South Carolina
Office of Regulatory Staff

THE WATER WELLSPRING

A Flowing Source of Information for Water and Wastewater Utilities

Fall 2017

Spring Workshop Date Set

The date for next year's water/wastewater workshop will be **April 20, 2018**! The theme is "Effective Tools for an Effective Utility." More information to follow in the winter edition of the newsletter!

How Southeast Water Utilities Can Conserve Energy

Robert B. Sowby

Providing clean, reliable drinking water requires energy for pumping, treatment, and distribution. But how much? Energy is often a water utility's largest operational expense and carries significant environmental and social impacts. With growing water scarcity, stricter water quality standards, and increasing energy prices, managing energy use is quickly becoming a sustainable best practice for water utilities. Energy intensity describes how much energy is needed to deliver a certain amount of water to a certain location. It is the ratio of energy inputs to water deliveries—an energy footprint specific to water—and is often expressed in kilowatt-hours per million gallons (kWh/MG). Energy intensity depends on many factors, including water source, topography, system size, and climate.

In a recent survey of over 100 U.S. drinking water utilities[1], energy intensities for those in the Southeast ranged from 1,200 kWh/MG to 3,300 kWh/MG, with an average of 2,100 kWh/MG. This means that for every million gallons of water delivered to end users, Southeast water suppliers expend 2,100 kWh. At an average industrial electricity price of $0.06/kWh, this comes to $126/MG ($0.126/kgal or $41/ac-ft) just for electricity.
Is that good or bad? Either way, it could be better. Regardless of size, location, energy intensity, or ownership, most water utilities can decrease their energy use by 10% to 30% through cost-effective actions, according to estimates by the EPA, the World Bank, and the Alliance to Save Energy. In recent years many water utilities, both public and private[2], have undertaken focused energy management programs and successfully reduced their energy use by 10% to 30% while still providing adequate hydraulic performance and water quality.[3] Much guidance on this subject has appeared in recent years.[4] Some of the most common practices include:

- Determine baseline energy use and monitor regularly
- Audit water and energy use simultaneously
- Upgrade old or improperly designed equipment
- Prioritize efficient water sources
- Prioritize efficient conveyance paths

- Increase storage utilization to balance demand and supply
- Adjust pressure-reducing valves to minimize unnecessary flow
- Eliminate redundant pumping
- Shut down nonessential facilities (permanently or seasonally)
- Conserve water and control water loss (every drop has some embedded energy)

All water utilities stand to benefit from energy management. While comparison to other systems is not always fair, water systems should compare against themselves and strive for improvement. With some effort, the systems that provide vital water services can conserve energy and operate more sustainably.

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Notes

1. "Survey of Energy Requirements for Public Water Supply in the United States," *Journal AWWA*, July 2017.
2. Subsequent analysis of the survey data (Note 1) showed no significant difference in energy intensity between publicly and privately owned water utilities.
3. See "Jordan Valley Water Redefines Sustainable Water Supply Through Energy Management," *Journal AWWA*, Oct. 2017; "Logan, Utah: A Case Study in Water and Energy Efficiency," *Journal AWWA*, Aug. 2015; "Water System Optimization: Aligning Energy Efficiency, System Performance, and Water Quality," *Journal AWWA*, June 2014.
4. See *Drinking Water Energy (Cost) Savings Handbook* (Utah Dept. of Environmental Quality, 2014); *Ensuring a Sustainable Future: An Energy Management Guidebook for Wastewater and Water Utilities* (EPA, 2008); *Water and Wastewater Energy Management Best Practices Handbook* (NYSERDA, 2010); *Energy Management for Water Utilities* (AWWA, 2016); *A Primer on Energy Efficiency for Municipal Water and Wastewater Utilities* (World Bank, 2012).

Avoiding the Tragic Consequences of Miscommunication

Melanie K. Goetz, MBA

When he heard NASA was proceeding with the space shuttle Challenger's launch, McDonald was confused. It was too cold. What had changed? Didn't he make it clear that the O-rings, designed to seal off the shuttle's volatile propellants were dangerously unreliable at temperatures below 40 degrees Fahrenheit? And that the small, but crucial O-rings had only been tested reliable above 50 degrees.

That morning on January 18, 1986, the temperature at Cape Canaveral was only in the mid-thirties. It was the first time a shuttle carried a civilian, a beloved teacher named Christa McAuliffe. McDonald would only be one of the millions of Americans watching the shuttle launch. As the shuttle launched, excitement quickly turned to shock and disbelief, for in less than two minutes the Challenger exploded killing all seven astronauts onboard.

An engineer, McDonald headed the Solid Rocket Motor Project for Morton Thiokol Inc., the manufacturer of the O-rings. While he understood the public relations' ramifications of another launch postponement; weather and technical problems having already delayed the launch by six days. He also understood his employer's desire to give NASA what it wanted. But when Thiokol's upper management got a call from NASA asking whether to launch the Challenger that fateful morning, they gave their approval. What had happened to McDonald's warning about the O-rings and cold temperatures?

The tragedy put the shuttle program on hold for nearly three years. The Rogers Commission, appointed by President Reagan, was charged with investigating what went wrong. The commission concluded that NASA's flawed organizational culture and decision-making processes were key factors in the tragedy. Today, NASA places distinct and appropriate emphasis on communications and the importance of empowering people at all levels to offer input and opinions freely.

This same openness and professional respect should apply to all industries. No matter if it's water or wastewater, shrugging off the input of a seemingly lower level operator, can lead to catastrophic consequences. So, what does it take to empower people to convey important, perhaps unpopular, messages at those critical moments? How can managers, stakeholders, regulators, and elected officials, be spared the disaster that faced the Challenger's team? Whose phone call is going to voice mail? Whose input gets ignored, for whatever reason, at that planning meeting? Why do budgetary constraints overcome technical concerns? Again, like with the launch of the Challenger, it can simply be attributed to good people not effectively communicating the seriousness of the situation.

Communicating Important Information

If you're in management, work in operations, or have engineered infrastructure, here are some key principles to keep in mind as you lay your cards of conveying important information on the table.

1. Get to the Point: If the information is important and there's an impending tragedy, it's best to just make your point. If it's even a possibility that your silence carries serious consequences… speak up! And do it clearly, succinctly, and by all means do not bury your point in tech speak. It's important, no matter what industry you're in to make sure there is on-going communication between those in the trenches and those making the decisions.
2. Message in Real Time: Real-time communications only occur when people are face-to-face, use video conferencing, or talk on the telephone. Emails don't offer the overlapping give-and-take of their real-time counterparts; they may "feel" instant, but they don't necessarily communicate in real time and they often lack both urgency and nuance. Have something to say? Then communicate in real time, and then you can back it up in an email.
3. Be Concise: Choose words carefully and fight off the too much information syndrome. Keep words simple and sentences short. Hide nothing, but don't guess and don't over-promise. Tell people first what the problem is and why it cannot be ignored in layman terms.
4. Make it Relevant: When a message is urgent, it's best to convey what's at risk by humanizing the message. People might not understand the consequences of their actions unless they understand how it's relevant. If people could be harmed or the environment polluted, put it in terms they can relate to.
5. Provide Enough Information: Finally, the real job begins after you've initially communicated the problem. Now it's time to assemble facts, history, and any backup information. Still keep it succinct and to the point.
6. Avoid the Downplay: This admonition is a simple but critical corollary to #5, but newbies and grizzled veterans are vulnerable. Often people like to build up the story before getting to the point. Make the point first and backfill behind it. Shocking the listener can be just the ticket when it comes to getting their attention.
7. Integrate the Chain of Command: When people's welfare is at stake or environmental disaster looms, you need to be able to rely on an integrated chain of command. And it takes persistence to develop allies up and down the organizational chart. But all that careful work can prove futile when a single whistleblower, however well intentioned, uncovers important information. The ensuing battle rarely turns out well for either party. Better to make sure there are open lines of communication that are utilized on a scheduled basis. In other words, invite anyone to the table that might know something important.

In Summary
Whether you're a utility manager, engineer, operator, or regulate the water industry, take the time to consider how you can empower individuals to stand up and be heard. Look around. Ask yourself how everyday people might be tested by dilemmas similar to the ones that faced the Challenger launch team. Ask yourself, where can the lines of communication be improved and how can someone with important information get the attention of the decision makers?

We're all good people. No one wants to see the environment polluted, or see harm come to others. But our corporate cultures too often avoid employee input and feedback, especially when it comes to financial decisions.

Certainly, upper management will always grapple with budgets and deadlines … but at the same time, managers should seek out overlooked people in the know, such as operators, and find ways to integrate them into the organization's mainstream. Such management foresight might well avert an environmental crisis or even save lives.

References:
The Fast Track, November 29, 2011, *Difficult Messages the Right Way,* http://www.quickbase.com/blog/delivering-difficult-messages-the-right-way.

Goetz, Melanie K., Miscommunicating Important Information: How to Avoid Tragic Results, Journal American Water Works Association, July 2017, Volume 109, Issue 7, Pages 52-55.

McDonald, A.J. & Hansen, J.R., 2012. *Truth, Lies, and O-Rings: Inside the Space Shuttle* Challenger *Disaster*. University Press of Florida, Gainesville, Florida.

About Melanie K. Goetz

Melanie is a consultant, speaker and author of two AWWA books about Communicating Water's Value. She conducts workshops on risk communications, media training, and how to get and keep the public's trust. With over three decades of marketing experience, she has been a driving force behind community supported rate increases, communication plans, and field-proven outreach campaigns that changed behaviors. She welcomes input: Melanie@HughesStuart.com.

Preparing for Rate Adjustments

If your utility is contemplating an adjustment of rates and charges to its tariff(s), a notice of intent to file and an application must be submitted to the Public Service Commission of South Carolina (PSC) for approval of the request. S. C. Code Section §58-5-240 requires that the utility "…shall give to the commission and regulatory staff not less than thirty days' notice of its intention to file…" This can be a brief statement that the utility plans to file an application seeking an increase in its rates for (*type of service here*) service not earlier than thirty (30) days from the date of the notice.

The regulations outline the information to submit with the application. Do not include any additional information in the initial application such as fines, penalties, expenses outside of the test year, acquisition costs, or adjustments. The ORS will review the application and draft an Audit Information Request (AIR) and send it to the utility after the application has been filed and accepted at the PSC.

The following is a brief sample list of typical questions in an AIR:

1. Number of customers served by the utility categorized by residential, commercial, and industrial
2. Accounting, pro forma, and proposed rate increase adjustments
3. Financials, general ledgers, and balance sheets
4. Fines/penalties paid or assessed
5. Copies of DHEC's drinking water sanitary survey and/or Wastewater Treatment Facility Operation and Maintenance Evaluation Report
6. Timeliness of bill issuance
7. Schedule of system maintenance
8. Any construction upgrades and associated costs
9. Number of employees
10. Other specific questions relating to the application

The ORS will also conduct a site visit to the utility during the review process. Be prepared to show the ORS specific assets claimed to be used and useful by the utility. If an asset is not in use or is in the construction phase, it cannot be included in the application.

The ORS encourages the utility to meet with homeowners in their service territory prior to submitting the application. Attend an HOA meeting or conduct a 'town hall' meeting inviting customers who will be affected by the rate increase to participate. Be prepared to answer questions, especially if the requested rate adjustment is significant. Present before-and-after photos of the work completed on the system to show why the utility is requesting the increase. Listen to the customers as they explain their point of view and help them understand why the utility is asking for the increase and the purpose behind the request.

The ORS cannot write the application for the utility, but will gladly review it prior to submission to the PSC and offer recommendations. The PSC will schedule the dates for placing an advertisement about the rate adjustment in a newspaper of general circulation, submitting testimony, and the hearing. Customers may intervene in the process, which gives them the option to cross-examine and to be cross-examined.

An Order must be issued within six months of the application's acceptance by the PSC. Once the Order is issued, the adjusted rate can be implemented.

As always, if you have any questions during the application process, please feel free to contact the ORS.

The Audit Corner: Accounting for Maintenance and Repair Expenses

What are maintenance and repair expenses?
These expenses include labor and any materials and supplies used in maintaining utility plant and property.

What are examples of these types of expenditures?

- Sludge transportation and hauling
- Pump repairs
- Repair of line breaks

What are regulatory requirements regarding these expenses?

- The expense must be legitimate and reasonable
- The items charged, including materials and supplies, must have actually been incurred
- Items expensed must be properly classified as maintenance rather than improvements or replacements

What is the major challenge in accounting for these expenditures?
The major challenge is making sure these expenditures are properly classified, i.e. expensed or capitalized.

What distinguishes a capital expenditure from a repair expense?
If a repair extends the life of an asset beyond one year, it should be classified as a capital expenditure. These costs are then charged over the asset's remaining useful life through depreciation rather than being expensed in one year. Any labor costs associated with these capital expenditures are also capitalized.

Does NARUC make any recommendations regarding the classification of expenditures as either maintenance and repair expense or a capital improvement?
NARUC recommends that expenditures below certain "capitalization thresholds," shown below by utility classification, be expensed:

- Class A: $750
- Class B: $400
- Class C: $150

Can a company set other capitalization levels?
Yes. Some companies have established their own capitalization levels based on the company's history of expenditures.

Sources: *Public Utility Accounting Theory and Application – Suelflow*
NARUC Uniform System of Accounts

Improving the Code of Practice for Wipe Disposal

The Water Environment Federation (WEF) works with the Flushable Task Force and Member Associations, among others, to communicate the importance of "Do Not Flush" warning labels on product packaging. To prevent problems with sewer systems, pipe and toilet blockages, the WEF promotes the message that only 3 Ps are flushable: pee, poo, and (toilet) paper.

To prevent problems with sewer systems, pipe and toilet blockages, and the human and environmental cost of sewer overflows and pollution, several international wastewater groups have issued a joint position statement of the following:

- Only the 3 Ps – pee, poo, and (toilet) paper – should be flushed.
- Currently, all wipes and personal hygiene products should be clearly marked as "Do Not Flush" and be disposed of in the trashcan.
- Wipes labeled "Flushable," based on passing a manufacturers' trade association guidance document, should be labeled "Do Not Flush" until there is a standard agreed to by the water and wastewater industry.
- Manufacturers of wipes and personal hygiene products should give consumers clear and unambiguous information about appropriate disposal methods.
- Looking to the future, new innovations in materials might make it possible for certain products to be flushed, if they pass a technical standard developed and agreed to by the water and wastewater industry. Preferably, this standard would be developed under the banner of the International Standards Organization (ISO).
- Key requirements for any standard include that the product a) breaks into small pieces quickly b) must not be buoyant and c) does not contain plastic or regenerated cellulose and only contains materials that will readily degrade in a range of natural environments.

Inform customers that flushing only the 3 Ps will reduce costs through protecting infrastructure, thus reducing the need for increased rates for repair and replacement of assets.

Reference:
Nakamura, B. (2017). Breaking Down Flushables. *Journal*, XLVII(2), 61-63.

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