South Carolina
Office of Regulatory Staff

THE WATER WELLSPRING

A Flowing Source of Information for Water and Wastewater Utilities

Fall 2015

Asset Management

As a water or wastewater system manager or operator, you are managing assets every day. You have to make decisions on what maintenance to perform on pumps, wells, tanks, treatment facilities, or any other assets. You have to decide what to do when an asset fails – repair it, replace it, or rehabilitate it. You have to make decisions regarding what spare parts to have on hand. The question is are you making well informed, data-driven decisions that are the most effective and efficient for your utility? Implementing an Asset Management Program will help you run your systems in a better, more informed way.

Asset Management has 5 core components. They are simple concepts that are probably practiced at some level already, but likely aren't organized into a strategic process that aids in decision making. The 5 core components are:

1. Current State of the Assets: What do you own and what are the characteristics?
2. Level of Service: What do you want your assets to do?
3. Asset Risk: Which assets would be critical to providing whatever it is you want to do?
4. Life Cycle Costs: How would you operate, maintain, repair, rehabilitate or replace your assets to make sure they keep providing what you want?
5. Long Term Funding: How will you pay for what you want to do with your assets (i.e., the operation, maintenance, repair, rehabilitation, and replacement)?

The Asset Management thought process works with any type of asset (not just water or wastewater). You probably use it in your everyday life to help you make decisions about how best to spend you hard earned money (i.e., buy a new car or rebuild the transmission of what you already own?). Asset management really works to save money, time, and effort. It helps you spend your limited dollars in order to have the maximum impact.

Asset Management can also be thought of as crisis management or crisis reduction. Asset Management shifts the focus to controlling risks and proactively addressing concerns rather than reacting to every problem. It is much more cost effective to prevent a high risk asset from failing than it is to let the asset fail

and deal with all the consequences that occur after the failure. For example, consider a pump whose failure will cause the entire community to be out of water. This pump has been poorly maintained and has been showing signs of distress. Fixing or replacing this pump *before* it fails is much better than waiting for the pump to actually shut down. It may be as much as 3 or 4 times more expensive to react to failure than prevent it. Asset Management also helps utilities identify which portion of the system actually requires replacement and which portions can remain in place. This analysis is vital given that the industry simply cannot afford to replace its entire aging infrastructure.

An asset management program can pay for itself in many ways: deferral of capital investment, avoiding catastrophic failure, reduction in lost revenues due to reduction of lost water, reduction in bonds and debt. A 2013 survey completed by McGraw Hill Construction on the Benefits of Asset Management reported the following: Improved ability to explain budgets; Better focus on priorities; Better understanding of risks; Increased ability to minimize costs; Reduced costs without sacrificing service levels. The more you do with Asset Management the more benefit you receive, but doing even a little bit will improve the operation and management of your system. Don't feel overwhelmed. If you can get started with it, it will be worth your while.

You are likely doing some asset management already. You can easily determine where your practice currently stands which will help you focus on the most appropriate next steps by using the Asset Management IQ tool developed by the Southwest Environmental Finance Center. The tool is available for your use at no cost and can be found at https://southwestefc.unm.edu/AssetManagementIQ/.

Article submitted by Dawn Nall, Environmental Finance Center Network (EFCN), Southwest Environmental Finance Center (www.efcnetwork.org)

How energy efficiency and renewable energy can transform wastewater treatment facilities

Water/Wastewater treatment plants are notoriously high energy users, with an estimated 3-4 percent of total U.S. electricity consumption used for the movement and treatment of water and wastewater (USEPA, 2012b). Treatment facilities have pumps, motors, and equipment that run 24 hours a day, seven days a week, making their energy usage anywhere from 25-40 percent of their annual operating budgets (NYSERDA, 2008). Energy efficiency and renewable energy can help save energy and improve the bottom line.

The first step to take is to initiate an energy audit to examine current electricity usage and potential areas for savings. Energy audits can help identify the greatest energy users at the facility, reveal opportunities for operational improvements, and detect problems with aging and/or underperforming equipment. A thorough audit will examine utility bills, equipment and motors, lighting, and other operations that utilize energy and outline steps to take to reduce overall energy consumption.

Once an energy audit has been completed and equipment upgrades have been made, renewable energy could be added to help power operations and increase energy savings. Renewable Water Resources (ReWa) was able to harness the power of renewable energy at their Mauldin Road Wastewater Treatment Facility (MRWTF) by instituting a waste-to-energy program. By utilizing anaerobic digesters MRWTF captured and used methane, which was created as bio-solids were broken down in the digesters, to create electricity for the plant.

Waste heat from the engine was recycled both into the digesters and to heat building interiors and meet other low-demand needs at the facility. This combined heat-and-power system generated approximately 5 million kW-hours of electricity annually from nearly 80 million cubic feet per year of waste. Over the life of the project, the CHP system will save MRWTF nearly $4 million.

With the recent distributed energy resources (DER) legislation that passed in South Carolina in 2014, solar photovoltaic incentives are now being offered by the state investor-owned utilities (Duke Energy Carolinas, Duke Energy Progress, and SCE&G). These incentives make solar an attractive renewable energy option for water treatment facilities. The DER programs will make it possible for individuals and companies that install solar to save money by offering utility bill credits (depending on the service provider) and by offsetting the electricity used from the grid. In Colorado, a one-megawatt solar photovoltaic system at a local wastewater treatment facility produces roughly 14 percent of the facility's annual power needs.

By coupling energy efficiency improvements with renewable energy projects, treatment facilities can realize significant savings. The U.S. Environmental Protection Agency (EPA) has created a series of tools for achieving your energy goals. These easy-to-access documents can put you on the path to energy savings with information on determining energy usage, cutting usage and costs, and exploring renewable energy options. For more information on the U.S. EPA sustainable infrastructure documents, visit their website online at water.epa.gov/infrastructure/sustain/energyefficiency.cfm

Here are some ways that South Carolina's wastewater treatment facilities have benefited from energy efficiency projects:

Amount of Project	Description	Return on Investment	Annual Energy Savings (BTU/yr.)
$28,000	Replace two 60hp motors with power factor correction equipment	1.20 years	316,000
$8,500	Install new gravity sewer main in order to abandon existing sewer lift station and pumps to reduce energy demand	1.65 years	392
$182,310	Replace 15 motors with premium energy efficient motors and replace 4 HVAC units	2.60 years	96,544
$110,292	Replace 10 pumps with high efficiency pumps and upgrade to LED lighting	4 years	760,586
$25,730	Upgrade the electrical control panel and replace 5 aged standard efficiency pump motors	5 years	220,876
$57,964	Replace 16 motors with high efficiency motors and install new power factor correction system	3.9 years	502,316
$58,551	Install a monitoring system that will allow variations in the speed of rotators used to achieve standard levels of dissolved oxygen. Install automated sluice gate to control rotor depth (more depth produces more oxygen but requires more energy)	6.10 years	249,640
$64,800	Replace 4 motors and 2 variable frequency drives	8.70 years	215,047
$36,700	Replace 2 pumps and add variable speed drives at pump station	6.30 years	235,571

Accounting for Interest on Long-Term Debt (LTD)

What is interest expense on LTD?

- The cost of borrowing money where the principal is due in more than one year. A utility usually borrows funds to pay for construction, equipment, vehicles, and other long-lived assets.

How is interest on LTD accounted for on the books and records of utilities?

- Per books Interest Expense on LTD is booked in Account 427, which is considered a "below-the-line" account and is not includable in the calculation of net income.

How does a utility recover its costs of borrowing?

- In lieu of per book interest expense, regulatory bodies typically allow a concept called Interest Synchronization. This concept allows the utility to recover financing costs by multiplying the LTD portion of rate base times the weighted average cost of debt. In a "Rate Base" filing, the company receives coverage in its rate of return for interest costs. In an "Operating Margin" filing, the company receives an allowance in the calculation of the margin to cover synchronized interest costs.

Why is interest expense used for the computation of income taxes?

- Interest expense is an allowable deduction for the calculation of income taxes and is therefore used to compute the proper taxes for ratemaking purposes.

Questions – Please contact Jay Jashinsky (803)737-1984 or Sharon Scott (803)737-0964 of the ORS Audit Department.

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

THE WATER WELLSPRING

Published by the South Carolina Office of Regulatory Staff
1401 Main Street, Suite 900
Columbia, South Carolina 29201
Phone: (803) 737-0800
Fax: (803) 737-0801
Hannah Majewski, Editor
Willie J. Morgan, P.E., Co-Editor

Submit all articles or suggestions to: hmajews@regstaff.sc.gov

C. Dukes Scott, Executive Director
Nanette S. Edwards, Deputy Executive Director
Dawn M. Hipp, Director of Consumer Services, Transportation, Water/Wastewater
www.regulatorystaff.sc.gov