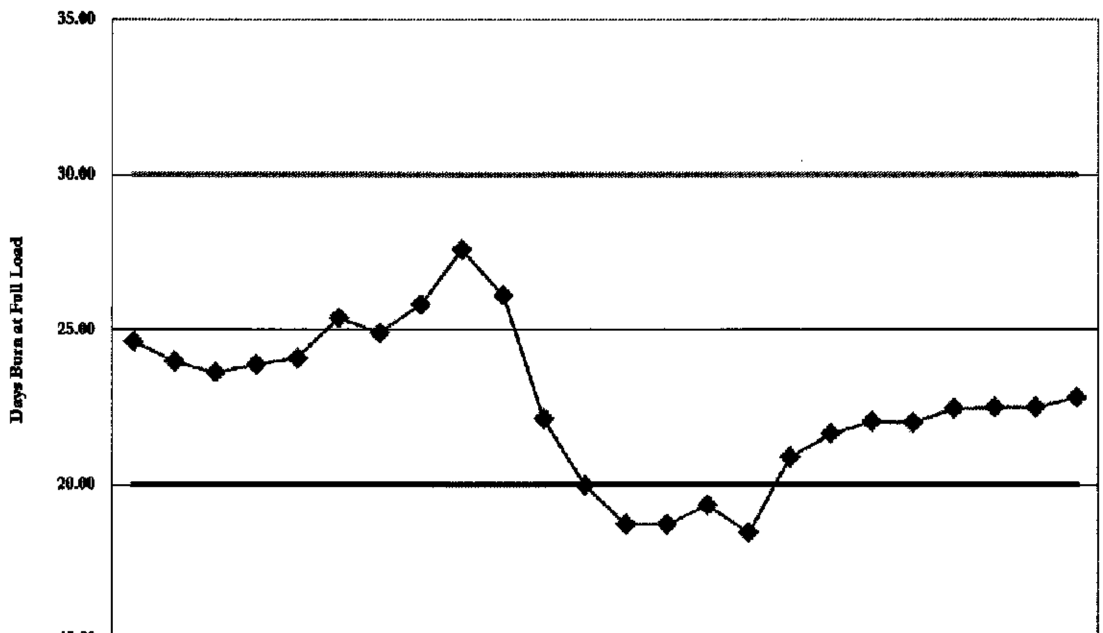
Source: Information Response 2

Beckjord Station

Finding III-15 **Beckjord coal inventories during 2009 were below Duke Energy Ohio's lower target level for the first four months of the year.**

Exhibit III-29 below provides the monthly inventory levels for Beckjord Station. Inventories for January through April of 2009 were slightly below established target levels.

Exhibit III-29
Beckjord Generating Station Monthly Coal Inventory Level
2008 to 2009



	2008 Jan	2008 Feb	2008 Mar	2008 Apr	2008 May	2008 Jun	2008 Jul	2008 Aug	2008 Sep	2008 Oct	2008 Nov	2008 Dec
Upper Target	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Inventory	24.63	23.98	23.63	23.89	24.09	25.40	24.91	25.84	27.61	26.14	22.15	20.00
Lower Target	20	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

	2009 Jan	2009 Feb	2009 Mar	2009 Apr	2009 May	2009 Jun	2009 Jul	2009 Aug	2009 Sep	2009 Oct	2009 Nov	2009 Dec
Upper Target	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Inventory	18.73	18.73	19.36	18.47	20.92	21.67	22.05	22.02	22.48	22.51	22.51	22.83
Lower Target	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

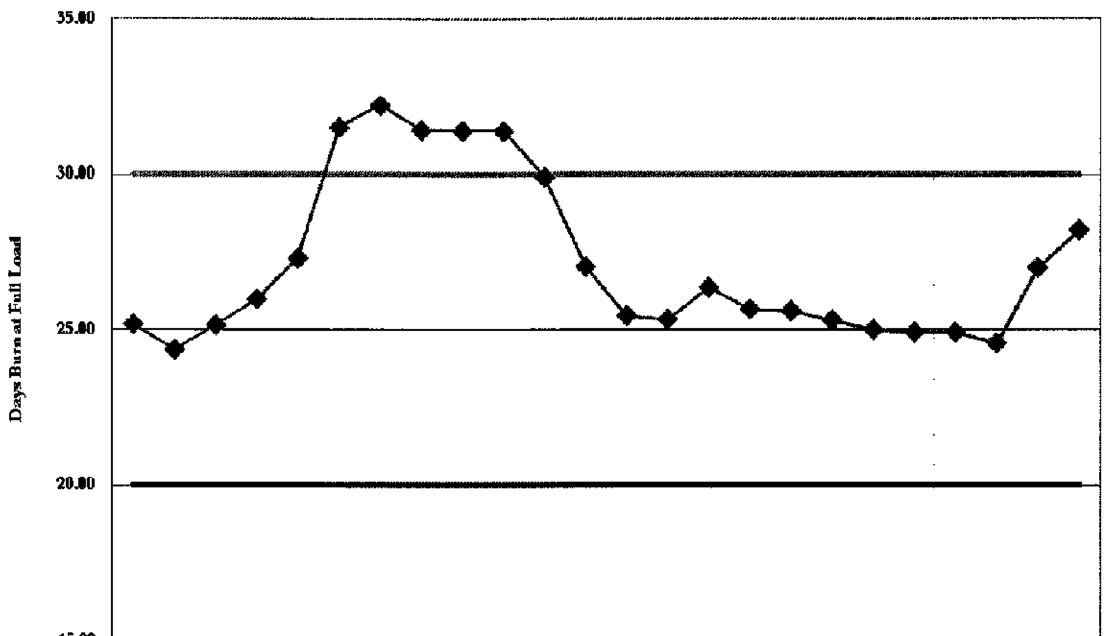
Source: Information Response 8

Miami Fort Station

Finding III-16 **Miami Fort coal inventory levels were maintained within Duke Energy Ohio's upper and lower target levels during 2009.**

Miami Fort inventory data is illustrated in *Exhibit III-30* below. Inventory during 2009 remained stable for ten (10) of twelve (12) months, with a slightly upward trend in November and December.

Exhibit III-30
Miami Fort Generating Station Monthly Coal Inventory Level
2008 to 2009



	2008 Jan	2008 Feb	2008 Mar	2008 Apr	2008 May	2008 Jun	2008 Jul	2008 Aug	2008 Sep	2008 Oct	2008 Nov	2008 Dec
Upper Target	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Inventory	25.19	24.36	25.16	26.03	27.33	31.53	32.24	31.44	31.40	31.40	29.93	27.06
Lower Target	20	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

	2009 Jan	2009 Feb	2009 Mar	2009 Apr	2009 May	2009 Jun	2009 Jul	2009 Aug	2009 Sep	2009 Oct	2009 Nov	2009 Dec
Upper Target	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Inventory	25.47	25.35	26.38	25.68	25.62	25.32	25.01	24.92	24.92	24.56	27.02	28.22
Lower Target	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

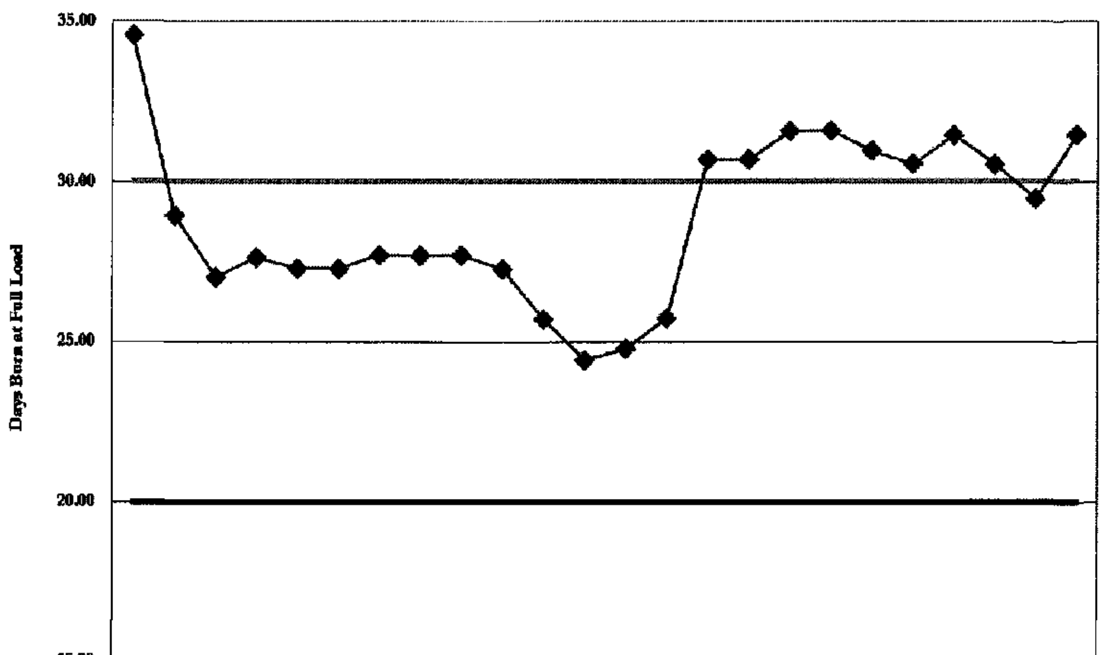
Source: Information Response 8

Zimmer Station

Finding III-17 **Zimmer Station's coal inventory levels were above Duke Energy Ohio's upper target levels for nine (9) of twelve (12) months during 2009.**

Exhibit III-31 below shows Zimmer inventory levels for 2008 and 2009. A big jump in inventory occurred between February and March and remained at the higher level throughout the remainder of the year.

Exhibit III-31
Zimmer Generating Station Monthly Coal Inventory Level
2008 to 2009



	2008 Jan	2008 Feb	2008 Mar	2008 Apr	2008 May	2008 Jun	2008 Jul	2008 Aug	2008 Sep	2008 Oct	2008 Nov	2008 Dec
Upper Target	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Inventory	34.56	28.94	27.03	27.64	27.29	27.29	27.71	27.69	27.71	27.27	25.72	24.44
Lower Target	20	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

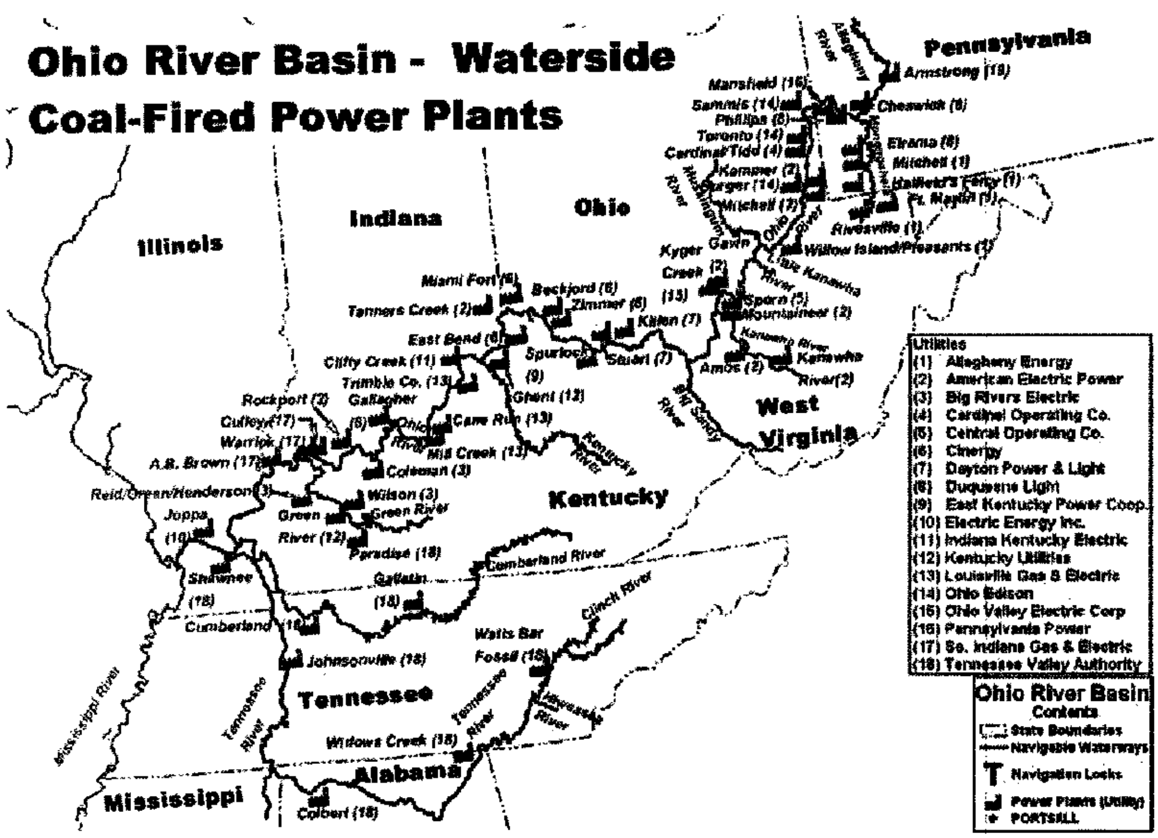
	2009 Jan	2009 Feb	2009 Mar	2009 Apr	2009 May	2009 Jun	2009 Jul	2009 Aug	2009 Sep	2009 Oct	2009 Nov	2009 Dec
Upper Target	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00	30.00
Inventory	24.80	25.75	30.70	30.70	31.59	31.60	30.97	30.57	31.45	30.55	29.47	31.45
Lower Target	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00

Source: Information Response 8

2009 Coal Cost Comparison

Duke Energy Ohio's 2009 coal costs were compared with coal costs from eight generating stations located along the Ohio River using coal delivered by barge. *Exhibit III-32* below shows the locations of all the coal-fired power plants in the Ohio River basin as document by the U.S. Army Corp of Engineers.

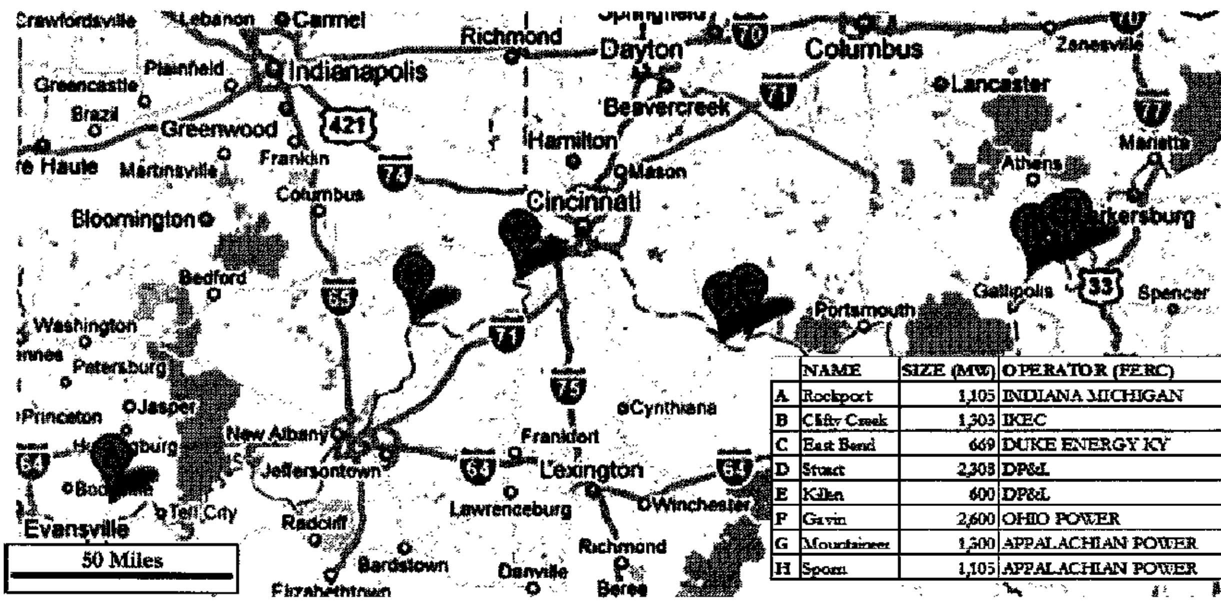
Exhibit III-32
Coal-Fired Waterside Power Plants in the Ohio River Basin
as of December 31, 2008



Source: http://outreach.lrh.usace.army.mil/Industries/Coal/default.htm

Exhibit III-33 below gives the locations of the eight (8) generating stations selected for comparison.

Exhibit III-33
Location of Generating Stations Used for Duke Energy Ohio Coal Cost Comparison
as of December 31, 2008



	NAME	SIZE (MW)	OPERATOR (FERC)
A	Rockport	1,105	INDIANA MICHIGAN
B	Clifty Creek	1,303	IKEC
C	East Bend	669	DUKE ENERGY KY
D	Stuart	2,308	DP&L
E	Killen	600	DP&L
F	Gavin	2,600	OHIO POWER
G	Mountaineer	1,300	APPALACHIAN POWER
H	Sporn	1,105	APPALACHIAN POWER

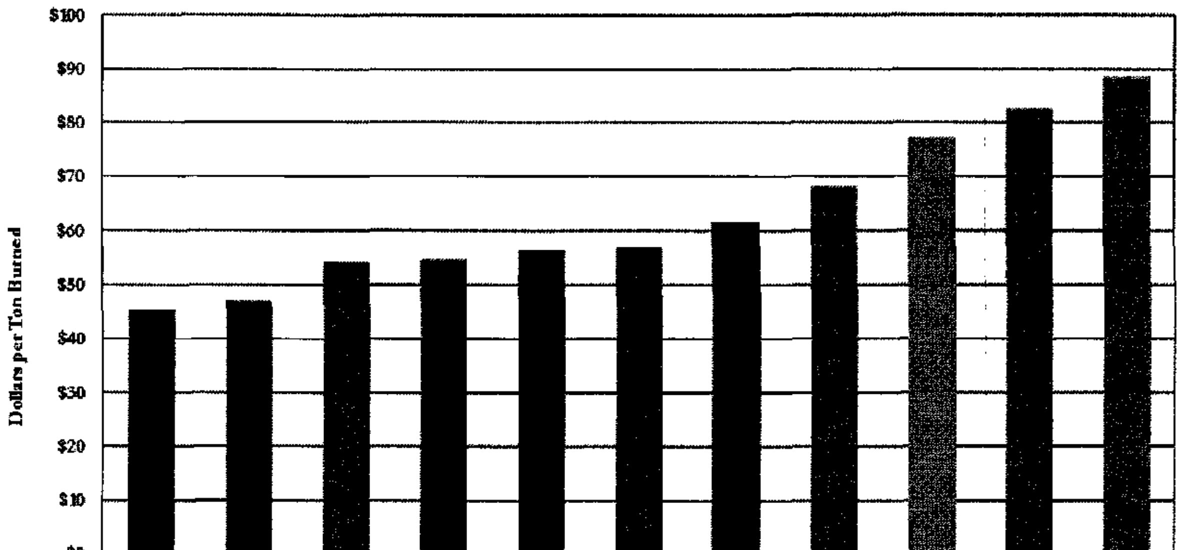
Source: Google Maps

Finding III-18 **Duke Energy Ohio has achieved low coal costs when compared with a select panel of generating stations along the Ohio River.**

FERC Form 423 provides monthly fuel data for power plants through the United States. January through November 2009 data was downloaded from www.ferc.gov. December data was not available at the time of report preparation.

Zimmer had the lowest cost per ton and Miami Fort and Beckjord were mid-panel, as shown in *Exhibit III-34* below. *Exhibit III-35* below indicates Beckjord had the lowest cost of the three plants in the panel that use coal with a low-sulfur content of 1.0% or less.

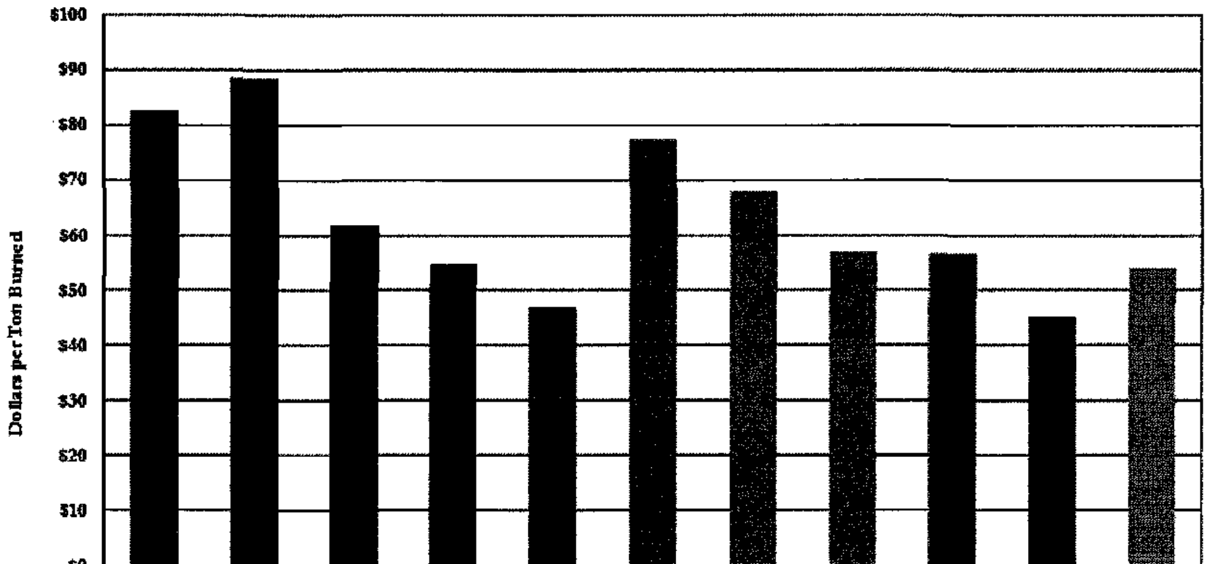
Exhibit III-34
Lowest to Highest Dollars per Ton Cost Comparison
January to November 2009



	Zimmer	Killen	Gavin	Stuart	Miami Fort	East Bend	Beckjord	Mountaineer	Clifty Creek	Rockport	Sporn
$$ per Ton	45.29	47.06	54.18	54.83	56.54	56.97	61.74	68.06	77.34	82.55	88.38
% Sulfur	3.50	1.96	3.74	1.38	3.09	2.90	1.00	2.89	2.09	0.71	0.86
Tons Burned (Millions)	2.90	1.80	7.27	6.51	3.31	1.85	2.16	4.36	1.31	1.51	1.15

Source: 2009 FERC Form 423 and Information Response 8

Exhibit III-35
Lowest to Highest Sulfur Content Comparison of Dollars per Ton Cost
January to November 2009



	Rockport	Sporn	Beckjord	Stuart	Killen	Clifty Creek	Mountaineer	East Bend	Miami Fort	Zimmer	Gavin
$$ per Ton	82.55	88.38	61.74	54.83	47.06	77.34	68.06	56.97	56.54	45.29	54.18
% Sulfur	0.71	0.86	1.00	1.58	1.96	2.09	2.89	2.90	3.09	3.50	3.74
Tons Burned (Millions)	1.51	1.15	2.16	6.51	1.80	1.21	4.16	1.85	3.31	2.90	7.27

Source: 2009 FERC Form 423 and Information Response 8

C. Recommendations

Recommendation III-1 **Duke Energy Ohio should continue to be flexible in exercising "spot" purchases for Beckjord Station to take advantage of the highly liquid low-sulfur coal market. (Refer to Finding III-11.)**

Beckjord Generating Station uses low-sulfur coal. Low-sulfur coal, which is traded on the New York Mercantile Exchange (NYMEX), is a highly liquid commodity in Duke Energy Ohio's coal supply region.

Recommendation III-2 **Duke Energy Ohio should investigate the feasibility of purchasing a higher percentage of annual coal requirements through "contract" for Miami Fort and Zimmer Generating Stations. (Refer to Finding III-12 and Finding III-13.)**

Both Miami Fort and Zimmer Generating Stations use high-sulfur coal. The data indicates that the "contract" pricing for Miami Fort and Zimmer was fairly stable for 2008 and 2009, whereas "spot" pricing was significantly higher. These differences warrant further investigation.
Schumaker & Company consultants recognize that Duke Energy Ohio uses its active management process for managing all the elements of its risk portfolio which includes power, emission allowances, and coal being the major elements. Our analysis showed that, when looking at coal alone, there might have been a cost savings in having more coal under contract. Although to some this analysis might look like:"Monday Morning Quarterbacking", there are things that can nonetheless be learned for such look backs. Schumaker & Company consultants concern is that active management may only be taking a short term view of certain elements – i.e. these elements are only being managed through 2011 using active management at this time. We recognize that there are others reasons for the 2011 timeframe, one of the more significant being that the regulatory situation could change again in 2011. There can be an advantage to having a greater portion of coal under contract in that the supplier might be willing to offer better pricing in return for a guaranteed purchase of coal for a period of time. Schumaker & Company would like to see how this is factored into the active management model (CBM) during the next review..

Recommendation III-3 **Duke Energy Ohio should investigate why inventory levels at Zimmer Station remained high during 2009 and should take steps to adjust inventory to meet internal policy. (Refer to Finding III-17.)**

Excluding the month of November, the inventory level at Zimmer Station remained at a level of 0.7 to 1.6 days burn above Duke Energy Ohio's upper inventory target level for March through December 2009. Schumaker & Company recognizes that the higher fuel inventory levels do not directly impact costs flowing through the FPP – i.e. costs only flow through as the fuel is consumed. However, higher inventory levels do impact an organization's working capital requirements so there is a financial benefit to not carrying any more inventory than necessary.

IV. Environmental Compliance

Schumaker & Company reviewed Duke Energy Ohio's environmental compliance activities because they relate to fuel procurement and utilization. This review included: (1) compliance with existing environmental regulations and (2) preparation for compliance with any proposed or newly enacted environmental regulations. We addressed the following environmental compliance-related issues:

- The impact compliance activities had on the company's fuel procurement strategy as well as the type and cost of fuel that was actually purchased
- The overall emission allowance management strategy, including any emission allowance transactions in which the company participated
- The methods used to analyze compliance options and develop overall mitigation strategies

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A. Background

All operators of electric generating stations are subject to environmental regulations. Electric generating stations, when originally built, had been designed to meet the then current environmental regulations. During the ongoing operation of the generating station, newly modified regulations can come into existence that may have necessitated an additional level of compliance from that which was originally built in to the design of the generating station. Compliance with these new regulations is usually accomplished in one of two ways, specifically:

- *Physical or Operational Plant Modifications* – changes in existing equipment or the addition of new equipment to meet the new environmental regulations and/or a change in the operation of the plant such as hours of operation, fuel sources, etc.
- *A Trading Activity (Emissions Trading)* – emissions trading (also known as cap and trade) is an administrative approach used to control pollution by providing economic incentives for achieving reductions in the emissions of pollutants.

A central authority (usually a governmental body) sets a limit, or *cap*, on the amount of a pollutant that can be emitted. Companies or other groups are issued emission permits and are required to hold an equivalent number of *allowances* (or *credits*), which represent an authorization to emit a specific amount of a particular pollutant. The total amount of allowances and credits cannot exceed the cap, limiting total emissions to that level. Companies that need to increase their emission allowance must buy credits from those who pollute less. The transfer of allowances is referred to as a trade. In effect, the buyer is paying a charge for polluting, while the seller is being rewarded for having reduced emissions by more than was needed. Thus, in theory, those who can reduce emissions most cheaply will do so, thereby achieving the pollution reduction at the lowest cost to society.

B. Findings and Conclusions

Finding IV-1 Duke Energy Ohio's plants are currently in compliance with existing environmental regulations.

Two of the three coal-fired generating stations, Miami Fort and Zimmer, have been originally designed or retrofitted with scrubbers (SO_2 removal) and SCRs (NO_X mitigation). As a result, they permit those units to burn higher-sulfur coals while being in compliance with current environmental regulations. The remaining coal-fired plant (Beckjord) is required to burn lower-sulfur coal (1% coal) in order to be in compliance at this time. Beckjord is currently equipped with precipitators to address particulates but no scrubbers. Beckjord Units 1, 2, and 3 have currently been placed in an extended outage, with only Units 4, 5, and 6 being operated.

Finding IV-2 Based on the expected burn at each of these plants, the appropriate emission allowances need to be acquired.

The Duke Energy Ohio Portfolio Risk Management group is responsible for acquiring and applying the necessary environmental credits based on the expected burn from each individual generating unit. The Energy Cost Manual includes an allowance for any necessary environmental costs that need to be factored into the offer made to MISO for the operation of each unit.

Finding IV-3 Duke Energy Ohio is aware of and is monitoring potential regulations that could have an impact on future operations of the coal-fired plants.

Although nothing is definitive at this time, Duke Energy Ohio is aware of the ongoing discussion regarding potential future greenhouse gas regulations that could have an impact on all coal-fired plants. If such regulations materialize within the next several years, Duke Energy Ohio will need to develop a plan for conforming to them.

In addition, due t0 the coal fly ash slurry spill incident that occurred at a Tennessee Valley Authority (TVA) fossil plant when an ash dike ruptured at an 84-acre solid waste containment area at the TVA's Kingston Fossil Plant in Roane County, Tennessee, the coal-fired power plant uses ponds to dewater the fly ash. During the TVA incident, 1.1 billion gallons of coal fly ash slurry was released making it the largest fly ash release in United States history. If new regulations arise as a result of this incident, Duke Energy Ohio coal-fired plant operations could be impacted, although Duke Energy Ohio plants do not necessarily use a coal slurry design for handling fly ash. Rather, the fly ash is hauled to the disposal location in a dry state.

C. Recommendations

None

V. Midwest ISO-Related Charges

This chapter discusses MISO related charges. In particular, our review included a review of net congestion costs/revenues and net marginal losses. This audit will:

- Review and determine to what degree Duke Energy Ohio has control over these costs.
- Investigate and report on the Duke Energy Ohio management practices used to ensure these costs are minimized, including an investigation of its Financial Transmission Rights (FTR) portfolio and its strategy of obtaining and maintaining FTRs used to hedge congestion costs.
- Evaluate and report on the trend in costs since the inception of Midwest ISO Day 2 markets.
- Identify issues and propose recommendations for Duke Energy Ohio to minimize these costs.

A. Background

As previously discussed, Duke Energy Ohio is a member of the Midwest Independent System Operator (MISO). As a member of MISO, Duke Energy Ohio is obligated to sell the output from its generating units to MISO and to buy the electricity to serve its load from MISO at market rates. MISO's original responsibilities pertained to the regional planning and coordination of transmission facilities. However, since the beginning, MISO's role has evolved into the development of energy markets and an ancillary services market such that this evolution of the scope of MISO can be depicted as:

- Day 1 (starting in February 1, 2001) – Effective regional planning and transparent access to the transmission system.
- Day 2 (starting April 1, 2005) – Independent and transparent energy markets and improving operational efficiencies
- Day 3 (starting June 6, 2009) – Development of new products and services referred to as the Ancillary Service Market.

B. Findings and Conclusions

Finding V-1 **Duke Energy Ohio has developed a detailed process for monitoring MISO charges.**

MISO charges are handled through various settlement statements as shown in *Exhibit V-1*. There are five statements issued on a daily basis.

Exhibit V-1
MISO Settlement Process

S1	Internal statement created within Duke Energy Ohio – not from MISO
S7	Internal statement created within Duke Energy Ohio for comparison to 1st MISO statement
S14	MISO generated statement, first financially binding statement
S55	MISO generated statement that is financially binding
S105	MISO generated statement that is financially binding

Source: Information Response 44 and Interview 2,3,4,5

The S1, S7, S14, S55, and S105 statements represent activity from an operating day. For example, on February 2nd, Duke Energy Ohio personnel review the S1 for February 1st, on February 8th they review the S7 for February 1st, and on February 15th they review the S14 for February 1st, etc.

The S1 is not from MISO but is an internally generated calculation for the estimated value for the operating day. The S7 is the first MISO provided statement that can be compared the S1. Duke Energy Ohio uses the S1 to compare to the MISO S7 to identify any disagreements which could result in a dispute. The MISO S14 is the first financially binding statement – i.e., MISO is paid based on this statement and generators are paid by MISO based on this statement. Duke Energy Ohio compares these values to the previously issued S7 to ensure agreement with all the values to identify any issues to dispute. Any remaining disputed amounts end up being settled on the S55 and S105. When the S55 is received from MISO, Duke Energy Ohio compares these values to the S14. The S55 are also financially binding and Duke Energy Ohio settles cash on an incremental basis. When the S109s are received, Duke Energy Ohio compares these values to the S55 to ensure agreement on the values to identify any issues that can be disputed. The S105s are also financially binding and settled on the incremental value.

Finding V-2 Duke Energy Ohio effectively uses its Financial Transmission Rights (FTR) to hedge against Day-Ahead congestion.

MISO is composed of both a Day-Ahead (DA) and Real-Time (RT) market for energy. Approximately 90% or more of the revenue is exchanged in the DA market. Generator offers and demand bids are due by 1100 EST the day before and the results are back by 1600 EST the day before. MISO operates based on a concept of Locational Marginal Pricing (LMP) which translates into the formula:

LMP = Energy + Congestion +Losses

These are LMPs for each energy producing location (generating station) and LMPs for each load consuming location (such as an electric utility service area). Each generating stations has an LMP which is composed of the above three components. Energy is derived from the generating stations heat curve and congestion and losses are characteristics of the transmission system and expected load flows which MISO is responsible for determining for each location.

Duke Energy Ohio uses its CBM to analyze its options regarding FTR. This Duke Energy Ohio position regarding FTR is managed in a similar manner to how all of the other products (energy, coal, emission allowances, etc.) are handled.

Finding V-3 Duke Energy Ohio exercises what control it has over MISO imposed charges through its participation on MISO committees.

Duke Energy Corporation is a Transmission Owning member of the Midwest ISO and a signatory to the Transmission Owners' Agreement. Duke Energy Ohio via the Midwest Commercial Generation group (CAMS) actively participates in and/or monitors the following MISO committees, work groups and task forces.

1. Advisory Committee
2. Market Subcommittee
   a. Revenue Sufficiency Guarantee Task Force
   b. Supply Adequacy Working Group
   c. FTR Working Group
   d. Minimum Generation Task Force
   e. Demand Response Working Group
   f. Market Settlements Working Group
3. Planning Advisory Committee
   a. Loss of Load Expectation Working Group
   b. Interconnection Process Task Force
4. Reliability Subcommittee
5. Steering Committee
6. RECB Task Force
7. Tariff and Business Practices Subcommittee
8. Stakeholder Goverance Working Group

Each committee has a written charter which identifies the committees mission statement, sunset provisions, meeting frequency, quorum and voting requirements, membership, and deliverables. Some of these groups and many of the other committees, working groups, and task forces are attended by other representatives of Duke Energy. Each MISO meeting has a posted agenda and a packet of discussion materials that Duke Energy Ohio personnel review to asses any potential impact. Duke energy Ohio coordinate any response as a member of the specific committee.

Duke Energy Corporation is a Generation Owning member of the PJM Interconnection, LLC and a signatory to PJM Operating Agreement. Duke Energy Business Services on behalf of Duke Energy Ohio via CAMS actively participates in and/or monitors numerous PJM committees, work groups and task forces.

C. Recommendations

None

VI. Power Plant Performance

Schumaker & Company has reviewed and reported on significant plant outages or other declines in the operating availability, equivalent availability, or capacity factors of major generating plants and their impact on ratepayers in the form of higher fuel or purchased power costs. As a result of that review, we have either made a recommendation to the Commission that further review is needed or have suggested Duke Energy Ohio undertake its own review to determine the reasonableness of its action. In addition, we conducted an onsite investigation of one of Duke Energy Ohio's generating stations (Zimmer) and reported the resultant findings, conclusions, and recommendations. Items to be covered during the station visitation include, but are not limited to, the following: fuel handling and quality control (i.e., weighing, sampling, scale calibrations, etc.), inventory surveying methodologies and results, performance monitoring (i.e., heat rate), and maintenance.

A. Background

When an electric utility cannot generate enough energy with its own facilities to supply customer demand, it is said to be "short" of generation. Under such circumstances, it needs to purchase power from the market. A utility can be "short" for a number of reasons, but typically such a situation arises when a generating facility is not available because of either a planned or unplanned outage. Likewise, when a utility has more generating capacity available than is required to meet its customer demand, it is said to be "long" on generation. In this case, it can sell its excess capacity to the market.

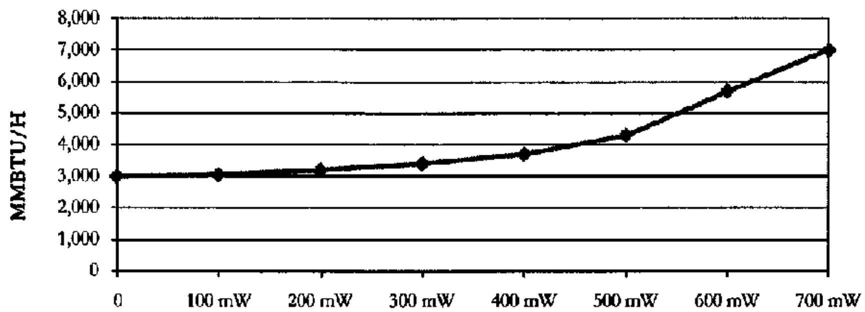
Utility Economic Dispatch 101

To completely understand some of the issues in this area, one must have a working knowledge of power plant operating characteristics. One must also understand how power plants are loaded to conform with the principles of economic dispatch.

Power Plant Models

All power plants can be modeled via an input-output curve or, in the case of thermal plants, by what is called a heat curve, as shown in *Exhibit VI-1*.

Exhibit VI-1
Input-Output Curve



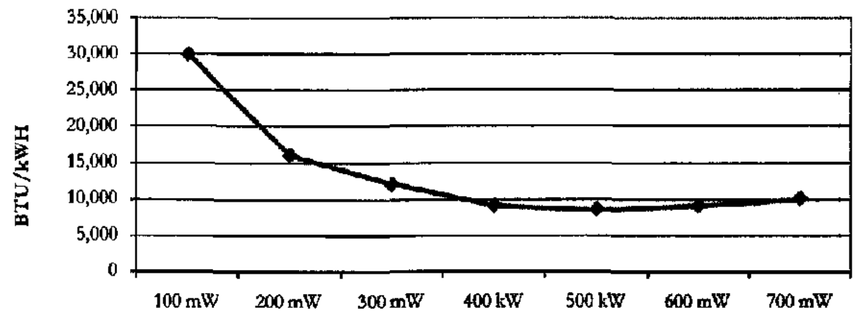
Source: Schumaker & Company Illustration

The industry practice is to obtain test results from various turbine throttle valve settings (valve point data) and to then model the unit's input-output curves as a smooth polynomial function (F):

$$F(P) = A + (B * P) + (C * P^2) + (D * P^3)$$

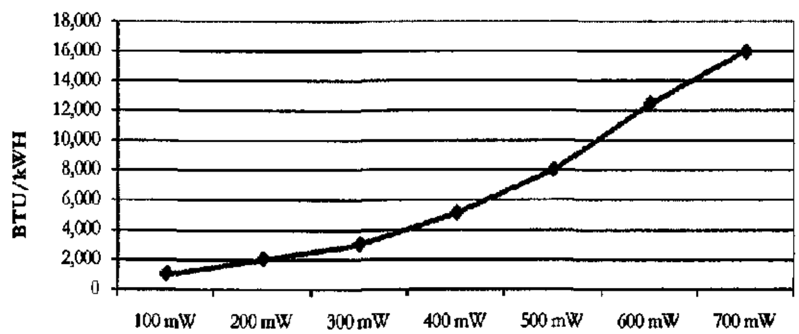
where F is the unit's thermal input in million BTU per hour (MMBtu/hour); P is the unit's net output power in megawatts (MW); and A, B, C, and D are constants obtained by curve fitting to the valve point data (discussed above). Once this input-output curve has been developed, two additional curves can be represented: specifically, the unit's average heat curve, as shown in *Exhibit VI-2*, and the unit's incremental heat rate curve, as shown in *Exhibit VI-3*, both of which are represented in BTU per kilowatt hour (BTU/kWh). In mathematical terms, the unit's incremental heat rate curve is the first derivative of the unit's input-output curve or heat curve.

Exhibit VI-2
Average Heat Curve



Source: Schumaker & Company Illustration

Exhibit VI-3
Incremental Heat Curve



Source: Schumaker & Company Illustration

The input-output curve shown in *Exhibit VI-1* is for "best conditions" (i.e., when the unit's components are at their best thermodynamic performance levels and the unit's human operator is performing his or her duties as best he or she can). If any component or the operator is performing at less than best, then for each output level, the unit will consume more heat input than that which is shown in *Exhibit VI-1*.

One example of the impact of the operator's performance is the control of "excess air." Normal atmospheric air is approximately 20% oxygen (O_2). Each boiler fuel has some minimum amount of oxygen necessary to complete combustion. Typical boiler design is such that the hot exhaust gas from a boiler should be at about 2% oxygen (O_2). Levels of O_2 that are less than 2% generally indicate the inefficiency of less-than-complete fuel combustion. They may also may indicate the risk of a build-up of carbon monoxide gas (CO)—a situation that can result in a catastrophic explosion of the boiler. On the other hand, levels of O_2 that are higher than 2% generally indicate the inefficiency of excess air input to the boiler. The excess air mass consumes extra fuel by being uselessly heated. In addition, the excess air is accompanied by higher-than-necessary gas flow velocities in the boiler, thereby bringing the hot gas in contact with the boiler's tubes for a shorter time than is optimal and transferring less heat content to the boiler's fluid.

Many utilities have operator-performance monitoring programs that monitor plant performance over a period of time. For instance, for a certain period of time a unit is monitored and a computer calculates what its input heat consumption could have been, under best operator performance, versus what its actual heat consumption was for the operator's shift. The difference in heat is priced at the fuel's cost rate and the dollar value of that difference is brought to the operator's attention as part of a continuous operator-performance training program.

At some utilities, the monitoring of the thermodynamic performance of a unit's components is the responsibility of Results Engineering. One example of a results engineer's work is condenser back pressure. The spent fluid, which has passed through the unit's turbine, is then passed through a condenser to reduce its heat content and, in turn, its volume. (The reduced volume fluid takes less energy to be pumped back into the boiler to repeat the work cycle.) As the condenser ages in service, it "fouls" (i.e., undesirable material builds up around its tubes). This buildup results in a reduction in the condenser's heat-transfer capabilities, a decrease in the unit's fluid volume reduction, and an increase in the condenser's back pressure. The turbine sees a net pressure head equal to the difference between the boiler's output forward pressure and the condenser's input back pressure. Thus, the turbine extracts less energy from the same unit expenditure of fuel.

The results engineer monitors the performance of the unit's components (like the condenser) and calculates the optimal time to take each component (or the entire unit) out of service for maintenance to restore best-condition performance efficiency. The optimal time is when the present value of the savings from restored performance exceeds the investment cost of the maintenance procedure.

All of these activities occur at the power plant, but the results (performance curves, etc.) are used within power plant dispatching to ensure proper economic dispatch, as discussed in the next section.

Power System Models

Economic dispatch of power plants is the real-time control process of an electric utility's units whereby customer demand is matched by generation supply in the least costly (optimal) way possible. The instantaneous consumption of electricity by individual utility customers is variable and volatile. Taken together, the sum total of the customer consumption is the demand the utility must match. Since electricity cannot be stored, the utility must then control, at each moment in time, the output supply from all of its generation units. That way, it can match the demand plus set aside a small additional amount for the power lost in transmission between the generation plants and the customers. This control process—matching the supply with the demand—is called "regulation."

Each interconnected utility, in negotiation with its neighbors, has established its "control area," which will generally conform to its franchise service territory. The utility installs instrumentation to measure the power flows on each transmission line that interconnects its control area with any other utility's control area. These interconnection transmission lines are called "tie-lines." Each utility has a facility, called a "control center" or a "dispatch center," where the tie-line measurements are received and interpreted by the utility's system controllers, coordinators, or dispatchers. The system controllers are people who, assisted by a real-time computer system, monitor the utility's match between demand and supply by observing the net (sum total) tie-line flow. They observe that:

- If the net tie-line power flow is zero, then the customer demand within the control area is exactly matched by the utility's generation supply.
- If the net power flow is positive (out), then supply exceeds demand and generation needs to be reduced.
- If the net power flow is negative (in), then demand exceeds supply and generation needs to be increased.

Another indicator of the utility's matching of demand by supply is the instantaneous rate of change in alternating current (AC) frequency shown by the system. If demand exceeds supply, then kinetic energy will be drawn out of the synchronous alternators to make up the shortage. The alternators will then slow down and cause a decrease in system frequency. If supply exceeds demand, then kinetic energy will be built up in the machines and system frequency will increase. This frequency behavior, coupled with the net tie-line flow, provides a control indicator, called the system's Area Control Error (ACE) signal. The ACE is calculated as a linear combination of the net tie-line flow and the system frequency departure.

Unit Running Costs

A utility's control center continually acts to match the customer demand with generation supply, but with many units available, this match can be made in many different ways. Suppose the utility needs one more megawatt of generation output to achieve match. Which of its several units should be selected to increase its output by one MW? The answer is whichever unit can provide the cheapest next one megawatt.

As previously discussed above, a thermal unit has an input-output function, F, such that for an output of P megawatts, the unit consumed an input of F(P), measured in MMBtu/H. Each unit has a cost for fuel that can be represented as \$/MMBtu, which in turn can be represented as *f*. Therefore, the cost rate incurred when we generate P megawatts is *f*(F(P)), measured in \$/H. Similarly, for P+1 megawatts, it is *f*(F(P+1)). The cost rate of the extra one MW is therefore *f*(F(P+1) – F(P))/1 MW, measured in \$/MWh. Carried to the logical limit, this means that the marginal cost rate for any small increase in power output is the derivative of *f*(F(P)) (i.e., *f*(F'(P))), where F' is the unit's incremental heat rate.

The application of the thermal units' marginal cost rate, *f*(F'(P)), is as follows:

- Whenever regulation requires an increase in generation to match load, the system controller (or coordinator or dispatcher) should dispatch (assign or allocate) that increase to whichever unit has the lowest marginal cost rate.
- Whenever regulation requires a decrease in generation, that decrease should be dispatched to whichever unit has the highest marginal cost rate.
- Whenever regulation indicates that no change in generation is needed and two generation units have different marginal cost rates, then the dispatch function should decrease the more expensive unit and increase the cheaper unit. Doing so will keep the total size of the generation the same but will save the cost difference between the two units.

In short, this dispatch procedure will eventually cause each unit to achieve an identical marginal cost rate.

System Lamba

The end result of having every generation unit at an identical marginal cost rate is so significant to the operation of a utility that it is useful to derive that result from a formal point of view. Consider a utility with several generation units available. Number them 1, 2 , ..., N. The customer demand, D, must be matched by the units' sum total generation. That is:

$$D = P_1 + P_2 + \ldots + P_N$$

where P_i is the net power output from the i[th] unit.

The cost rate to the utility to match the demand is C:

$$C = f_1(F_1(P_1)) + f_2(F_2(P_2)) + \ldots + f_N(F_N(P_N))$$

where f_i is the fuel cost rate for the i[th] unit and F_i is that unit's input-output function.

The question is: What values of $P_1, P_2, \ldots, P_N$ should we select to minimize the cost rate C? Using the technique of Lagrange Multipliers, these equations can be solved, but such calculations fall beyond the scope of what needs to be discussed here. Because this classic derivation of the necessary condition for thermal unit fuel-cost optimization involves the Lagrange Multiplier, "lambda," the industry has come to speak of the result as "system lambda."

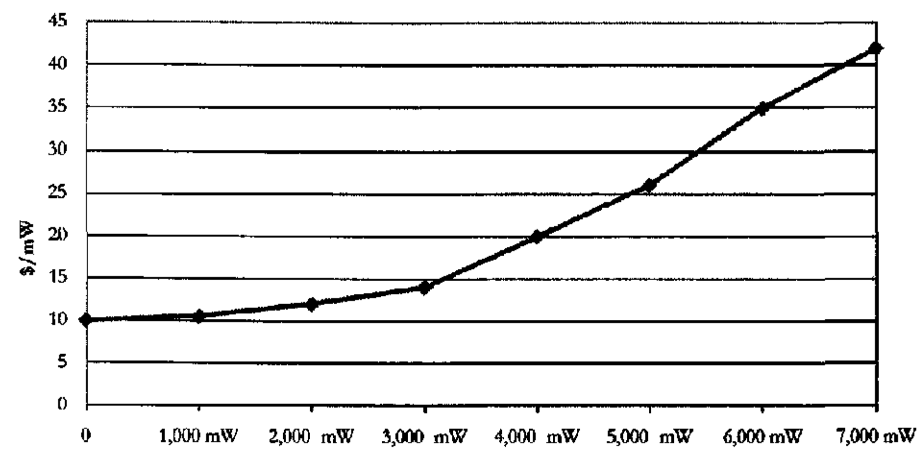
System lambda (λ) is a marginal cost rate, in \$/MWh, for the production of electrical power. System lambda is the marginal cost rate for the entire utility production system because the mathematical result is every unit being at an identical marginal cost rate, or λ.

There are exceptions to the "every unit at system lambda" rule. These are:

- ***High Limit Units*** – A unit whose marginal cost is very low so that it would be desirable to generate additional power output from it, but which has already reached its point of maximum power output (i.e., every valve is wide open), will have topped out at a marginal cost rate below system lambda.
- ***Low Limit Units*** – A unit whose marginal cost is very high so that less power output is desired from it, but which has already reached its point of minimum power output (i.e., to go lower would require shutdown to remove the unit from the system), will display a marginal cost rate above system lambda.
- ***Load Support*** – In some cases, a unit may be required to support the load within the given areas for load or transient instability support.

One result of these solutions is the determination of the utility's system lambda vs. load curve, as shown in *Exhibit VI-4*. Note that lambda is a monotonically increasing function of load (i.e., each extra block of power costs more than the blocks that preceded it). Thus, economic dispatch adds power in layers of increasing cost.

Exhibit VI-4
System Lambda Curve



Source: Schumaker & Company Illustration

Utilities management of response to increase incremental costs is the essence of what economic dispatch is all about. It needs to be based on sound engineering as well as financial principles and data being integrated into real-time computer systems. Such a foundation provides real-time traders and dispatchers with the ability to properly operate the electrical system so as to minimize costs.

Plant Performance Availability

The Net Capacity Factor (NCF) is a measure of the loading or usage of an electric generating unit. It is defined as follows:

$$NCF = \frac{\text{Net Actual Generation (NAG)} \times 100\%}{(\text{Period Hours (PHs)} \times \text{Net Maximum Capacity (NMC)})},$$

where:

- NAG is the actual electrical output by the unit during the period being considered, net of any electrical usage by the plant
- PH is the time period over which the electrical output is measured
- NMC is the capacity the unit can sustain over a specified period, when not restricted by ambient conditions or equipment deratings, minus the losses associated with station service or auxiliary loads

NCF is a measure of the usage of a generating unit over a period of time. The key factors determining the usage of that unit are:

1. The availability of the unit to operate
2. The need for the electrical energy that can be generated
3. The economic costs associated with the electrical energy (i.e., Is the unit "in the money" compared to other generation sources?)

The first item above deals with the availability of the unit to operate, and the industry has developed another factor specifically measuring that component of capacity factor. This factor is referred to as the Equivalent Availability Factor (EAF) which is defined as;

$$EAF = \text{Available Hours (AHs)} - (EUDH + EPDH + ESDH)/\text{Period Hours (PH)} \times 100\%,$$

where:

- AH is the sum of hours the unit was operating in a period.
- EUDH – Equivalent Unplanned Derated Hours – is the product of the unplanned derated hours and the size of the reduction divided by the Net Maximum Capacity.
- EPDH – Equivalent Planned Derated Hours – is the product of the planned derated hours and the size of the reduction divided by the Net Maximum Capacity.
- ESDH – Equivalent Seasonal Derated Hours – is the product of the planned derated hours and the size of the reduction divided by the Net Maximum Capacity.

Although this may appear to be a fairly complicated formula, it can be more succinctly shown in the following example.

If a 400 MW unit (400 MW Net Maximum Capacity) is generating 300 MW to meet a load requirement but incurs a partial derating of 40 MW for an hour, then:

$$EAF = (400 - 40)/400 \times 100\% = 90\%$$

$$NCF = 300/400 \times 100\% = 75\%$$

Another way of looking at these factors is that they represent the average of all the hourly NCFs and EAFs over any given time period.

In summary, EAF is a clearer representation of the availability of the unit to serve load as a result of proper management of operating and maintenance procedures. In contrast, NCF, although a partial indication of operating and maintenance procedures, also includes the impact of items 2 and 3 above. If a plant is shut down for an outage during that time period, EAF and NCF are both 0 for the outage time period. Generally, it would be expected that EAF would always be a larger number than NCF.

B. Findings and Conclusions

Finding VI-1 Duke Energy Ohio has developed and maintained an Energy Cost Manual that forms the basis for the dispatching curves.

The Energy Cost Manual is essentially an Excel spreadsheet workbook that has been developed over a number of years. It contains the information necessary to model plant heat curves in the form of the polynomial equations discussed in the background above. The Energy Cost Manual deals primarily with the variable costs that change with the operation of the unit (i.e., fixed costs are excluded). The dispatch curves include additional items such as actual fuel, coal tax credits, SO_2 allowances, lime and limestone, and HG allowances, such that the actual equations are actually of the form:

> \$/HR = Fuel + Tax Credits + SO_2 Allowances + Limestone + Mercury (HG) Allowances + NOx Allowances + Ammonia + VOMC/HR + VOMC/MWh,
>
> Where VOMC/HR is the variable operations and maintenance costs capital and VOMC/MWh is the variable operations and maintenance costs.

Not all of these factors are necessarily applicable at this time to each unit for example mercury allowances. Where applicable, however, a separate representation (formula) is incorporated to account for these costs, if they might become a requirement.

These overall input-output equations do change over time for a unit, the exception being if the unit were to undergo extensive modification and/or upgrades. Changes that occur to the unit over time are accounted for through the application of a Thermal Performance Factor (TPF), which takes into account two primary considerations, specifically:

- A shape factor – the seasonal variation in performance due to primarily seasonal temperature and humidity changes
- A degradation factor – to account for the degradation in unit performance based on operating time between major overhauls.

The TPF is adjusted for each unit at the beginning of the year. In additional, the unit startup costs, unit no load operating costs, and minimum and maximum loads are maintain in the Energy Cost Manual. The Energy Cost Manual forms the underlying source data for the MISO Resource Offer, which is submitted to MISO for each operating day of the year. In essence, information from the Energy Cost Manual can be copied and pasted into the nMarket, which is the system used for submitting Resource Offers to MISO.

Finding VI-2 Power plant performance monitoring is proceduralized and being performed by procedures.

Schumaker & Company consultants reviewed generating station performance monitoring programs. In particular, on the Zimmer stations visit, we reviewed the use of the maintenance management program (Maximo) that is currently in use at the plant to manage all maintenance activities. Maximo is currently in the process of being upgraded to a later version of the software. An older version is currently being used within Duke Energy Ohio.

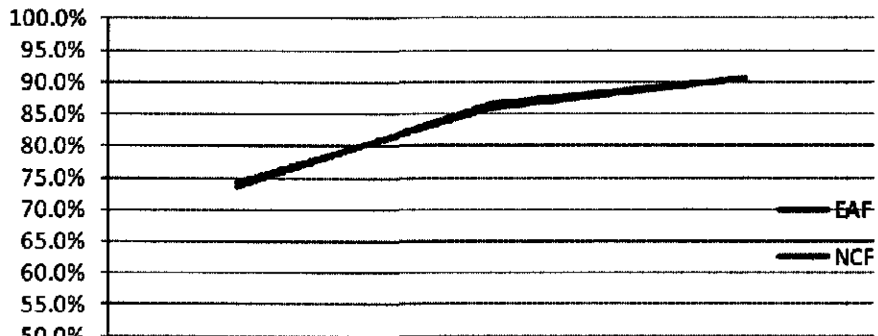
We obtained the Zimmer Condition-Based Maintenance 2009 Schedule, which identifies the frequency for all the tests, such as infrared thermography and vibration testing equipment. We requested a couple of sample results (written reports showing the testing results) from this schedule to verify that these activities are being performed.

Finding VI-3 Power plant availabilities have been reasonably good with the exception of the Zimmer plant.

The equivalent availability and net capacity factor for Miami Fort Units 7 and 8 are shown in *Exhibit VI-5*. As a point of reference, each week a unit is down for maintenance, the equivalent availability and net capacity factor is lowered by approximately 2%. Because most units that are operated fairly consistently usually require anywhere from a two- to six-week outage each year, those outages alone can lower EAF and NCF by anywhere from 4% to 12%. Thus, a 90% EAF coupled with a 90% NCF would indicated that the units were performing very well during the audit period. A small spread between EAF and NCF would indicate that these units are "in the money" pretty much all the time. Industry averages for generating stations, shown in *Exhibit VI-8*, further support this conclusion.

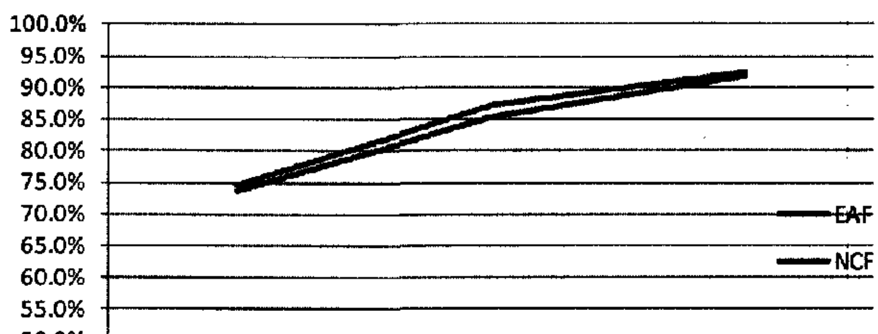
Exhibit VI-5
Miami Fort Plant Performance
2007 to 2009

Miami Fort Station - Unit 7



	2007	2008	2009
EAF	74.17%	85.83%	90.70%
NCF	73.60%	86.58%	90.63%

Miami Fort Station - Unit 8



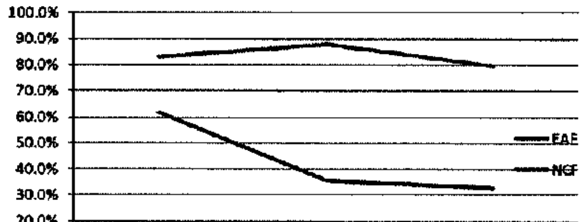
	2007	2008	2009
EAF	74.41%	87.09%	92.43%
NCF	73.61%	85.42%	91.75%

Source: Information Response 48

The performance of the Beckjord units is shown in *Exhibit VI-6*. These units did not perform as well as Miami Fort, and the spread between the EAF and NCF would indicate that they are not "in the money" as frequently as Miami Fort. Their equivalent availability factors are near industry averages. It should also be noted that Beckjord units 1 through 3 are currently in an extended shutdown beginning in 2010.

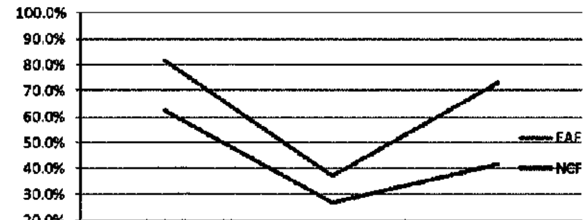
Exhibit VI-6
Beckjord Plant Performance
2007 to 2009

WC Beckjord - Unit 1



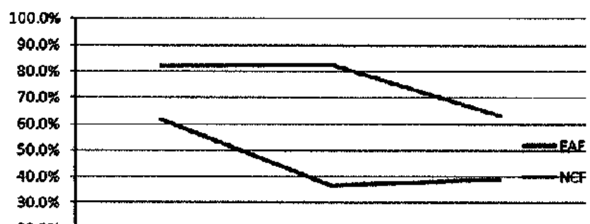
	2007	2008	2009
EAF	82.77%	87.92%	79.28%
NCF	61.72%	35.71%	32.43%

WC Beckjord - Unit 2



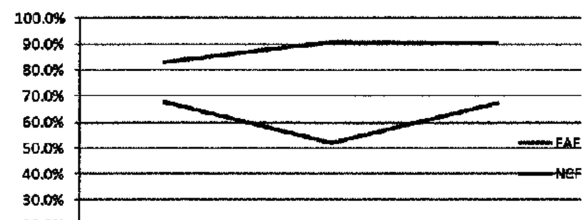
	2007	2008	2009
EAF	81.26%	37.12%	73.26%
NCF	62.39%	26.73%	41.76%

WC Beckjord - Unit 3



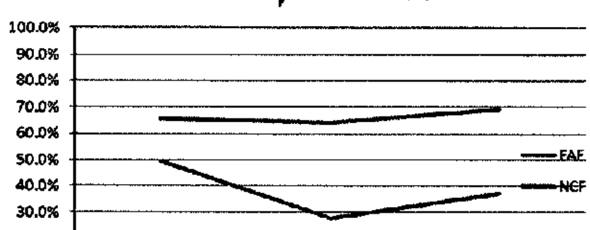
	2007	2008	2009
EAF	81.96%	82.46%	63.21%
NCF	61.90%	36.38%	39.10%

WC Beckjord - Unit 4



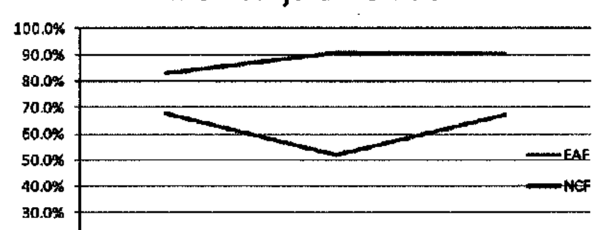
	2007	2008	2009
EAF	82.91%	90.77%	90.11%
NCF	67.56%	51.85%	67.14%

WC Beckjord - Unit 5



	2007	2008	2009
EAF	65.85%	63.96%	69.20%
NCF	49.44%	27.88%	37.03%

WC Beckjord - Unit 6

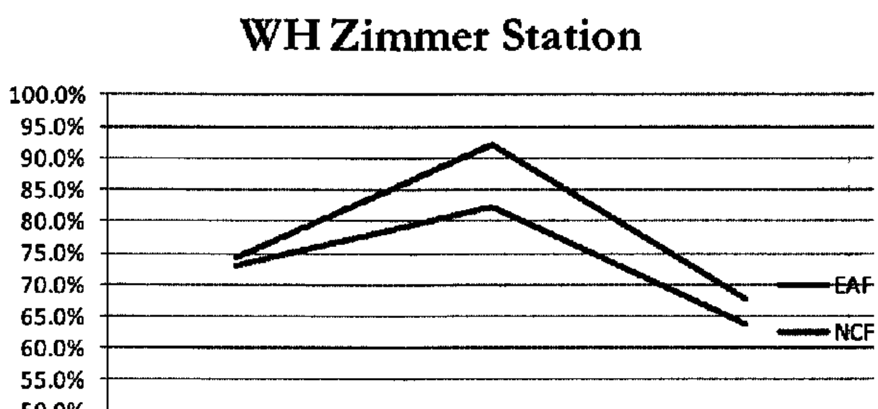


	2007	2008	2009
EAF	82.91%	90.77%	90.11%
NCF	67.56%	51.85%	67.14%

Source: Information Response 48

Zimmer's performance, shown in *Exhibit VI-7*, was impacted by a 10-week outage that occurred in the spring. Although the plant was originally scheduled for an extended outage in the fall, in the spring the low pressure turbine lost a blade, causing the unit to trip on high vibration. Based on that incident, the outage was taken in the spring instead of the fall. The outage resulted in a 21% reduction in EAF and NCF. Another 7% reduction in EAF and NCF was attributable to two instances of tube leaks, one in the reheat section and one in the bottom of the boiler. Our review of the generating station event logs did not identify any out-of-the-ordinary events for a typical generation station. Prior to the 2009 audit period, Zimmer had achieved reasonable EAF and NCF.

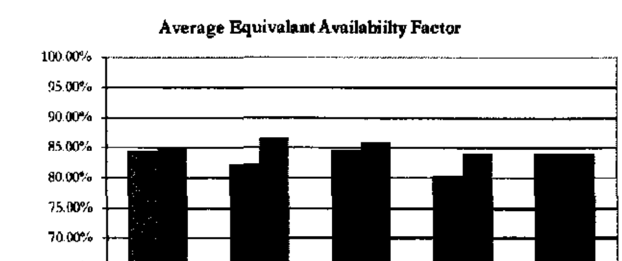
Exhibit VI-7
Zimmer Station Plant Performance
2007 to 2009



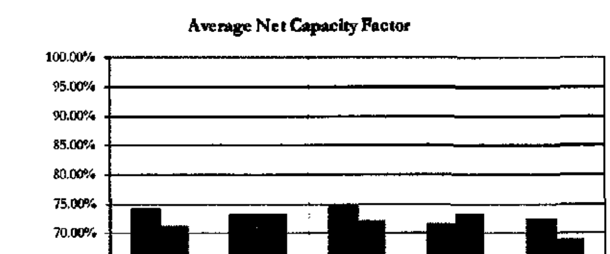
	2007	2008	2009
EAF	74.36%	91.99%	67.81%
NCF	73.00%	82.19%	63.79%

Source: Information Response 48

Exhibit VI-8
Industry Averages
2007 to 2009



	2004	2005	2006	2007	2008
■ 400-599 MW	84.28%	82.21%	84.38%	80.26%	83.98%
■ 300-399 MW	84.91%	86.61%	85.84%	83.97%	83.94%



	2004	2005	2006	2007	2008
■ 400-599 MW	74.16%	73.26%	74.82%	71.60%	72.49%
■ 300-399 MW	71.40%	73.23%	72.03%	73.31%	68.99%

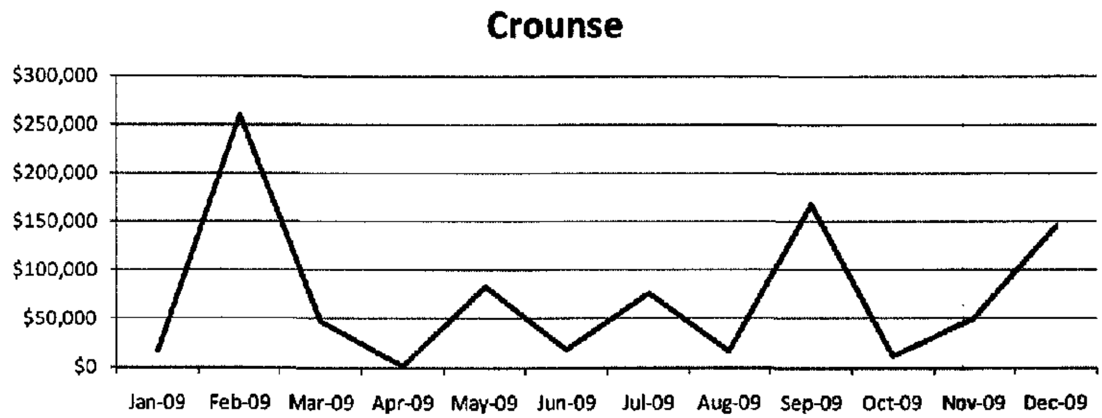
Source: North American Electric Reliability Corporation – Generating Availability Data System 8/21/2009 Garrpt 1 and Garrpt 2 reports

Finding VI-4 Demurrage charges have varied significantly over the audit period.

Demurrage is a charge incurred from the barge line if the barges are not offloaded in a timely fashion and returned to the barge line for use. Demurrage is usually assessed on a per barge per day basis beyond a certain grace period.

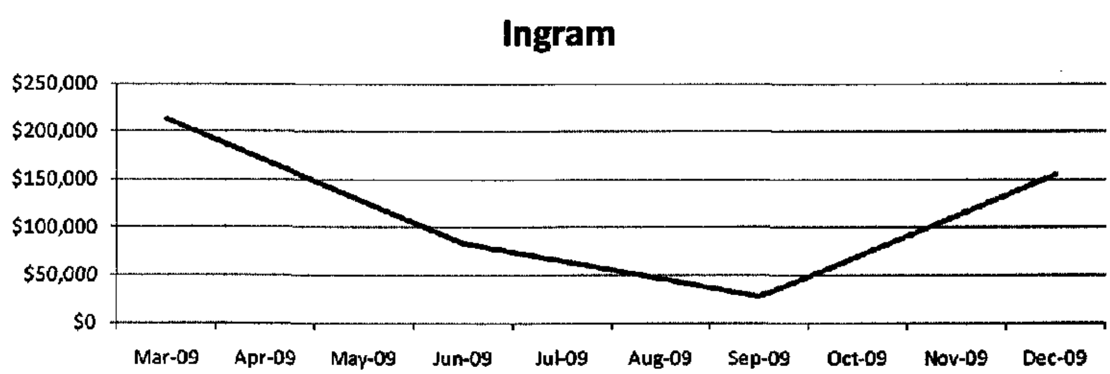
Duke Energy Ohio incurred approximately $1.4 million in demurrage charges during the audit period. There is a significant amount of variability in these charges (by month and/or by quarter) has shown in *Exhibit VI-9.*

Exhibit VI-9
Demurrage Charges
as of December 31, 2009



	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
Crounse	$16,381	$259,403	$46,488	$1,028	$83,492	$18,508	$76,639	$15,894	$168,104	$10,784	$50,887	$145,786

—Crounse



	Mar-09	Jun-09	Sep-09	Dec-09
Ingram	$212,295	$82,532	$27,663	$154,294

—Ingram

Source: Information Response 86

C. Recommendations

Recommendation VI-1 Investigate methods to lower demurrage charges being incurred. (Refer to Finding VI-4.)

Demurrage charges have varied significantly over the audit period from a high of $259,403 in February to a low of $1,208 in April for Crouse and somewhat similarly for Ingram. Although we would expect that these charges would vary somewhat, we would expect less variation with Duke Energy Ohio's emphasis on "active management" which, in a sense, would translate into a "just-in-time' approach in the manufacturing world.

VII. Power Interruptions

Schumaker & Company investigated and reported on any instances during the audit period in which customers' power supplies were interrupted or requested to be interrupted. This investigation included a review of the following topics:

- The cause(s) of the interruption
- Steps taken by Duke Energy Ohio to minimize the impacts of the interruption
- Efforts made to secure replacement power, if applicable
- The methodology employed to price the replacement power, if applicable
- Cost impacts resulting from the periods during which the interruptions occurred

A. Background

Schumaker & Company consultants investigated any major outages that occurred during the audit period. All generating plants experienced either full or partial outages during the audit period. Schumaker & Company consultants reviewed all of the event logs for each of the major generating stations.

B. Findings and Conclusions

Finding VII-1 **Our review of the event summaries for each of the major generating stations (Zimmer, Beckjord, and Miami Fort) did not identify any significant questionable outages.**

As already identified in *Exhibit VI-5*, Miami Fort units achieved high equivalent availability and net capacity factors during the audit period. As would be expected, our review of the Miami Fort event logs did not reveal any questionable repeated deratings or outages.

As already identified in our previous discussion (page 66), Zimmer was impacted by a 10-week outage that occurred in the spring. Although the plant was originally scheduled for an extended outage in the fall, in the spring the low pressure turbine lost a blade, causing the unit to trip on high vibration. Our review of the generating station event logs did not identify any out-of-the-ordinary events for a typical generation station. Prior to the 2009 audit period, Zimmer had achieved reasonable EAF and NCF.

As already identified in our previous discussion (page 65), the Beckjord units are not called on as much as is reflected in their lower net capacity factors. Our review of the generating station event logs did not identify any out-of-the-ordinary events for a typical generation station.

Finding VII-2 **Duke Energy Ohio undertook reasonable steps to secure replacement power for the Zimmer outage.**

Schumaker & Company consultants reviewed output from the Commercial Business Model and some of the decisions made around that time regarding the Zimmer outage. As new information on the extent of the outage was identified, that information was factored into the CBM analysis. The resulting output from the model was used by the risk managers to execute various actions to minimize the impact of the outage.

C. Recommendations

None

VIII. Alternative Energy Portfolio

This chapter discusses Duke Energy Ohio's activities in response to Administrative Code Chapter 4901:1-40.

A. Background

Chapter 4901:1-40 of the Ohio Administrative Code requires all electric utilities and electric services companies to develop an alternative energy resource portfolio, consisting of renewable and solar energy resources, according to annual benchmarks described in the Code. These requirements gradually increase from 2009 through 2024 and can be graphically represented as shown in *Exhibit VIII-1*

Exhibit VIII-1
Alternative Energy Portfolio Requirements

	In State	Out of State - Contiguous
Renewable Energy Sources – Wind/Biomass	0.125%	0.125%
Solar Energy Sources	0.002%	0.002%

Source: Administrative Code 4901:1-40

An electric utility can meet these requirements by owning and operating the appropriate alternative energy facilities and/or purchasing the appropriate Renewable Energy Certificates (RECs). RECs, also known as Green Tags, Renewable Energy Credits, Renewable Electricity Certificates, or Tradable Renewable Certificates (TRCs), are tradable, non-tangible energy commodities in the United States that represent proof that one megawatt-hour (MWh) of electricity was generated from an eligible renewable energy resource (renewable electricity). These certificates can be sold and traded or bartered, and the owner of the REC can claim to have purchased renewable energy. While traditional carbon emissions trading programs promote low-carbon technologies by increasing the cost of emitting carbon, RECs can incentivize carbon-neutral renewable energy by providing a production subsidy to electricity generated from renewable sources. It is important to note that the energy associated with a REC may be sold separately and used by another party therefore, the consumer of a REC may receive only a certificate.

In states that have a REC program, a green energy provider (such as a wind farm) is generally credited with one REC for every 1,000 kWh or one MWh of electricity it produces (For reference, an average residential customer consumes about 800 kWh in a month). The energy is then fed into the electrical grid (by mandate), and the accompanying REC can then be sold on the open market.

An attribute tracking system gives each REC a unique identification number to make sure it doesn't get double-counted. They are then made available to MISO members in MRET (Midwest Renewable Energy Tracking System) and to PJM members in GATS (Generation Attributes Tracking System). A report is issued by the Risk Management Trading Group that gives Duke Energy Ohio's position in meeting the Renewable Energy Credits Requirements.

Duke Energy Ohio actively addressed the Renewable Energy Requirements in 2009 by contacting prospective suppliers. The 2009 requirements shown in Exhibit VIII-2 were attempted to be met through the Risk Management Trading Group.

B. Findings and Conclusions

Finding VIII-1 Duke Energy Ohio had plans to meet its renewable requirements though 2011 by purchasing RECs.

The renewable energy strategy for Duke Energy Ohio has been developed by the Renewable Energy Strategy group which consists of one (1) FTE located in the Duke Energy Business Services (DEBS). This is currently a one person organization with that person currently retiring and another person taking over that responsibility in April 2010. An RFP for Renewable Energy Credits (REC) was issued from this organization in the June 2008 for third parties to provide qualifying facilities or RECs to fulfill Duke Energy Ohio's requirements. Duke Energy Ohio used this solicitation and other forms of direct contact to identify the availability of RECs for the 2009 through 2011 timeframe.

Duke Energy Ohio's current position regarding its renewable requirements is shown in *Exhibit VIII-2.*

Exhibit VIII-2
Renewable/Solar Positions
as of April 15, 2010

Summary Position Including Confirms

Ohio Solar	2008	2009	2010	2011
Requirement		(411)	(989)	(2,541)
Contracted		231	231	231
Confirmed	18	55	62	62
Net	18	(125)	(696)	(2,248)
Cumulative	**18**	**(107)**	**(803)**	**(3,051)**
Non Ohio Solar	**2008**	**2009**	**2010**	**2011**
Requirement		(411)	(989)	(2,541)
Contracted		500		
Confirmed	7	18	18	18
Net	7	107	(971)	(2,523)
Cumulative	**7**	**114**	**(857)**	**(3,380)**
Ohio Non Solar	**2008**	**2009**	**2010**	**2011**
Requirement		(25,286)	(48,476)	(82,143)
Contracted	47,202	50,000	50,000	50,000
Confirmed	(10,000)	(15,000)		
Net	37,202	9,714	1,524	(32,143)
Cumulative	**37,202**	**46,916**	**48,440**	**16,297**
Non Ohio Non Solar	**2008**	**2009**	**2010**	**2011**
Requirement		(25,286)	(48,476)	(82,143)
Contracted		20,102		
Confirmed		68,797		
Net	0	63,613	(48,476)	(82,143)
Cumulative	**0**	**63,613**	**15,137**	**(67,006)**

Notes: Requirement: The number of RECs Duke needs to comply
Contracted: The number of RECs Duke has signed contracts
Confirmed: The number of RECs Duke has agreements to procure but not a signed contract
Source: Information Response 116

Finding VIII-2 Duke Energy Ohio was not able to totally meet the 2009 requirements.

On April 15, 2010, Duke Energy Ohio filed its Alternative Energy Portfolio Status Report in which it described its difficulties in meeting the 2009 benchmarks (specifically with respect to achievement of the In-State Solar benchmark) and requested certain modifications to the application of the code. In particular, Duke Energy Ohio is

- Seeking an adjustment to its energy baseline [redacted] within the Duke Energy Ohio service territory [redacted] which effectively [redacted] rules in the Administrative Code.

- Requesting a limited, one time, waiver of certain rules in the Administrative Code to allow Duke Energy Ohio to count toward compliance certain SRECs in order to show compliance

C. Recommendations

Recommendation VIII-1 Develop a plan for meeting requirements for 2010 and beyond 2011. (Refer to Finding VIII-1)

Schumaker & Company consultants recognize that these requirements have only come into existence within the last year. The fact that Duke Energy Ohio was unable to achieve compliance is of concern but of a bigger concern is that fact that in each of the next years, the requirements essentially double. As shown in *Exhibit VIII-2*, the increase in the percentage requirements each year results in an almost doubling of the requirements. In Duke Energy Ohio's Alternative Energy Portfolio Status Report, Duke Energy Ohio submitted an outline of its Renewable Energy Compliance Strategies which reiterated the requirement of the administrative code specifically:

"This plan to be filed by April fifteenth of each year, shall include at latest the following items:

1. Baseline for current and future calendar years
2. Supply portfolio project, including both generation fleet and power purchases
3. A description of the methodology used by the company to evaluate its compliance options
4. A discussion of any perceived impediments to achieving compliance with required benchmarks, as well as suggestions for addressing any such impediments"

In short, Duke Energy Ohio has really not submitted a plan in their status report that shows that they will be able to achieve the benchmarking but more a discussion of why they cannot develop a plan at this time.

Duke Energy Ohio should concentrate on developing a plan which looks at various scenarios such as :

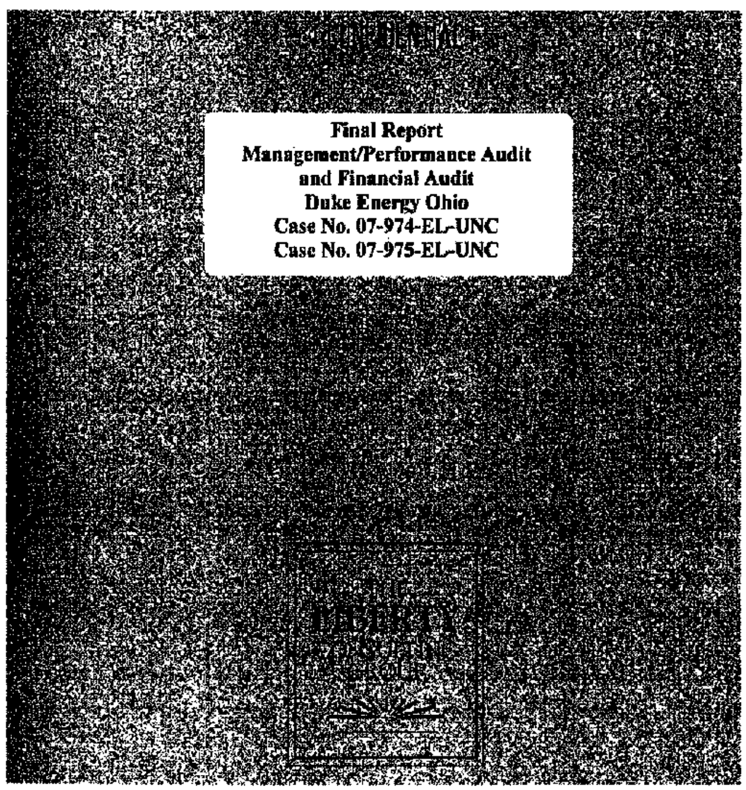
- Duke Energy Ohio has indicated [redacted] analysis?
- Baselines – According to the administrative code, the 2010 baseline would [redacted] Duke Energy Ohio needs to look at [redacted]

IX. Liberty Report Follow-Up

A. Background

The Liberty Consulting Group (Liberty) was awarded a contract by the Public Utility Commission of Ohio to conduct an audit of Duke Energy Ohio's FPP and SRT for the period spanning July 1, 2007 through December 31, 2008. Liberty issued its final report on May 15, 2009 (see *Exhibit IX-1* below).

Exhibit IX-1
Liberty Consulting Group Audit Cover
as of May 15, 2009



Source: Information Response

Subsequent to the final report, various issues about Liberty's recommendations were raised by the following parties:

- Duke Energy Ohio
- The Office of Ohio Consumers' Counsel (OCC)
- Ohio Energy Users Group (OEG)
- Ohio Partners for Affordable Energy (OPAE)
- Commission Staff

On August 28, 2009, all parties agreed to twenty-two (22) stipulations to resolve the issues. Updates for all the stipulations are provided below.

B. Findings and Conclusions

Stipulation 1 – Margins Associated with Coal Sales Allocations

"The parties agree that during the audit period beginning July 1, 2007 and ending December 31, 2008, margins associated with coal sales for Rider FPP should be allocated based on the generation ratio share between standard service offer (SSO) customers and non-SSO customers. The resulting adjustment of $5.7 million in margins that should be allocated to the non-SSO share of generation is shown in Attachment 1. The parties further agree that Duke Energy Ohio shall refund to SSO customers $1.8 million associated with auction revenue rights for the period spanning January 1, 2008 through December 31, 2008, which were allocated to non-SSO customers. The net adjustment of the two issues is an increase to Rider PTC-FPP of $3.9 million, which shall be allocated to SSO customers evenly over the next four quarterly filings for Rider PTC-FPP. The parties agree that any non-allocated coal margins for Rider FPP audit periods prior to July 1,2007 will not be included in Rider PTC-FPP calculations."

Finding IX-1 **Duke Energy Ohio has fulfilled the requirements of the "margins associated with coal sales allocations" stipulation.**

Allocation to SSO customers will be made during the four (4) quarterly filings in 2010 per March 2, 2010 testimony displayed in *Exhibit IX-2* below.

Exhibit IX-2
Direct Testimony of Salil Pradhan Concerning Margins Associated with Coal Sales Allocations as of March 2, 2010

"Paragraph 1 addressed coal margin allocation and the allocation of ARRs between SSO customers and non-standard service offer customers. The net result was a cost adjustment to Rider PTC-FPP of $3.9 million to be allocated to SSO customers evenly over the next four quarterly Rider PTC-FPP adjustments. The Company complied with this and the adjustment will be made during the four quarterly filings for 2010."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 2 – Approval Process for CAM Risk Management Policy

"The parties agree that Duke Energy Ohio shall "[d]evelop a process for initial approval of the new CAM Portfolio Risk Management Policy and Procedures document [issued] by the other Duke [Energy Corp.] departments having ultimate responsibility for corporate risk management and accounting controls. Duke Energy Ohio shall document the initial approval process for review for the 2009 audit period, and shall thereafter document ongoing approval by these departments when revisions are made to the document." (Liberty Recommendation 1, Chapter I, p. I-12)

Finding IX-2 **Duke Energy Ohio has met the "approval process for CAM Risk Management Policy" stipulation.**

The approval process section added to CAM Portfolio Risk Management Policy and Procedures Manual per March 2, 2010 testimony is shown in *Exhibit IX-3* below. *Exhibit IX-4* below gives an example of the added approval page.

Exhibit IX-3
Direct Testimony of Salil Pradhan Concerning Approval Process for CAM Risk Management Policy as of March 2, 2010

"The CAMS Policies and Procedures document now contains a new section that describes the updating and approval process. Specifically, the Vice President – Risk Management (CAMS), the Vice President – Non-Regulated Accounting, and the Vice President – Corporate Risk Management are required to review and approve changes to CAMS Policies and Procedures. Changes or updates are reviewed and approved in a redline format. Also included are approval dates and effective dates as well as descriptions of the changes made to the previous version so updates to the document can be tracked historically. The CAMS Policies and Procedures will be made available for review during the audit."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Exhibit IX-4
Example Approval Section from January 2010 Draft of Revisions to CAM Risk Management Manual as of January 2010

Commercial Asset Management
Policy and Procedures

CONFIDENTIAL PROPRIETARY TRADE SECRET

[redacted]

Approval Date: 12/15/08
Effective Date: 12/15/08

Mark Krabbe, Director – Corporate Risk Management
Gwen Pate, Vice President – <u>Non-Regulated Accounting</u>
Salil Pradahn, Vice President – Risk Management (CAMS)

[redacted]

Revision 01 (12/11/09)

Approval Section – Added new section to track updates to CAMS Policies and Procedures and associated approvals by other departments having ultimate responsibility for corporate risk management and accounting controls. All changes will be highlighted in any revised version and submitted to other departments for approval. Changes will be highlighted and captured in the Approval and Revision section.

<u>Section 4 – Entire Section needs to be revised when new organization is complete.</u>

<u>Section 6.1 – Section was revised to reflect implementation of the ESP.</u>

<u>Section 6.2 – Section was revised to reflect implementation of the ESP.</u>

<u>Section 6.3 – Section was revised to reflect implementation of the ESP.</u>

<u>Section 7.2.2 – Section was revised to include procedures for the administration of fuel contracts.</u>

Source: Information Response 2

Stipulation 3 – Formalized System for Performance Management

"The parties agree that Duke Energy Ohio will ensure that the corporate Human Resources Department "[d]evelop[s] a formalized system for performance management of individuals in the CAM organization." Duke Energy Ohio shall provide written documentation of such system, which shall be available to the auditor selected for review of the 2009 audit period." (Liberty Recommendation 2, Chapter I, p. I-12)

Finding IX-3 Duke Energy Ohio has fulfilled the requirements of the "formalized system for performance management" stipulation.

Per testimony shown in *Exhibit IX-5* below, interim performance goals were developed and will be transitioned to a new company-wide system when implemented in the second quarter of 2010.

Exhibit IX-5
Direct Testimony of Salil Pradhan Concerning Formalized System for Performance Management as of March 2, 2010

"In recognition that Duke Energy Corp was going to be implementing a new company-wide performance management and employee evaluation and tracking system in early 2010, the CAM group worked with its Human Resource Department to implement an interim performance management process for all CAM employees. Specifically, all CAM employees, in conjunction with their supervisors, identified job- and task-related goals, personal development goals, as well as a safety goal or community activity goal for 2010. Once the new company-wide performance management and employee evaluation system is activated and employees are trained, the CAM goals will be transitioned into the new system. This is expected to occur by April 2010. CAM employee performance management goals are available for review during the Rider PTC-FPP auditor visits."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 4 – Adherence to Board-Approved Delegation of Authority

"The parties agree that Duke Energy Ohio will rigorously adhere to its board-approved delegation of authority (DOA) for contract and transaction approval. Duke Energy Ohio will document that detailed contract information, including justification for requested approval of the transaction, has been provided and DOA approval has been obtained at the appropriate DOA level before each contract is executed." (Liberty Recommendation 3, Chapter I, p. I-13)

Finding IX-4 Duke Energy Ohio has completed the requirements of the "adherence to board-approved delegation of authority" stipulation.

Documentation of "adherence to board-approved delegation of authority" has been added to the contract documentation per testimony shown in *Exhibit IX-6* below. *Exhibit IX-7* below gives an example of the added documentation.

Exhibit IX-6
Direct Testimony of Salil Pradhan Concerning Adherence to Board-Approved Delegation of Authority as of March 2, 2010

"Documentation for contract approval according to the DOA is being made available to the current auditor upon request. The information includes, but is not limited to, whitepapers that demonstrate how new coal contracts and renegotiated contracts have followed the DOA guidelines."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Exhibit IX-7
Redacted Example of DOA Documentation
as of December 31, 2008

Short Form Summary

American Energy – Second Amendment to the

Third Amended and Restated Coal Supply Agreement

Deal Summary:

- Term: 1/1/10 – 12/31/10
- Decision Date – December 22, 2009
- Net Notional Value of the Amendment: [redacted] million
- Volume: 900,000 tons
- Flat pricing of [redacted] per ton
- The agreement will have accrual accounting treatment

Strategic Rationale:

- Adds a [redacted]
- Transaction [redacted]
- Opportunity to [redacted]
- [redacted]

Process

Throughout the negotiation and approval process, the CAM organization had considerable and frequent interaction with Global Risk Management, Accounting, Legal, and operations; [redacted]

American Energy [redacted]

Though the notional value of the Amendment was [redacted] million, the notional value of the original contract [redacted] and [redacted] million. In accordance with the DOA Policy, any Amendment to this contract requires the approval of Duke's CEO and the Transaction Review Committee (TRC). On December 22, 2009, a request for approval was made to, and granted, by Duke's CEO (see Appendices B and C). The Managing Director–Coal Risk Management executed the Amendment.

Source: Information Response 63

Stipulation 5 – Adherence to TRC Contract Approval Process

"The Parties agree that Duke Energy Ohio will rigorously adhere to its contract approval process for transactions that must be brought before the Transaction Review Committee (TRC). Duke Energy Ohio will provide documentation in future audits to show TRC approval was obtained before the contract administrator signs the contract. The documentation may include, but is not limited to, meeting minutes or other electronic affirmation of member approvals." (Liberty Recommendation 4, Chapter I, p. I-13)

Finding IX-5 **Duke Energy Ohio has met the requirements of the "adherence to TRC approval process" stipulation.**

Documentation of "adherence to TRC approval process" has been added to the contract documentation per testimony shown in *Exhibit IX-8* below. An example of electronic affirmation of TRC approval is given in *Exhibit IX-7* above.

Exhibit IX-8
Direct Testimony of Salil Pradhan Concerning Adherence to TRC Contract Approval Process as of March 2, 2010

"The Company will provide documentation including TRC meeting minutes and electronic affirmation to the current Riders PTC-FPP and SRA-SRT auditors."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 6 – HR Department Update CAM Organization Information

"The parties agree that Duke Energy Ohio will make sure the corporate "Human Resources Department immediately update[s] its information related to the organizational structure of the Commercial Asset Management organization such that the department's records reflect the correct organizational structure of the CAM." (Liberty Recommendation 5, Chester 1, p. I-13)

Finding IX-6 **Duke Energy Ohio has fulfilled the requirements of the "HR Department update CAM organization information" stipulation.**

Exhibit IX-9 below presents the testimony concerning "HR department updating CAM organization information" stipulation. We were provided updated CAM organization information that is reflected elsewhere in this report in response to Information Request 1.

Exhibit IX-9
Direct Testimony of Salil Pradhan Concerning HR Department Update CAM Organization Information as of March 2, 2010

"In Paragraph 6, Duke Energy Ohio committed to make the corporate Human Resources Department update its information related to the CAM organization. This update was completed and the update process is continuous as the organization changes. In addition, the Human Resource organizational charts serve as the official record. In fact, the CAM organization was recently restructured and that information was provided to Human Resources and is reflected in the current organization charts. As the CAM organization continues to refine its organizational structure, Human Resources will continue to update the organizational charts. The reorganization is expected to be completed in April 2010."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 7 – Formalized Procedures for Administration of Fuel Contracts

"The parties agree that Duke Energy Ohio shall "[d]evelop formalized procedures for administration of fuel contracts. Such procedures shall consist of systems, job descriptions, and processes that document the administration of fuel contracts. The documentation shall be available to the auditor selected for review of the 2009 audit period." (Liberty Recommendation 6, Chapter I, p. I-13)

Finding IX-7 **Duke Energy Ohio has completed the "formalized procedures for administration of fuel contracts" stipulation.**

Exhibit IX-10 below gives the testimony concerning "formalized procedures for administration of fuel contracts." *Exhibit IX-11* below presents the section 7.2.2 referenced.

Exhibit IX-10
Direct Testimony of Salil Pradhan Concerning Formalized Procedures for Administration of Fuel Contracts as of March 2, 2010

"Section 7.2.2, Coal Contracting and Administration of CAM'S Policies and Procedures, reflects the procedures for the administration of fuel contract, systems, and processes for fuel contract administration."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Exhibit IX-11
Extract of Section 7.2.2 from CAM Portfolio Risk Management Policy and Procedures Manual Draft as of January 2010

7.2.2 ~~Contracting~~ Coal Contracting and Administration

The contract purchases made by the Coal Group are result from a negotiated agreement with the producer, utilizing DE-Ohio's negotiating team. The members of this team generally consist of:

1. An Originator.
2. The Managing Director Coal Risk Management.
3. One member from the legal staff.
4. One member from credit.

This team recommends contracts, in final form, for approval under policy guidelines based on the term and commitment amount of the contract.

Short term and 12-month coal supplies have these general characteristics:

1. Normal tonnages of less than 500,000.
2. They are subject to a short form agreement.
3. Requirement of legal and credit approval.
4. Deals are targeted to get closed in one to fourteen days.

1-3 year supply agreements have these characteristics:

1. Tonnages of between 200,000 and 3 million per year.
2. They are subject to a long form agreement.
3. They require significant legal participation.
4. The credit approval process is more thorough.
5. "White Paper[10]" approvals are prepared if IRC approval is required.
6. Different approval levels based on the dollar values of the transaction.

Source: Information Response 2

Stipulation 8 – Demonstrate the Effectiveness of Active Management

"The parties agree that Duke Energy Ohio will continue to actively manage its portfolio during the existing electric security plan (ESP), as agreed to in the stipulation in Case No. 08-920-EL-SSO concerning the existing ESP. Duke Energy Ohio shall work with the Commission staff and future auditors to develop a reasonable process to audit Duke Energy Ohio's portfolio and to "[d]emonstrate the economic effectiveness of Active Management."" (Liberty Recommendation 1, Chapter II, p. II-23)

Finding IX-8 **Duke Energy Ohio has partially completed the "demonstrate the effectiveness of Active Management" stipulation.**

Exhibit IX-12 below provides the testimony concerning the "demonstrate the effectiveness of Active Management" stipulation. We met with CAM representatives on March 30, 2010 to begin developing a process to "demonstrate the effectiveness of Active Management." If the process cannot be developed for this audit, we will continue development during the 2010 audit.

Exhibit IX-12
Direct Testimony of Salil Pradhan Concerning Demonstration of the Effectiveness of Active Management as of March 2, 2010

"This particular commitment is ongoing and Duke Energy Ohio will address this commitment with the auditors who were only recently selected to review the Company's 2009 Rider PTC-FPP and Rider SRA-SRT."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 9 – Detail Report on Controls Applicable to Affiliate Transactions

"The parties agree that, as part of the next Rider PTC-FPP audit for the 2009 period, Duke Energy Ohio will prepare a "detailed report on controls applicable to affiliate transactions." The auditor shall examine and report upon the controls in place that are applicable to the CAM organization and the affiliate transactions regarding commodity portfolio management." (Liberty Recommendation 2, Chapter II, p. II-23)

Finding IX-9 Duke Energy Ohio has fulfilled the requirements of the "detail report on controls applicable to affiliate transactions" stipulation.

The testimony given for the "detail report on controls applicable to affiliate transactions" is shown in *Exhibit IX-13* below. *Exhibit IX-14* below provides the page header from the twelve-page report provided by Duke Energy Ohio.

Exhibit IX-13
Direct Testimony of Salil Pradhan Concerning Detail Report on Affiliate Transactions Controls as of March 2, 2010

"A copy of the report, which details the applicable controls and policies, will be provided to the current auditors."

Source: March 2, 2010 Direct Testimony of Salil Pradhan – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Exhibit IX-14
Header of Report on Affiliate Controls as of April 21, 2010

CONFIDENTIAL PROPRIETARY TRADE SECRET

Duke Energy Ohio, Inc. Report on Affiliate Controls.
CONFIDENTIAL

Source: Information Response 68

Stipulation 10 – Zimmer Coal Inventory

"The parties agree that Duke Energy Ohio shall "[f]orm a multi-disciplined task force to evaluate the consistent variation in coal inventory at the Zimmer Station, where book inventory has been greater than measured physical inventory since 1995." Duke Energy Ohio shall report the results of this investigation as part of its 2010 Rider PTC-FPP annual filing." (Liberty Recommendation 1, Chapter III, p. III-18)

Finding IX-10 Duke Energy Ohio has met the "Zimmer coal inventory" stipulation.

Exhibit IX-15 below provides the testimony concerning the "Zimmer coal inventory" stipulation.

Exhibit IX-15
Direct Testimony of Timothy J. Thiemann Concerning Zimmer Station Inventory as of March 2, 2010

"Duke Energy Ohio organized a multi-disciplined task force to examine the issue. The task force included expertise in Station Operation, Material Handling, Corporate Engineering that supports the physical inventory adjustments, Coal Origination, Fuel Supply Management, and Coal Settlement and Accounting Management. The team assembled included personnel spanning the beginning of the coal handling process to the end (i.e., barge to bunker).

In reviewing the physical inventory calculations for 2008, an error was discovered. The volume on the low-sulfur pile at Zimmer Station was not updated from 2007. After correcting that volume number, the physical inventory for Zimmer was determined to be within 1.63% of the book value. More importantly, the physical inventory was greater than the book inventory for 2008. This reverses the trend that prior auditors have noted. Therefore, after taking the actions responding to the audit recommendations, the 2006 and 2008 physical inventories were within a 3% tolerance. The 2007 result was slightly outside of that range at 4.42%.

Also noted was another factor that tended to skew the data. The methodology Duke Energy Ohio uses allows for an adjustment of 50% of the variance between physical inventory and book inventory. Consequently, a large variance in one year can skew the results for several years to come. A spreadsheet was prepared showing the variance between book and physical inventory, assuming 100% of the difference was adjusted. That spreadsheet analysis shows that there is not a consistent bias in reporting book inventory greater than physical inventory when a 100% correction is made. A copy of the spreadsheet is included as Confidential Attachment TJT-1. Duke Energy Ohio's Engineering group is working on developing a company-wide policy that is consistent in performing the physical inventory and in making adjustments.

The variance between physical and book inventory at Zimmer Station has decreased over time and has now reversed the trend, falling below the 3% tolerance. Forward yearly trends will be reviewed and documented as part of the inventory adjustment procedure."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 11 – Documentation of Fuel Contract Renegotiations

"The parties agree that Duke Energy Ohio will document all fuel contract renegotiations, including in such documentation the appropriate analyses and the approvals of appropriate personnel." (Liberty Recommendation 2, Chapter III, p. III-19)

- If payment is due to Duke, information is sent to the CXL Accounts Receivable (A/R) group. Likewise, payments to Duke will be monitored and verified until the transaction is completed. There are approximately 20 to 60 A/R transactions per month.

Transactions from CXL automatically feed the PeopleSoft general accounting system.

Commercial Power –EA & Fuel Accounting

The EA & Fuel Accounting group is responsible for settlements, accounting, payments, cash processing, reporting, contracts, and confirmations regarding fuel and emission allowances. Five staff members, along with the manager of this group, work on settlements, accounting, payments, cash processing, and reporting activities, while two staff members work primarily on contracts and confirmations. Regarding contracts and confirmations, the terms for all trades performed are included in contracts, which are set in place before a trade is executed. These two staff members verify that there is a contract and that the trade terms follow the contract specifications. They also confirm that the trade has taken place.

Commercial Power Reporting – Management Reporting and Regulatory Filing

This group, which was comprised of two employees on December 31, 2009, currently has only one employee, a Lead Accounting Analyst. The Lead Accounting Analyst is responsible for the consolidation of the data provided by the other two groups and for providing them to the Rates and Regulatory Filing organization for inclusion in FPP/SRT filings. Among the Lead Accounting Analyst's duties and responsibilities are the following:

- Allocation of realized generation between native and non-native on a daily basis
- Development of a profit and loss statement on a weekly basis for the CAMS organization
- Providing filing assistance, including:
  - Responding to data responses
  - Assembling SRT, FPP, transmission cost recovery (TCR), and annually adjusted component (AAC) rider data for PUCO filings
- Accounting and management support for public information (such as the 10Q and 10K SEC filings) and press releases for the commercial business unit within Duke

Exhibit IX-17
Direct Testimony of Timothy J. Thiemann Concerning Zimmer Station Coal Yard Housekeeping as of March 2, 2010

"As a result of the concern on coal yard housekeeping, station management has implemented a strategy that focuses on cleaning up the coal yard and maintaining a high standard of cleanliness. As a result of the commitment, the company has dedicated resources to support the cleanliness strategy. Sunbelt, a company that provides labor for cleaning, is used throughout the coal yard as directed by coal yard supervision to clean problem areas. Zachry Maintenance has been hired to assist in performing routine and preventative maintenance to decrease coal spillage and to identify equipment system problems before they become a housekeeping concern.

The addition of these resources has resulted in a notable improvement in coal yard housekeeping. These resources are used during the day shift throughout the week. The company is also considering additional resources to assist coal yard operating teams. These resources are expected to further improve the cleanliness of the coal yard. As this strategy implementation develops, I expect that the housekeeping at the Zimmer Station will improve to a point that it is no longer a concern."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 13 – Multi-Year Boiler Recovery Plan

"The parties agree that Duke Energy Ohio shall "[f]ile a multi-year boiler recovery plan with the Public Utilities Commission prior to the next audit." The prioritized plan shall address "[b]oiler related problems [that] are the major contributor to outages at Duke Energy Ohio's [generating] units." The plan shall include projects and the coordination of boiler improvements that are "consistent with the projected outage schedules for generating units." (Liberty Recommendation 1, Chapter V, p. V-22)

Finding IX-13 Duke Energy Ohio has met the "multi-year boiler recovery plan" stipulation.

Testimony about the "multi-year boiler recovery plan" is shown in *Exhibit IX-18* below. The multi-year boiler recovery plan was filed with PUCO on or about January 28, 2010.

Exhibit IX-18
Direct Testimony of Timothy J. Thiemann Concerning Multi-year Boiler Recovery Plan as of March 2, 2010

"The Company filed its plan in this proceeding on or about January 28, 2010. I hereby incorporate this filing by reference. The recovery plan lists the various projects by year through 2019. It includes projected costs and outage dates. Given that the plan includes multiple projects at different generating units and extends over several years, the Company recognizes that factors may arise that could cause a change in the priority of the projects listed or new projects being created. Therefore, Duke Energy Ohio reserves the right to amend the plan, and if there is a material change, the Company proposes to update its boiler plan filing in future Rider PTC-FPP proceedings."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 14 – Consistent Generation Availability Data System Reporting

"The parties agree that Duke Energy Ohio shall work with co-owners of generating units not operated by Duke Energy Ohio and shall use its best efforts to achieve consistent generation availability data system (GADS) reporting for both Duke Energy Ohio operated and non-operated units. In addition, Duke Energy Ohio shall understand and document the differences between them." (Liberty Recommendation 2, Chester V, p. V-22)

Finding IX-14 **Duke Energy Ohio has completed the "consistent generation availability data system reporting" stipulation.**

Exhibit IX-19 below presents the resolution of the "consistent generation availability data system reporting" issue.

Exhibit IX-19
Direct Testimony of Timothy J. Thiemann Concerning Consistent Generation Availability Reporting as of March 2, 2010

"The Company initiated discussions with the co-owners of the joint operating units (Columbus Southern Power and Dayton Power and Light, collectively, the Joint Owners) of the co-owned units. The purpose of the discussion was to review the North American Electric Reliability Corporation (NERC) GADS definitions to ensure there is consistent interpretation of the event types and to develop and implement a plan that promotes consistency among the three companies with respect to GADS reporting. The call resulted in a plan to reduce/eliminate the inconsistencies as well as paved the way for the three companies to timely resolve the inconsistencies in real time instead of after the fact. Each company has its own business reasons for reporting and classifying an outage. However, the three companies agree that there is a need to hold true to the NERC GADS definitions for planned outages, maintenance, and forced outages/derates whenever possible and to instill consistency when deviation from NERC GADS guidelines is necessary.

The Joint Owners identified some of the possible reasons for deviation from the NERC GADS definitions, including:

- The PJM eDART system does not have all of the event types listed that are included with the NERC GADS event types—specifically, planned outage extensions that will cause many inconsistencies.
- In the PJM eDART system, a new outage must be created or the original date of the outage must be extended manually instead of creating a planned outage extension. The old outage end date is lost.
- Some outages may be marginal by nature as to whether they are deemed forced or maintenance outages. In cases like this, maintenance outage may be selected over forced outage as part of an economic decision. The rules for this selective process vary between regional transmission organizations and in some cases lead to inconsistencies

Going forward, the Joint Owners agree that all three companies need to be consistent in their method of reporting NERC GADS. Although maintenance and forced outages have a subjective aspect to them, each Joint Owner will strive to be consistent in the coding of events including outages and derates. To provide insight when a deviation is necessary, the Joint Owners agree:

- Planned outages shall be those listed in the official CD/CCD outage schedule.
- All three Joint Owners will review all maintenance outage requests and agree to the outage type beforehand.
- Maintenance derates may be declared for any derate planned for next day (mill tests, valve checks, etc.).
- The unit status reports distributed daily between the Joint Owners (via e-mail) will include derate and outage types."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 15 – Wet Coal Conditions

"The parties agree that Duke Energy Ohio shall "[p]erform a survey of peer generating stations and develop an action plan to help address the situation where wet coal conditions exist at each Duke Energy Ohio plant." Duke Energy Ohio shall report on the progress of the survey and action plan development as part of the 2009 Rider PTC-FPP audit. The action plan shall be finalized and be available to the auditor selected for review during the 2010 Rider PTC-FPP audit period." (Liberty Recommendation 3, Chester V, p. V-22)

Finding IX-15 Duke Energy Ohio has fulfilled the requirements of the "wet coal conditions" stipulation.

Exhibit IX-20 below provides the testimony concerning the resolution of the "wet coal conditions" issue. *Exhibit IX-21* below presents the cover page of Duke Energy Ohio's "Wet Coal Handling Procedure," which was developed as a result of the survey.

Exhibit IX-20
Direct Testimony of Timothy J. Thiemann Concerning Wet Coal Conditions as of March 2, 2010

"Duke Energy Ohio did perform the survey as agreed. The Company examined the procedures at its Beckjord, Miami Fort, and Zimmer Stations. The peer companies and generating units that were surveyed included Duke Energy Indiana's Gallagher Station, American Electric Power's Rockport and Tanners Creek Stations, and Dayton Power and Light's Stuart and Killen Stations. From this survey, the Company has developed and implemented coal handling procedures for both the coal yard and the generating station. Attachment TJT-2 is a copy of Duke Energy Ohio's new wet coal handling procedure."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Exhibit IX-21
Cover Page of Wet Coal Handling Procedure
February 1, 2010

Duke Energy.

DUKE ENERGY MIDWEST GENERATION OPERATIONS (MGO) PROCEDURE

MGO-XXX **Wet Coal Handling Procedure**

Process/Program Owner: Duke Energy MGO Production Manager

REVISION NUMBER	**ISSUE DATE**
000	02/01/2010

Approved By/Date
Mike Hofmann/01-XX-2010
VP Midwest Generation Operations

Issued By:
Bill A Marshall/01-XX-2010
Technical Manager

Effective Date:
02/01/2010

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 16 – Replacement Power Costs Associated with Zimmer Spring 2007 Outage

"The parties agree that "[r]eplacement power costs associated with the Zimmer spring 2007 planned outage extension should not be excluded from [Rider PTC-]FPP recovery due to imprudence."" (Liberty Recommendation 4, Chapter V, p. V-23)

Finding IX-16 Duke Energy Ohio has met the requirements for the "replacement power costs associated with the Zimmer spring 2007 outage" stipulation.

All parties, per stipulation, have agreed that "replacement power costs associated with Zimmer spring outage" should not be excluded from Rider PTC-FPP recovery.

Stipulation 17 – Beckjord Smoking Policy

"The parties agree that Duke Energy Ohio shall "[m]aintain high expectations for safety consciousness, cleanliness, and employee attitude at Beckjord Station." Duke Energy Ohio will identify and post all smoking areas for its employees at the Beckjord Station. Duke Energy Ohio will send written communication of the smoking and non-smoking designation to all Beckjord employees, identifying the designated smoking areas, and will enforce the ban on smoking in non-smoking areas to rectify the concerns stated in the Final Audit Report. Duke Energy will also issue hard hats at the administration building to the Beckjord Station to persons not so equipped and shall enforce the hard hat designation in designated hard hat areas at its Beckjord Station." (Liberty Recommendation 5, Chapter V, p. V-23)

Finding IX-17 Duke Energy Ohio has satisfied the "Beckjord smoking policy" stipulation.

A smoking policy was issued at Beckjord Station on October 11, 2009. *Exhibit IX-22* below provides the applicable testimony. *Exhibit IX-23* below provides a copy of the header of the smoking policy that was issued at Beckjord Station.

Exhibit IX-22
Direct Testimony of Timothy J. Thiemann Concerning Beckjord Smoking Policy as of March 2, 2010

"Duke Energy Ohio developed and implemented a smoking policy for the Beckjord Station and has marked the designated location at the Beckjord Station. Attachment TJT-3 is a copy of this policy. The policy was communicated to all Beckjord employees and is now used as part of new hire education. Duke Energy Ohio also issues hard hats and other personal protective equipment (e.g., ear plugs, goggles, etc.) at its administration buildings for each of its generating stations. This is done at the time station visitors sign in. The Company has also modified the painting on the station asphalt to better designate the areas where employees and visitors can walk without hard hats."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Exhibit IX-23
Header of Smoking Policy Issued at Beckjord Station
as of October 11, 2009

Duke Energy
Beckjord Station

Page 1 of 2
OPERATIONS AND
MAINTENANCE SITE PROCEDURES

SUBJECT: SMOKING POLICY

Revision #	Date	Summary	Issued by:
1	10/11/09	Initial issue.	WCB

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 18 – Capital and Operations and Management (O&M) Budget Support for Beckjord Station

"The parties agree that Duke Energy Ohio shall "[p]rovide further capital and O&M budget support beyond 2008 for Beckjord Station performance."" (Liberty Recommendation 6, Chapter V, p. V-23)

Finding IX-18 **Duke Energy Ohio has met the "capital and O&M budget support for Beckjord Station" stipulation.**

Exhibit IX-24 below presents the testimony about the "capital and O&M support for Beckjord Station" stipulation.

Exhibit IX-24
Direct Testimony of Timothy J. Thiemann Concerning Beckjord Station Capital and O&M Support
as of March 2, 2010

"The Company has complied with this requirement and has spent $7 million over the $50 million deferral authorized in the ESP stipulation for an approximate total of $57 million dollars at the Beckjord Station in 2009."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 19 – Level of Spare Parts Analysis

"The parties agree that Duke Energy Ohio shall "[p]erform economic market analyses to determine the level of spare parts at each unit at Duke Energy Ohio generating stations and the use of online maintenance/redundant equipment at [each of] its generating stations." Duke Energy Ohio shall report on the progress of this analysis as part of the 2009 audit, and the final analysis shall be filed with the Public Utilities Commission prior to the 2010 audit." (Liberty Recommendation 7, Chapter V, p. V-23)

Finding IX-19 Duke Energy Ohio has satisfied the "level of spare parts analysis" stipulation.

The testimony shown in *Exhibit IX-25* below indicates Duke Energy Ohio hired GAI Consultants in December 2009 to perform the analysis. Schumaker & Company consultants received the GAI report at the beginning of April and have reviewed the report. This report satisfies the requirement of this stipulation.

Exhibit IX-25
Direct Testimony of Timothy J. Thiemann Concerning Spare Parts Analysis
as of March 2, 2010

"In December 2009, Duke Energy Ohio hired GAI Consultants to perform the analysis at the Company's generating stations. The project is underway and the Company expects the analysis to be completed by mid-2010."

Source: March 2, 2010 Direct Testimony of Timothy J. Thiemann – Cases No. 09-974-EL-FAC and 09-975-EL-RDR

Stipulation 20 – Bankruptcy Settlement

"The parties agree that the bankruptcy settlement (identified in Recommendation 1, Chapter VII, p. VII-9) shall not be refunded back to the [SSO] customers due to the settlement recovery's connection with a period when electricity rates were frozen following enactment of Sub. S.B.3." (Liberty Recommendation 1, Chapter VII, p. VII-9)

Finding IX-20 Duke Energy Ohio has completed the "bankruptcy settlement" stipulation.

All parties, per stipulation, agree that the identified "bankruptcy settlement" does not have to be refunded back to SSO customers.

Stipulation 21 – Vintage Emission Allowance Transactions

"The parties agree that the merits of refunding the margins of $612,970 resulting from 2010 vintage emission allowance transactions shall be reviewed during the audit for 2010." (Liberty Recommendation 2, Chapter VII, p. VII-10)

Finding IX-21 **Duke Energy Ohio has partially satisfied the requirements of the "vintage emission allowance transactions" stipulation.**

All parties, per stipulation, agree that the merits of refunding the margins from 2010 "vintage emission allowance transactions" will be reviewed as part of the 2010 audit.

Stipulation 22 – Combination of Rate Schedules

"The parties agree that Rate Schedules RS, GS-FL, EH, and DM shall not be combined into a single group for Rider SRA-SRI rate calculations." (Liberty Recommendation 1, Chapter VIII, p. VII1-5)

Finding IX-22 **Duke Energy Ohio has met all requirements for the "combination of rate schedules" stipulation.**

All parties, per stipulation, agree that Rate Schedules RS, GS-FL, EH, and DM shall not be combined into a single group.

C. Recommendations

Recommendation IX-1 **Confirm, as part of the audit of 2010 Duke Energy Ohio's PTC-FPP, that the quarterly SSO adjustments were included. (Refer to Finding IX-1.)**

Testimony on March 2, 2010 by Salil Pradhan indicated that adjustment would be made with the 2010 quarterly filings.

Recommendation IX-2 **Verify during the 2010 PTC-FPP audit that the company-wide performance management system was implemented and included CAM employees. (Refer to Finding IX-3.)**

Testimony on March 2, 2010 by Salil Pradhan indicated that a company-wide system will be implemented during 2010 and that CAM employees' performance will be tracked within the new system.

Recommendation IX-3 **During the 2010 audit, continue development of a process to demonstrate the effectiveness of Active Management. (Refer to Finding IX-8.)**

Time was not available to develop the process prior to completion of the 2009 audit. Development work would continue for the 2010 audit.

Recommendation IX-4	**Corroborate, as part of the 2010 audit, the development by Duke Energy Ohio's Engineering group of a company-wide policy for performing the physical coal inventory and coal-making adjustments. (Refer to Finding IX-10.)**

Testimony on March 2, 2010 by Timothy J Thiemann indicated a company-wide policy would be developed.

Recommendation IX-5	**Validate the progress and effectiveness of the coal yard housekeeping strategy being implemented for Zimmer Station as part of the 2010 audit. (Refer to Finding IX-12.)**

The expectation from the testimony is that "housekeeping at the Zimmer Station will improve to a point that it is no longer a concern."

Recommendation IX-6	**Review the merits of refunding the margins from 2010 "vintage emission allowance transactions" during the 2010 audit. (Refer to Finding IX-21.)**

The review by the auditor was agreed to by all parties in the August 28, 2009 stipulation agreement.

X. Financial Review

This chapter addresses Schumaker & Company's financial review of the price to compare (PTC)/fuel and purchased power (FPP) rider and the service resource adequacy (SRA)/system reliability tracker (SRT) rider of Duke Energy Ohio for the January 1, 2009 to December 31, 2009 period. In this report, these riders will be referred to as the FPP and SRT riders.

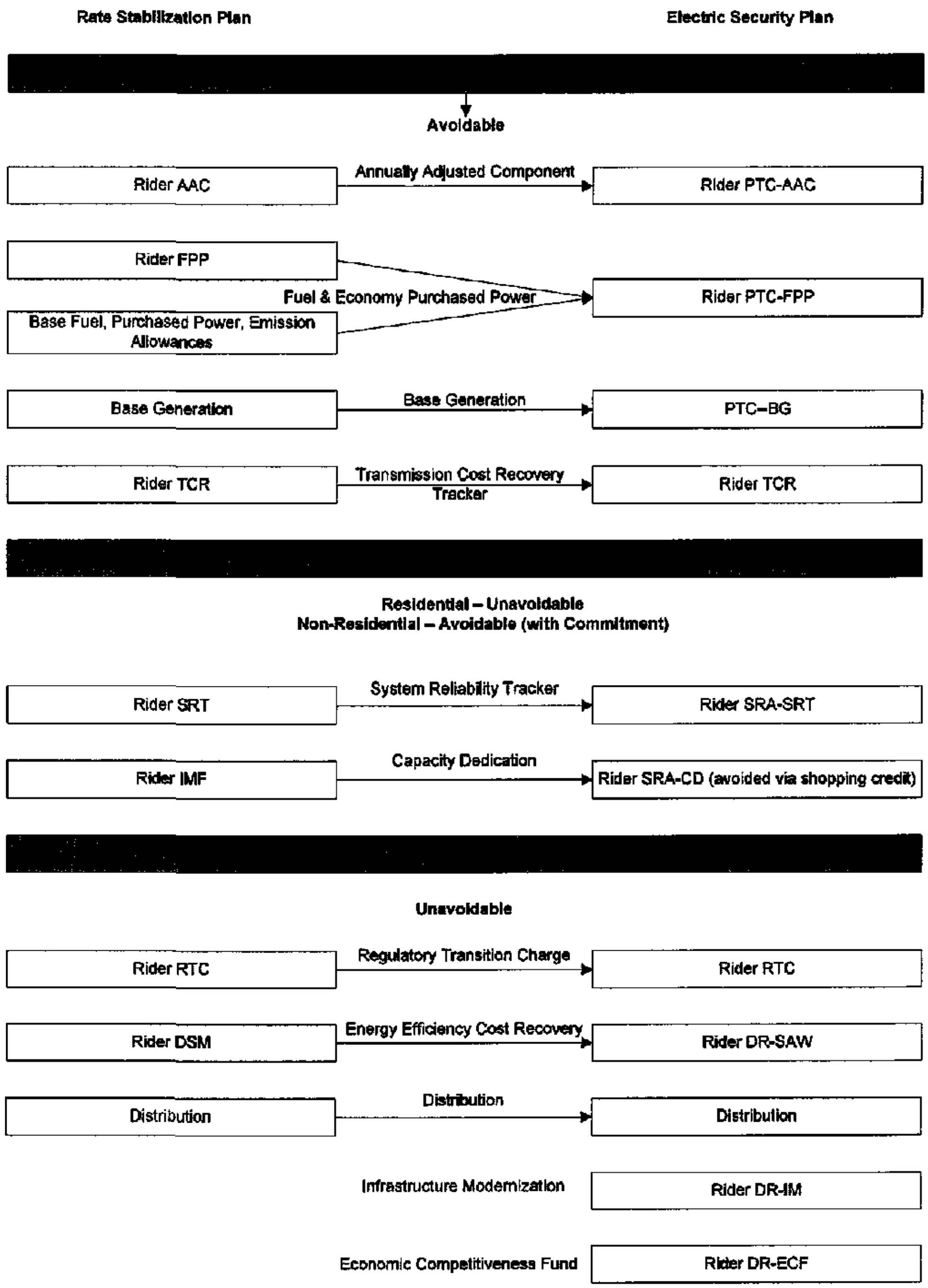
The scope of financial review services includes the following components:

- All cost elements of Duke Energy Ohio's fuel clause, specifically its price to compare fuel and purchased power rider, was audited and reviewed for accuracy and compliance to ensure that only appropriate costs are being recovered from retail ratepayers. Included in the investigation was a review of the MISO-related charges that are included in the PTC-FPP, which includes a review of congestion costs/revenues, financial transmission rights revenues/costs, net marginal losses, marginal loss surplus distribution, and revenue sufficiency guarantee (RSG) make-whole payments.
  - Review and report on costs incurred/revenues received in each area.
  - Verify consistency of costs/revenues with actual Midwest ISO invoices.
  - Verify that the company is passing through charges, and all appropriate revenues, associated only with serving retail load customers in Ohio.
- All cost elements of Duke Energy Ohio's SRT rider were audited and reviewed for accuracy and compliance to ensure that only appropriate costs are being recovered from retail ratepayers.

A. Overall Background and Perspective

Previously, Duke Energy Ohio, like other Ohio electric utilities, was required to submit and follow a rate stabilization plan (RSP). Then in July 2008, Duke Energy Ohio filed a three-year electric security plan (ESP) to comply with Senate Bill (SB) 221. A settlement with the intervening parties was reached in October 2008. A hearing was held during November 2008 and the Public Utilities Commission of Ohio (PUCO) approved the ESP in December 2008. The ESP rates became effective January 1, 2009 through December 31, 2011. *Exhibit X-1* illustrates the riders included in the ESP versus those previously included in the RSP.

Exhibit X-1
ESP Versus RSP
January 1, 2009 to December 31, 2009



Source: February 23, 2010 Duke Energy Ohio presentation titled "Electric Security Plan – Standard Service Offer and Distribution Rates Update" given by Jim Ziolkowski, Rates Manager

As part of the ESP implementation, both the FPP and SRT filings were instituted as follows:

> "By opinion and order issued December 17, 2008, *In the Matter of the Application of Duke Energy Ohio, Inc., for Approval of an Electric Security Plan*, Case No. 08-920-EL-SSO, et. al, the Commission approved a stipulation submitted by the parties in that case, as well as an annual audit process which would require Duke to file quarterly reports and to make a filing in the first quarter of each year regarding the audits for riders price-to-compare (PTC)-FPP and system resource adequacy (SRA)-SRT, formerly known as riders FPP and SRT."

Organizational Structure and Staffing

This section briefly discusses the various Duke groups involved in activities that impact the FPP and SRT rider filings.

Commercial Asset Management Service

The CAMS organization of Duke Energy Ohio is responsible for managing the power, fuel, and emission allowance positions for Duke Energy Ohio's operating units, including its Ohio generation portfolio. The aim of this management is to provide a reliable, low-cost, market-based supply of electricity for Ohio customers.

The CAMS organization is responsible for establishing and implementing the multi-commodity risk management strategy for power, fuel, and emission allowances by monitoring and adjusting the contract mix all the way through physical delivery. These adjustments result in the purchases or sales of fuel, emission allowances, and power for the approved term if the forward market allows them to transact.

Fuel (coal) purchases are made through a combination of long-term and spot-market purchases. The CAMS Fuel Procurement and Logistic groups are responsible for evaluating proposals for: fuel and transportation contracts; selecting and qualifying suppliers and shippers; contract negotiation; administration and enforcement; and ongoing transportation maintenance and operations support. The CAMS organization is also responsible for complying with fuel procurement regulations.

The CAMS organization is responsible for evaluating its fuel and transportation services practices on a continuing basis and for updating them as needed. Duke Energy Ohio management believes that this continuous self-evaluation ensures that the CAMS organization follows the best available practices as they relate to the changing business environment of Duke Energy Ohio and the industry, the effect of state and/or federal legislation, the orders or rules of any state commission, or any other event that may impact Duke Energy Ohio's procurement and use of fuel. Duke Energy Ohio management also believes that a balancing of short-term and long-term contracts is an effective way to achieve critical portfolio goals, such as:

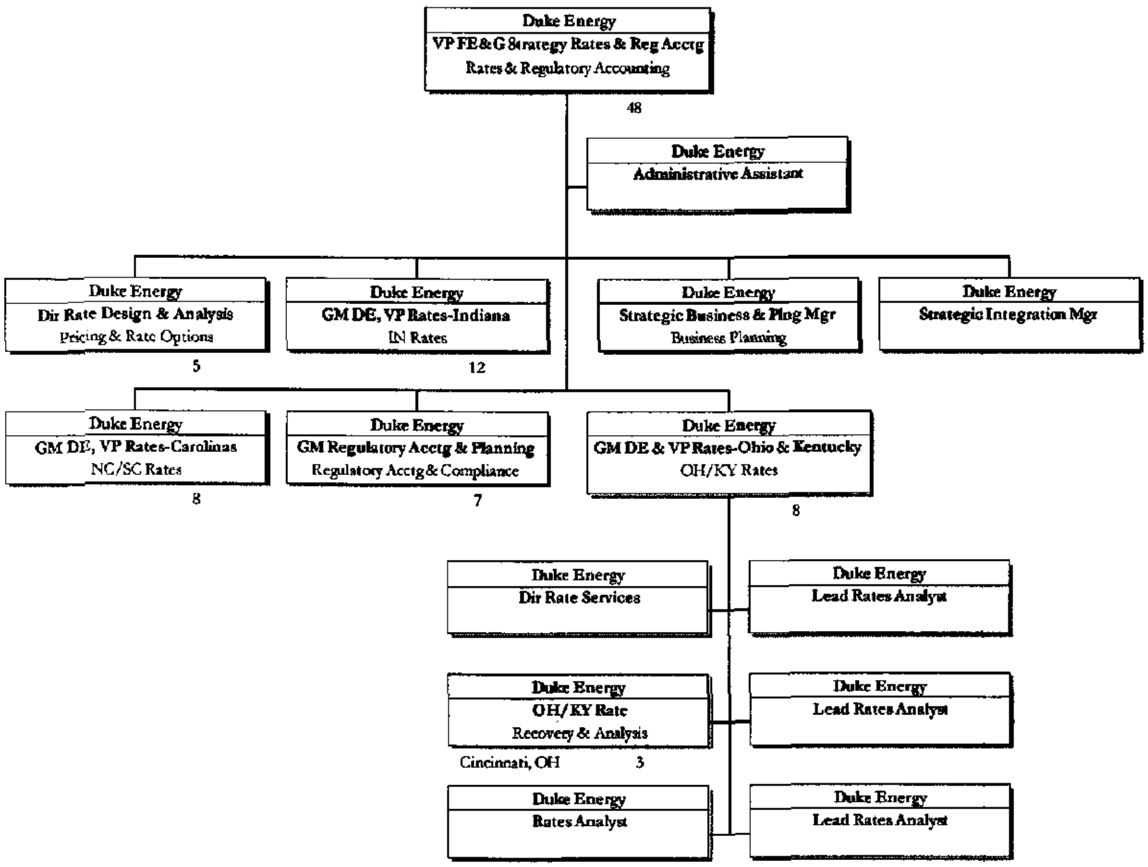
- Effective management of market price risk
- Assurance of adequate and appropriate supply from reliable suppliers
- Competitive pricing
- Market intelligence
- Continuing evaluation of suppliers
- Flexibility in responding to changing market or economic conditions
- Efficient delivery of shipments and contract administration
- Coal basin balance and diversity

In performing its fuel procurement activities, the CAMS organization makes every effort to purchase fuels that are compatible with all Ohio generation portfolios. This decision-making process also heavily involves inputs from all station managers. Furthermore, the cost of complying with environmental regulations regarding emissions is factored into purchasing decisions. Coal quality specifications may include moisture, ash, calorific value, sulfur, volatility, grindability, chlorine, mineral ash analysis, and fusion temperature to assure that the purchased coal will be compatible with equipment operation and environmental regulations. Quality price adjustments are made for deliveries not within contract specifications. For longer-term commitments, suppliers are generally evaluated on the basis of delivered cost (adjusted for MMBtu, SO_2, and freight), credit strength, proximity to transportation, and willingness to extend commercial terms. Additional evaluation is conducted, as needed, concerning byproduct handling, disposal, and various environmental limits at the station sites. For short-term purchases, the evaluation focuses primarily on evaluated cost relative to the market.

Rates & Regulatory Accounting

The Rates & Regulatory Accounting organization, as shown in *Exhibit X-2*, is responsible for the FPP/SRT filings to PUCO.

Exhibit X-2
Rates & Regulatory Accounting Organization
as of December 31, 2009

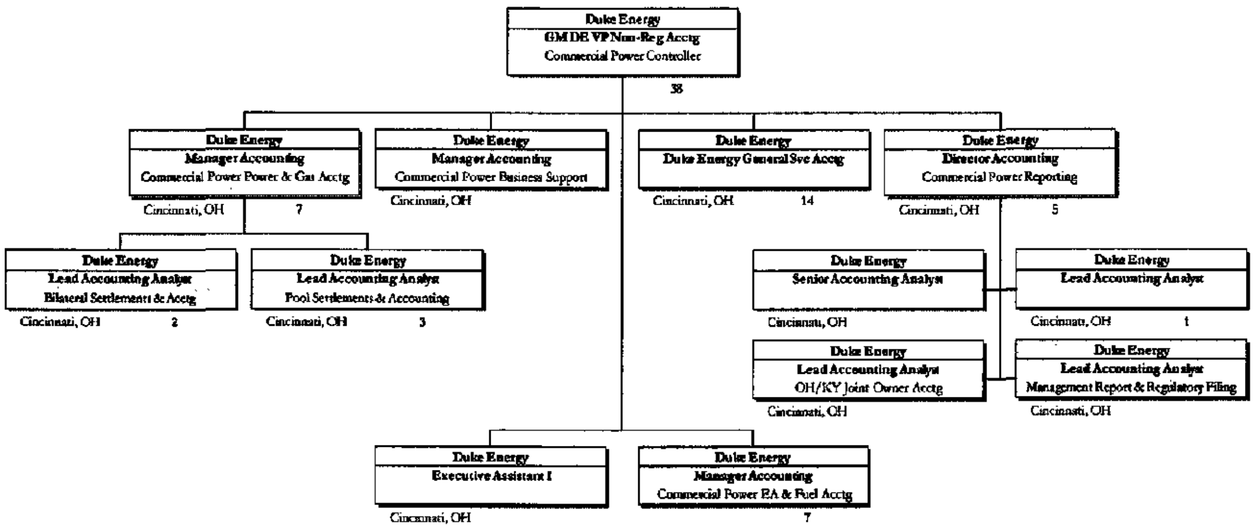


Source: Information Response 1

Commercial Power Accounting

The Commercial Power Accounting organization, as shown in *Exhibit X-3*, is responsible for the provision of accounting data that goes into these filings.

Exhibit X-3
Commercial Power Accounting Organization
as of December 31, 2009



Source: Information Response 1

Those groups primarily responsible include the following within the Commercial Power Accounting organization:

- Commercial Power – Power & Gas Accounting
- Commercial Power – Emission Allowance (EA) & Fuel Accounting
- Commercial Power Reporting – Management Reporting and Regulatory Filing

The systems used by these groups include PeopleSoft, Business Objects, CXL, and nMarket, as follows:

- *PeopleSoft*: PeopleSoft is the general ledger system used by all Duke entities, including Duke Energy Ohio.
- *Business Objects*: This application is a general ledger reporting application.
- *CXL*: Duke Energy Ohio's trading and settlement/fuel/EA accounting functions use the Commodity XL (CXL) system. This multi-commodity trading platform supports front-to-back office processes (trade capture, confirmation, scheduling, logistics, settlement, and accounting) into a single scalable and customizable platform. Triple Point Technologies was the CXL

vendor, although the code for the system has now been purchased by Duke, which the Duke Information Technology (IT) group now supports.

- *nMarket.* This application is a client server application that provides an integrated, modular toolset that enables communication to independent system operator (ISO)/regional transmission organization (RTO) markets. It allows Duke Energy Ohio to interact with MISO, including the shadowing of MISO transactions. Duke Energy Ohio's front office staff uses nMarket for bidding, nominations, scheduling, and dispatch. Settlements functionality within the tool allows the downloading of ISO statements and invoices for comparison to internally generated estimates.

Each of these groups is further described in the following sections.

Commercial Power – Power & Gas Accounting

The Pool Settlements & Accounting group, which is comprised of a Lead Accounting Analyst and three other employees, is responsible for all power market settlements involving independent system operators (ISOs), including:

- MISO
- PJM Interconnections (PJM)
- Electric Reliability Council of Texas (ERCOT) (primarily for wind energy)

The group interacts with the Generation Dispatch and Operations (also referred to as the front office) and the IT organizations to perform its duties, which include:

- Verifying settlements and resettlements on a daily basis by using the nMarket system to "shadow" the MISO transactions
- Managing disputes with MISO
- Participating in settlement meetings
- Developing accounting entries during the monthly accounting close process
- Assisting other Commercial Power Accounting staff with settlement and resettlement issues

The Bilateral Settlements and Accounting group, which is comprised of a Lead Accounting Analyst and two other employees, is responsible for all power market settlements involving any entity other than MISO.

Regarding bilateral and MISO settlements:

- If payment is due from Duke, requests for payment (RFPs) are sent to the CXL Accounts Payable (A/P) work group. The deal will be closed out when the invoice arrives from the counterparty (or is self-invoiced by Duke) and is paid by the bank. In addition to the weekly MISO invoices, there are approximately 20 to 60 A/P transactions per month.

- If payment is due to Duke, information is sent to the CXL Accounts Receivable (A/R) group. Likewise, payments to Duke will be monitored and verified until the transaction is completed. There are approximately 20 to 60 A/R transactions per month.

Transactions from CXL automatically feed the PeopleSoft general accounting system.

Commercial Power –EA & Fuel Accounting

The EA & Fuel Accounting group is responsible for settlements, accounting, payments, cash processing, reporting, contracts, and confirmations regarding fuel and emission allowances. Five staff members, along with the manager of this group, work on settlements, accounting, payments, cash processing, and reporting activities, while two staff members work primarily on contracts and confirmations. Regarding contracts and confirmations, the terms for all trades performed are included in contracts, which are set in place before a trade is executed. These two staff members verify that there is a contract and that the trade terms follow the contract specifications. They also confirm that the trade has taken place.

Commercial Power Reporting – Management Reporting and Regulatory Filing

This group, which was comprised of two employees on December 31, 2009, currently has only one employee, a Lead Accounting Analyst. The Lead Accounting Analyst is responsible for the consolidation of the data provided by the other two groups and for providing them to the Rates and Regulatory Filing organization for inclusion in FPP/SRT filings. Among the Lead Accounting Analyst's duties and responsibilities are the following:

- Allocation of generation between native and non-native on a daily basis
- Development of a profit and loss statement on a weekly basis for the CAMS organization
- Providing filing assistance, including:
  - Responding to data responses
  - Assembling SRT, FPP, transmission cost recovery (TCR), and annually adjusted component (AAC) rider data for PUCO filings
- Accounting and management support for public information (such as the 10Q and 10K SEC filings) and press releases for the commercial business unit within Duke

Sarbanes-Oxley (SOX) Controls and Internal Audits Involving FPP and SRT

SOX Controls

Duke Energy Ohio has developed 20 SOX controls involving the Commercial Asset Management Department and its PUCO filings involving FPP and SRT riders. These controls include the following sub-processes:

- Data Modeling and Analytics
- Settlement – Power
- Settlement – Coal
- Cost and Issue Inventory
- Settlement – Emission Allowance
- Emission Allowance Master File Data and Cost and Usage of Emissions

Eight of the SOX controls relevant to the FPP and SRT filings were tested in the 2009 time period, seven using the observation test method and one using the direct testing test method. Observation is a test method used for lower-risk control activities and consists of interviewing personnel responsible for performing the control, observing how the control is conducted, and reviewing documentation of the test process and the test results. The direct testing test method involves selecting a random sample and performing the control process to verify the results of the process.

In the course of the fieldwork for this audit, the Schumaker & Company auditors reviewed the SOX business process flowcharts, the SOX controls in the FPP and SRT compilation and filing areas, and the SOX tests conducted. All were evaluated for appropriateness, completeness, and effectiveness.

Internal Audit

Duke's Internal Audit group performed three audits in 2009 involving purchased power or fuel costs and coal contracts and invoices. These audits encompassed larger areas than those covered in this audit and included portfolio optimization (report issued 7/24/2009), front-office processes (report issued 12/18/2009), and coal processes (report issued 3/1/2010). These audits were reviewed for any issues relative to the filing of the FPP and SRT rates.

B. Fuel and Purchased Power Rider

This section reviews and assesses implementation of the fuel and purchased power rider by Duke Energy Ohio for the January 1, 2009 to December 31, 2009 period. It includes Schumaker & Company's testing of FPP data.

Background and Perspective

Duke's fuel costs for 2009 are to be recovered through Rider PTC-FPP (fuel, purchased power, and emission allowances) rates that are included on monthly rate-payers' bills. Rider FPP charges are for Duke's costs related to fuel, off-system power purchases, and emission allowances to provide electric generation service to its customers. (Starting in the fourth quarter of 2009, in addition to emission allowances, it also included alternative energy portfolio standard costs; and in 2010, it included environmental reagent costs as well.) The FPP charge is applicable to all customers except those who receive generation service from a certified supplier. This rider is designed to capture the difference between the current and baseline amounts for fuel and emission costs. This difference is calculated monthly on a projected basis, and the FPP rate is revised and trued up quarterly (again on a projected basis) with a filing to PUCO. The FPP component of Duke's residential billing rate averaged $0.029821 in 2009 and comprised 26% of the average total residential billing rate, as shown in *Exhibit X-4*.

Exhibit X-4
Average Components of Residential Billing Rate
as of December 31, 2009

	1Q 2009	2Q 2009	3Q 2009	4Q 2009	Monthly Average	% of Total
Generation First 1000 kWh	$0.040238	$0.040238	$0.040238	$0.040238	$0.040238	35.08%
Rider AAC First 1000 kWh	$0.007335	$0.006540	$0.006540	$0.006540	$0.006739	5.88%
Rider SRA-CD First 1000 kWh	$0.002651	$0.002651	$0.002651	$0.002651	$0.002651	2.31%
Rider SRT	$0.001692	$0.001401	$0.000543	$0.000801	$0.001109	0.97%
Rider FPP	$0.026680	$0.019763	$0.033785	$0.039055	$0.029821	26.00%
Rider DR-SAWR	$0.001602	$0.001602	$0.001602	$0.001602	$0.001602	1.40%
Distribution Charge	$0.019949	$0.019949	$0.022126	$0.022126	$0.020856	18.18%
Rider TCR All kWh	$0.006225	$0.006225	$0.006225	$0.005115	$0.005948	5.19%
Rider OET First 2000 kWh	$0.004650	$0.004650	$0.004650	$0.004650	$0.004650	4.05%
Rider USR First 833,000 kWh	$0.001086	$0.001086	$0.001086	$0.001086	$0.001086	0.95%
					$0.114698	100.00%

Source: Information Response 83 (Per bill customer charges have been excluded in above calculations, plus only those items relative to a residential bill that is typically under 1,000 kWh are included)

The customer base for the FPP rider consists of three types: residential, non-residential, and voltage reduction. Residential and non-residential customers are distribution customers, while voltage reduction customers are transmission customers. The FPP rate, as proposed in the quarterly PUCO filings for 2009 and the first two quarters of 2010 for each of these types of customers, is shown in *Exhibit X-5.*

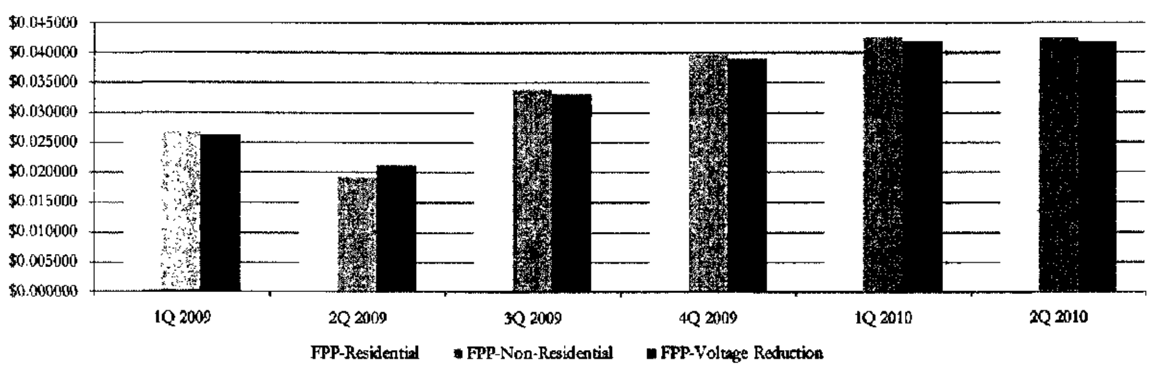
Exhibit X-5
FPP Rate Filing
2009 to 2010

	1Q 2009	2Q 2009	3Q 2009	4Q 2009	1Q 2010	2Q 2010
FPP-Residential	$0.026680	$0.019763	$0.033785	$0.039055	$0.040076	$0.040533
FPP-Non-Residential	$0.026680	$0.019169	$0.033709	$0.039827	$0.042691	$0.042393
FPP-Voltage Reduction	$0.026334	$0.021167	$0.033120	$0.039155	$0.042054	$0.041704

Source: Information Response 81

The FFP data reflecting rates by type of customer for this same time period is shown graphically in *Exhibit X-6.*

Exhibit X-6
FFP Rate by Quarter and by Type of Customer
2009 to 2010 (Through Second Quarter)



Source: Information Response 81

FPP Components

The FPP rate as filed with PUCO for the first three quarters of 2009 was comprised of the following three components:

- *Fuel Cost* (FC) – a forecast of cost (fuel, purchased power, and price hedges) associated with the expected electric load for the upcoming quarter
- *Emission Allowance* (EA) – emission cost associated with the expected electric load

- *Reconciliation Adjustment* (RA) – reconciliation between actual and projected fuel cost and emission allowances
- *System Loss Adjustment* (SLA) – projected loss of energy between generation and delivery to the final customer

For the fourth quarter filing in 2009, another cost component, alternative energy portfolio standard, was added to the quarterly filing. In 2010, the cost component "environmental reagents" was also added.

- *Alternative Energy Portfolio Standard (AEPS)* – composed of annual projected includable alternative energy resource costs, as required by Ohio Revised Code 4928.64
- *Environmental Reagents* (ER) – composed of three months' projected includable environmental reagent costs, as required by the stipulation in Case No. 09-770-EL-UNC

The individual rates that apply to the individual components of Duke's FPP rate for 2009 and the first half of 2010 are shown in *Exhibit X-7*.

Exhibit X-7
FFP Components
2009 to 2010 (Through Second Quarter)

		FPP Components		
Time Period	**Component**	**Residential**	**Non-Residential**	**Voltage Reduction**
1st Quarter 2009	Fuel Cost	2.4689	2.4689	2.4689
	Emission Allowance	0.1281	0.1281	0.1281
	Reconciliation Adjustment	0.0000	0.0000	0.0000
	System Loss Adjustment	0.0710	0.0710	0.0364
	Total FPP Rate ¢/kWh	2.6680	2.6680	2.6334
2nd Quarter 2009	Fuel Cost	2.4188	2.4188	2.4188
	Emission Allowance	0.0882	0.0882	0.0882
	Reconciliation Adjustment	(0.5979)	(0.6573)	(0.4247)
	System Loss Adjustment	0.0672	0.0672	0.0344
	Total FPP Rate ¢/kWh	1.9763	1.9169	2.1167
3rd Quarter 2009	Fuel Cost	3.0195	3.0195	3.0195
	Emission Allowance	0.1802	0.1802	0.1802
	Reconciliation Adjustment	0.0659	0.0583	0.0545
	System Loss Adjustment	0.1129	0.1129	0.0578
	Total FPP Rate ¢/kWh	3.3785	3.3709	3.3120
4th Quarter 2009	Fuel Cost	3.3453	3.3453	3.3453
	Emission Allowance	0.0746	0.0746	0.0746
	Alternative Energy Portfolio Standard	0.0632	0.0632	0.0632
	Reconciliation Adjustment	0.2847	0.3619	0.3619
	System Loss Adjustment	0.1377	0.1377	0.0705
	Total FPP Rate ¢/kWh	3.9055	3.9827	3.9155
1st Quarter 2010	Fuel Cost	3.2502	3.2502	3.2502
	Emission Allowance	0.0459	0.0459	0.0459
	Alternative Energy Portfolio Standard	0.0209	0.0209	0.0209
	Environmental Reagents	0.1605	0.1605	0.1605
	Reconciliation Adjustment	0.3997	0.6612	0.6612
	System Loss Adjustment	0.1304	0.1304	0.0667
	Total FPP Rate ¢/kWh	4.0076	4.2691	4.2054
2nd Quarter 2010	Fuel Cost	3.3908	3.3908	3.3908
	Emission Allowance	0.0550	0.0550	0.0550
	Alternative Energy Portfolio Standard	0.0274	0.0274	0.0274
	Environmental Reagents	0.1669	0.1669	0.1669
	Reconciliation Adjustment	0.2720	0.4580	0.4580
	System Loss Adjustment	0.1412	0.1412	0.0723
	Total FPP Rate ¢/kWh	4.0533	4.2393	4.1704

Source: Information Response 82

Fuel Cost Component

The FC component is composed of three months of projected includable fuel costs and economy purchased power data. The FC component by customer type included in the Duke Energy Ohio quarterly FPP filings for 2009 and the first two quarters of 2010 are shown in *Exhibit X-8*.

Exhibit X-8
FC Rate Projections
January 1, 2009 – June 30, 2010

FC Rate Projections	Q1 2009	Q2 2009	Q3 2009	Q4 2009	Q1 2010	Q2 2010
Projected Fuel Cost	$135,021,531	$122,584,900	$174,662,652	$141,850,577	$104,233,772	$82,981,026
Projected Load (kWh)	5,468,949,949	5,068,081,440	5,784,498,961	4,240,333,776	3,206,998,748	2,447,245,389
Total Fuel Rate ($/kWh)	0.024688749	0.024187634	0.030194949	$0.0334527	0.032501968	0.03390793
Total Fuel Rate (¢/kWh)	2.4689	2.4188	3.0195	3.3453	3.2502	3.3908

Source: Information Response 81

Emission Allowances Component

The proposed EA, AEPS, and ER of the quarterly FPP rate is composed of three months' projected includable emission allowance data. The total EA calculated portion of the FPP as filed quarterly with the PUCO is shown in *Exhibit X-9*.

Exhibit X-9
Emission Allowance Rate Projections
January 1, 2009 – June 30, 2010

EA Rate Projections	Q1 2009	Q2 2009	Q3 2009	Q4 2009	Q1 2010	Q2 2010
Projected Emission Allowance Cost	$6,508,474	$4,237,596	$9,423,424	$3,069,791	$1,427,419	$1,305,483
Projected Load (kWh)	5,081,847,193	4,806,375,736	5,229,727,236	4,113,123,763	3,110,788,786	2,373,828,027
Emission Allowance Rate (¢/kWh)	0.1281	0.0882	0.1802	0.0746	0.0459	0.0550
Projected Alternative Energy Portfolio Standard Cost				$2,601,000	$650,000	$650,000
Projected Load (kWh)				4,113,123,763	3,110,788,786	2,373,828,027
Projected Alternative Energy Portfolio Standard Rate (¢/kWh)				0.0632	0.0209	0.0274
Projected Environmental Reagents Cost					$4,992,497	$3,962,619
Projected Load (kWh)					3,110,788,786	2,373,828,027
Projected Environmental Reagents Rate (¢/kWh)					0.1605	0.1669

Source: Information Response 81

Reconciliation Adjustment Component

The RA component represents a true-up between the projected and actual FC and EA components experienced. The RA for 2009 and the first two quarters of 2010 is shown in *Exhibit X-10*. Starting with the fourth quarter of 2009, the total non-residential rate filed with the PUCO included both non-residential and voltage reduction items.

Exhibit X-10
Reconciliation Adjustments
January 1, 2009 – June 30, 2010

Time Period	Component	Reconciliation Adjustments: Residential	Reconciliation Adjustments: Non-Residential	Reconciliation Adjustments: Voltage Reduction
1st Quarter 2009	Current Period Adjustment	$6,395,492.21	$8,428,554.91	$2,976,344.92
	Deferred to Future Period	$0.00	$0.00	$0.00
	Prior Period Adjustment	$0.00	$0.00	$0.00
	Total Adjustment	$6,395,492.21	$8,428,554.91	$2,976,344.92
	Predicted Load	0	0	0
	Net RA in FPP ¢/kWh	0.0000	0.0000	0.0000
2nd Quarter 2009	Current Period Adjustment	($9,212,153.55)	($14,774,320.98)	($3,334,867.23)
	Deferred to Future Period	$0.00	$0.00	$0.00
	Prior Period Adjustment	$0.00	$0.00	$0.00
	Total Adjustment	($9,212,153.55)	($14,774,320.98)	($3,334,867.23)
	Predicted Load	1,540,700,000	2,247,735,000	785,289,000
	Net RA in FPP ¢/kWh	(0.5979)	(0.6573)	(0.4247)
3rd Quarter 2009	Current Period Adjustment	$13,812,151.95	$15,759,590.73	$4,006,860.57
	Deferred to Future Period	($12,430,937.00)	($14,183,632.00)	($3,606,175.00)
	Prior Period Adjustment	$0.00	$0.00	$0.00
	Total Adjustment	$1,381,214.95	$1,575,958.73	$400,685.57
	Predicted Load	2,096,486,000	2,701,909,000	735,353,000

Time Period	Component	Reconciliation Adjustments: Residential	Reconciliation Adjustments: Non-Residential (Includes Voltage Reduction)
4th Quarter 2009	Current Period Adjustment	$12,747,004.01	$27,582,063.66
	Deferred to Future Period	($10,197,603.21)	($22,065,650.93)
	Prior Period Adjustment	$1,381,215.00	$1,976,645.00
	Total Adjustment	$3,930,615.80	$7,493,057.73
	Predicted Load	1,380,795,000	2,070,716,000
	Net RA in FPP ¢/kWh	0.2847	0.3619
1st Quarter 2010	Current Period Adjustment	$316,608.93	$655,928.11
	Deferred to Future Period	$0.00	$0.00
	Prior Period Adjustment	$6,374,197.56	$11,363,643.88
	Total Adjustment	$6,690,806.49	$12,019,571.99
	Predicted Load	1,673,752,000	1,817,840,000
	Net RA in FPP ¢/kWh	0.3997	0.6612
2nd Quarter 2010	Current Period Adjustment	($2,618,629.34)	($2,076,172.47)
	Deferred to Future Period	$0.00	$0.00
	Prior Period Adjustment	$5,949,251.06	$10,606,067.62
	Total Adjustment	$3,330,621.72	$8,529,895.15
	Predicted Load	1,224,390,000	1,862,370,000
	Net RA in FPP ¢/kWh	0.2720	0.4580

Source: Information Response 81

System Loss Adjustment Component

The SLA represents projections of lost energy from the point of generation to delivery to the customer. It is based on a forecast of projected meter load applied to the current FC rate for the upcoming quarter, adjusted for historic losses in market-based standard service officer (MBSSO) along with an adjustment for total system-wide losses. The SLA for 2009 and the first two quarters of 2010 is shown in *Exhibit X-11*.

Exhibit X-11
System Loss Adjustments
January 1, 2009 – June 30, 2010

		System Loss Adjustments		
Time Period	**Component**	**Residential**	**Non-Residential**	**Voltage Reduction**
1st Quarter 20	Average Loss Rate	0.1690	0.1690	0.0774
	Losses in MBSSO	(0.1051)	(0.1051)	(0.0481)
	Synchronization Adjustment	0.0071	0.0071	0.0071
	Net SLA in FPP ¢/kWh	0.0710	0.0710	0.0364
2nd Quarter 2	Average Loss Rate	0.1656	0.1656	0.0758
	Losses in MBSSO	(0.1051)	(0.1051)	(0.0481)
	Synchronization Adjustment	0.0067	0.0067	0.0067
	Net SLA in FPP ¢/kWh	0.0672	0.0672	0.0344
3rd Quarter 2	Average Loss Rate	0.2067	0.2067	0.0946
	Losses in MBSSO	(0.1051)	(0.1051)	(0.0481)
	Synchronization Adjustment	0.0113	0.0113	0.0113
	Net SLA in FPP ¢/kWh	0.1129	0.1129	0.0578
4th Quarter 2	Average Loss Rate	0.2290	0.2290	0.1048
	Losses in MBSSO	(0.1051)	(0.1051)	(0.0481)
	Synchronization Adjustment	0.0138	0.0138	0.0138
	Net SLA in FPP ¢/kWh	0.1377	0.1377	0.0705
1st Quarter 20	Average Loss Rate	0.2225	0.2225	0.1018
	Losses in MBSSO	(0.1051)	(0.1051)	(0.0481)
	Synchronization Adjustment	0.0130	0.0130	0.0130
	Net SLA in FPP ¢/kWh	0.1304	0.1304	0.0667
2nd Quarter 2	Average Loss Rate	0.2322	0.2322	0.1063
	Losses in MBSSO	(0.1051)	(0.1051)	(0.0481)
	Synchronization Adjustment	0.0141	0.0141	0.0141
	Net SLA in FPP ¢/kWh	0.1412	0.1412	0.0723

Source: Information Response 81

Overall Audit Objectives and Scope

The overall objectives of the financial review of the FPP rider for 2009 were to:

- Determine that Duke Energy Ohio has procedures in place that are being followed to achieve control of costs associated with processing fuel receipts and consumption transactions; processing energy purchase and sale transactions; processing emission allowances, reconciliation adjustments, and system loss adjustment and that it is accurately calculating the FPP rate, including compliance with the financial procedural aspects of former *Chapter 4901:1—11 of the Administrative Code.*
- Determine whether Duke Energy Ohio's FPP procedures are reasonable and being followed.
- Verify the arithmetic accuracy of the calculation and reporting of allowable cost components (FC, EA, RA, SLA, AEPS, and ER) included in the FPP rate charged to Duke Energy Ohio customers.
- Verify the arithmetic accuracy of Duke Energy Ohio's calculation of the FPP rate, including the difference between actual net revenues and actual net fuel costs.
- Review the procedures and control for assembly and reporting of information in the FPP tariff billing sheets.
- Verify the proper FPP rates were properly applied in customer billings.
- Determine whether the fuel (coal) delivered to Duke Energy Ohio plants meets quality and quantity specifications. (Refer to *Chapter III – Fuel Procurement/Management and Coal Prices* for discussion.)

To address these objectives, Schumaker & Company performed the following activities:

- Interviewed personnel involved with accounting for fuel and purchased power comprising FPP items and developing PUCO filings
- Reviewed quarterly filings and supporting work papers and recomputed the FPP rates during the audit period
  - Reviewed proposed FC, EA, RA, SLA, AEPS, and ER components of the FPP rate
  - Verified the mathematical accuracy of calculations
  - Reviewed the forecasting methods used to project customer loads and associated costs with Duke personnel
  - Verified the entry of the FC, EA, RA, SLA, AEPS, and ER rates into Duke's billing system
  - Reviewed supporting documentation, including:
    - Relevant pages from Duke's general ledger
    - Fuel ledger

- Purchase orders and invoices
- Journal entries and supporting data

- Compared recomputed rates to those filed with PUCO
- Traced the recovery of revenues produced from the components of the FPP rate to the sales volumes included in financial statements
- Verified that actual revenues recovered from the total FPP rates were reconciled against the FPP's projected costs
- Randomly selected and tested customer bills from each quarter of the audit period to confirm appropriate application of the FPP rates in Duke Energy Ohio's billing system, as shown below in *Exhibit X-12*
- Reviewed SOX controls regarding PUCO filings for FPP rate
- Traced process for computing and filing FPP rates through the SOX business process flowcharts
- Reviewed SOX test procedures for completeness and effectiveness
- Reviewed results of SOX tests completed in 2009
- Reviewed Duke internal audits involving power or fuel costs, including FPP, SRT, and coal contracts and invoices

To verify that the correct FPP and SRT rates had been included on the Duke electric bills, Schumaker & Company reviewed a random sample selection of monthly bills from mid-month and end-of-month bill cycles for the months of March, June, September, and December of 2009. Fifty-nine sample bills were selected, representing 17 different Duke Energy Ohio billing rates. Because several of the bills contained information for multiple electric meters, a total of 92 sets of billing detail containing FPP and delivery rider (including SRT) charges were examined. The delivery rider and FPP charges were recalculated and compared to rates included in the quarterly PUCO filings. Statistics regarding the bill testing conducted is shown in *Exhibit X-12*. No exceptions were found.

Exhibit X-12
Sample Bill Testing
2009

Filing Quarter	# Sample Bills	Electricity Usage		Number of Meters	Riders Examined	
		Charges ($)	kWh		FPP	SRT
1	15	439,103	7,704,295	28	25	27
2	17	221,416	1,281,520	32	30	32
3	13	64,232	660,069	16	15	16
4	14	592,879	2,644,381	18	15	18
Total	59	1,317,630	12,290,265	94	85	93

Source: Information Response 112 and Schumaker & Company Analysis

Prior Audit Recommendations Follow-Up

Regarding the two recommendations in the prior audit report, the following actions have been taken:

- *Recommendation 1, Chapter VII, p. VII-9* regarding the merits of refunding the bankruptcy settlement finds of $319,518 from a formal coal customer back to the customers: The recommendation was resolved via a stipulation filed on August 28, 2009, whereby the parties agreed "…that the bankruptcy settlement (identified in *Recommendation 1, Chapter VII, p. VII-9)* shall not be refunded back to the (SSO) customers due to the settlement recovery's connection with a period when electricity rates were frozen following enactment of Sub. S.B.3." The stipulation was approved by PUCO on September 30, 2009.
- *Recommendation 2, Chapter VII, p. VII-10* regarding refunding the omitted $612, 970 in 2010 vintage year EA Sales Margins back to customers: The recommendation was resolved via a stipulation filed on August 28, 2009, whereby the parties agreed that "…the merits of refunding the margins of $612,970 resulting from 2010 vintage emission allowance transactions shall be reviewed during the audit for 2010." The stipulation was approved by PUCO on September 30, 2009. It will be included in the audit for the upcoming year.

Findings and Conclusions

Finding X-1 **In 2009, five FPP rates were incorrectly characterized as residential or non-residential in Duke Energy Ohio's compilation of billing data; however, the error was noted by Duke staff and was corrected in 2010 filings.**

During 2009 (January 2009 through June 2009), five FPP rates were incorrectly characterized as residential or non-residential by Duke Energy Ohio in its compilation of billing data (and therefore its FPP filings), as shown in *Exhibit X-13.*

Exhibit X-13
FPP Rates Improperly Designated in Duke Energy Ohio Compilation of Billing Data
2009

	Rate Designation	
	Original	**Revised**
RSLIS	Non-residential	Residential
RS3P	Non-residential	Residential
RS01-CUR	Residential	Non-residential
ORH-S	Non-residential	Residential
TD	Non-residential	Residential

Source: Interview 6 and Schumaker & Company Analysis of Duke Energy Ohio Supporting Documentation for January–March 2010 FPP filings

The incorrect characterization results in a shift of usage and fuel/purchased power (PP) as shown in *Exhibit X-14*.

Exhibit X-14
Changes in Usage and Fuel/PP Due to FPP Rates Improperly Designated in Duke Energy Ohio
Compilation of Billing Data
2009

	FPP Usage Only			Residential		Non-Residential		Voltage Reduction	
	Usage	Total Revenue	CGE Fuel/PP	Usage	CGE Fuel/PP	Usage	CGE Fuel/PP	Usage	CGE Fuel/PP
Original									
Jan-09	1,803,967,408	172,933,689	43,318,587	778,527,219	18,581,963	813,759,335	19,282,419	211,680,854	5,454,204
Feb-09	1,728,097,050	166,493,112	46,019,127	743,318,683	19,824,450	788,396,644	21,025,186	196,381,723	5,169,491
Mar-09	1,529,669,358	149,477,593	40,749,490	575,292,037	15,346,340	740,528,431	19,776,568	213,848,890	5,626,582
Apr-09	1,376,416,233	125,917,625	27,074,152	455,696,059	8,988,100	729,371,004	13,979,537	191,349,170	4,106,515
May-09	1,303,259,693	119,532,938	25,427,688	417,001,545	8,238,209	757,117,022	14,510,870	129,141,126	2,678,609
Jun-09	1,555,938,266	145,081,468	30,539,777	526,105,050	10,402,633	831,003,151	15,928,586	198,830,065	4,208,558
Total	9,297,348,008	879,436,425	213,128,822	3,495,940,593	81,381,695	4,660,175,587	104,503,167	1,141,231,828	27,243,960
Revised									
Jan-09	1,803,967,408	172,933,689	43,318,587	779,525,813	18,607,079	812,760,741	19,257,304	211,680,854	5,454,204
Feb-09	1,728,097,050	166,493,112	46,019,127	744,543,057	19,858,128	787,172,270	20,991,508	196,381,723	5,169,491
Mar-09	1,529,669,358	149,477,593	40,749,490	576,055,484	15,367,352	739,764,984	19,755,556	213,848,890	5,626,582
Apr-09	1,376,416,233	125,917,625	27,074,152	456,212,474	8,998,848	728,854,589	13,968,789	191,349,170	4,106,515
May-09	1,303,259,693	119,532,938	25,427,688	417,390,966	8,246,305	756,727,601	14,502,773	129,141,126	2,678,609
Jun-09	1,555,938,266	145,081,468	30,539,777	526,590,119	10,412,219	830,518,082	15,919,000	198,830,065	4,208,558
Total	**9,297,348,008**	**879,436,425**	**213,128,822**	**3,500,317,913**	**81,489,932**	**4,655,798,267**	**104,394,930**	**1,141,231,828**	**27,243,960**
Difference	**0**	**0**	**0**	**4,377,320**	**108,237**	**(4,377,320)**	**(108,237)**	**0**	**0**

Source: Interview 6 and Schumaker & Company Analysis of Duke Energy Ohio Supporting Documentation for July–December 2009 filings (original figures) and January–March 2010 FPP filings (revised figures); filings use CGE acronym (previously Cincinnati Gas & Electric) for referencing Duke Energy Ohio.

These shifts were part of the reconciliation adjustments for January 2009 through June 2009 in Duke Energy Ohio's first quarter of 2010 (January–March 2010) filing (Schedule 1 Page 3 of 5), as shown in *Exhibit X-15*.

Exhibit X-15
Reconciliation Adjustment Due to FPP Rates Improperly Designated in Duke Energy Ohio Compilation of Billing Data
January–March 2010 Filings

Duke Energy Ohio
Electric Department
Calculation of Quarterly Fuel and Economy Purchased Power Component for Billing
Reconciliation Adjustment
Actual Fuel and Economy Purchased Power Costs Incurred, Actual FPP Revenues Billed Summary
January 2010 through March 2010

Line	Reconciliation Adjustment (RA)		Total		Residential		Total Non-Residential	
1	September 2009 (See Page 3C Line 33)	$	(2,243,788.17)	$	(895,725.19)	$	(1,348,062.98)	
2	August 2009 (See Page 3B Line 33)	$	1,666,151.67	$	600,176.48	$	1,065,975.19	
3	July 2009 (See Page 3A Line 33)	$	2,845,355.80	$	1,050,080.58	$	1,795,275.22	
4	June 2009 (See Page 5L Line 34)	$	(12,114.14)	$	11,481.58	$	(23,595.72)	
5	May 2009 (See Page 5J Line 34)	$	(256,795.51)	$	(74,096.36)	$	(182,699.15)	
6	April 2009 (See Page 5H Line 34)	$	(262,794.66)	$	(78,259.57)	$	(184,535.09)	
7	March 2009 (See Page 5F Line 34)	$	(267,068.27)	$	(95,457.78)	$	(171,610.49)	
8	February 2009 (See Page 5D Line 34)	$	(262,980.29)	$	(102,934.36)	$	(160,045.93)	
9	January 2009 (See Page 5B Line 34)	$	(233,429.39)	$	(98,656.45)	$	(134,772.94)	
10	Miscellaneous Prior Period Adjustments	$	-	$	-	$	-	
11	Total Reconciliation Adjustment (Line 1 through Line 10)	$	972,537.04	$	316,608.93	$	655,928.11	
12	Portion of Reconciliation deferred from 3rd and 4th quarter 2009	$	17,737,841.44	$	6,374,197.56	$	11,363,643.88	
13	Reconciliation Adjustment to recover in 1st quarter 2010	$	18,710,378.48	$	6,690,806.49	$	12,019,571.99	
14	Projected Retail Energy (kWh)		3,491,592,000		1,673,752,000		1,817,840,000	
15	Total RA Rate (Line 13 / Line 14) To Page 1 Line 12				0.3997		0.6612	¢/kWh

Source: Interview 6 and January–March 2010 FPP filings

Finding X-2 Schumaker & Company's review of the methodology, calculations, and accounting entries concerning the quarterly filing of the FPP rate disclosed no discrepancies.

Schumaker & Company reviewed and recalculated, where appropriate, the work papers, supporting documentation, and accounting entries used to develop, report, and file the FPP rate included in PUCO filings. The mathematical accuracy of calculations was verified, entries were traced to supporting documentation, and rates were recomputed. Also a random sample of customer bills was examined to verify that the appropriate FPP rate was included on each bill. Revenues and electricity usage were traced to monthly and annual financial reports used for external and internal purposes. No discrepancies in Duke Energy Ohio's accounting and reporting concerning the FPP rate for 2009 were discovered.

Finding X-3 There is no formal comprehensive manual governing the FPP rider.

There is significant documentation concerning the process of compiling, preparing, and filing the quarterly FPP forms that support the proposed calculation of the FPP components of Duke Energy Ohio's market-based standard service offer. However, there is no overarching comprehensive manual describing the processes necessary to perform the associated activities and the rationale for doing so. Duke Energy Ohio maintains numerous electronic desktop procedures to guide Duke Energy Ohio personnel through the various individual tasks and procedures necessary for accounting and business processes involved in collecting data and preparing and filing the quarterly FPP forms. A considerable file of work papers support the filing, and the filing itself also contains a number of schedules that support the filing process. Additionally, the SOX controls over this area include business process flowcharts and SOX tests to verify that the controls are working. Duke Energy Ohio's personnel appear to be significantly experienced and knowledgeable in performing the compilation, calculation, and filing tasks that are required. Nevertheless, a comprehensive FPP manual would allow a person who is unfamiliar with this area to perform these functions more easily and would enable external reviewers to more easily verify that proper steps were being followed.

Recommendations

Recommendation X-1 Establish a procedure for verifying rate information when supplying it for Duke Energy Ohio's billing system. (Refer to Finding X-1.)

Mistakes such as the one identified in *Finding X-1* above were identified by the Duke Energy Ohio Lead Rates Analyst, who is part of the Revenue and Analysis group of the Rates & Regulatory Accounting organization. Having Duke Energy Ohio find these mistakes and fixing them is favorable; however, they should not have been allowed to happen in the first place. Verification procedures should have been in place to ensure that these kinds of mistakes are found sooner. Duke Energy Ohio should develop and implement such procedures, making sure they are incorporated into SOX controls.

Recommendation X-2 Develop an accounting and procedures manual governing the processes involved in filing the FPP rider. (Refer to Finding X-3.)

Duke Energy Ohio should develop an accounting and procedures manual that reinforces the monthly fuel and purchased power accounting processes supporting the calculation of the FPP components of Duke Energy Ohio's MBSSO for filing with the PUCO. This manual should be sufficiently detailed to allow personnel who are new to this area to easily function with the assistance of more experienced personnel. It should provide an overview of the accounting and business processes with narrative to explain what is being done and why. The desktop procedures should be organized in a manner to tie to the narrative discussion. It should also combine the existing desktop procedures with the SOX business process flowcharts, providing personnel with work steps, examples, and written procedures to allow them to support and verify their ongoing activities. Additionally, it should serve as a reference manual supporting reviews by external auditors and consultants.

C. System Reliability Tracker Rider

This section reviews and assesses implementation of the SRT rider by Duke Energy Ohio for the January 1, 2009 to December 31, 2009 period, including Schumaker & Company's testing of SRT data.

Background and Perspective

The SRT rider is intended to recover the Duke Energy Ohio system reliability costs the utility incurs in maintaining a sufficient reserve margin to ensure reliable service to its residential and non-residential customers (non-switched load). This rider permits Duke Energy Ohio to apply annually to PUCO for the purchase of capacity to cover peak and reserve capacity requirements and to flow through those actual costs on a dollar-for-dollar basis. It allows Duke Energy Ohio to track and collect costs associated with meeting its MBSSO load obligation plus a planning reserve margin. The SRT rider is updated and filed quarterly based on year-to-date estimates of annual revenues and costs.

In selected situations, Duke Energy Ohio customers may avoid the SRT and receive the shopping credit. Such situations include:

- Residential end-use customers receiving generation service through a governmental aggregator avoid (are waived) the SRT if the governmental aggregator notifies Duke Energy Ohio at least 60 days prior to the start of the governmental aggregation of its intent to place all residential end-use customers served by the aggregation on the Rider SRA-SRT waiver program and agrees to maintain the governmental aggregation through December 31, 2011. Residential end-use customers receiving generation service through such an aggregation who do not want to participate in the waiver program may request that Duke Energy Ohio bill them monthly for the rider.
- Non-residential customers who agree not to return to the SSO for the remainder of the three-year term of the proposed ESP period avoid the SRT. If such customers desire to return to ESP-SSO service, they agree to return at 115% of Duke Energy Ohio's ESP-SSO price, including the generation riders. Such non-residential customers shall also receive a generation price shopping credit equal to the SRA-CD rider. Non-residential customers who purchase competitive retail electric service from a competitive retail energy service (CRES) provider,but choose to pay the SRT rider, and waive the shopping credit may return to the ESP-SSO price at any time without notice.

Overall Audit Objectives and Scope

The overall objectives of the financial review of the SRT rider for 2009 were to:

- Determine that Duke Energy Ohio has procedures in place that are being followed to achieve control of costs associated with meeting the MBSSO load obligation plus a reserve margin, is processing capacity costs incurred to serve SRT customers, and is accurately calculating the SRT rate, including compliance with the financial procedural aspects of former *Chapter 4901:1—11 of the Administrative Code.* (Prior to June 2009, the reserve margin was 15% with installed capacity product (ICAP) MWs. Beginning in June 2009, the reserve margin requirement was set to 5.35% above the load obligation using unforced capacity product (UCAP) MWs.) (UCAP is ICAP adjusted for a three-year average historic forced outage rate.)
- Determine whether the Duke Energy Ohio SRT procedures are reasonable and being followed.
- Verify the arithmetic accuracy of allowable capacity costs passed through the SRT rate to Duke Energy Ohio's customers.
- Verify the arithmetic accuracy of the calculation and reporting of the SRT rate, including the difference between actual net revenues and actual net costs.
- Verify the proper SRT rates were applied in customer billings.
- Review the procedures and control for assembly and reporting of information in the SRT tariff billing sheets.
- Determine whether the company is following procedures for processing capacity data and whether those procedures are reasonable.
- Determine whether the company correctly reported payments made for capacity costs.
- Calculate the difference between actual net revenues and actual net capacity costs.

To address these objectives, Schumaker & Company performed the following activities:

- Interviewed personnel involved with accounting and filing relative to the SRT filings.
- Obtained and reviewed SRT quarterly filings with PUCO showing SRT tariffs by group and rate.
- Obtained and reviewed supporting work papers/documentation used by Duke Energy Ohio in developing these tariffs.
- Verified the arithmetic accuracy of Duke Energy Ohio's rate calculations and compared the resulting rates to PUCO filings.
- Traced the recovery of the revenues produced from the individual components of the SRT rates to the sales volumes included in Duke Energy Ohio's financial statements.
- Verified that actual revenues recovered from the SRT rates were reconciled against projected costs.
- Randomly selected customer bills from each quarter of the audit period (2009) to confirm that appropriate application of the SRT rate occurred in Duke Energy Ohio's customer billing system, as previously shown in *Exhibit X-12*

2009 Tariff Filing Data

Duke Energy Ohio made four quarterly SRT filings for 2009. *Exhibit X-16* below illustrates the quarterly (1Q, 2Q, 3Q, and 4Q) SRT filing rates for the 2009 audit period.

Exhibit X-16
SRT Tariff Filings
Four 2009 Quarters

Type of Tariff Charge			Q1 2009	Q2 2009	Q3 2009	Q4 2009
RS	Residential Service	All kWh	$0.001692	$0.001401	$0.000543	$0.000801
ORH	Optional Residential Service with Electric Space Heating	All kWh	$0.001692	$0.001401	$0.000543	$0.000801
TD	Optional Time-of-Day Rate	All kWh	$0.001692	$0.001401	$0.000543	$0.000801
CUR	Common Use Residential Serfice	All kWh	$0.001692	$0.001401	$0.000543	$0.000801
DS	Service at Secondary Distribution Voltage	First 1,000 kW	$0.254000	$0.300500	$0.109000	$0.163300
		Additional kW	$0.200900	$0.232000	$0.083000	$0.128400
		Billing Demand Times 300	$0.000649	$0.000310	$0.000112	$0.000172
		Additional kWh	$0.000539	$0.000165	$0.000056	$0.000095
GS-FL	Optional Unmetered for Small Fixed Loads	All kWh	$0.001326	$0.001116	$0.000359	$0.000543
EH	Optional Rate for Electric Space Heating	All kWh	$0.001465	$0.000715	($0.000180)	($0.000005)
DM	Secondary Distribution Service, Small	All kWh	$0.001567	$0.001320	$0.000499	$0.000752
DP	Service at Primary Distribution Voltage	First 1,000 kW	$0.235100	$0.318600	$0.112300	$0.163100
		Additional kW	$0.185500	$0.243100	$0.086700	$0.136000
		Billing Demand Times 300	$0.000750	$0.000465	$0.000164	$0.000251
		Addition kWh	$0.000601	$0.000254	$0.000086	$0.000135
TS	Service at Transmission Voltage	First 50,000 kVa	$0.310700	$0.456500	$0.204800	$0.342900
		Additional kVa	$0.224000	$0.335000	$0.147900	$0.242300
		Billing Demand Times 300	$0.000534	$0.000146	$0.000065	$0.000107
		Additional kWh	$0.000607	$0.000252	$0.000113	$0.000205
SL	Street Lighting	All kWh	$0.000985	$0.000845	$0.000301	$0.000468
TL	Traffic Lighting Service	All kWh	$0.000985	$0.000845	$0.000301	$0.000468
OL	Outdoor Lighting Service	All kWh	$0.000985	$0.000845	$0.000301	$0.000468
NSU	Street Lighting Service for Non-Standard Units	All kWh	$0.000985	$0.000845	$0.000301	$0.000468
NSP	Private Outdoor Lighting for Non-Standard Units	All kWh	$0.000985	$0.000845	$0.000301	$0.000468
SC	Street Lighting Service-Customer Owned	All kWh	$0.000985	$0.000845	$0.000301	$0.000468
SE	Street Lighting Service-Overhead Equivalent	All kWh	$0.000985	$0.000845	$0.000301	$0.000468
UOLS	Unmetered Outdoor Lighting Electric Service	All kWh	$0.000985	$0.000845	$0.000301	$0.000468

Source: SRT Tariff Filings with PUCO\

For each of the individual rates included in *Exhibit X-16,* Duke Energy Ohio performed the following calculations:

1. Estimates of 2009 capacity costs by rate group to be collected through SRT rates in 2009
2. Prior period SRT over/under collections by rate group to be collected from customers through SRT rates in 2009
3. Estimates of 2009 SRT billings by rate group
4. Item #1 plus Item #2 minus Item #3 as the total of Duke Energy Ohio's 2009 estimate of net capacity costs by rate group
5. Allocated Item #4 to individual rates and then divided by either estimated billing kW demands (first 1,000 kW and additional kW for DS, DP, and TS rates) or estimated kWh sales for 2009 (all other rates) to calculate the individual SRT rates

Exhibit X-17 below illustrates the summary totals for these items used in Duke Energy Ohio's supporting documentation to its SRT tariff filings.

Exhibit X-17
2009 Summary Estimates for SRT Filings by Quarter

	Projected Capacity and Purchased Power Costs (Item #1)	Prior Period Costs Over/Under Collections (Item #2)	Total SRT Costs to be Recovered	Estimates of SRT Billing (Item #3)	Estimates of Net Power Costs	kWh	kW
1Q 2009	$28,594,202	$617,730	$29,211,932	$0	$29,211,932	20,491,885,398	31,468,824
2Q2009	$25,215,633	$582,449	$25,798,082	$7,615,525	$18,182,557	15,065,584,893	23,711,927
3Q2009	$17,182,412	$582,449	$17,764,861	$12,999,234	$4,765,627	10,365,788,690	15,765,219
4Q 2009	$18,253,989	$582,449	$18,836,438	$15,468,911	$3,367,527	4,752,259,762	7,593,770

Source: SRT filings

With each quarterly filing, Duke Energy Ohio updates its estimated costs and billing based on actual results experienced on a year-to-date basis. For example, with its first quarter 2009 filing, its project data is based solely on estimated data. However, for its second quarter 2009 filing, Duke Energy Ohio has two months of actual data and 10 months of projected data. Then for its third quarter 2009 filing, Duke Energy Ohio has five months of actual data and seven months of project data.

Prior Audit Recommendations Follow-Up

Regarding the one recommendation in the prior audit report, the following actions have been taken:

- *Recommendation 1, Chapter VIII, p. VIII-10* regarding the potential combination of rate schedules TS, GS-FL, EH, and DM into a single group for SRT calculations: The recommendation was resolved via a stipulation filed on August 28, 2009, whereby the parties agreed that "….that Rate Schedules RS, GS-FL, EH, and DM shall not be combined into a single group for Rider SRA-SRT rate calculations (*Recommendation 1, Chapter VIII, p. VII-I-5*)." The stipulation was approved by PUCO on September 30, 2009.

Findings and Conclusions

Finding X-4 **Schumaker & Company's review of the methodology, calculations, and accounting entries concerning the quarterly filing of the SRT rate disclosed no discrepancies.**

Schumaker & Company reviewed and recalculated, where appropriate, the work papers, supporting documentation, and accounting entries used to develop, report, and file the SRT rate included in PUCO filings. The mathematical accuracy of calculations was verified, entries were traced to supporting documentation, and rates were recomputed. Also, a random sample of customer bills was examined to verify that the appropriate SRT rate was included on each invoice. Revenues and electricity usage were traced to monthly and annual financial reports used for external and internal purposes. No discrepancies in Duke Energy Ohio's accounting and reporting concerning the SRT rate for 2009 were discovered.

Finding X-5 There is no formal comprehensive manual governing the SRT rider.

There is significant documentation concerning the process of compiling, preparing, and filing the quarterly SRT forms that support the proposed calculation of the SRT filings. However, there is no overarching comprehensive manual describing the processes necessary to perform the associated activities and the rationale for doing so. Duke Energy Ohio maintains numerous electronic desktop procedures to guide Duke Energy Ohio personnel through the various individual tasks and procedures necessary for accounting and business processes involved in collecting data and preparing and filing the quarterly SRT forms. A considerable file of work papers support the filing, and the filing itself also contains a number of schedules that support the filing process. Additionally, the SOX controls over this area include business process flowcharts and SOX tests to verify that the controls are working. Duke Energy Ohio's personnel appear to be significantly experienced and knowledgeable in performing the compilation, calculation, and filing tasks that are required. Nevertheless, a comprehensive SRT manual would allow a person who is unfamiliar with this area to perform these functions more easily and would enable external reviewers to more easily verify that proper steps were being followed.

Recommendations

Recommendation X-3 Develop an accounting and procedures manual governing the processes involved in filing the SRT rider. (Refer to Finding X-5.)

Duke Energy Ohio should develop an accounting and procedures manual that reinforces the monthly processes supporting the calculation of the SRT components of Duke Energy Ohio's MBSSO for filing with the PUCO. This manual should be sufficiently detailed to allow personnel who are new to this area to easily function with the assistance of more experienced personnel. It should provide an overview of the accounting and business processes with narrative to explain what is being done and why. The desktop procedures should be organized in a manner to tie to the narrative discussion. It should also combine the existing desktop procedures with the SOX business process flowcharts, providing personnel with work steps, examples, and written procedures to allow them to support and verify their ongoing activities. Additionally, it should serve as a reference manual supporting reviews by external auditors and consultants.