



March 30, 2010

100160-EG

Ms. Ann Cole, Commission Clerk  
Florida Public Service Commission  
2540 Shumard Oak Boulevard  
Tallahassee, FL 32399-0850

Re: PEF Rate Case Issue 110 Analysis for DSM Filing

Dear Ms. Cole:

Enclosed for filing are an original and 15 copies of PEF's analysis of billing determinants for use as a basis for application of interruptible demand credit including Mr. Jeffry Pollock's recommended alternatives in regards to PEF's general service interruptible DSM program.

PEF was directed by the Commission to file this analysis with its Proposed DSM Plan for the years 2010 through 2019 (see page 137 of Order No. PSC-10-0131-FOF-EI). Under separate cover, PEF has filed its Petition for Approval of Proposed Demand-Side Management Plan with the proposed DSM plan attached.

Thank you for your assistance in this matter and please let me know if you have any questions.

Sincerely,

John T. Burnett

JTB/at  
Attachments

- COM \_\_\_\_\_
- APA   1
- ECR   17
- GCL   1
- RAD   1
- SSC   1
- ADM \_\_\_\_\_
- OPC \_\_\_\_\_
- CLK \_\_\_\_\_

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**PROGRESS ENERGY FLORIDA  
GENERAL SERVICE INTERRUPTIBLE DSM PROGRAM**

**Analysis of Billing Determinants for Use as Basis for Application of Interruptible Demand  
Credit Including Mr. Jeffrey Pollock's Recommended Alternatives**

**I. Present Billing Determinant Basis for Interruptible IS-2 Credit:**

A demand Credit is applied each month to the product of the customer's non-coincident maximum demand and the customer's load factor during the billing month.

**II. Mr. Jeffrey Pollock's Recommendation for Billing Determinant Basis:**

Alternative No. 1:

A demand Credit should apply each month to the customer's normal operating demand for a defined "base line" period using actual data from a prior critical period.

Alternative No. 2:

A demand Credit should apply to directly measured amounts of interruptible demand in real-time for each customer. The interruptible demand would be the average of the daily maximum on-peak demands for the billing period.

**III. Analysis**

**A. Interruptible Program Valuation**

The total dollar amount of Interruptible Credits to be distributed to participating customers of the General Service Interruptible DSM Program is primarily a function of the aggregate coincident load of these customers at the time of the Company's monthly system peaks. The cost effective determination for this Program is based on the cost of generation facilities that are avoided by not having to serve this load at peak times. The avoided cost is per unitized as an amount related to monthly coincident demand.

**B. Deriving Demand Credits**

Since the avoided cost of the Interruptible DSM Program is stated as an amount per monthly coincident demand, a demand Credit should ideally apply to each participating customer's monthly measured coincident

demand. This measurement may not be feasible or practical and a more readily-available, alternative billing determinant need be selected. However, where another billing determinant is used, the demand Credit as determined from the avoided cost determination must be mathematically adjusted to reflect the relationship of the customer's coincident demand and the customer's alternative billing determinant.

As an example, assume the avoided cost determination results in a monthly interruptible value of \$4.00 per coincident demand. However, the rate designer desires to apply a credit to a customer on the basis of his maximum monthly billing demand. From load research, the rate designer finds that the sum of the maximum billing demands of participating customers is two times that of their coincident demand. The appropriate demand Credit is therefore determined by multiplying the value of \$4.00 per coincident demand times  $\frac{1}{2}$ , which is the ratio of the sum of the participating customers' coincident demands to the sum of their maximum monthly billing demands, resulting in an Interruptible Demand Credit of \$2.00 per maximum monthly billing demand. The application of \$2.00 per maximum monthly billing demands produces the same total payments to participating customers in the Program as would result if \$4.00 was applied to the participating customers monthly coincident demand.

Since the Credit can be mathematically adjusted to apply to any choice of billing determinant, and each application produces a total amount of payments equal to the avoided cost value of the Program, the choice of billing determinant has significance only as to how the value of the Program is distributed to individual customers participating in the Program.

### **C. Factors Affecting Billing Determinant Feasibility**

#### **(1) Cycle Billing**

The Company employs cycle meter reading and billing where most of the participating customer's billing periods occur in portions of two calendar months. If an analysis of calendar month usage is required, or other special analyses are required, additional billing costs would be incurred and the timing of normal bill rendering would be delayed.

#### **(2) Metering Installation**

All participating customers have metering that is time-recorded and retrieved at the time of monthly meter reading. This type of

metering provides hourly load information. If such information is required in real time, costly communication equipment would be required. Existing metering is programmed to readily provide the following information for the customer's usage during the current billing period:

- (a) Maximum Demand
- (b) Total KWH use
- (c) Maximum On-Peak Demand
- (d) Total On-Peak and Total Off-Peak KWH use
- (e) KVAR requirements

Although the existing metering also provides a record of interval load data, the search for the customer's coincident load may span more than one billing cycle requiring more costly billing expense and a delay in rendering a customer's bill.

**(3) Periods of possible or actual interruptions/curtailments**

Where notice is given by the Company of the possibility of exercising interruptions or curtailments, the customer may modify his usage schedule and not impose his normal load during such peak periods. And, of course, the customer's normal load is not being imposed when the Company actually exercises interruptions or curtailments during the Company's peaks.

**(4) Purchase Power Provision of Interruptible Rate Schedule**

When purchase power from other sources is available and sought in lieu of exercising an interruption, it is difficult to ascertain the amount of load a customer would have otherwise normally used.

**(5) Number of Participating Customers requiring Special Billing Analysis**

PEF has approximately 150 customers participating in its Interruptible DSM program. Customer loads may change from month to month and year to year. Considerable effort would be required to maintain historic data records. In addition, PEF has concerns as to the validity or appropriateness of using historic data for application as a customer's current usage.

**D. Suggested Billing Determinant Bases for IS-2 Interruptible Credit Application**

**1. Load Factor Adjusted Billing Demand**

This basis is the current determination being employed. The customer's billing demand is readily available in the billing process and is the typical billing determinant used for application of demand charges in general service demand rates. The load factor adjustment serves as a proxy factor for the customer's coincidence factor with system peak.

2. Mr. Pollock's Recommended Alternative No. 1:

Normal Operating Demand Derived from Actual, Historic Data.

PEF does not consider this determination to be a feasible basis since it requires a burdensome effort to continually analyze and establish so-called normal operating loads during critical periods. In addition, this development employs judgmental analyses and injects estimates as to the customer's current loads.

3. Mr. Pollock's Recommended Alternative No. 2:

Directly Measuring Demand in Real Time.

Mr. Pollock has suggested in his direct testimony in Docket No. 090079 to use a customer's average of his measured daily maximum on-peak demands during the billing period. He stated that this is similar to a determination required in the Company's Stand-by Service Rate Schedules. Although Mr. Pollock is correct in observing this application, it is performed for only four Stand-by Rate Schedule customers. It would be very burdensome to make this determination for 150 interruptible customers.

However, PEF believes that the following bases are closely related to Mr. Pollock's Recommended Alternative No. 2 and are feasible to consider as a billing determinant basis for the Interruptible Credit:

- a) A customer's maximum on-peak demand during the billing period.
- b) A customer's average hourly on-peak demand during the billing period.

4. Maximum Monthly Billing Demand (Non Coincident Peak or NCP)

The customer's billing demand is readily available in the billing process and is the typical billing determinant used for application of demand charges in rate schedules for general service demand customers.

**E. Billing Determinant Correlations with Coincident Demand**

PEF believes it is important to select that billing determinant basis for application of Interruptible Demand Credit that has the strongest relationship to a customer's load contribution to system peak. In statistics, this relationship is described as a correlation coefficient. A correlation coefficient is a measure of the strength of the relationship of two variables. The greater value of the correlation coefficient, the stronger the relationship is of the variables.

From its most recent Load Research Studies, PEF established an hourly load data base for each of its approximately 150 general service interruptible customers for the annual period beginning in April 2008 through the end of March 2009. From this data, monthly correlation coefficients have been calculated for the relationship between a customer's coincident demand and each of the following billing determinants:

- (1) Maximum Monthly Billing Demand (NCP)
- (2) Load Factor Adjusted Billing Demand (LF x NCP)
- (3) Maximum On-Peak Demand
- (4) Average Hourly On-Peak Demand

A summary of the monthly correlation coefficients is shown in Table No. 1. All of the four described billing determinants indicate a strong relationship with coincident demand. The billing determinant having the strongest correlation coefficient is that of the "Load Factor Adjusted Billing Demand". This billing determinant has the greatest average of its monthly correlation coefficients and is the greatest correlation coefficient in 7 of the 12 months. It is the basis currently employed for application of the IS-2 Interruptible Credit. The billing determinant having the next strongest relationship with coincident demand is that of the "Average Hourly On-Peak Demand". The Company considers this particular billing determinant as one that is close to the type of measurement suggested by Mr. Pollock's Alternative No. 2.

#### **IV. Conclusion**

The significance of the billing determinant basis for providing an Interruptible Demand Credit affects only how individual participating customers are apportioned the net benefits of the Interruptible General Service DSM Program. That is, whichever billing determinant basis is selected, the total of all payments to Interruptible customers should be the same regardless of the billing determinant basis. However, the billing determinant basis does affect how individual customer's share in the benefits of the Program.

A summary is presented in Table No. 2 of the attributes of the various billing determinants considered for application of the IS-2 Interruptible Demand Credit. PEF believes that the attribute that should mostly heavily be weighed is that of the calculation of the determinant's correlation coefficient with contribution to monthly system peak. This is because the Interruptible customers' monthly coincident load is the primary driver of the avoided cost valuation of the Interruptible program.

Direct measurement of the customer's load coincident with the system peak is not feasible under cycle billing practices and existing metering installations.

PEF finds as burdensome and of questionable validity the billing determinant basis suggested by Mr. Pollock's Alternative No. 1 of developing a customer's normal operating demand for a defined "base line" period using actual data from a prior critical.

PEF finds that the present basis for the IS-2 Credit of "Load Factor Adjusted Billing Demand" represents the billing determinant which has the strongest correlation with monthly coincident demand and is a readily available determination that does not require any additional metering or billing cost.

The Company believes that the billing determinant basis of "Average Hourly On-Peak Demand" is closely related to Mr. Pollock's suggested Alternative No. 2 basis. The Company finds that this basis has the next strongest correlation with coincident demand and is a readily available determination requiring only an initial billing set-up cost.

Table No. 1

PROGRESS ENERGY FLORIDA

Summary of Calculated Correlation Coefficients with Contribution to Monthly System Peak  
 Based on Time Recorded Load Data for All Customers in IS Class (approximately 150 customers)  
 During Most Recent Load Research Study from April 1, 2008 thru March 31, 2009

Month	(1)	(2)	(3)	(4)	Greatest Correlation Coefficient	Corresponds to:
	NCP	KW Billing Determinant LF x NCP	Max On-Peak	Avg Hourly On-Peak		
April '08	0.9064	0.9068	0.9184	0.9557	0.9557	Avg. Hourly On-Peak
May '08	0.9256	0.9629	0.8228	0.8494	0.9629	LF x NCP
June '08	0.9418	0.9664	0.9510	0.9629	0.9664	LF x NCP
July '08	0.9012	0.9744	0.9064	0.9721	0.9744	LF x NCP
Aug '08	0.9675	0.9690	0.9707	0.9698	0.9707	Max On-Peak
Sept '08	0.9423	0.9687	0.9485	0.9686	0.9687	LF x NCP
Oct '08	0.9223	0.9594	0.9276	0.9489	0.9594	LF x NCP
Nov '08	0.7341	0.7909	0.7416	0.8072	0.8072	Avg. Hourly On-Peak
Dec '08	0.8506	0.8797	0.8422	0.8775	0.8797	LF x NCP
Jan '09	0.8560	0.9111	0.9323	0.9395	0.9395	Avg. Hourly On-Peak
Feb '09	0.9360	0.9669	0.9355	0.9623	0.9669	LF x NCP
Mar '09	0.8488	0.8705	0.8554	0.8787	0.8787	Avg. Hourly On-Peak
Average Monthly	0.8944	0.9272	0.8960	0.9244		

No. of months as greatest:

0                      7                      1                      4



**Table No. 2**

**PROGRESS ENERGY FLORIDA  
Summary Analysis of Billing Determinant Bases for Application of IS-2 Interruptible Demand Credit**

Billing Determinant Basis		Attribute				
		Correlation Coefficient w/ Coincident Peak Demand [Ranking: 1 = Greatest]	Additional Initial Set-up Metering/Billing Cost Required	Additional On-Going Metering/Billing Cost Required	Pre-Billing Judgmental Analysis Required	Measurement Readily Available at time of Billing
I.	Max. Non-Coincident Demand (Billing Demand or NCP) (Billing Demand or NCP)	4	Yes	No	No	Yes
II.	Load Factor Adjusted Max. Non-Coincident Demand (Present IS-2 Basis)	1	No	No	No	Yes
III.	Maximum On-Peak Demand	3	Yes	No	No	Yes
IV.	Average Daily Max. On-Peak Demand (Pollock Alternative No. 2)	Data not readily available for analysis.	Yes	Yes	No	No
V.	Average Hourly On-Peak Demand (Similar to Pollock Alt. No. 2)	2	Yes	No	No	Yes
VI.	Actual "Base Line" Load Determination from prior critical period (Pollock Alternative No. 1)	Data not readily available for analysis.	Yes	Yes	Yes	Yes