DELMARVA POWER & LIGHT COMPANY

BEFORE THE
DELAWARE PUBLIC SERVICE COMMISSION
REBUTTAL TESTIMONY OF ELLIOTT P. TANOS
DOCKET NO. 13-115

Q1. Please state your name and position.

A1. My name is Elliott P. Tanos. I am Manager, Cost Allocation for Pepco Holdings, Inc. (PHI). I am testifying on behalf of Delmarva Power & Light Company (Delmarva or the Company).

Q2. What is the purpose of your Rebuttal Testimony?

A2. The purpose of my Rebuttal Testimony is to respond to Class Cost of Service Study (COSS) issues identified in the direct testimonies of the Public Service Commission of Delaware Staff (Staff) Witness Pavlovic, Division of Public Advocate (DPA) Witness Dismukes, and the Delaware Energy Users Group (DEUG) Witness Phillips.

I commence my testimony with a brief discussion of the COSS initiatives implemented as a result of the COSS workshop conducted in accordance with Commission Order No. 8011 issued in PSC Docket No. 09-414 that were also recognized in the Direct Testimonies of DPA Witness Dismukes and Staff Witness Pavlovic.

Q3. DPA Witness Dismukes and Staff Witness Pavlovic discuss the COSS initiatives implemented as a result of the COSS workshop. Please comment.

A3. Both the DPA and Staff witnesses acknowledge that several COSS initiatives have been implemented as a result of the COSS workshop conducted in

accordance with the Commission Order. In particular this includes: the use of Delaware-specific load survey data to estimate residential non-coincident peak demands; the use of weather normalized sales and revenue data; the development of a revised Account 369- Service line allocator; and the disaggregation of the traffic signal service class from the general street lighting class. The results of these initiatives have been reflected in the COSS that I have submitted in this case.

<u>Staff Witness Pavlovic</u>

Q4. Staff Witness Pavlovic's Direct Testimony on page 16 states that Delmarva's Demand allocators assume zero diversity. Do you agree?

A4. No. I do not. Staff Witness Pavlovic's testimony is incorrect and misstates the basic structure of the Company's demand allocation factors by claiming they assume zero load diversity.

Q5. Please describe the Company's demand allocation factors and the rationale underlying their use.

A5. The demand allocators used in the COSS are the DEMPRI, DEMSEC, and DEMTRANSF. Each of these allocators is clearly defined on the first page of the Allocation Factor Table located on page 18 of Schedule (EPT)-1. None of these demand allocators reflect zero diversity.

For example, the DEMPRI demand allocator is used to assign the Company's investment in distribution substations. Distribution substations are designed to meet the maximum diversified demands of the customers served by the facility. To reflect this diversified demand, I have applied the respective customer class demands to allocate the costs related to these facilities. The customer class demands are defined

in the COSS as the Class Maximum Diversified Demands. The DEMPRI demand allocator is thus based on diversified demands, not zero diversity.

This allocation approach is also consistent with the method used in the COSS filings in Docket Nos. 05-304, 09-414, and 11-528; and, is a demand allocation method recognized in the National Association of Regulatory Commissioners Electric Cost Allocation Manual (NARUC Manual), as discussed on page 97 of that publication.

Q6. Please briefly discuss the concept of load diversity.

A6. The Company installs equipment based on the maximum demand of the customer and the diversity of customer demands that can be used to efficiently make investment in the required facilities. Diversity is a characteristic of a variety of electric loads whereby individual customer maximum demands usually occur at different times.

For example, the individual residential customer may have numerous connected load devices for air conditioning, space heating, water heating, lighting, refrigeration, and many other applications. Similarly, individual commercial buildings and factories will have numerous and varied applications. Because of household lifestyles and the various business operations; the peaks, valleys, and maximum demands of the individual customers will differ.

At the distribution substation level, the combined demands of a large set of customer loads is smoothed-out and the substation load does not experience the abrupt changes as would be seen in the individual customer's demand.

The NARUC manual also discusses load diversity on page 97 and explains

that load diversity at distribution substations and primary feeders is usually high and facilities nearer the customer, such as secondary feeders and line transformers, have much lower load diversity. Along this diversity continuum, the levels of the demands for each class and the actual point for each customer will be different.

Q7. On page 14 of his Direct Testimony, Staff Witness Pavlovic comments on the use of the 50/50 weighting of demand measures and the allocation of transformer and other equipment cost. Would you now discuss the allocation of distribution line transformers in your cost of service study.

A7. Distribution line transformers are installed to meet the load requirements of customers either directly or with the use of secondary conductors over several poles that can connect additional customers.

Very large secondary customers generally will have their own transformer at their facility and are generally not adjacent to other large customers. Smaller customers have much smaller loads and are often more clustered which provides for the aggregation of several customers for sizing and installing equipment.

Use of the 50/50 weighting of class diversified demands and customer maximum non-coincident demands recognizes this aggregation and is a reasonable and manageable approach to achieve a fair allocation of these costs. Either demand approach (class demands or maximum) would under allocate (class demands) or materially over allocate (maximum) to smaller customers such as residential. The magnitudes of these demands by customer class are clearly shown on page 18-2 of Schedule (EPT)-1. The only proper use of maximum demands is in the allocation with respect to large secondary customers.

1 This weighted allocation factor is defined as DEMTRANSF and is consistent
2 with the method used in the COSS filings in Docket Nos. 05-304, 09-414, and 11-
3 528. The DEMTRANSF allocator is based primarily on the weighted demand
4 measures, not zero diversity, as claimed by Staff Witness Pavlovic on page 16 of his
5 Direct Testimony.

6 **Q8. Does Staff Witness Pavlovic also make assertions regarding the use of the**
7 **Company's overhead and underground distribution systems by commercial**
8 **customers?**

9 A8. Yes, in the present case, as well as in Docket No. 11-528, Staff Witness
10 Pavlovic stated that because commercial customers generally make greater use of
11 underground facilities, and because underground facilities are significantly more
12 costly than overhead facilities, use of the same allocator over allocates costs to the
13 residential classes and under allocates costs to commercial customers.

14 **Q9. Has Staff Witness Pavlovic presented any specific evidence regarding the use of**
15 **the overhead and underground distribution systems by the commercial**
16 **customers in Delaware?**

17 A9. No, he has not presented any evidence regarding the commercial customers'
18 use of the distribution system in Delaware.

19 **Q10. What has been the Company's recent experience with underground**
20 **installations?**

21 A10. Almost every new subdivision in Delaware is installed with underground
22 facilities. The only new residential customers that request overhead service would be
23 single homes built near an existing distribution power line.

The vast majority of new homes built over the last several years in Delaware are planned subdivisions, with about 95% (or 4,385) new residential customers requesting underground service at a cost of about $9.1 million. This compares to about 71% (781) new commercial customers with costs of about $4.7 million.

Q11. On page 15 of his Direct Testimony, Staff Witness Pavlovic recommends the use of Advanced Metering Infrastructure (AMI) data to develop the COSS demand measures in the next base rate case. Please comment.

A11. The Company has started to use the AMI meter data from the residential and small commercial class services in its Load Settlement process to aggregate the individual service point hourly demands by customer class and by supplier to accurately account for the supplier loads at the Delmarva Zone. The first month of final, zone reconciled hourly class loads using Delaware AMI metered load data were created August 29, 2013. After a year of load data are collected, the Company will be able to determine the COSS class maximum diversified loads. At that point, a full year of service point hourly demands will have been collected to analyze for the maximum customer demands. In addition, the Company is developing a process to reliably identify the maximum hourly demand for all service points in the Delaware retail classes.

Q12. Staff Witness Pavlovic recommends the use of the AMI load data, and the Geospatial Information System (GIS) to develop demand measures for application in the next base rate case. Please comment.

A12. Delmarva's AMI load data and GIS distribution system component data are housed in several major Company systems. First, the Company's customer

information system (C3) is the system that contains the customer account information and rate class identification. The Load Profiling and Settlement System (LPSS) contains the AMI load data by service point in a form that allows for hourly load aggregation and by customer class for demand analysis. However, LPSS does not aggregate loads by distribution system component. The system that does contain the distribution system physical attributes and location details is GIS. The GIS however is a locational mapping system and does not contain customer demand data. Moreover, the GIS identifies the physical system attributes and does not contain asset cost accounting data, such as vintage distribution plant costs, or depreciation reserve amounts. The Company's asset cost accounting data is contained in SAP and PowerPlant, the subsidiary asset ledger system.

There is no simple way to merge these large databases and to link the distribution component information to the massive load information in LPSS, for cost analysis and cost assignment purposes. Any such initiative would be highly complex and expensive for cost of service purposes.

Q13. What are your conclusions?

A13. The focus of the cost of service study is to apportion costs in a manner that is reasonable and reflects cost causation. The COSS then serves as an important guide in the rate making process that also must seek a reasoned, balanced approach.

The cost of service study that I have submitted in this case provides a reasonable and practical approach to achieve a fair allocation of the cost to serve the respective customer classes and should be used as an important guide to the ratemaking process in this case.

1 **DPA Witness Dismukes**

2 **Q14. DPA Witness Dismukes discusses on pages 32-33 of his Direct Testimony the**
3 **load data used in the Company's COSS and the statistical tests used to verify the**
4 **validity of the Company's load research samples. Please comment.**

5 A14. The Company has followed historical filing processes and has used the most
6 recent load data available at the time of preparing the class cost of service studies.
7 The load data required for a cost of service study is prepared annually on a calendar
8 year basis and is compiled by supplier and customer class after the settlement of the
9 Delmarva zonal loads. The system and class peak load data is then derived from a
10 study of the prior calendar year retail load settlement hourly loads. The customer
11 maximum demand data has historically come from an annual analysis of all demand-
12 metered class customer demand and energy readings for the calendar year, together
13 with a ratio analyses performed on twelve-months of the residential profile class
14 survey data. Once these steps are performed, the class demand measures are then
15 available for the cost of service study. Since the cost of service year ended December
16 2012, the most recent set of annual demand measures were based on 2011.

17 **Q15. On page 33 of his Direct Testimony, DPA Witness Dismukes asserts that the**
18 **Company has not verified the validity of its load research samples since the**
19 **sample was designed (2008). Do you agree?**

20 A15. No, I do not agree. The Company performs regular monthly checks of the
21 sample statistical reliability as part of the monthly load profiling process for the
22 Delmarva Zone final load settlements. The validity of the sample is checked by
23 comparing the sample monthly mean energy with that of its class population. This

check along with others such as the relative precision of the sample noncoincident demand and energy values during the peak months show how well the samples would perform in determining the customer maximum demands used in the COSS. The following tables show that the non-demand metered class noncoincident demands exceeded the statistical reliability design standards during the peak months of the last several years:

Delaware Residential Class				
Load Analysis Statistic	Target	Jul-10	Jul-11	Jul-12
Sample to population energy %Difference	+/-10%	0.9%	-3.0%	1.8%
Weighted Energy Relative Precision	<=10%	7.6%	8.1%	7.7%
Non-coincident Demand Relative Precision	<=10%	6.3%	5.4%	5.4%

Delaware Residential Heat Class				
Load Analysis Statistic	Target	Jul-10	Jul-11	Jul-12
Sample to population energy %Difference	+/-10%	-4.4%	-1.5%	-3.0%
Weighted Energy Relative Precision	<=10%	6.4%	6.9%	6.5%
Non-coincident Demand Relative Precision	<=10%	5.0%	4.9%	5.0%

Furthermore, a set of sample validation tests like those originally performed for the sample design were performed to demonstrate that the residential profile class samples were valid in the 2011 load study year. The results of that set of tests are presented in Schedule (EPT-R)-1 confirming the results of the monthly tests shown above. From these results we can conclude that the sample data used for the customer maximum demands for the Residential Classes were valid and statistically reliable.

Q16. Please discuss DPA Witness Dismukes' comments regarding the allocation of General and Common Plant on distribution plant.

A16. DPA Witness Dismukes acknowledges that the Company's LABOR allocator is similar in function to the use of operating labor ratios discussed in the NARUC Manual. However, Witness Dismukes does not agree with the use of LABOR due to the complexity that this approach adds to the COSS, compared to his recommended use of the total distribution plant allocator.

Q17. Please provide your rationale for using LABOR to allocate the costs of General and Common Plant.

A17. As explained throughout my Direct Testimony and Rebuttal, the underlying principle guiding the development of the cost of service studies is cost causation.

In the COSS, the LABOR allocation factor reflects the weighting of the functionalized Operations and Maintenance (O&M) expense accounts. Further, the O&M expense allocations themselves reflect the weighting of functionalized plant categories.

The LABOR allocator has been applied to General and Common plant as well as to certain Administrative and General expense accounts that are labor oriented or labor based. This would include infrastructure that is used in housing staff and meeting personnel resource needs, including computers, communication equipment, and software that are used by personnel to run the system.

The Company has applied the LABOR allocator to assign the costs associated with General and Common plant for the Delmarva Delaware Electric and Gas businesses, Delmarva Maryland, and the Atlantic City Electric Company.[1] The labor ratio approach is also recognized by the FERC.

[1] Due to historical filing practices, the Pepco operations continue to use a plant-based allocator.

1 The use of the labor allocator continues to be a predominate method to
2 allocate general plant in the industry today. For example, a 2006 Edison Electric
3 Institute (EEI) survey showed that almost 70% of the electric companies reporting
4 (representing 25 companies operating in 21 States) use labor to allocate general plant.

5 **Q18. DPA Witness Dismukes also recommends that Customer Information and Sales**
6 **Expenses (FERC Accounts 907-913) should be allocated based on total number**
7 **of customers. Do you agree?**

8 A18. No, I do not. The use of the number of customers alone to allocate the costs of
9 the referenced accounts would assign the vast majority of the costs essentially to one
10 class (Residential) based on total class population. These O&M accounts include
11 services that benefit all customers who receive electric service; and are focused on
12 programs designed to encourage safety, efficiency, and conservation. The Company
13 maintains personnel that service all customers, and the most representative approach
14 is to prepare an equally weighted composite allocation based on the number of
15 customers and their corresponding sales usage. In this manner, all customers are
16 fairly represented in the final allocation process for these expenses.

17 **Q19. Do you agree with DPA Witness Dismukes' reference to the NARUC cost**
18 **allocation manual regarding these expenses?**

19 A19. No, I do not. Regarding FERC Accounts 906-910, the NARUC manual
20 describes the goal of the programs, such as conservation programs, that include
21 saving electricity on an annual basis. Regarding Sales Expenses (Account 913) the
22 NARUC manual explains that these expenses include the costs of exhibits, displays,

1 and advertising designed to promote utility service; and the NARUC manual suggests
2 the use of a more general allocation scheme, not the numbers of customers.

3 **DEUG Witness Phillips**

4 **Q20. Please discuss DEUG Witness Phillips' recommendation to use the minimum**
5 **distribution system approach to classify distribution plant costs.**

6 A20. DEUG Witness Phillips believes that a portion of the distribution plant costs
7 associated with poles and conductors that are classified as demand-related should be
8 re-classified as customer-related. Moreover, DEUG Witness Phillips supports the use
9 of the minimum distribution system (MDS) analysis to determine this customer cost
10 component. The minimum system approach hypothetically reconstructs the
11 distribution system using the smallest size poles, conductors, and transformers that
12 assumedly have minimal or "no" load-bearing capability, to simply connect
13 customers to the system. The estimated minimum system costs for each plant account
14 are then classified as customer-related and the remaining plant costs are classified as
15 demand-related.

16 **Q21. Do you agree with the use of the minimum distribution system analysis to**
17 **determine the Company's customer-related cost component?**

18 A21. No, I do not. The Company does not make distribution investment decisions
19 based upon a hypothetical minimum system to simply connect customers having no
20 load, i.e. the phantom system that no utility would build. Moreover, there are
21 fundamental flaws attributed to the minimum distribution system analysis that can
22 disproportionately impact the residential class customers. Another practical concern is
23 the availability of the data needed to conduct the minimum system analyses. Finally,

the many problems and shortcomings inherent in these approaches have led companies to simply abandon these methods. In fact, the EEI survey of cost allocation methods referenced above showed that the vast majority of major electric companies responding to the survey used the demand-only classification approach for the distribution plant accounts surveyed (FERC Accounts 364-367).

Q22. Has DEUG recommended the use of the MDS for Delaware in prior Commission proceedings?

A22. Yes. In Docket Nos. 05-304 and No. 11-528, DEUG recommended that the Commission require Delmarva to provide the results of its COSS incorporating the results of a minimum distribution system.

Q23. Did the Commission render a decision in those cases regarding the use of the MDS?

A23. Docket No. 11-528 was settled; however, the Commission in Docket No. 05-304 decided not to implement MDS approach and adopted instead the Hearing Examiner's findings, that included the following rationale:

- The Company's COSS did recognize customer costs. In particular, the COSS recognized 100% of services and meter costs as customer-related.
- There are weaknesses with the past allocation methods, and it is extremely difficult to quantify and properly address all elements of the related costs.
- To establish a minimum distribution system size, one must estimate the system capabilities of this minimum size. Overlooking or ignoring the capacity served by the minimum system over-allocates and double-counts the cost assignment to small customers.

- Finally, the Hearing Examiner noted that DEUG's proposed COSS was flawed because it had not removed the minimum size capability from its cost of service calculations.

Q24. Did DEUG Witness Phillips prepare an independent MDS analysis for the prior or current proceedings?

A24. No, he did not. Instead, he simply used data from a Maryland MDS analysis. Further, he averaged the results of the Maryland minimum size and zero intercept studies to reach his conclusions regarding the level of customer-related costs.

Q25. Does the combination of a minimum system and zero intercept results from another utility reflect any reasonable approach that can withstand any critical review?

A25. No. It appears that DEUG Witness Phillips is simply presenting an arbitrary computation in an attempt to achieve an end-result. Simply averaging two hypothetical results from another utility to create a portion of certain distribution accounts as customer-related is extremely misleading and does not remotely reflect cost causation but is more end-result driven.

Q26. Have the minimum size installations changed during the last 20 to 30 years?

A26. Yes, they have. The evaluation in standardization, economies of scale, reliability, load density, and safety have all contributed to a more economic and reliable delivery system with installed facilities that have increased in size and achieved lower overall costs.

1 **Q27. Are there any minimum size facilities that carry no load?**

2 A27. No, there are not. The general concept relating to this approach is a zero
3 intercept approach whereby historical investments are ranked according to increasing
4 size and costs with a regression analysis of these data. This has not been prepared
5 and is typically the most problematic and controversial area of these analyses as
6 highlighted in the NARUC cost allocation manual on page 95.

7 **Q28. Did Witness Phillips remove the minimum size capability from its cost of service**
8 **calculations as recommended for the Maryland MDS?**

9 A28. No, DEUG's MDS proposal did not make all the adjustments recommended
10 for the Maryland MDS to avoid "double dipping." On page 18 of his Direct
11 Testimony, Witness Phillips explains that he has made adjustments to the demand and
12 customer allocations for the secondary system.

13 During the proceedings in MD Case No. 9285, however, Paul Normand of
14 Management Applications Consulting, Inc., the authors of the MDS analysis, detailed
15 the need to also make adjustments to the primary system allocators. The results of the
16 minimum size system-based COSS[2], reflecting all recommended adjustments to
17 primary and secondary allocators, actually reduced the Rate GSP class ROR from
18 1.70% to 0.66%, or a reduction of about 61% compared to the Company's Base
19 COSS.

[2] In MD Case No. 9285, the Commission required the Company to subsequently file an alternative minimum size system-based COSS, and the Company would continue to file the previously approved Base COSS. A zero intercept-based study was not required because the majority of the results of that study were not found to be statistically reliable.

1 As emphasized throughout my testimony, however, the Company does not
2 support the use of the MDS approach (either the Minimum Size System or Zero
3 intercept method) to classify customer related costs.

4 **Q29. What are your findings regarding the classification of costs?**

5 A29. The Company's proposal to classify distribution poles, lines, and line
6 transformers as demand-related; and to classify services and meters as customer-
7 related, is consistent with the methods used in previous studies before the
8 Commission and provides a reasonable classification of the customer- and demand-
9 related cost components. The Company's approach is well recognized in the industry
10 and should be continued.

11 **Q30. What are your conclusions?**

12 A30. The COSS that I have filed in this case is consistent with the Company's
13 submissions in the prior cases that was the starting point for the approved rate designs
14 in those cases. The cost of service that I have submitted provides a reasonable and
15 practical approach to achieve a fair allocation of costs to the respective customer
16 classes.

17 In this proceeding, there has not been any evidence presented of changed
18 conditions, and the Company's COSS should be used as an important guide to the
19 rate design process in this case.

20 **Q31. Does this conclude your Rebuttal Testimony?**

21 A31. Yes, it does.

UNIVARIATE PROCEDURE FOR DPL DE RESIDENTIAL POPULATIONS
WITH AUGUST 2011 BILLING DATA

The UNIVARIATE Procedure

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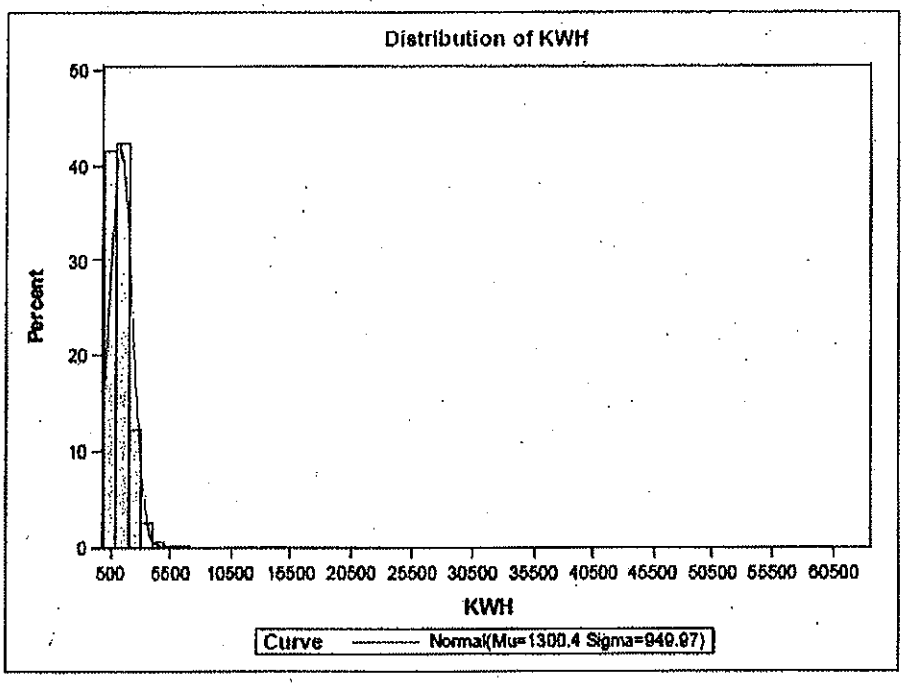

UNIVARIATE PROCEDURE FOR DPL DE RESIDENTIAL POPULATIONS
WITH AUGUST 2011 BILLING DATA

The UNIVARIATE Procedure
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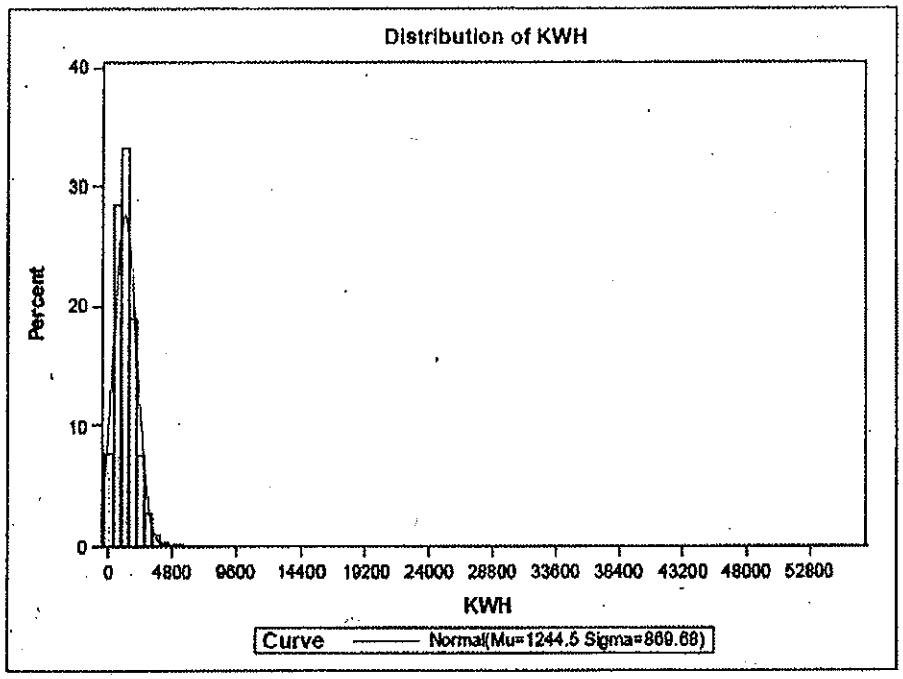

UNIVARIATE PROCEDURE FOR DPL DE RESIDENTIAL SAMPLES

The UNIVARIATE Procedure
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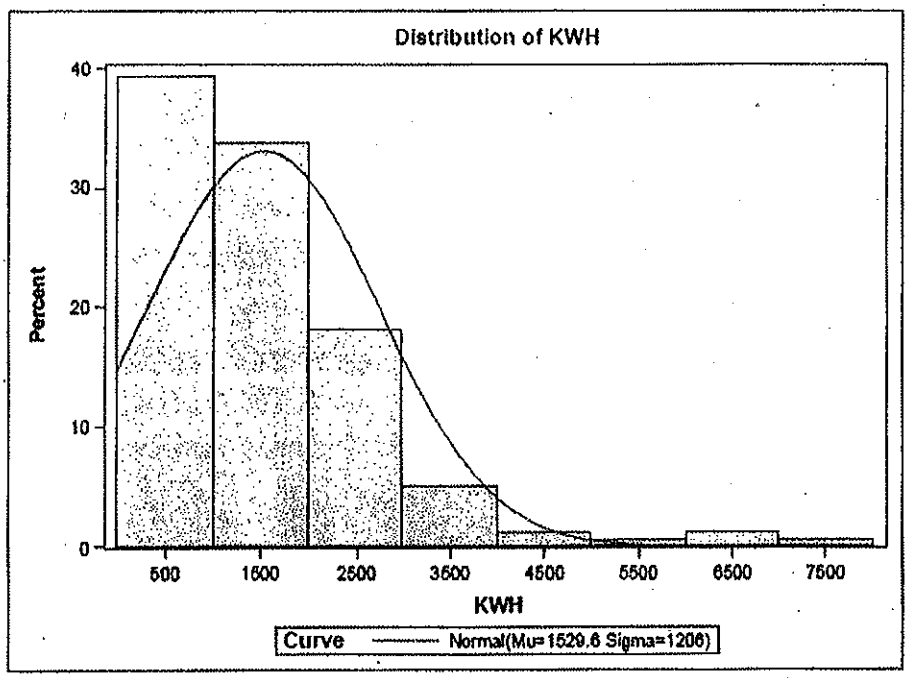

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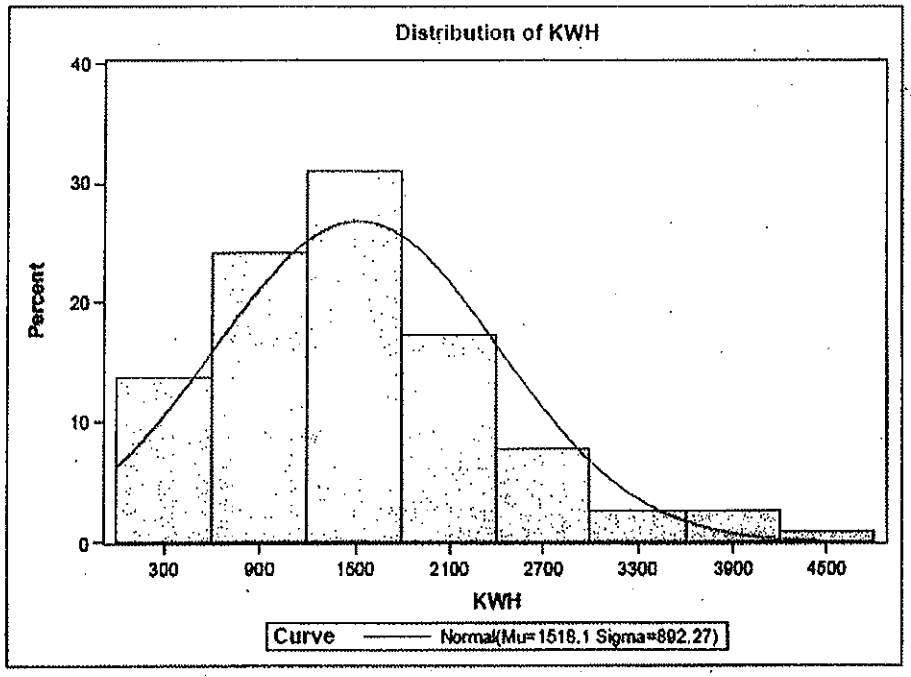

CLASS CHARACTERISTICS USING PROC MEANS

The MEANS Procedure

PROFILE	STRATUM	WEIGHT	Variable	N	Mean	Std Dev	Minimum	Maximum
DEDRH	1	0.467873	KWH	69	833.03	497.15	42.00	2153.00
			WKWH	69	389.75	232.60	19.65	1007.33
	2	0.421864	KWH	45	1390.71	580.92	349.00	2910.00
			WKWH	45	586.69	245.07	147.23	1227.62
	3	0.110263	KWH	46	2710.43	1499.01	297.00	7510.00
			WKWH	46	296.86	165.29	32.75	828.08
DEDRS	1	0.464945	KWH	39	791.95	494.04	49.00	1723.00
			WKWH	39	368.21	229.70	22.78	801.10
	2	0.421646	KWH	36	1474.78	551.02	268.00	3415.00
			WKWH	36	621.83	232.34	113.00	1439.92
	3	0.113409	KWH	41	2246.90	855.07	620.00	4684.00
			WKWH	41	254.82	96.97	70.31	531.21

Obs	PROFILE	N	WMEAN
1	DEDRH	160	1275.30
2	DEDRS	116	1244.87

Obs	PROFILE	Pop N	Samp n	n/N (%)	xbar Samp Mean	MU Pop Mean	xbar-MU	STD Pop	STD/ Sqrt(n)
1	DEDRH	77815	160	0.20999	1275.30	1300.43	-25.1278	949.965	75.1013
2	DEDRS	200468	116	0.06000	1244.87	1244.51	0.3581	869.676	80.7474

Obs	PROFILE	z =(xbar-MU)/STD	Null Hypothesis Accepted if |z|<1.645
1	DEDRH	-0.33459	ACCEPTED
2	DEDRS	0.00444	ACCEPTED