A Discussion Of Customer Service, Utility Billing, and Revenue Generation

Presented at the Ohio AWWA-WEA Technical Conference & Expo, August 27th – 30th, 2018, Columbus, Ohio
A Discussion of Customer Service, Utility Billing and Revenue Generation

The correct billing of every customer is the financial life blood of a Utility. Incorrect billing can lead to customer dissatisfaction and distrust of the Utility. As a part of this presentation the most common billing errors identified by URM will be discussed, and some simple diagnostics that can be used by the Customer Service billing staff to avoid or minimize them will be reviewed.
URM – Who are We?

• Headquartered in Houston, Texas, Utility Revenue Management (URM) is a privately held business that provides revenue enhancement audit services to the public water and wastewater utility industry in the United States.
• Incorporated in 1992, the company was founded by A. Mitch Robertson and William P. Bulloch, Jr.
• URM has assembled a uniquely qualified team of professionals consisting of engineers, accountants, programmers, utility technical specialists and business experts.
• URM as a team has more than 150 years of experience working in the highly specialized field of “Revenue Enhancement Management Audits” of water and wastewater utilities’ billing systems.
PERFORMANCE

URM has:

• Successfully provided audit services for over twenty five years
• Analyzed more than 4.5 million customer accounts
• Conducted over 45,000 detailed field investigations
• Verified over 7500 billing and metering inconsistencies in the field
• Generated over $45,000,000 of annual increased revenue as a result of the correction of these deficiencies
• Completed audits of thirty public water/wastewater/stormwater billing systems
URM Engagements

- East Bay Municipal Utility District (EBMUD)
- Phoenix Water Services
- San Antonio Water System (SAWS)
- Washington Suburban Sanitary Commission (WSSC)
- The City of San Diego
- Dallas Water Utilities
- Austin Water
- Metro Water Services
- Charlotte Water
- The City of Baltimore
- The City of Atlanta
- The Pittsburgh Water and Sewer Authority
- Youngstown Ohio
- Baltimore County Maryland
- St. John the Baptist Parish Louisiana
- Jefferson Parish Water Department Louisiana
- The City of Plano Texas
- Tampa Water Utilities
- The City of Tucson Arizona
- Fulton County Georgia (two engagements)
- Richmond Virginia
- Anne Arundel County Maryland
- Irving Texas
- Corpus Christi Texas
- The City of Tempe Arizona
- San Angelo Texas
- Charleston South Carolina
- Cobb County Georgia
- Columbia South Carolina
- Columbus Ohio (active)
- Augusta Georgia (active)
Comparison of Number and Revenue of Work Orders
Billing, Wastewater and Metering
Utility Revenue Management
IDENTIFICATION OF POSSIBLE METERING RELATED REVENUE LOSSES

- Consumption Pattern Analysis
- Meter Size and Type
- Land Use Type
## BILLING, WASTEWATER AND METERING RELATED REVENUE LOSS

Non-Single Family Residential Customer Accounts Only  
Utility Revenue Management

<table>
<thead>
<tr>
<th>Work Order Type</th>
<th>Annualized Projected Increased Revenue/Percentage</th>
<th>Work Orders Number/Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Billing</td>
<td>$11,616,930.29 (26.10%)</td>
<td>2434 (29.25%)</td>
</tr>
<tr>
<td>Wastewater</td>
<td>$17,081,862.89 (38.38%)</td>
<td>4224 (50.76%)</td>
</tr>
<tr>
<td>Metering</td>
<td>$15,810,304.64 (35.52%)</td>
<td>1663 (19.99%)</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$44,509,097.82 (100.00%)</strong></td>
<td><strong>8321 (100.00%)</strong></td>
</tr>
</tbody>
</table>

Billing includes:
- New (Lost) Account, Line Size, Fire, Class Code, Flat Rate, Billing Rate, Unit Count, Read Meter, Winter Average, and Back bill

Wastewater includes:
- No Sewer, Stormwater, Restaurant Surcharge, Industrial Surcharge, Cooling Tower and Reclaimed Water

Metering includes:
- Meter Change, Meter Repair and Open Bypass.

Solid Waste, Electricity and Gas not included in the above numbers
# Billing, Wastewater and Metering Related Revenue Loss

Non-Single Family Residential Customer Accounts Only

## Utility Revenue Management

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<tr>
<th>Work Order Type</th>
<th>Annualized Projected Increased Revenue Dollars/Percentage</th>
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<tr>
<td>Billing</td>
<td>$11,616,930.29 (26.10%)</td>
<td>2434 (29.25%)</td>
</tr>
<tr>
<td>Billing plus Wastewater</td>
<td>$28,698,793.18 (64.48%)</td>
<td>6658 (80.01%)</td>
</tr>
<tr>
<td>Wastewater</td>
<td>$17,081,862.89 (38.38%)</td>
<td>4224 (50.76%)</td>
</tr>
<tr>
<td>Bypass</td>
<td>$5,532,794.21 (12.43%)</td>
<td>555 (6.67%)</td>
</tr>
<tr>
<td>Metering</td>
<td>$15,810,304.64 (35.52%)</td>
<td>1663 (19.99%)</td>
</tr>
<tr>
<td>Metering w/o Bypass</td>
<td>$10,277,510.21 (23.09%)</td>
<td>1108 (13.32%)</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$44,509,097.82 (100.00%)</strong></td>
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Billing includes:
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Metering includes:
- Meter Change, Meter Repair and Open Bypass

**Note:** Solid Waste, Electricity and Gas not included in the above numbers
Percentage Distribution of Billing, Metering and Bypass Inconsistencies
Results from 30 Public Utilities (Non-Single Family Residential Data) in the United States, 1993 to 2016

Utility Revenue Management

Billing, Bypass and Metering Inconsistencies Percentage by Number and Revenue
Utility Revenue Management
Revenue Loss Associated with Billing and Metering Systems
Results from 30 Public Utilities (Non-Residential Data) in the United States, 1993 to 2016

Billing and Metering Inconsistencies Percentage by Number and Revenue
Utility Revenue Management

- Billing:
  - Number: 86.68%
  - Revenue: 76.91%

- Metering:
  - Number: 23.09%
  - Revenue: 13.32%
FIELD INVESTIGATION STATISTICS
RESULTS FROM 30 PUBLIC UTILITIES (NON-RESIDENTIAL DATA) IN THE UNITED STATES, 1993 TO 2016
UTILITY REVENUE MANAGEMENT

URM Field Investigation by Land Use Type
Utility Revenue Management

- Commercial: 18078
- Apartments: 9413
- Irrigation: 8399
- Office: 2217
- College/School: 2211
- Single Family: 1594
- Restaurant: 1468
- Other: 1064
- Office/Warehouse: 644
- HOSP/ARE: 495
- Government: 491
- Industrial: 466
- Fireline: 459
- PAK/REC: 421
- Manufacturing: 242
- Mobile Homes: 187
- Res. Duplex: 80

Legend:
- COMMERCIAL
- APARTMENTS
- IRRIGATION
- OFFICE
- COLLEGE / SCHOOL
- SINGLE FAMILY
- RESTAURANT
- OTHER
- OFFICE / WAREHOUSE
- HOSP / ARE
- GOVERNMENT
- INDUSTRIAL
- FIRELINE
- PARKS / REC
- MANUFACTURING
- MOBILE HOMES
- RES. DUPLEX
Revenue Loss Associated with Billing and Metering Systems
Results from 30 Public Utilities (Non-Single Family Residential Data) in the United States, 1993 to 2016
Utility Revenue Management

Distribution of Billing and Metering Inconsistencies by Meter Size
Utility Revenue Management

Billing includes wastewater and open bypasses
Percentage Distribution of Billing Inconsistencies
Results from 30 Public Utilities (Non-Residential Data) in the United States, 1993 to 2016
Utility Revenue Management

- No Sewer: 36%
- New Account: 9%
- Fire: 9%
- Line Size: 9%
- Class Code: 8%
- Flat Rate Change: 8%
- Bypass: 4%
- Billing Rate Change: 3%
- Restaurant: 2%
- Industrial Surcharge: 1%
- Unit Count: 1%
- Read Meter: 1%
- Cooling Tower: 1%
- Winter Average: 1%
- Reclaimed Water: 1%
- Back Bill: 1%
Percentage Distribution of Increased Revenue by Billing Inconsistency Type
Results from 30 Public Utilities (Non-Residential Data) in the United States, 1993 to 2016
Utility Revenue Management

- No Sewer: 31%
- New Account: 14%
- Fire: 13%
- Line Size: 11%
- Class Code: 5%
- Flat Rate Change: 5%
- Bypass: 4%
- Billing Rate Change: 4%
- Restaurant: 3%
- Industrial Surcharge: 2%
- Unit Count: 2%
- Read Meter: 1%
- Coolong Tower: 0%
- Winter Average: 0%
- Reclaimed Water: 0%
- Back Bill: 0%
### Increased Revenue by Type and Percentage

<table>
<thead>
<tr>
<th>Type</th>
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<tr>
<td>NO SEWER</td>
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<td>OPEN BYPASS (THEFT OF SERVICE)</td>
<td>16%</td>
</tr>
<tr>
<td>COOLING TOWER (EVAPORATION CREDITS)</td>
<td>14%</td>
</tr>
<tr>
<td>BACK BILL</td>
<td>13%</td>
</tr>
<tr>
<td>NEW (LOST) ACCOUNT</td>
<td>5%</td>
</tr>
<tr>
<td>CLASS CODE</td>
<td>5%</td>
</tr>
<tr>
<td>UNIT COUNT</td>
<td>5%</td>
</tr>
<tr>
<td>RESTAURANT</td>
<td>4%</td>
</tr>
<tr>
<td>READ METER</td>
<td>4%</td>
</tr>
<tr>
<td>FIRE SERVICE</td>
<td>1%</td>
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<td>LINE SIZE, BILLING RATE CHANGE, INDUSTRIAL SURCHARGE, WINTER AVERAGE, RECLAIMED WATER, FLAT RATE CHANGE</td>
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### Work Orders by Type and Percentage

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Billing Related Revenue Loss
RESULTS FROM 30 PUBLIC UTILITIES (NON-RESIDENTIAL DATA) IN THE UNITED STATES, 1993 TO 2016

- No sewer: 36%
- Open bypass: 16%
- Cooling Tower: 14%
- Back Bill: 13%
- Class code: 8%
- Unit count: 8%
- New (lost account): 4%
- Restaurant: 13%
- Read meter: 4%
- Line, Blng, Ind., etc: 3%
- Fire Service: 3%

NUMBER REVENUE
Revenue Loss Associated with Billing Systems
Results from 30 Public Utilities (Non-Residential Data) in the United States, 1993 to 2016

No Sewer.  ($10,748,274.00, 31.4%; 2563 Occurrences, 35.53%)

The Issue.

• This is the most common billing related issue URM has identified in audits of public water and wastewater billing systems. Over 35% of billing inconsistencies identified by URM were related to incorrect sewer billing.

Discussion.

• There are many reasons for this type of billing inconsistency: organizational, policy, staff turnover/training, lack of updated written procedures, human error, internal communication and the unique characteristics of each billing system.
• Once the meter is set and there is an initial meter reading should the customer be billed for sewer service?
• Once the service line has been connected to the wastewater lateral and has passed inspection, should Customer Service Billing begin billing for sewer service?
• Develop a detailed step-by-step written procedures manual for initiation of new sewer service.
• TRAINING, TRAINING, TRAINING
• Regardless of the above, run queries once every 90 days containing accounts set up during the last 90 days that are not being billed for sewer service.
• Field investigate those new accounts to verify that they are indeed tied to the wastewater collection system.
Open Bypass. ($5,532,794.21, 16.16%; 555 Occurrences, 7.69%)

The Issue.

- The majority of the open bypasses verified in the field were associated with tampering.
- The most prominent land use type associated with manipulation of large meter bypasses is apartment complexes. In fact, the most occurrences of bypass manipulation, meter tampering, illegal connections and incorrect information provided to the Utility that have been identified by URM through billing system audits have been associated with apartment complexes.
- There are occurrences of bypasses being left open after meter installation or test and repair.

Discussion.

- Depending on the frequency of testing large meters 3 inches and above, the bypass could be manipulated anywhere from 12 to 24 months.
- Since the open bypass will allow most or all of the water to flow through the bypass, and depending on the usage characteristics of that particular account, the change in consumption may or may not hit the Billing Exception Report.
- The Billing Exception Team can play a key role in identifying open bypasses, if the drop in consumption kicks out on Exception.
- Meter Management will catch the open bypass when the metering system is tested and repaired or replaced, if necessary.
- Lock all bypasses. Ensure that all bypasses are closed (and locked) after installation, periodic testing or meter replacement.
- COMMUNICATION, COMMUNICATION, COMMUNICATION
- TRAINING, TRAINING, TRAINING
Revenue Loss Associated with Billing Systems
Results from 30 Public Utilities (Non-Residential Data) in the United States, 1993 to 2016

Class Code/Billing Rate. ($5,667,409.05, 16.56%; 2,340 Occurrences, 32.44%)

The Issue.
• There are actually many Class Code and Billing Rate related categories, including Fire Service, Line Size, Class Code, Flat Rate Change, Billing Rate Change, Restaurant Surcharge, Industrial Surcharge, Unit Count and Winter Average.

Discussion.
• There are many reasons for this type of billing inconsistency: policy, organizational, staff turnover/training, lack of updated written procedures, human error, internal communication and the unique characteristics of each billing system.
• Complete all account set up during the same work day. Eliminate any daily back log.
• Produce a written document concerning account set up procedures. Review with all staff at least once a year, with any updates and with new staff members within the first week. Update the document based on changes in procedure on an ongoing basis.
Revenue Loss associated with Billing and Meter Reading Systems

**Billing**
- Account Set-Up/Lost Accounts
  - Obtaining Incorrect Information
  - Data Input Errors
  - Improper Account Structure
- Systematic Bill Handling
  - Programming Errors
- Billing Adjustment Procedures
  - Are dollars being adjusted correctly?
- Billing/Meter Reading Systems Interface
  - Programming Errors

**Meter Reading**
- Meter reading programming (Hand held, AMR)
- Faulty Encoder Receiver Transmitters (ERT’s) and wiring
- Battery Life
The Billing Exception Team
The Billing Exception Team plays one of the most important roles in a Water/Wastewater/Stormwater Utility. Millions of dollars can be lost annually if the Team doesn’t work all Exceptions consistently every meter reading route/cycle, and communicate effectively with other groups such as Meter Management.

The Billing Exception Team is also one of the least understood groups inside the Utility.

Revenue Protection
Establish a Revenue Protection Team whose mission is to minimize billing, meter reading and metering inconsistencies previously discussed.

Members of The Billing Exception Team and Meter Management should lead the effort.

Existing Public Utility Billing and Meter Reading Programs
Can improved guidance and evaluation procedures coupled with technology based analytical techniques reduce these billing and meter reading inconsistencies?

AMI
Will AMI allow public utilities to identify and correct all billing inconsistencies?
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Providing Professional Services to Water, Wastewater and Stormwater Utilities Nationwide