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Witness: James A. Busch
Sponsoring Party: MO PSC Staff
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Case No.: ER-2005-0436
Date Testimony Prepared: October 28, 2005

MISSOURI PUBLIC SERVICE COMMISSION
UTILITY OPERATIONS DIVISION

DIRECT TESTIMONY

OF

JAMES A. BUSCH

AQUILA, INC.

CASE NO. ER-2005-0436

Jefferson City, Missouri
October 2005

FILED²
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Service Commission

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Date 1-09-06 Rptr 25

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI**

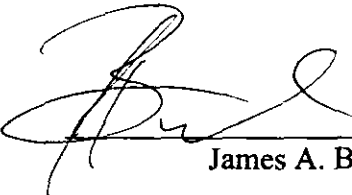
In the Matter of Aquila, Inc. d/b/a Aquila)
Networks-MPS and Aquila Networks-)
L&P, for Authority to File Increasing)
Electric Rates For the Service Provided to)
Customers in the Aquila Networks-MPS)
and Aquila Networks-L&P Area.)

Case No. ER-2005-0436

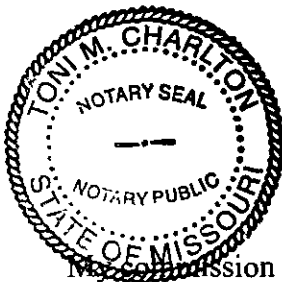
AFFIDAVIT OF JAMES A. BUSCH

STATE OF MISSOURI)
) ss
COUNTY OF COLE)

James A. Busch, of lawful age, on his oath states: that he has participated in the preparation of the following Direct Testimony in question and answer form, consisting of 17 pages of Direct Testimony to be presented in the above case, that the answers in the following Direct Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.


James A. Busch

Subscribed and sworn to before me this 27th day of October, 2005.




Notary Public

TONI M. CHARLTON
Notary Public - State of Missouri
My Commission Expires December 28, 2008
Cole County
Commission #04474301

My Commission expires _____

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DIRECT TESTIMONY

OF

JAMES A. BUSCH

AQUILA, INC.

CASE NO. ER-2005-0436

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12
13 Q. Please state your name and business address.

14 A. My name is James A. Busch and my business address is P. O. Box 360,
15
16 Jefferson City, Missouri 65102.

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

18 A. I am a Regulatory Economist III in the Economic Analysis Section of the
19 Energy Department, Utility Operations Division of the Missouri Public Service
20 Commission (Staff).

21 Q. Please describe your educational and professional background?

22 A. I hold Bachelor of Science and Master of Science degrees in Economics
23 from Southern Illinois University at Edwardsville. Previously, I worked as a Public
24 Utility Economist with the Office of the Public Counsel (Public Counsel) from 1999 to
25 2005. Prior to my employment with Public Counsel, I worked as a Regulatory
26 Economist I with the Procurement Analysis Department of the Missouri Public Service
27 Commission from 1997 to 1999. I have been employed as a Regulatory Economist III
28 with the Staff of the Public Service Commission (Staff) since April 2005. Also, I am a
29 member of the Adjunct Faculty of Columbia College, Jefferson City Campus. I teach
30 both graduate and undergraduate classes in economics.

1 Q. Have you previously filed testimony before the Commission?

2 A. Yes. The cases in which I have filed testimony before the Commission are
3 listed on Schedule 1.

4 Q. What is the purpose of your direct testimony in this case?

5 A. The purpose of my testimony is to present the Staff's Class Cost of
6 Service (CCOS) study results for each of the areas in which Aquila provides electric
7 utility service—the two areas are served by Aquila, Inc. d/b/a Aquila Networks-MPS
8 (MPS) and as Aquila Networks-L&P (L&P).

9 Q. How have you organized your testimony?

10 A. First, I give a brief overview of the purpose of a Class Cost of Service
11 study. Second, I present Staff's Class Cost of Service study results for both MPS and
12 L&P.

13 **I. Executive Summary**

14 Q. Please summarize this testimony.

15 A. In this testimony, Staff has filed a new Class Cost of Service study for
16 both Aquila – MPS and Aquila – L & P. Staff has filed these new studies due to changes
17 in the proportion of costs in the functional categories of both MPS and L & P. This
18 testimony also describes the process that is undertaken in order to perform a CCOS study.
19 This process includes the functionalization, classification, and allocation of the utility's
20 costs. Finally, this testimony provides the results of the CCOS studies utilized by Staff
21 witness James Watkins in his rate design recommendation.

II. Class Cost of Service Study – Overview

Q. Has not the Staff recently filed CCOS studies for MPS and L&P in another proceeding that is pending before the Commission?

A. Yes. The Staff filed CCOS studies in Case No. EO-2002-384 that were based on cost and revenue data from Case No. ER-2004-0034.

Q. Are the CCOS studies that are the subject of your testimony in this case the same as those you filed testimony regarding in Case No. EO-2002-384.

A. No. The CCOS studies for MPS and L&P the Staff performed for this case are different because the proportion of costs in each functional category has changed since they were determined in Case No. ER-2004-0034. In all other respects they are the same. Schedule 2 attached to this testimony shows how the distribution of costs has changed between those two cases. This schedule shows the difference in functionalized costs between the two cases. The far right column labeled "Change," shows the difference between the percentage change in the costs in a particular functional category and the average, or overall, percentage change in each system's cost of service (revenue requirement). For example, the percentage increase in total cost of service for MPS was 20.76%. The costs in the production-energy function increased by 47.68%, which is 26.92 percentage points more than the total cost of service. However, the production capacity function increased by 12.25%, which is 8.51 percentage points less than the total cost of service. Because the distribution of costs has changed significantly, for this case, the Staff updated its CCOS studies developed in Case No. EO-2002-384 to reflect these changes and current revenue levels; however, no changes were made to the allocation factors developed in Case No. EO-2002-384.

1 Q. What is the primary purpose of performing a CCOS study?

2 A. The primary purpose of a CCOS study is to estimate a utility's costs of
3 providing service to each of the utility's customer classes by allocating total costs in a
4 reasonable manner. In turn, that allocation may then be relied on as a guide for setting
5 rates to the extent allowed by other rate design objectives, such as affordability, rate
6 shock, and continuity. A utility's total costs of providing service to its regulated
7 customers include the utility's expenses plus a reasonable rate of return on the utility's
8 rate base. A CCOS study is used to estimate how well each customer class fulfills its
9 revenue responsibility by comparing that class' share of the utility's total costs to the
10 revenue that class currently provides to the utility. The results of a CCOS study also
11 provide guidance for determining how rate elements should be designed for collecting
12 revenues from customers within a class, depending on customer usage levels and
13 patterns. In other words, the overall goal of a CCOS study is to match, on a customer
14 class basis, service received to the cost of providing that service, plus a reasonable return,
15 so that each customer pays a "fair share" of the costs incurred to serve that customer.

16 Q. What was the general procedure Staff followed in its CCOS study?

17 A. The Staff generally used the procedure described in Chapter 2 of the
18 National Association of Regulatory Utility Commissioners (NARUC) ELECTRIC
19 UTILITY COST ALLOCATION MANUAL, January, 1992 (NARUC Manual). The
20 CCOS studies the Staff performs are embedded cost studies. An embedded cost study is
21 based on dollars actually spent by the utility. Generally, the historical information
22 required to develop cost allocations, including the utility's plant investment, operating
23 costs, current revenues, and load information, are contained in the books and records

1 maintained by the utility, and are examined by the Staff's auditing and rate design
2 personnel.

3 Q. What are the primary steps in a Class Cost of Service study?

4 A. Once the relevant data are gathered, there are three primary steps in
5 performing a CCOS study. These steps are functionalization, classification, and
6 allocation of costs.

7 Q. Please explain functionalization of costs.

8 A. The first step of a CCOS study is functionalization. Functionalization of
9 costs involves categorizing plant investment and operation cost accounts by the type of
10 function with which an account is associated. Each major account was categorized by
11 whether the costs associated with that account were related to the utility's function of
12 production, transmission, distribution, or customer services and facilities; or, to some
13 combination of these functions.

14 Q. Please explain classification of costs.

15 A. The second step is to separate the functionalized costs into classifications
16 based on the components of utility service being provided. In addition, some costs can be
17 identified as logically incurred to serve a particular customer or customer group. For
18 example, costs in each of the distribution accounts can be classified as demand related
19 (costs that vary with kW demands) or customer related (costs that vary with the number
20 or type of customer served), and primary (utilized by both customers taking service at the
21 primary voltage and customers taking service at the secondary voltage) or secondary
22 (utilized by only customers taking service at the secondary voltage). Another example is

1 that certain plant investments can be identified as exclusively serving a special contract
2 customer, and thus can be directly assigned.

3 Q. Please explain allocation of costs.

4 A. The third step of performing a CCOS study is called allocation. After
5 costs have been properly classified, the analyst chooses allocation factors that will
6 allocate a reasonable share of jurisdictional costs to each customer class. Allocation
7 factors are based on ratios that represent the proportion of total units (total number of
8 customers, total annual energy consumption, etc.) attributable to a certain customer class.
9 These ratios are then used to calculate the proportions of various cost categories for
10 which a class is responsible.

11 **III. Staff's Class Cost Of Service Studies**

12 Q. What was the source of the data the Staff used in its Class Cost of Service
13 studies?

14 A. The source of the data Staff used in its Class Cost of Service studies was
15 the Staff's accounting schedules filed on October 14, 2005. Also, revenue data was
16 obtained from Staff witness Janice Pyatte. Furthermore, Staff utilized the same allocators
17 it used in filing its Class Cost of Service studies in Case No. EO-2002-0384.

18 Q. What customer classes did the Staff use in its Class Cost of Service
19 studies?

20 A. The Staff used the following classes for Aquila Networks-MPS customers:
21 Residential Service (RES), Small General Service (SGS), Large General Service (LGS),
22 Large Power Service (LPS), Other, and Lighting. The Other class includes Thermal
23 Energy Storage and the special contract customer.

1 The Staff used the following classes for Aquila Networks-L&P customers:
2 Residential (RES), Small General Service (SGS), Large General Service (LGS), Large
3 Power Service (LPS), and Lighting.

4 Q. Please describe how the Staff functionalized costs in its Class Cost of
5 Service studies.

6 A. Staff functionalized all plant accounts and expense accounts into the
7 following categories: production, transmission, distribution and customer.

8 The production function consists of generating plants where energy resources
9 such as natural gas and coal are converted to electricity. It also includes cost of fuel and
10 labor to operate these plants.

11 The transmission function moves electricity at a very high voltage, from
12 generating plants over long distances to local service areas. Electricity is transferred at
13 high voltages to minimize the current flow and thus the amount of electrical energy
14 converted to heat in the wires, and thereby to lessen energy loss and the risk of fire. The
15 transmission function consists of costs for high voltage lines and transmission
16 substations, and labor to operate and maintain these facilities. Transmission lines
17 typically consist of large steel or wood structures and wires.

18 The distribution function converts high voltage power from the transmission
19 system into lower primary voltage and delivers it to large industrial complexes, and
20 further converts it into even lower secondary voltage power which can be delivered into
21 homes for lights and appliances. Distribution is the final link in the chain built to deliver
22 electricity to the customers' homes or businesses. A utility's distribution plant includes

1 distribution substations, poles, wires, transformers and meters, as well as service and
2 labor expenses incurred for the operation and maintenance of these distribution facilities.

3 The customer function includes labor expenses incurred for billing and customer
4 services.

5 The pie charts below show the relative percentage of the costs for each of these
6 functions for Aquila's Missouri regulated electric operations.

7 **Table 1 – Aquila Networks – MPS Functionalized Costs**

FUNCTIONALIZED COSTS
AQUILA NETWORKS - MPS
Case No. ER-2005-0436

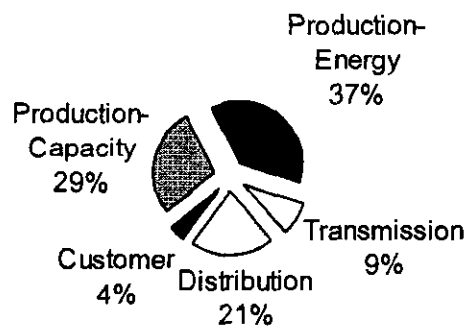
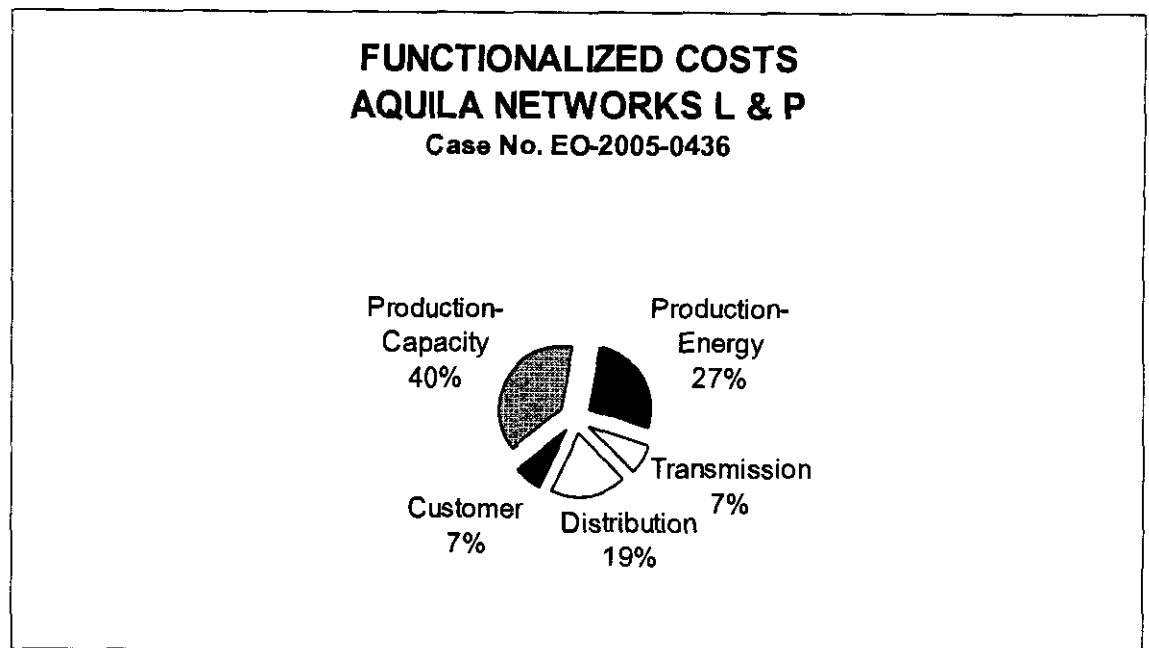


Table 2 - Aquila Networks – L & P Functionalized Costs



Q. Please describe how the Staff classified costs in its Class Cost of Service Study.

A. The functionalized costs were further classified into the following categories:

Production – Energy

Production – Capacity

Transmission – Capacity

Distribution – Substations – Primary demand

Distribution – Feeder Lines – Primary demand

Distribution – Overhead Lines & Poles – Primary customer

Distribution – Overhead Lines & Poles – Secondary customer

Distribution – Underground Lines & Conduits – Primary customer

Distribution – Underground Lines & Conduits – Secondary customer

- 1 Distribution – Lines, Poles, & Conduits – Primary demand
- 2 Distribution – Lines, Poles, & Conduits – Secondary demand
- 3 Distribution – Transformers – Secondary customer
- 4 Distribution – Transformers – Demand
- 5 Distribution – Customer Installations
- 6 Distribution – Services
- 7 Distribution – Meters
- 8 Customer – Customer Deposits
- 9 Customer – Meter Reading
- 10 Customer – Billing, Customer Sales & Services
- 11 Assigned – Other
- 12 Assigned – Large Power
- 13 Assigned – LGS/LPS/Other Classes
- 14 Assigned – RES/SGS Classes
- 15 Revenue Related
- 16 Lighting

17 Q. Why is Production Plant classified into two different categories?

18 A. Production Plant includes the cost of land, structures and equipment used
19 in connection with power generation. Both demand and energy characteristics of a
20 system's loads are important determinants of production plant costs. Specifically, fuel
21 expenses and purchased power costs are directly related to the amount of electricity sold,
22 and are thus classified as energy related. The costs of generation facilities are directly
23 related to a utility's generation capacity, which is determined through the utility's system

1 planning, where many factors including both load factor and demand are considered, and
2 are thus classified as capacity related.

3 Q. Staff recently filed CCOS studies in Case No. EO-2002-0384. Did Staff
4 use the same allocators in this case as it did in Case No. EO-2002-0384?

5 A. Yes it did. The only differences between the CCOS studies filed in Case
6 No. EO-2002-0384 and the CCOS studies filed in Case No. ER-2005-0436 are that costs
7 and revenues have been updated.

8 Q. How did the Staff allocate Production – capacity cost?

9 A. The Staff allocated Production – capacity cost based on a Time of Use
10 allocator (TOU).

11 Q. How did the Staff allocate Production – energy cost?

12 A. The Staff allocated Production – energy cost based on a TOU allocator.

13 Q. Why did the Staff use TOU allocators to allocate production costs?

14 A. Since different types of generating units (base, intermediate, and peaking)
15 have different operational and cost characteristics, utilities attempt to build the amounts
16 and types of generating units that provide flexibility to match supply to demand in every
17 hour throughout the year at the lowest possible annual cost. Because production-capacity
18 costs are determined by loads throughout the year, each class's contribution to the sum of
19 hourly class loads was used to allocate hourly production-capacity costs. For consistency
20 and because production-energy costs also vary throughout the year, each class's
21 contribution to the sum of hourly class loads was used to allocate hourly production-
22 energy costs.

1 Q. Did the Staff use the same TOU allocator to allocate production-capacity,
2 production-energy, and transmission-capacity costs?

3 A. No. While the allocator (each class's contribution to the sum of hourly
4 class loads) is the same on an hourly basis, it is not the same on an annual basis.
5 Weather-sensitive classes have a larger contribution to the sum of the hourly class
6 demands during periods when incremental capacity costs are relatively low and
7 incremental energy costs are relatively high, while the opposite is true for classes with
8 little weather sensitivity.

9 Q. How were the TOU allocators calculated?

10 A. Hourly energy costs from a production simulation model run (fuel run)
11 were used to develop a functional relationship between hourly energy costs and load
12 level. This functional relationship was used to calculate hourly marginal energy costs.
13 Hourly marginal production-capacity costs were derived from the hourly marginal energy
14 costs. In each hour the marginal energy costs are summed to determine the total energy
15 cost. The total energy cost in each hour is then allocated to the classes based on their
16 contribution to total load in that hour. A similar process was followed for summing
17 marginal capacity costs and allocating the total to the classes each hour. This is
18 equivalent to the capacity utilization method when each increment of capacity is priced at
19 its marginal cost. Hourly transmission-capacity costs were derived from functionalized
20 transmission-capacity costs based on capacity utilization with each increment of capacity
21 priced the same, i.e. transmission-capacity costs per kW were assumed to be constant.

22 In each hour the production-capacity costs, production-energy costs, and the
23 transmission-capacity costs (separately) are allocated to each class based on their

1 contribution in that hour to the sum of the class loads. Summing the allocated costs over
2 all hours for each class results in annual costs. The TOU allocator is then calculated as
3 each class's contribution to the sum of the annual costs.

4 Q. Is there an alternative way to describe TOU allocations?

5 A. Yes. Three sets of hourly prices were developed – one for production
6 capacity, one for transmission capacity, and one for energy. Each class's hourly load is
7 then priced out on each set of hourly prices and summed over all hours. The resulting
8 sum is each class's allocation of production capacity costs, transmission capacity costs,
9 and production energy costs, respectively.

10 A TOU allocation methodology has been favored by past Commissions
11 because it has the characteristic that every customer, large or small, residential or
12 industrial, pays exactly the same price as every other customer taking service in the same
13 hour. In this respect, TOU allocations mimic a truly competitive retail electricity market.
14 Real-time pricing tariffs, which are offered in various forms by several utilities in
15 Missouri, are also based on this concept.

16 Q. Why is the distribution function classified into primary and secondary
17 categories?

18 A. An electric utility's distribution system includes a primary (higher
19 voltage) system and a secondary (lower voltage) system. Some industrial customers and
20 research centers require higher voltage or stricter voltage regulation than can be provided
21 by the secondary distribution system, thus they receive services at the high voltage side
22 of the transformer.

1 Q. Why is the overhead and underground distribution function classified into
2 customer and demand categories?

3 A. The cost of distribution conductors is directly related to their size as well
4 as their length. Conductors are sized based on customers' demand. The length of a
5 conductor is determined by customers' locations relative to the source of the electricity
6 they use. In other words, a portion of the costs of conductors is not directly related to the
7 customers' demand and should reasonably be separated from the portion of the costs of
8 the conductors that varies directly with capacity or demand. Poles and underground
9 conduits are used to support the conductors and thus should receive the same treatment.

10 Q. How did the Staff determine the primary/secondary, and customer/demand
11 splits?

12 A. The Staff relied on a distribution study performed by Aquila for
13 determining the primary/secondary and customer/demand splits.

14 Q. How did the Staff allocate the portion of substations, poles, and
15 conductors related to primary demand?

16 A. The Staff used class contribution to the sum of annual class peak demands
17 to allocate the portion of substations, poles, and conductors related to primary demand
18 since substations and primary conductors are sized to meet the diversified demands of
19 customers. Diversity incorporates the fact that not all individual customer's usage of
20 electricity peak at the same time. However, since each substation serves a geographic
21 area smaller than the total service territory, system coincident peak demands are not
22 appropriate. The class peak demands incorporate the diversity within each class, but do
23 not take that diversity all the way to the total system.

1 Q. How did the Staff allocate the portion of poles, conductors, and
2 transformers costs related to secondary demand?

3 A. Secondary lines are sized to meet the diversified demands of the
4 secondary customers and therefore class contribution to the sum of annual non-coincident
5 class peak demands were used to allocate secondary poles, conductors, and conduits.
6 Line transformers serve an even smaller group of customers. Class peaks incorporate too
7 much diversity for allocating this cost, and customer maximum demand incorporates too
8 little since it accounts for none of the diversity between customers within these small
9 groups. Therefore, the Staff used class contribution to customer diversified demand at
10 secondary, which is a mix of the non-coincident class peak and customer maximum
11 demand, to allocate line transformer costs.

12 Q. How did the Staff allocate the customer portion of poles, conductors, and
13 conduits?

14 A. The Staff used weighted customer costs. The Staff developed the
15 weighted customer allocator based on the number of customers in each class, multiplied
16 by a set of weights that approximately reflect customer density for each customer class. I
17 believe this is a reasonable way to allocate the portion of costs of poles, conductors, and
18 conduits that varies with length.

19 Q. How did the Staff allocate costs associated with meters?

20 A. Costs of meters were allocated on a meter-weighted customer allocator,
21 each of which is equal to customer numbers for each particular class multiplied by the
22 meter weight. The weights used in the allocations reflect the cost of a "typical" meter by
23 class.

1 Q. How did the Staff allocate costs associated with service lines?

2 A. The Staff allocated the cost of service lines on the same meter-weighted
3 customer allocator described above.

4 Q. Please discuss the methods that you used to classify and allocate expenses.

5 A. Expenses were directly assigned, if possible. For the expenses that could
6 not be directly assigned, classification of costs are made consistent with the principle that
7 "expenses follow plant."

8 Q. Please explain the "expenses follow plant" principle.

9 A. "Expenses follow plant" basically means that for any expense related to a
10 particular rate base component, the expense should be allocated in the same manner as
11 the rate base account.

12 Q. Why did the Staff use allocators based on weighted number of customers
13 to allocate the cost of meter reading?

14 A. Since meter reading costs are related both to the number of customers and
15 customer density, these costs were allocated based on weighted customers.

16 Q. How did the Staff allocate uncollectible accounts, billing and records,
17 customer services, and sales promotion expenses?

18 A. The Staff allocated these costs on non-weighted customer numbers
19 because they vary with the number of customers and no special studies have been done to
20 determine what, if any, weighting would be appropriate.

21 Q. How did the Staff allocate property and payroll taxes?

22 A. Staff allocated property taxes on the basis of allocated total plant, and
23 payroll taxes on the basis of allocated payroll expenses.

1 Q. How did the Staff allocate state and federal income taxes?

2 A. These taxes were allocated on the basis of rate base since a utility
3 company's income taxes will be a function of the size of its rate base, and thus each class
4 should contribute revenues for income taxes in proportion with the amount of rate base
5 that is necessary to serve it.

6 Q. What were the results of the Staff's Class Cost of Service Study?

7 A. The Staff's Class Cost of Service Study for MPS shows that all classes
8 need to have their rates increased. For L&P, the revenues for the Residential, Large
9 Power, and Lighting classes need to be increased and the Small General Service and
10 Large General Service need to be decreased. The class specific information for MPS and
11 L&P is provided in Schedule 3 and 4, and is summarized below in Tables 3 and 4.

12 **Table 3 – Aquila Networks - MPS CCOS Class Revenues**

	Total	Residential	SGS	LGS	LPS	Other	Lighting
Revenue							
Deficiency	34,026,863	15,038,228	6,168,236	2,951,387	8,354,910	237,972	1,276,131
%	9.92%	8.15%	11.48%	6.61%	15.28%	45.78%	26.31%

13 **Table 4 – Aquila Networks - L&P CCOS Class Revenues**

	Total	Residential	SGS	LGS	LPS	Lighting
Revenue						
Deficiency	5,878,009	5,360,556	(458,854)	(521,402)	1,100,123	397,587
%	5.90%	12.48%	-5.88%	-2.72%	4.02%	17.37%

14
15 Q. Does this conclude your direct testimony?

16 A. Yes.

Cases of Filed Testimony

James A. Busch

<u>Company</u>	<u>Case No.</u>
Union Electric Company	GR-97-393
Missouri Gas Energy	GR-98-140
Laclede Gas Company	GO-98-484
Laclede Gas Company	GR-98-374
St. Joseph Light & Power	GR-99-246
Laclede Gas Company	GT-99-303
Laclede Gas Company	GR-99-315
Fiber Four Corporation	TA-2000-23; et al.
Missouri American Water Company	WR-2000-281/SR-2000-282
Union Electric Company d/b/a AmerenUE	GR-2000-512
St. Louis County Water	WR-2000-844
Empire District Electric Company	ER-2001-299
Missouri Gas Energy	GR-2001-292
Laclede Gas Company	GT-2001-329
Laclede Gas Company	GO-2000-394
Laclede Gas Company	GR-2001-629
UtiliCorp United, Inc.	ER-2001-672
Union Electric Company d/b/a AmerenUE	EC-2001-1
Laclede Gas Company	GR-2002-356
Empire District Electric Company	ER-2002-424
Southern Union Company	GM-2003-0238
Aquila, Inc.	EF-2003-0465
Missouri American Water Company	WR-2003-0500
Union Electric Company d/b/a AmerenUE	GR-2003-0571
Aquila, Inc.	ER-2004-0034
Aquila, Inc.	GR-2004-0072
Missouri Gas Energy	GR-2004-0209
Empire District Electric Company	ER-2004-0570
Aquila, Inc.	EO-2002-0384

Aquila Inc.
ER-2005-0436
Functionalized Costs Comparison

AQUILA NETWORKS - MPS

		MPS EO-2002-0384		MPS ER-2005-0436		
FUNCTIONAL CATEGORY		TOTAL	% OF TOTAL	TOTAL	% OF TOTAL	Change
PRODUCTION	CAPACITY	\$105,941,269	30.82%	\$118,924,230	28.65%	12.25%
PRODUCTION	ENERGY	\$103,102,997	30.00%	\$152,265,519	36.68%	47.68%
TRANSMISSION	CAPACITY	\$28,688,150	8.35%	\$36,073,946	8.69%	25.75%
DISTRIBUTION	SUBSTATIONS	\$10,751,813	3.13%	\$11,016,806	2.65%	2.46%
DISTRIBUTION	POLES AND CONDUCTORS	\$0	0.00%	\$0	0.00%	
DISTRIBUTION	POLES AND CONDUCTORS	\$10,318,945	3.00%	\$10,647,241	2.57%	3.18%
DISTRIBUTION	POLES AND CONDUCTORS	\$8,390,350	2.44%	\$8,603,988	2.07%	2.55%
DISTRIBUTION	POLES AND CONDUCTORS	\$18,728,964	5.45%	\$19,477,035	4.69%	3.99%
DISTRIBUTION	POLES AND CONDUCTORS	\$7,900,415	2.30%	\$8,207,347	1.98%	3.89%
DISTRIBUTION	TRANSFORMERS	\$14,896,817	4.33%	\$14,136,480	3.41%	-5.10%
DISTRIBUTION	TRANSFORMERS	\$786,681	0.23%	\$722,329	0.17%	-8.18%
DISTRIBUTION	CUSTOMER INSTALLATIONS	\$1,735,474	0.50%	\$1,669,650	0.40%	-3.79%
DISTRIBUTION	SERVICES	\$7,273,165	2.12%	\$7,447,184	1.79%	2.39%
DISTRIBUTION	METERS	\$4,933,058	1.44%	\$5,192,627	1.25%	5.26%
	CUSTOMER DEPOSITS	(\$313,682)	-0.09%	(\$376,716)	-0.09%	20.09%
	METER READING	\$1,799,452	0.52%	\$2,509,853	0.60%	39.48%
	BILLING, SALES, SERVICE	\$6,865,696	2.00%	\$7,999,189	1.93%	16.51%
	ASSIGNED LGS/LPS/SC	\$1,174,153	0.34%	\$552,324	0.13%	-52.96%
	ASSIGNED RES/SGS	\$8,409,388	2.45%	\$7,441,865	1.79%	-11.51%
	Assigned Lighting	\$2,342,925	0.68%	\$2,578,547	0.62%	10.06%
TOTAL		#####	100.00%	#####	100.00%	0.00%

Aquila Inc.
ER-2005-0436
Functionalized Costs Comparison

AQUILA NETWORKS - L&P

		L&P EO-2002-0384		L&P ER-2005-0436		
FUNCTIONAL CATEGORY		TOTAL	% OF TOTAL	TOTAL	% OF TOTAL	Change
PRODUCTION	CAPACITY	\$33,414,490	34.49%	\$44,913,579	38.82%	34.41%
PRODUCTION	ENERGY	\$25,489,586	26.31%	\$30,874,612	26.69%	21.13%
TRANSMISSION	CAPACITY	\$7,471,900	7.71%	\$8,552,319	7.39%	14.46%
DISTRIBUTION	SUBSTATIONS	\$4,774,537	4.93%	\$4,763,617	4.12%	-0.23%
DISTRIBUTION	POLES AND CONDUCTORS	\$0	0.00%	\$0	0.00%	
DISTRIBUTION	POLES AND CONDUCTORS	\$1,759,136	1.82%	\$1,904,709	1.65%	8.28%
DISTRIBUTION	POLES AND CONDUCTORS	\$1,737,008	1.79%	\$1,783,637	1.54%	2.68%
DISTRIBUTION	POLES AND CONDUCTORS	\$5,923,041	6.11%	\$6,589,817	5.70%	11.26%
DISTRIBUTION	POLES AND CONDUCTORS	\$1,365,404	1.41%	\$1,485,003	1.28%	8.76%
DISTRIBUTION	TRANSFORMERS	\$3,223,509	3.33%	\$2,097,537	1.81%	-34.93%
DISTRIBUTION	TRANSFORMERS	\$183,997	0.19%	\$119,727	0.10%	-34.93%
DISTRIBUTION	CUSTOMER INSTALLATIONS	\$380,890	0.39%	\$347,486	0.30%	-8.77%
DISTRIBUTION	SERVICES	\$1,673,780	1.73%	\$1,472,690	1.27%	-12.01%
DISTRIBUTION	METERS	\$1,368,373	1.41%	\$1,614,976	1.40%	18.02%
	CUSTOMER DEPOSITS	(\$36,413)	-0.04%	(\$63,778)	-0.06%	75.15%
	METER READING	\$479,353	0.49%	\$742,579	0.64%	54.91%
	BILLING, SALES, SERVICE	\$3,422,931	3.53%	\$4,403,307	3.81%	28.64%
	ASSIGNED LGS/LPS/SC	\$392,698	0.41%	\$197,855	0.17%	-49.62%
	ASSIGNED RES/SGS	\$3,053,016	3.15%	\$3,003,591	2.60%	-1.62%
	Assigned Lighting	\$807,417	0.83%	\$885,254	0.77%	9.64%
TOTAL		\$96,884,654	100.00%	#####	100.00%	0.00%

STAFF CLASS COST-OF-SERVICE RESULTS

(At Staff ROR 7.90%)
AQUILA NETWORKS - MPS
CASE NO. ER-2005-0436

FUNCTIONAL CATEGORY	RES	SGS	LGS	LPS	Other	Lighting	TOTAL
PRODUCTION	\$59,021,434	\$18,654,989	\$17,195,316	\$23,295,719	\$271,075	\$485,697	\$118,924,230
PRODUCTION	\$70,164,689	\$23,318,984	\$23,452,821	\$33,820,323	\$382,176	\$1,126,526	\$152,265,519
TRANSMISSION	\$17,693,949	\$5,625,971	\$5,243,946	\$7,252,501	\$82,392	\$175,187	\$36,073,946
DISTRIBUTION	\$6,089,034	\$1,781,454	\$1,394,775	\$1,645,351	\$24,631	\$81,561	\$11,016,806
POLES AND CONDUCTORS	\$0	\$0	\$0	\$0	\$0	\$0	\$0
POLES AND CONDUCTORS	\$6,893,666	\$2,983,255	\$240,001	\$47,598	\$0	\$482,721	\$10,647,241
POLES AND CONDUCTORS	\$5,845,044	\$2,928,798	\$199,136	\$30,695	\$316	\$0	\$8,603,988
POLES AND CONDUCTORS	\$10,765,037	\$3,149,501	\$2,465,877	\$2,908,879	\$43,547	\$144,195	\$19,477,035
POLES AND CONDUCTORS	\$4,980,527	\$1,455,164	\$1,099,021	\$652,487	\$20,147	\$0	\$8,207,347
TRANSFORMERS	\$10,765,818	\$2,040,642	\$862,111	\$454,803	\$13,107	\$0	\$14,136,480
TRANSFORMERS	\$463,644	\$123,318	\$86,911	\$47,030	\$1,427	\$0	\$722,329
CUSTOMER INSTALLATIONS	\$1,451,257	\$209,290	\$8,241	\$847	\$16	\$0	\$1,669,650
SERVICES	\$6,000,455	\$865,572	\$119,772	\$40,878	\$332	\$420,175	\$7,447,184
METERS	\$4,183,880	\$603,529	\$83,512	\$28,503	\$231	\$292,972	\$5,192,627
CUSTOMER DEPOSITS	(\$308,567)	(\$44,511)	(\$1,790)	(\$237)	(\$3)	(\$21,607)	(\$376,716)
METER READING	\$1,624,973	\$703,212	\$56,573	\$11,220	\$88	\$113,787	\$2,509,853
BILLING, SALES, SERVICE	\$6,552,118	\$945,150	\$38,018	\$5,027	\$71	\$458,805	\$7,999,189
ASSIGNED LGS/LPS/SC	\$0	\$0	\$487,024	\$64,392	\$907	\$0	\$552,324
ASSIGNED RES/SGS	\$6,503,699	\$938,165	\$0	\$0	\$0	\$0	\$7,441,865
Assigned Lighting	\$0	\$0	\$0	\$0	\$0	\$2,578,547	\$2,578,547
TOTAL	\$218,690,657	\$65,882,482	\$53,031,266	\$70,306,016	\$840,459	\$6,338,564	\$415,089,444
TOTAL COST OF SERVICE	\$218,690,657	\$65,882,482	\$53,031,266	\$70,306,016	\$840,459	\$6,338,564	\$415,089,444
%	52.69%	15.87%	12.78%	16.94%	0.20%	1.53%	100%
RATE REVENUE	\$184,480,271	\$53,730,060	\$44,644,508	\$54,683,163	\$519,838	\$4,849,668	\$342,907,508
NON RATE REVENUE	\$3,039,647	\$885,300	\$735,599	\$901,004	\$8,565	\$79,907	\$5,650,023
Interruptible Credit	\$0	\$0	\$0	\$0	\$0	\$0	\$0
CRS System Revenue	\$16,126,890	\$5,097,249	\$4,698,411	\$8,365,272	\$74,068	\$132,711	\$32,494,802
Excess Facility Revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Interdepartmental Sales	\$5,621	\$1,637	\$1,360	\$1,666	\$16	\$148	\$10,448
TOTAL REVENUE	\$203,652,429	\$59,714,246	\$50,079,879	\$61,951,106	\$602,487	\$5,062,434	\$381,062,581
%	53.44%	15.67%	13.14%	16.26%	0.16%	1.33%	100%
REVENUE DEFICIENCY	\$15,038,228	\$6,168,236	\$2,951,387	\$8,354,910	\$237,972	\$1,276,131	\$34,026,863
% CHANGE	8.15%	11.48%	6.61%	15.28%	45.78%	26.31%	9.92%
Revenue Neutral % Change	-1.61%	1.42%	-3.01%	4.87%	32.62%	14.91%	

STAFF CLASS COST-OF-SERVICE RESULTS

(At Staff ROR 7.90%)

AQUILA NETWORKS - L&P

CASE NO. ER-2005-0436

FUNCTIONAL CATEGORY	RES	SGS	LGS	LPS	Other	Lighting	TOTAL
PRODUCTION	\$17,985,302	\$2,577,683	\$9,057,553	\$14,859,025	\$0	\$434,016	\$44,913,579
PRODUCTION	\$12,108,609	\$1,751,299	\$6,219,530	\$10,429,434	\$0	\$365,740	\$30,874,612
TRANSMISSION	\$3,424,711	\$480,835	\$1,724,714	\$2,829,414	\$0	\$82,644	\$8,552,319
DISTRIBUTION	\$2,248,401	\$321,786	\$928,004	\$1,205,059	\$0	\$60,367	\$4,763,617
POLES AND CONDUCTORS	\$0	\$0	\$0	\$0	\$0	\$0	\$0
POLES AND CONDUCTORS	\$1,214,569	\$388,236	\$140,940	\$11,117	\$0	\$149,847	\$1,904,709
POLES AND CONDUCTORS	\$1,235,492	\$394,924	\$142,707	\$10,515	\$0	\$0	\$1,783,637
POLES AND CONDUCTORS	\$3,110,357	\$445,147	\$1,283,767	\$1,667,036	\$0	\$83,510	\$6,589,817
POLES AND CONDUCTORS	\$739,484	\$105,833	\$303,561	\$336,124	\$0	\$0	\$1,485,003
TRANSFORMERS	\$1,409,773	\$237,565	\$257,117	\$193,082	\$0	\$0	\$2,097,537
TRANSFORMERS	\$62,103	\$9,024	\$21,961	\$26,638	\$0	\$0	\$119,727
CUSTOMER INSTALLATIONS	\$72,195	\$46,603	\$112,947	\$115,741	\$0	\$0	\$347,486
SERVICES	\$1,056,932	\$192,573	\$87,284	\$5,503	\$0	\$130,398	\$1,472,690
METERS	\$1,159,048	\$211,178	\$95,717	\$6,035	\$0	\$142,997	\$1,614,976
CUSTOMER DEPOSITS	(\$51,011)	(\$5,435)	(\$987)	(\$52)	\$0	(\$6,293)	(\$63,778)
METER READING	\$473,518	\$151,359	\$54,948	\$4,334	\$0	\$58,420	\$742,579
BILLING, SALES, SERVICE	\$3,521,854	\$375,252	\$68,113	\$3,582	\$0	\$434,506	\$4,403,307
ASSIGNED LGS/LPS/SC	\$0	\$0	\$187,971	\$9,884	\$0	\$0	\$197,855
ASSIGNED RES/SGS	\$2,714,375	\$289,216	\$0	\$0	\$0	\$0	\$3,003,591
Assigned Lighting	\$0	\$0	\$0	\$0	\$0	\$885,254	\$885,254
TOTAL	\$52,485,714	\$7,983,078	\$20,685,850	\$31,712,470	\$0	\$2,821,405	\$115,688,516
TOTAL COST OF SERVICE	\$52,485,714	\$7,983,078	\$20,685,850	\$31,712,470	\$0	\$2,821,405	\$115,688,516
%	45.37%	6.90%	17.88%	27.41%	0.00%	2.44%	100%
RATE REVENUE	\$42,938,459	\$7,797,085	\$19,165,828	\$27,374,278	\$0	\$2,288,634	\$99,564,284
NON RATE REVENUE	\$1,170,638	\$212,609	\$522,510	\$746,437	\$0	\$62,406	\$2,714,900
Interruptible Credit	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Off-System Revenue	\$3,015,661	\$432,238	\$1,518,814	\$2,491,632	\$0	\$72,778	\$7,531,323
Excess Facility Revenue	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Interdepartmental Sales	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL REVENUE	\$47,125,158	\$8,441,933	\$21,207,252	\$30,612,347	\$0	\$2,423,818	\$109,810,507
%	42.91%	7.69%	19.31%	27.86%	0.00%	2.21%	100%
REVENUE DEFICIENCY	\$5,360,556	(\$458,854)	(\$521,402)	\$1,100,123	\$0	\$397,587	\$5,878,009
% CHANGE	12.48%	-5.88%	-2.72%	4.02%		17.37%	5.90%
Revenue Neutral % Change	6.21%	-11.13%	-8.14%	-1.78%	0.00%	10.83%	