Improving Whole Sale Metering and Billing Equity

SPU Action Plan

I. Billing Meter Performance Monitoring within a given year

1. By SPU Billing. Each month SPU Billing and Audit staff would compare monthly consumption by meter and by whole sale customer to the same period of prior years. The comparison would include total consumption by the customer, as well as service by service check. Any discrepancies would be investigated with a goal of early detection of meter malfunctions. For example, ad hoc meter testing would be performed when a consumption drop outside of the overall trend is noted.

2. By the Customer. The impact of a malfunctioning meter on billing could be minimized by detecting the failure as early as possible.

   Many whole sale customers operate their own meters immediately downstream of SPU's billing meters, and use them to verify the volume of water billed by SPU on a monthly basis.

   Each whole sale customer is encouraged (but not required) to pro-actively monitor its whole sale purchases from SPU against its own master meters, and alert SPU as soon as possible of any changes or discrepancies indicative of a billing meter malfunction. It is understood that not all customers have meters downstream of the SPU meter, so some may not be able to do such comparisons. Over time, though, the tendency would be for any gaps to be filled as more and more whole sale customers install master meters at their feeds from SPU.

3. Estimating consumption in case of SPU meter malfunction. When it is known that a certain SPU meter did not work accurately in a given month, SPU would issue an estimated bill based on past total consumption for that customer during a period with similar weather. Customers with own sources would be requested to provide information on water production from their sources if a change in source operation makes the above estimate problematic. In case the customer has a well-functioning meter downstream of the malfunctioning SPU meter, readings from it may be used instead of estimates.

II. Annual Review and Adjustment Based on Distribution System Losses (DSL)

Whole sale billing annual review process would be established in SPU with clear process definition, schedule, and owner. SPU Audit appears to be the logical home for the process, with USM in a support role. The process would run during the 2nd Quarter of each year, and would apply to the previous year's billing.

It would be **a two-step process, involving an interim adjustment, and a final adjustment**.

DSL Reporting. At the end of the first quarter SPU whole sale customers report their DSL information using consistent methodology to WA DOH for the previous year; this information is also shared with SPU. SPU reviews the data and compiles a DSL report.

Meter Testing. SPU reviews the DSL data, and immediately tests all meters serving each customer where the DSL data suggests possible SPU meter malfunction, per the criteria below. The meter tests would identify any outstanding meter inaccuracies that would have contributed to the lower DLS number.

Interim Adjustment. SPU requests customers meeting one or more of the following criteria to participate in the annual review which would take a slightly different track depending on the trigger, as laid out below:

1. **Some drop in DSL and known SPU meter malfunction during the previous year** not fully resolved due to lack of accurate metering data. For example, a Neptune meter was tested mid-year and found to be 80% accurate. UME is replaced and meter functions normally for the rest of the year, however, it is unknown how meter performance deteriorated during the first part of the year, and how much water was missed, as there is no customer's meter downstream to fill in the data gap. The DSL is 1.5% lower than the previous year.

   The customer would be requested to provide any other possible reasons for the reduction in DSL, beyond the SPU meter malfunction. Depending on the circumstances, facts, and data, the annual adjustment would be somewhere between zero and 1.5 percent, per the example above. In other words, if the customer can attribute part of the DSL reduction to other causes, the interim adjustment will be reduced accordingly.

2. **Significant drop in DSL compared to prior year.** Reducing DSL is typically a slow process, with sudden and significant year-over-year drops typically indicative of SPU meter malfunctions. For example, the DSL for the year under review is 5% lower than the year before. No SPU meter malfunctions were noted during the year, however, if such malfunctions did occur and thereby caused the DSL drop, they would most likely be discovered when the meters are tested, which would then be used as guidance in the adjustment process.

   The customer would be requested to provide justification or reasons for the DSL drop, if any. Depending on the circumstances, facts, and data, including recent meter test results, the interim adjustment would be somewhere between zero and the amount of the drop. In other words, if the customer can attribute part of the DSL reduction to other causes, the interim adjustment will be reduced accordingly. In the example above, if a customer can demonstrate an active retail meter replacement program that could have reduced unmetered water by 0.5 percent, the interim adjustment would be set at 5% - 0.5% = 4.5%.

3. **DSL below four (4) percent.** It is highly unusual for a water utility to operate with DSL under four percent. It is expected, however, that over time, as the process is consistently applied, the number of reviews solely triggered by this criterion will decline and ultimately cease.

   The interim adjustment would be calculated to bring the DSL up to the 4% level.

Final Adjustment. The final adjustment would typically occur a year later when sound DSL data becomes available, i.e., a full year period when all SPU meters serving a customer worked normally, and DSL can be reliably calculated. For example, the interim

adjustment for 2013 would occur in the first quarter of 2014, and the final adjustment in the first quarter of 2015.

To determine the extent and direction (refund or charge) of the final adjustment, the reliable actual and most recent DSL value would be compared to that assumed when calculating the interim adjustment.

For example, if the interim adjustment was based on a *DSL = 4%*, and next year's actual DSL comes in at 6%, an additional bill would be generated. Conversely, if the interim adjustment was based on *DSL = 7%*, and next year's actual DSL value came in at 5%, a refund back to the customer would be processed.

III. SPU's Meter Maintenance and Renewal Program

1. Krohne Electromagnetic (Mag) Meters. Majority of the billing issues over the last several years have been caused by the Krohne Electromagnetic (mag) meters. Installed in the 2002-2004 period as replacements to the original sonic meters from the late 1980s, the Krohne mags are getting to be over 10 years old.

   SPU will endeavor to improve their reliability by contracting with Krohne to inspect, test, refurbish, water proof, and re-certify the meters. This is expected to occur in August of 2013 at SPU's cost. Additionally, SPU will contract out to Krohne the annual testing and recertification.

   Should these steps fail to improve the performance of the Krohne mags, they would be replaced expeditiously, much like they replaced the original sonic meters. Each customer would then be responsible for the cost of replacing its meters, per the whole sale contract.

2. FM-CT (Protectus) meters, Compound meters, and Metron meters. The annual meter testing program currently in effect will be enhanced to include more frequent testing of the high consumption meters. This additional effort would be at SPU's cost.

3. Turbine Meters (Sensus Rockwell). These meters cannot be tested on site. The current approach to testing includes: (a) remove the measuring element; (b) install a different one that has been tested on the bench; (c) test the removed measuring element on the bench to identify past performance. Some of these measuring elements are over 20 years old.

   New federal regulations limiting the use of leaded brass components in contact with drinking water in water systems will make these meters untestable as of Jan 1, 2014.

   Consequently SPU will replace the Rockwell turbine meters with new Sensus AccuMAG meters by the end of 2014. Each customer would be responsible for the cost of replacing its meters, per the whole sale contract.

   On a positive note, the replacement of a Rockwell Turbine meter with an AccuMAG can be accomplished at a fairly low cost ($10-$15k per meter) since the new meters are less expensive and shorter than the turbines, and no major vault or piping modifications would be necessary.