



September 20, 2018

Mr. Mark Randall
Assistant City Manager
City of Independence
111 East Maple Ave.
Independence, MO 64050

Ref: Utility Billing System Conversion Review
B1912

Mr. Randall,

The City of Independence has requested the assistance of BHMGM Engineers, Inc. to review the utility customer concerns with the conversion from the legacy utility billing system to CIS Infinity in May 2018. Most of the customer concerns are related to the feeling that the conversion of the billing system led to billing errors causing the customer bills to be higher than they otherwise would be.

BHMGM has had several teleconference meetings with City staff concerning issues, complaints, analyses and results, comparative statistics and methodologies of the conversion process. From these meetings and our own independent analysis, we offer the following observations and conclusions.

1. Need for a system conversion

For the past 30 years, the City of Independence, MO used their own software (legacy) for utility billing. This software was proprietary and exclusive to the City. Support for this software was terminating in July 2018, therefore in 2015 the City selected CIS Affinity (CIS) as the replacement to the legacy system and began integration in the summer of that year.

Initially it was thought that the conversion should take approximately one (1) year to complete. This time estimate was not aggressive, in the opinion of the staff of both the City and CIS.

As reported by City staff, integration did not go as quickly as they would have liked. As with most billing software conversions, the plan was to transfer the data from the legacy system to CIS. The data transfer process caused most of the delays in the implementation. The legacy system had some data that was 30 years old. During the life-cycle of the legacy system, data formatting evolved so that the existing data was not all formatted the same way. The old data was not purged or cleaned.

The implementation team tested CIS for eight (8) months prior to going live with CIS on May 22, 2018. Prior to the “go live” date, staff had two (2) cycles of matching sample data in both systems prompting the system conversion to CIS. Note that all parallel system operations were completed in the off-peak season not allowing for complete testing of all of the rate calculation variables.

Unfortunately, the “go live” was in the middle of the monthly billing cycles and just ahead of the transition to the on-peak electric rates. This is unfortunate timing but, due to the pending July 2018 deadline for the conversion, it could not be helped.

Shortly after the first set of unity bills were issued and mailed from the CIS system, the City started receiving customer complaints. The complaints were mostly about the amounts of the utility bills, but other complaints such as not receiving bills, level pay amounts changing, meter reading dates and differences between the paper bills and online account information were noted.

2. Billing calculation validations

The City has twenty-six (26) electric rate codes, thirty-three (33) water rate codes, thirty (30) sewer rate codes and a few other miscellaneous rate codes including fire protection, irrigation and private lighting. A rate code listing is attached to this report letter.

During our review of the billing calculations, we found that the water and sewer rate codes were calculating correctly. We also found that most of the electric bill codes are calculating correctly. Those that were not have been brought to the attention of CIS and are waiting on rate code updates. Once that is complete, the bills will be re-run and adjustments will be made to the customer accounts.

It is important to note that the codes we found that need changed impact a very small portion of the customers. CIS is not correctly billing customers with more than one meter (approximately 150 residential customers and 80 commercial customers). This results in a small overbilled amount each month and will be corrected once CIS updates the rate code. The other few rate codes which need updates are EG3, EL1, ES1, EG7 and EG8.

EG3 is for primarily metered, large general service customers of which the City presently has 9. EL1 is for large power customers of which the City presently has 5. Not all EL1 customers are affected, only those being billed at the minimum rate or those with a load factor discount. ES1 is for education customers of which the City presently has 65 and the calculation updates are the same as for EL1 and only affect a small amount of the customers.

EG7 and EG8 rates are for commercial and large general service customers with space heat. The City presently has 24 customers on these rates. These customers each have two meters and CIS is not calculating the meters correctly. The City staff is working with

CIS to get this resolved. We were not able to verify the off-peak rate calculations as none of these customers have been billed off peak rates through CIS.

3. Rate set-up

BHMG reviewed the rate code setup files from CIS and compared it to the rates for electric, water and sewer. We have confirmed that the rates set-up in CIS match the existing rate structure.

While there are many water and sewer rate codes, they are relatively straightforward and simple. The electric rates, however, are complicated. The electric rate codes that are still being corrected by CIS are mainly non-residential and the need for the correction is likely due to their complexity. We think that the City and its customers would benefit from a much simpler electric rate structure. We understand that the City is presently in the process of a rate study which should allow the opportunity to simplify the rates.

4. Fuel factor calculations

The electric rate structure for the City of Independence includes a base rate and a monthly adjustment, called a fuel cost adjustment (FCA), sometimes referred to as a fuel factor. The present method of calculation and the base value have been the same since 2012.

BHMG reviewed the FCA calculations for May, June and July of 2017 and 2018. We confirmed that the methodology for the calculations did not change during the reviewed months. Therefore, we have concluded that a change in FCA calculations alone would not have caused an increase in the 2018 bills for May, June or July.

Furthermore, after a review of the resultant FCA values, the 2018 calculated FCA values were lower than the 2017 values for May and June and slightly higher for July, as illustrated in the table below. This observation indicates that the FCA had a lowering effect on the electric rate for the 2018 billing periods of May and June and an overall rate reduction for the summation of May, June and July 2018. Overall, for the three (3) month total, the FCA had an overall minimal impact on the electric rates as compared to the summer of 2017.

Bill / Read Month	FCA (Cents/kWh)		% change 2017-2018
	2017	2018	
MAY	2.89800	2.88450	-0.47%
JUN	2.97600	2.84100	-4.54%
JUL	2.50350	2.60400	4.01%
			-0.99%

5. Weather impacts on utility bills

The summer of 2018 was much warmer, for a longer period of time, than we have experienced in the Midwest in recent years. The temperatures rose to air conditioning levels earlier in the season than it had in many years prior. In fact, a comparison of the cooling degree days for 2018 illustrated the demand for energy earlier in the season. May 2018 had three times more cooling degree days than 2016 and two times more than 2017. June 2018 experienced a 30% increase over June 2017.

Degree days is a simplification of weather data to normalize the data for comparison, usually for weekly or monthly comparisons. A base temperature of 65 degrees F is generally used and the degrees above or below that temperature are calculated for the referenced time period. Cooling degree days (CDD) are used for summertime comparisons. For example, when comparing two months, if one has 10% more CDD than another, the higher month could be expected to have about a 10% larger air conditioning load than the other month.

The increased use of electricity was evident in the City's energy sales statistics. Energy sales for May 2018 were up 24% from May 2017. June 2018 was up 5% from June 2017.

6. Bill cycle impacts

All of the utility customers are assigned to a cycle for utility meter reads and bill processing. The City presently has twenty (20) monthly billing cycles, which result in a group of utility bills being processed effectively every business day in any given month.

There is approximately one (1) week between meter reads and bill processing for each cycle. Immediately after "go-live", various adjustments had to be made in the CIS. These adjustments added some delay in billing. Additionally, meter reads did not timely import into the CIS system initially, causing a delay in bill processing.

For the three (3) working days in advance of the "go live" date, the billing systems were locked-out for meter file downloads and meter data uploads. This lock-out caused an unavoidable delay in meter reading and uploading to customer accounts.

This delay caused some customers to have less time between receipt of the bill and the payment due date. The billing process delays, due to meter reading delays (discussed in item #8 below), affected the total bill amount by extending the billing period for that particular bill cycle.

Typical monthly billing periods are 29-31 days. The largest increase in a customer's billing period with their first utility bill from the CIS system was reported to be 4 days. Customer bills with a longer than typical billing period could have seen a usage increase on that specific bill of 3-13%. Once the meter read bill cycle was back on track, the resulting billing period was shorter than normal, causing a 3-13% decrease on that particular month's usage. The net effect is a shift in usage from one month to another, not an overbilling.

In most instances, the billing cycle returned to typical within one (1) billing period, with two (2) billing periods for the remainder of the customers. Most of the extended billing periods occurred with the July bills. As noted in section #4 above, the fuel factor for the July bills was less than that of the June bills. Any usage shift into the July bill would result in that usage being billed at a lesser "all-in" electric rate.

It is important to note that some customers had experienced fluctuating billing periods from 27 to 34 days with the legacy system. This situation is not unusual for utilities with manual-read systems. In the CIS system, the billing parameters such as blocks and flat charges are prorated for any billing period outside of 26-34 days.

7. Delivery of utility bills

The largest volume of initial customer complaints related to the delivery of utility bills. Approximately 1500 to 1800 bills were mailed to the wrong addresses. Furthermore, when the legacy system data was imported into the CIS system the data did not have consistent formatting due to the large number of years of data inputs. Because of this inconsistent formatting many bills were returned undeliverable because the addresses transferred incorrectly into CIS. Formatting errors included missing bar codes and missing or incorrectly placed apartment numbers or suite numbers.

The City presently mails bills using the post office's commercial bulk mail program. The legacy system printed bills with bar codes, utilizing the commercial mail automation services offered by the post office to lower postage costs. Since the data transferred from the legacy system was not formatted consistently, the resultant mailing bar codes were not printed in a way that ensured delivery. Until the staff has confidence in the data reformatting, specifically with respect to the address formats, they have reduced the postal automation to improve mail delivery success.

As an additional mitigating step for bill delivery concerns, the utility billing office has issued a temporary moratorium on late fees and shut-offs.

8. Meter reading impacts

Utility meter reading for the City of Independence is presently done by manual entry with handheld collectors. (It is the goal of the utility department to move to an automated

system once the utility billing software migration is finalized.) During the conversion to CIS, the method for standard meter reading did not change.

All of the manual processes with the legacy billing system became automated with CIS. Existing work processes had to be modified to work with the inputs and outputs of CIS. Some of these modifications are not creating efficiencies, rather extending the time it takes for completion. An example of increased inefficiency happens when reviewing the mis-read report. In the legacy system the report items were all on one page and easy to sort through. In CIS, the report listing does not have all of the data necessary to make a determination on the read without drilling down into the details on each account. Requests have been made to CIS for an updated report and the staff is being told is not able to be done. Additionally, the computer processing time for entries is longer and therefore does not allow the staff to complete as many customer updates as before. This situation is being reviewed to determine the source of the delay in hopes of eliminating it.

CIS has a tighter algorithm for exception reporting. A comparison was made between the volume of accounts on each cycle's exception report with the legacy system and CIS. It seems that the volume for water and sewer has not changed, but the volume for electric is higher with CIS. This is likely due to the CIS exception reporting algorithm.

There are some customer situations which prohibit the meter reader from reading the electric meter. This situation may be caused by a yard animal prohibiting access or simply the meter location requires the customer to be home to allow access to the meter. Some customers have self-read postcards mailed monthly while others will have a postcard left by the meter reader in the event the meter cannot be read during the normal route. If the post card is not received in time for the prescribed bill cycle processing, the meter read is estimated. It is the goal of the utility billing department to true-up the billing in a subsequent month with an actual read. It is worthy to note that there are some customers with limited or no access to their electric meters. When this happens, true-up readings are problematic to acquire. Meters in this situation are earmarked to be in the automated meter reading pilot program.

Approximately 480 City of Independence customers are billed utilizing self-report postcards. A larger than typical number of these customers experienced bills from CIS which were estimated rather than the reported read on the postcard due to the timing on the receipt of the postcard. CIS has a similar estimation algorithm to the legacy system and similar values are expected.

9. Level pay customer impacts

Approximately 4,800 customers participated in the level pay program under the legacy system at the time the billing system was converted to CIS.

The legacy level pay program provided the customer a manageable bill every month based on the rolling average of the consumption for the last 12 months. CIS handles

level pay in a similar manor, except the average is based on daily consumption rather than monthly consumption. This enhanced algorithm results in a tighter monthly calculation which should further reduce the reconciliation amount.

In the specific months of May, June and July 2018, the weather drove usages higher than the recent summer seasons. The increased daily usage in 2018 drove the level pay calculation higher in the CIS system than it would have been in the legacy system.

Any type of level pay or budget billing program is normally combined with an annual reconcile period. Unfortunately, the legacy system did not have a reconcile period, so annual excesses or shortages continued to accumulate on the customer's account. These funds were paid to the customer or collected from the customer once the account was closed. Upon conversion into CIS, any reconciliation amount (positive or negative) was added to the customer's balance and divided for collection over ten (10) months. There were approximately 1,630 level pay customers with positive reconciliation at the time of the conversion.

The tighter calculation algorithm of the CIS system, combined with the reconciliation balance due collections, caused some customers to see a noticeable impact on their level pay bill since the level pay amounts were higher than they would have been under the legacy system.

10. Net metering customer impacts

There presently are approximately 57 net metering customers, 47 of which are residential. Reviews of the sample monthly billing calculations indicated that the system is calculating these bills correctly.

The City of Independence utilizes a combination of one-for-one credits and avoided cost to compensate the net metering customers for their renewable energy generation. Any excess generation is first used to offset the customer's utility system consumption at a one-for-one rate. All customer generation above the customer's consumption in any given month is credited to the customer the same month at the avoided cost rate.

The City calculates the avoided cost rate annually and it is updated with the June billing. The avoided cost rate for implementation in June 2018 was slightly lower than that of the rate calculated for implementation in June 2017. The process for updating the rate in CIS requires copying of rate tables. The staff has not yet updated the rate in CIS and will not until all the rate tables are calculating correctly in CIS without intervention. With CIS still using the June 2017 rate calculation which is higher, net metering customers are presently getting a slightly larger credit for excess generation than they normally would.

Summary of Findings

The City of Independence was forced to replace an aged, proprietary utility billing system. The legacy system had been in place for thirty (30) years.

Software implementations are never perfect and often unforeseen complications often arise. The success should be measured on the ability and timeliness of the modifications and responsiveness. In every area that we reviewed, any problematic situation was addressed immediately and efficiently. It is our opinion that the implementation issues arose mostly due to the condition of the existing data and properties and constraints of the legacy system, rather than any limitations or programming mistakes in the CIS system.

Billing system conversions are best done at the beginning of shoulder months. These months typically have lower usages and add less confusion to the transition. The transition was implemented at the beginning of the 2018 summer season, which resulted in higher electric, water and sewer usages due to weather. The usage increase in consumptions, due to weather, led to larger bills, which were confused with billing system errors.

After reviewing the billing of each rate code, we are confident that the system is now programmed to bill the City of Independence's customers appropriately (with noted exceptions). It is also our opinion that the utility billing department appropriately mitigated the billing system customer issues to minimize the final impact to the customer.

While the system is calculating customer bills correctly, bill delivery issues, bill cycle lengths, timing of the conversion with increased bills due to weather, and the reconciliation recovery for the level-pay customers created reasonable customer frustration. The complexity of the electric rates is likely another cause of customer frustration.

Sincerely,

BHMG Engineers, Inc.



Verbal J. Blakey, P.E.
Vice President