

If You Can't Measure It, You Can't Fix It

A Whitepaper on AMI Analytics for Water Utilities

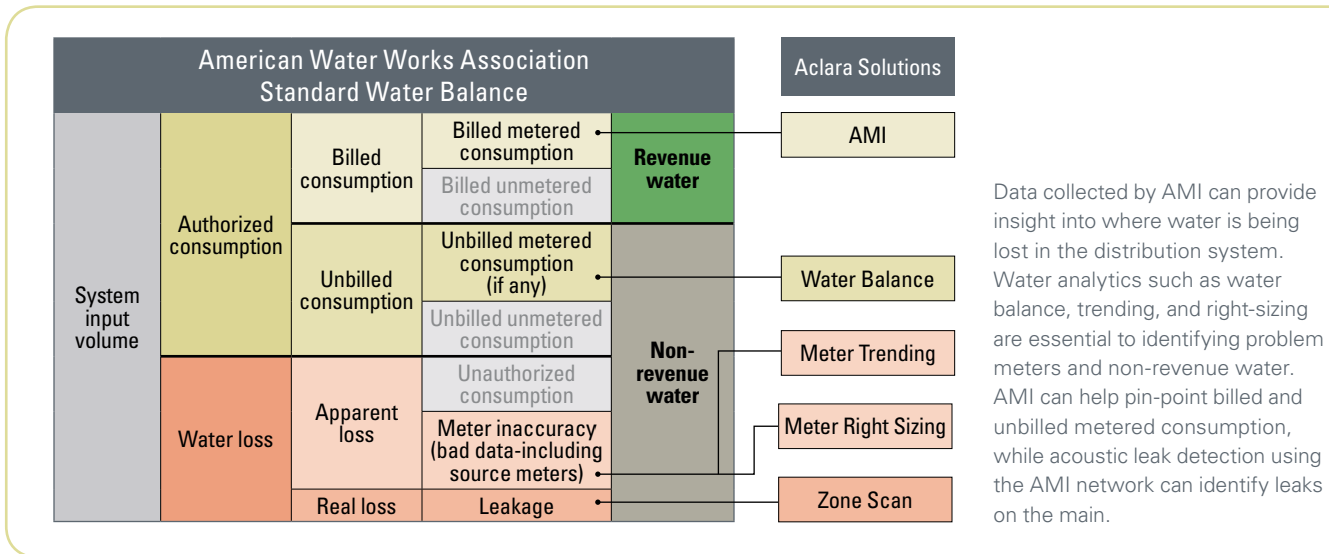
Harnessing Aclara Advanced Analytics for Water Balancing, Meter Trending and Meter Right-Sizing

Water utility managers today face a conundrum. The American Water Works Association (AWWA) recommends a water utility strive for non-revenue water loss at 10-15 percent, but managers know that many systems lose as much as 50 percent. Discovering where these losses occur is difficult.

There's plenty of data out there explaining the scope of non-revenue water (NRW) loss that can account for more than \$2.6 billion in lost revenues for U.S. water utilities each year. Figures from the AWWA show a complex combination of unmetered or unbilled consumption factors, along with an array of meter misread issues, or pure

leakage, creating this problem. Yet assessing the exact combination of these factors, and deciding how to deploy time and resources to fix which set of problems is inherently unclear.

But two things are clear. One, every water utility understands the issue and is looking for solutions. And two, any water utility with an advanced metering infrastructure (AMI) communications network may already have the tools to mitigate the impact of unauthorized consumption, unbilled unmetered consumption, meter inaccuracy, and leakage.



This white paper will explore how water utilities with planned or deployed AMI systems can leverage the data on their systems in combination with Aclara analytic tools to:

- Significantly improve insight into the problem and derive solutions to water balancing,
- Get more accurate meter trending information to improve meter accuracy and meter asset management,
- Harness data to improve meter reading by checking and fixing meter right-sizing, and
- Use enhanced AMI-based data to improve meter operations and ROI, and recapture lost revenue from non-revenue water use.

Get More From AMI Data

Today, AMI is as much about getting the data you need to power new applications and services as it is about meter reading. It's about using data-driven information to leverage your AMI investment to improve existing services and to manage your water distribution network. It's about data that's easy to access and analytics that provide insight about resources and revenues.

Aclara's STAR_*prestige*[™], which is based on industry-leading FATHOM[™] meter data management and analytics software, is a hosted solution that leverages the information – and investment – of a water company's advanced metering infrastructure. With complete web-based visibility across the entire distribution system, utilities have a new level of information and control over their resources, assets, and revenue.

Utilities gain new insights via the STAR_*prestige* network management dashboard, which provides geospatial status and alarm conditions for both meter transmission units (MTUs) and data collector units (DCUs), as well as installation and management reports and network queries.

STAR_*prestige* advanced distribution and meter analytics lets water utilities maintain complete visibility, end-to-end, across the distribution network with web-based analytic tools that help determine water balances, meter trends, and meter right-sizing.

Water Balancing

How to recover the millions of dollars in non-revenue water lost is a challenge every water utility faces. Both authorized and unauthorized consumption, apparent losses through theft or meter-reading inaccuracy, and real loss from distribution mains right up to end-point hook-ups contribute to the loss between the pump and the user – both commercial and industrial.

By collecting hourly data at multiple metering points along the network – from production points such as wells or bulk water supplies, to key points along the distribution, to the end-user meters – water utility operations teams can pin-point problems at a single meter or trends across thousands of units.

Is a shut off meter still recording flow – either a constant leak or intermittent but unauthorized consumption? Is more water being pumped into a neighborhood than is being metered? STAR_*select*'s powerful analytic and geospatial mapping tools can readily compile and analyze consumption data, at a single point or macro view, to let water utilities quickly respond to site-level individual problems or better plan and allocate their maintenance and capital resources.

Meter Trending

Active meter monitoring, testing, and recalibration is one of those time-consuming, necessary evils. Traditionally the meter shop team pulls 50 or so meters, tests, recalibrates, and then extrapolates maintenance or replacement schedules based on that small sample. But 50 out of tens of thousands of meters is a poor metric, and cannot accommodate for real-time condition changes.

New AMI systems may let meter shops see if meters are working – on or off – but do little to offer condition or performance data. Active visibility across an entire meter network allows for new and powerful trending analysis to spot meter anomalies of one meter against a local cluster of meters to zero in on a repair or replacement. The same tools may trend performance of meters over time, which is a better predictor to plan for replacement schedules compared with random sample projections.

Aclara also offers dedicated meter trending services through its hosted STAR_*prestige* solution, to give customers drill-down views of meter trending data, with troubled meters or even groups of meters highlighted on a geospatial map.

Meter Right-Sizing

A major non-revenue water culprit is often just the wrong meter size for the application. For example, contractors might install a one-size-fits-all meter in multiple locations, especially in commercial sites. Or a residential plumbing designer doesn't account for future water use of a new sprinkler system, pool, or a growing family. These and other factors often result in the meter being over- or under-specified for a particular setting. A 3-inch displacement meter, for example, may not register low flow rates of a couple of gallons per minute as associated with toilets or sinks, and thus miss a major source of revenue. An undersized meter-to-pipe ratio, on the other hand, may not accurately read the resulting high pressure flow, again giving an under-flow reading.

A misread of a few percentages above or below the AWWA recommended standard of +/-5 percent has a dramatic effect on meter accuracy and lost revenue. A study for one Aclara water-utility partner found meter-sizing errors of between 5.5 and as low as 0.5 percent for its top 20 commercial customers. The resulting under-reads, over the course of the year, represented a staggering \$400,000 in lost revenue.

Harnessing data from AMI can, with data analysis, further leverage the value and investment of an Aclara AMI network. The STAR_*prestige*[™] solution offers a suite of analytics tools for monitoring, comparing, and pin-pointing meters that may be misreading millions of gallons a year. By pooling massive amounts of data – the hourly reads of thousands of meters over a year – the analytics tool can find seemingly minor deviations of select meters compared with the norm. A scan of the data or geospatial information can readily highlight an incorrectly sized meter, flagging it for prompt replacement.

Putting your AMI data to work – at the right time, at the right level, and in sync with your business, service, and infrastructure planning – is a challenge. Aclara's STAR_*prestige* solution is one of the powerful applications that are part of the STAR_*select*[™] platform, which links proven, fixed-network communications with a host of integrated applications and professional services to give water-utility teams a full suite of powerful and scalable water-management solutions.

Big Data Prevents Big Problems in Redmond, Oregon

The city of Redmond recently installed Aclara's Series 3000 two-way, fixed network AMI infrastructure to provide time-synchronized meter readings at the top-of-the-hour. This allows water managers to better understand whether water being pumped to the individual irrigation zones across Redmond is actually being metered, helping to identify leaks and non-revenue water losses more efficiently.

The City also now imports additional information, such as cycle, route, billing account status (active or inactive), billing and class codes (residential, commercial or industrial) from its customer information system into Aclara's STAR[®] network database to further gain visibility into their water network. Redmond also now runs an automatic, weekly report on active accounts not using water to identify broken meters, minimizing lost revenue from unbilled water.



Contact Aclara today!

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Aclara represents the utility industry's leading technologies for device networking and communications, data management, analytics, and customer-service. Your utility can rely on the Aclara STAR_*select*[™] network, solutions, and services to improve end-to-end system communications, increase billings and customer satisfaction, and enhance conservation of water resources.

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