

**Analysis of DS-3 and DS-4 Rate Classes and Respective  
Distribution Delivery Charges**

I. Background

Rate DS-3 is available to customers with demands from 150 kW up to 1,000 kW, while Rate DS-4 is available to customers with demands of 1,000 kW and greater. There were two related issues pertaining to DS-3 and DS-4 rate classes and rates raised in the previous rate case. The first issue pertains to the propriety of keeping separate rate classes for DS-3 and DS-4. In other words, at least one party was interested in combining the two rate groups. The second issue pertains separating DS-3 into subgroups, where group A would be for customers with demands from 150 kW up to 400 kW, and group B would be for customers with demands from 400 kW up to 1,000 kW.

Regarding the first issue, in the last rate case, the Commercial Group focused on the disparity of Distribution Delivery Charges between DS-3 and DS-4. Conceptually, it costs about the same to provide a kW of service to a DS-3 customer as it does a DS-4 customer. It follows that the \$/kW charges for DS-3 and DS-4 should be close together (with the exception of a slight difference – about 5% - to account for the inclusion of a Reactive Demand Charge in DS-4). The DS-3 and DS-4 Distribution Delivery Charges are reasonably close together for AmerenIP, but the gap is wide for AmerenCIPS and quite large for AmerenCILCO. The table below illustrates.

Distribution Delivery Charges: Rates Effective 10/1/08

	AmIP	AmCIPS	AmCILCO
<u>Supply Voltage</u>		<u>DS-3 Rates</u>	
Primary Voltage/kW	\$ 5.796	\$ 4.111	\$ 4.633
High Voltage/kW	\$ 1.479	\$ 1.260	\$ 1.019
+100 kV Voltage/kW	\$ 0.080	\$ 0.081	\$ 0.056
<u>Supply Voltage</u>		<u>DS-4 Rates</u>	
Primary Voltage/kW	\$ 5.111	\$ 2.880	\$ 2.444
High Voltage/kW	\$ 1.309	\$ 0.888	\$ 0.540
+100 kV Voltage/kW	\$ 0.075	\$ 0.055	\$ 0.032
<u>Supply Voltage</u>		<u>\$/kW Difference</u>	
Primary Voltage/kW	\$ 0.685	\$ 1.231	\$ 2.189
High Voltage/kW	\$ 0.170	\$ 0.372	\$ 0.479
+100 kV Voltage/kW	\$ 0.005	\$ 0.026	\$ 0.024
<u>Supply Voltage</u>		<u>% Difference</u>	
Primary Voltage/kW	13.4%	42.7%	89.6%
High Voltage/kW	13.0%	41.9%	88.7%
+100 kV Voltage/kW	6.7%	47.3%	75.0%

In the last DS rate case, the Commercial Group also raised an issue where a hypothetical customer reduced demand through energy efficiency measures<sup>1</sup> to a point where they are reclassified from DS-4 to DS-3. One can surmise by examining the table above that a reclassification change for customers at IP will be relatively smooth, since the difference in Delivery Charges is approximately 13% (and less than 10% after the unbundled Reactive Demand Charge applicable to DS-4 is considered). Conversely, a reclassification at AmerenCIPS and AmerenCILCO could result in a much greater customer impact. The table below illustrates Distribution Delivery Charges customers pay under DS-3 at 900 kW compared to the same charges for customers on DS-4 using 1,100 kW.

Distribution Delivery Charges Under Present Rates			
	AmIP	AmCIPS	AmCILCO
DS-3 Demand Charge at 900 kW Demand			
Supply Voltage	900	900	900
Primary Voltage/kW	\$ 5,216.40	\$ 3,699.90	\$ 4,169.70
High Voltage/kW	\$ 1,331.10	\$ 1,134.00	\$ 917.10
+100 kV Voltage/kW	\$ 72.00	\$ 72.90	\$ 50.40
DS-4 Demand Charge at 1,100 kW Demand			
Supply Voltage	1,100	1,100	1,100
Primary Voltage/kW	\$ 5,622.10	\$ 3,168.00	\$ 2,688.40
High Voltage/kW	\$ 1,439.90	\$ 976.80	\$ 594.00
+100 kV Voltage/kW	\$ 82.50	\$ 60.50	\$ 35.20
Difference in Demand Charge Revenue			
Supply Voltage			
Primary Voltage/kW	\$ (405.70)	\$ 531.90	\$ 1,481.30
High Voltage/kW	\$ (108.80)	\$ 157.20	\$ 323.10
+100 kV Voltage/kW	\$ (10.50)	\$ 12.40	\$ 15.20
Percent Difference			
Supply Voltage			
Primary Voltage/kW	-7.2%	16.8%	55.1%
High Voltage/kW	-7.6%	16.1%	54.4%
+100 kV Voltage/kW	-12.7%	20.5%	43.2%

As shown, the Customer uses about 22% less  $[(1,100\text{kW}-900\text{kW})/900\text{kW}]$ , but the amount of Distribution Delivery Charges paid vary by Ameren Illinois Utility. At AmerenIP, the customer pays at least 7% less in Delivery Charges (amount varies by supply voltage). At AmerenCIPS, the customer would pay about 16% more, and at AmerenCILCO, the customer would pay about 50% more.

It is appropriate for DS-3 and DS-4 to have some disparity in the demand charges. Consider that the cost of service cost allocation methodology apportions distribution demand related costs predominantly based on non-coincident demand, which occur in the summer for the DS-3 and DS-4 rate classes. High voltage facilities likewise are allocated based on non-coincident peak demand. Thus, summer demands drive the cost model. However, customers are not charged an amount only for their summer demand. Instead,

<sup>1</sup> Energy efficiency measures offered by AIU for this class of customer focus on kWh savings rather than kW demand savings. The hypothetical example should not be taken to infer expectations for AIU's energy efficiency programs.

customers are charged the Distribution Delivery Charge based on the greater of their monthly on-peak maximum demand or 50% of their off-peak maximum demand (i.e., the customer's Billing Demand). Under this pricing structure, the annual average of the monthly Billing Demands as a percent of their maximum demand occurring in the year (a surrogate for customers' summer non-coincident demand) is less for DS-3 than it is for DS-4. The table below illustrates this point.

**Ameren Illinois Utilities**

Comparison of Sum of Annual Maximum Demand Occurring in 12 Months of 2008  
To Sum of 12 Monthly Billing Demands Occurring in 2008

<u>AmerenIP</u>	Sum of Annual Maximum Demand in Past 12 Months 1/	Sum of 12 Monthly Billing Demands 2/	Sum of (Annual Max / Mo Max)	DS-4% less DS-3%
DS-3A	4,519,854	3,341,806	73.9%	
DS-3B	<u>3,619,996</u>	<u>2,754,165</u>	<u>76.1%</u>	
DS-3 Total	8,139,851	6,095,971	74.9%	
DS-4	19,213,263	15,947,254	83.0%	8.1%
 <b><u>AmerenCIPS</u></b>				
DS-3A	3,415,681	2,506,584	73.4%	
DS-3B	<u>2,916,301</u>	<u>2,191,051</u>	<u>75.1%</u>	
DS-3 Total	6,331,982	4,697,635	74.2%	
DS-4	10,935,988	9,717,352	88.9%	14.7%
 <b><u>AmerenCILCO</u></b>				
DS-3A	1,791,315	1,322,785	73.8%	
DS-3B	<u>1,298,208</u>	<u>944,006</u>	<u>72.7%</u>	
DS-3 Total	3,089,523	2,266,791	73.4%	
DS-4	3,885,297	3,482,660	89.6%	16.3%
 <b><u>Ameren Illinois Utilities</u></b>				
DS-3A	9,726,851	7,171,174	73.7%	
DS-3B	<u>7,834,505</u>	<u>5,889,222</u>	<u>75.2%</u>	
DS-3 Total	17,561,356	13,060,397	74.4%	
DS-4	34,034,548	29,147,267	85.6%	11.3%

1/ Customer's maximum demand occurring in the most recent 12 billing periods for each of the 12 monthly billing periods in 2008 ("annual maximum").

2/ Customer's monthly Billing Demand for each of the 12 monthly billing periods in 2008 ("monthly maximum")

Thus, as customers are billed the Distribution Delivery Charge through the year, the DS-3 class would be expected to contribute less revenue than the DS-4 class if the charges were identical. For AmerenIP, the ratio of "monthly maximum" demands to "annual maximum" demands is about 75% for DS-3 and 83% for DS-4. Similarly, the ratio for CIPS DS-3 and DS-4 is about 74% and 89%, respectively, and for AmerenCILCO 73% and 90% for DS-3 and DS-4, respectively. These ratios indicate that as a class, DS-4 will contribute more revenue from a \$/kW demand charge based on monthly demands. Moreover, the table also shows that the ratios between DS-3 and DS-

4 are wider for AmerenCIPS and AmerenCILCO (at about 15% and 16%, respectively) compared to AmerenIP (at about 8%). This observation may partially explain why demand charges for DS-3 and DS-4 are further apart for AmerenCIPS and AmerenCILCO, compared to those for AmerenIP. With regard to the potential of two DS-3 subclasses, the table demonstrates that the ratio of monthly maximum demands to annual maximum demands for the DS-3A group (customers with demands from 150 kW up to 400 kW) and the DS-3B group (customers with demands from 400 kW up to 1,000 kW) are comparable. The overall AIU average ratio for DS-3A is 73.7% and 75.2% for DS-3B. By comparison, the average ratio for the DS-4 group is 85.6%. This indicates that the DS-3A and DS-3B groups appear to appropriately belong together for ratemaking purposes, and that moving the DS-3B group to DS-4 would not produce a good fit.

The table above includes demands across all supply voltage types (i.e., primary, high voltage, and +100 kV). The next two tables show the same comparison of monthly maximum demands to annual maximum demands, but isolating customers supplied at primary voltage and high voltage, respectively. DS-3 demand supplied in the “high voltage” category is relatively light compared to DS-4. The DS-3 class does not have sufficient use at the “+100 kV” supply category to provide a meaningful comparison to DS-4. About 0.1% of DS-3 total demand is supplied at this level. By comparison, about 25% of DS-4 demand is supplied in the +100 kV category. The differences observed in the primary supply voltage table for each AIU could be useful in development of DS-3 and DS-4 primary voltage demand charges. For development of the high voltage demand charge, it may be best to use an AIU total average.

**Primary Supply Voltage****Ameren Illinois Utilities**

Comparison of Sum of Annual Maximum Demand Occurring in 12 Months of 2008  
To Sum of 12 Monthly Billing Demands Occurring in 2008

	Sum of Annual Maximum Demand in <u>Past 12 Months 1/</u>	Sum of 12 Monthly <u>Billing Demands 2/</u>	Sum of (Annual Max <u>/ Mo Max</u> )	DS-4% less <u>DS-3%</u>
<b><u>AmerenIP</u></b>				
DS-3A	4,240,275	3,137,970	74.0%	
DS-3B	<u>2,912,493</u>	<u>2,199,098</u>	<u>75.5%</u>	
DS-3 Total	7,152,768	5,337,069	74.6%	
DS-4	2,412,471	1,914,753	79.4%	4.8%
<b><u>AmerenCIPS</u></b>				
DS-3A	3,376,463	2,482,105	73.5%	
DS-3B	<u>2,780,369</u>	<u>2,087,933</u>	<u>75.1%</u>	
DS-3 Total	6,156,832	4,570,038	74.2%	
DS-4	3,368,581	2,905,650	86.3%	12.0%
<b><u>AmerenCILCO</u></b>				
DS-3A	1,774,266	1,308,995	73.8%	
DS-3B	<u>1,252,292</u>	<u>909,926</u>	<u>72.7%</u>	
DS-3 Total	3,026,558	2,218,920	73.3%	
DS-4	1,484,682	1,342,166	90.4%	17.1%
<b><u>Ameren Illinois Utilities</u></b>				
DS-3A	9,391,004	6,929,069	73.8%	
DS-3B	<u>6,945,155</u>	<u>5,196,957</u>	<u>74.8%</u>	
DS-3 Total	16,336,159	12,126,026	74.2%	
DS-4	7,265,733	6,162,568	84.8%	10.6%

1/ Customer's maximum demand occurring in the most recent 12 billing periods for each of the 12 monthly billing periods in 2008 ("annual maximum").

2/ Customer's monthly Billing Demand for each of the 12 monthly billing periods in 2008 ("monthly maximum")

**High Voltage Supply****Ameren Illinois Utilities**

Comparison of Sum of Annual Maximum Demand Occurring in 12 Months of 2008  
To Sum of 12 Monthly Billing Demands Occurring in 2008

<b><u>AmerenIP</u></b>	Sum of Annual Maximum Demand in <u>Past 12 Months 1/</u>	Sum of 12 Monthly <u>Billing Demands 2/</u>	Sum of (Annual Max <u>/ Mo Max</u> )	DS-4% less <u>DS-3%</u>
DS-3A	276,244	201,056	72.8%	
DS-3B	<u>703,885</u>	<u>551,470</u>	<u>78.3%</u>	
DS-3 Total	980,129	752,525	76.8%	
DS-4	10,803,882	9,157,670	84.8%	8.0%
<b><u>AmerenCIPS</u></b>				
DS-3A	37,469	24,479	65.3%	
DS-3B	<u>129,745</u>	<u>100,344</u>	<u>77.3%</u>	
DS-3 Total	167,214	124,824	74.6%	
DS-4	5,202,755	4,546,825	87.4%	12.7%
<b><u>AmerenCILCO</u></b>				
DS-3A	17,049	13,790	80.9%	
DS-3B	<u>34,844</u>	<u>30,688</u>	<u>88.1%</u>	
DS-3 Total	51,893	44,478	85.7%	
DS-4	1,540,914	1,320,086	85.7%	0.0%
<b><u>Ameren Illinois Utilities</u></b>				
DS-3A	330,761	239,325	72.4%	
DS-3B	<u>868,475</u>	<u>682,502</u>	<u>78.6%</u>	
DS-3 Total	1,199,236	921,827	76.9%	
DS-4	17,547,551	15,024,581	85.6%	8.8%

1/ Customer's maximum demand occurring in the most recent 12 billing periods for each of the 12 monthly billing periods in 2008 ("annual maximum").

2/ Customer's monthly Billing Demand for each of the 12 monthly billing periods in 2008 ("monthly maximum")

## II. Understanding Variations in Distribution Delivery Charges

To understand why large differences in the Distribution Delivery Charges AmerenCIPS and AmerenCILCO have emerged, this next section revisits how the individual rate components for DS-3 and DS-4 were developed.

Uniformity in rates has been a goal for the AIU, and the ICC has been supportive of that objective. Accordingly, DS-3 and DS-4 Customer and Meter Charges have been set uniformly across the AIU, but do vary by a customer's meter voltage (Secondary, Primary, High Voltage, and +100 kV). Likewise, the Transformation Charge is identical for all AIU for DS-3 and DS-4. The charge is presently \$0.57/kW. DS-4 also contains a Reactive Demand Charge that is uniform across the AIU. The charge is presently \$0.24/kVAR. The only unique charge to each AIU is the Distribution Delivery Charge.

The Distribution Delivery Charge was developed through a multi-step process. First, the cost per kW of Billing Demand at each supply voltage was calculated. The Billing Demands for both DS-3 and DS-4 were combined in this step. This produced a voltage differentiated \$/Billing Demand for both DS-3 and DS-4. Next, voltage differentiated DS-4 charges were developed by reducing the \$/kW values by a percentage that reflected the cost contribution for the Reactive Demand Charge. For example, if total costs were determined to be \$100, and the Reactive Demand Charge contributed \$5 of revenue, the \$/kW values were reduced by 5% each so that \$/kW demands would recover \$95.

The final step involved adjusting the DS-3 and DS-4 \$/kW charges by an equal percentage amount such that the total revenue recovered from each DS class equaled the revenue requirement allocated to each class. For example, in Dockets 06-0070/06-0071/06-0072 (Cons.), the Distribution Delivery Charge adjustments for each of the AIU were as follows:

	<b>DS-3</b>	<b>DS-4</b>
AmerenIP	105.5%	103.8%
AmerenCIPS	112.7	83.3
AmerenCILCO	122.2	77.6

As shown, the adjustments for AmerenIP were relatively minor, meaning that the jointly developed DS-3 and DS-4 demand charges were only modestly altered. The adjustments for AmerenCIPS increased DS-3 \$/kW Distribution Delivery Charge values by 12.7% while decreasing DS-4 \$/kW Distribution Delivery Charge values by 16.7%. The gap was even wider for AmerenCILCO, where DS-3 \$/kW Distribution Delivery Charges were increased by 22.2% and DS-4 \$/kW charges were decreased by 32.4%. For CIPS and CILCO, these adjustments produced a wider gap than can be explained by the effect of the Reactive Demand Charge and the difference in monthly demands compared to annual demands.

### III. Prospective Considerations and Alternatives

The gap between DS-3 and DS-4 Distribution Delivery Charges for AmerenCIPS and AmerenCILCO is wider than can be explained by the effect of the Reactive Demand Charge and the difference in monthly demands compared to annual demands. Rather, it is possible that part of the current gap is due to imperfections inherent within past cost of service models. Thus, steps should be taken in the next DS rate case to pull DS-3 and DS-4 Distribution Delivery Charges closer together while at the same time keeping cognizant of the important cost-based and bill impact considerations that are intrinsic to ratemaking. Methods to achieve this end vary as articulated below:

1. Follow same or similar \$/kW development as used in Dockets 06-0070 – 06-0072, but instead of conforming to an individual class revenue requirements, combine DS-3 and DS-4 for revenue allocation purposes. Rate design adjustments can then be made to differentiate prices between DS-3 and DS-4 to recognize that DS-4 customers pay an unbundled Reactive Demand Charge, a component of service that is “included” within the DS-3 Distribution Delivery Charge. The price adjustment can also recognize

that as a class, monthly demands for DS-3 fluctuate more than they do for DS-4 customers, and thus DS-3 should be priced higher to reflect the expectation of lower revenue per \$/kW.

2. Build on the method outlined in #1 above, but instead of making a price adjustment due to demand fluctuations, place greater emphasis on a customer's annual maximum demand within the demand charges. For example, a third component to the Billing Demand could be added. Today, the Billing Demand is based on the greater of the customer's monthly on-peak demand or 50% of their off-peak demand. The Billing Demand is reset each month, and is not linked to the underlying demand basis for cost allocation: summer NCP. The third component that could be added is to ensure that the Billing Demand is never less than say 80% of the customer's maximum summer peak demand. This would ensure that customers pay their "fair share" of costs by placing more importance on the demand that usually drives distribution system cost. This option risks confusing customers, and would be more difficult to administer. In October, 2008, the Billing Demand was changed from the monthly maximum to the parameters described above. Changing Billing Demand so soon may not be understood by some customers. Moreover, this method has not been analyzed to measure customer impacts.

3. Follow method #1 above to reflect pricing differences between DS-3 and DS-4 for the Reactive Demand Charge component in DS-4, but instead of the adjustment to reflect greater fluctuations of DS-3 demands, base the Billing Demand entirely on the customer's maximum demand occurring in the past year. The method outlined in #1 adjusts price to reflect class usage differences. This method adjusts demand so that monthly usage differences are not as relevant. This will ensure that revenue per \$/kW demand charge will be equal between DS-3 and DS-4 (aside from the Reactive Demand Charge adjustment).

4. Follow same or similar \$/kW development as used in Dockets 06-0070 – 06-0072, and continue to conform to each individual class' target revenue requirements. In the context of a general rate case requesting increases to various rate classes, this option may be necessary in order to address potential bill impact concerns. The gap between DS-3 and DS-4 demand charges could widen if the revenue allocation of class revenue requirements is restricted to limit bill impacts. Conversely, the gap between DS-3 and DS-4 demand charges may close if the revenue allocation restriction is relaxed.

#### Recommendation:

Existing rate classes should be retained. The analysis shows that load differences between DS-3 and DS-4 do not warrant combining DS-3 and DS-4 into a single DS rate. The ratio of AIU's DS-4 customers' monthly demands to annual demands is about 11% greater than those of AIU's DS-3, indicating that DS-4 customers contribute greater revenue than DS-3 customers under the current demand charge structure. Moreover, the subgroups of DS-3A and DS-3B do not exhibit significant usage differences. The ratio of AIU's DS-3A customers' monthly demands to annual demands is only about 1.5% less than those of AIU's DS-3B, indicating that splitting DS-3 into A and B subgroups is not warranted.

The gap between \$/kW Distribution Delivery Charges for DS-3 and DS-4 should fall closer to the differences that can be explained by the reactive demand and differences

in the ratio of monthly demands to annual demands. In a situation where revenue allocations are not restricted (i.e., each class is expected to recover revenue to produce an equalized rate of return) the first method outlined above should be used. Use of this method will ensure that the demand charges will be consistent between the rates, yet reflect recognizable differences in usage patterns and charges (e.g., the reactive demand charge applicable to DS-4 customers). This option will be harsher on the DS-4 classes at AmerenCIPS and AmerenCILCO since the gap between DS-3 and DS-4 demand charges is the greatest for those two utilities.

In a situation where revenue allocations are restricted (i.e., rate changes to each class restricted to limit potential bill impacts) the fourth option is recommended. Use of the fourth method will insure that each class will receive the targeted revenue allocation. However, use of this method may have the effect of further widening the gap between DS-3 and DS-4 demand charges if the revenue allocation limits are too restrictive. The revenue allocation limit must balance the goal of closing the gap in DS-3 and DS-4 demand charges and limiting bill impacts to customers.