The Blueprint

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Engineers and Land Surveyors

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Congratulations to the 2015 Louisiana Rural Water Association Conference Winners

Village of Forest Hill—Mayor Elizabeth Jeter
Energy Conservation System of the Year, North

Town of Simmesport—Mayor Eric John Rusk
Energy Conservation System of the Year, South

Contact your local LRWA Circuit Rider for information on how your system can be this year's winner!

Lower Electricity Bills Through Energy Efficient Engineering

South Oakdale Water System – Project Case Study

The System: The South Oakdale Water System is a 500-customer rural water system located between Oberlin and Oakdale in Allen Parish, Louisiana.

The Problem:

- High monthly electricity bills believed to be caused by outdated equipment, inefficiencies in the pumping system, and high energy demand charges.
- Safety concerns due to the hydropneumatic tank age and condition.
- Minimal funding

Preliminary Engineering Evaluation:

- The goal was to determine the source of the high energy bills and provide three energy efficient alternatives for consideration.
- MML&H determined that high energy bills caused by demand charges were partly due to excessive amperage draws by across-the-line starters, which controlled the booster pump operation.
- The existing booster pumps were operating at an inefficient point on their curves and were driven by inefficient oversized 40 HP motors.
- An analysis of the system revealed that the system peak demands could be met using smaller 20 HP pumps.

What are Demand Charges?

- Demand charges are assessed by the electrical utility based on the highest peak usage reading over a predetermined amount of time. Demand charges are applied over a number of future months, regardless of actual usage. Demand charges continue to be assessed until the utility reevaluates the demand readings. Reevaluations are typically completed each year during peak usage months.

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Jena Airport Rehabilitation

The LaSalle Economic Development District (LEDD) received two facility improvement grants for improvements at the Jena Airport in 2015. The funds were acquired through the LADOTD Aviation Section and the Federal Aviation Administration. The funds were used to sealcoat and re-mark the airport runway and taxiway. Both were showing signs of oxidation, a condition which causes brittleness, loss of elasticity and an increase in wearing course failure. An FAA approved protective seal coating was installed, extending the life of the asphaltic surfaces. After placement and curing, the sealed areas were re-striped in accordance with FAA standards and designations. The project was completed in late 2015 and the airport has returned to full service.

The grant funds will also be used to ready the facility for the future. The project will update the airport's official Airport Layout Plan (ALP). An ALP is a planning document that typically shows both existing and planned development along with critical airport information and details. The updated ALP will accurately depict the existing airport runway, taxiway, hangars, adjacent land use and other physical structures located on and adjacent to the airport property. The updated document will identify areas of the airport and adjoining property that should be addressed, as well as needed facility improvements. Included will be approach and departure profiles, airspace protection surfaces, obstruction information and other useful planning tools. The completed ALP will serve as a plan which will allow the airport manager along with the FAA and LADOTD to plan future facility improvements.

MML&H provided engineering and grant services for the Jena airport. Please give us a call to see how we can help you manage your great asset - your airport.

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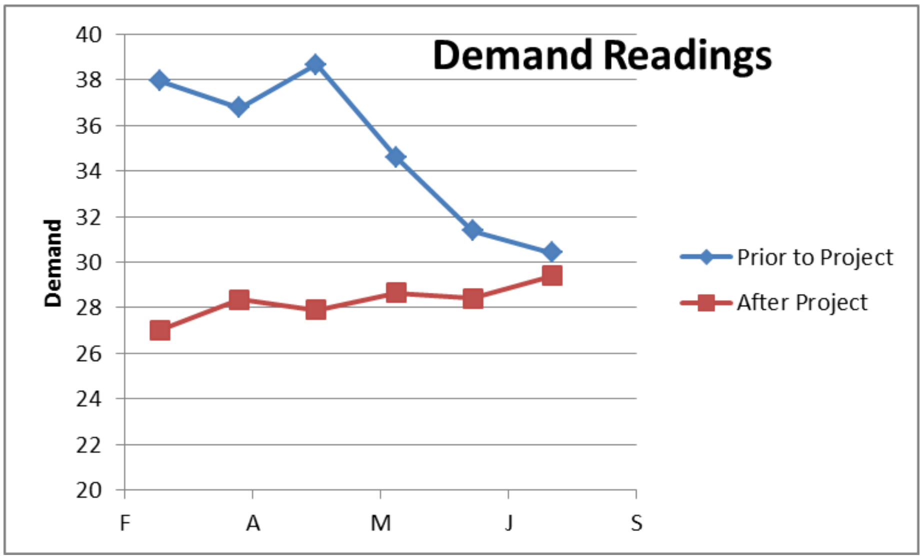
The Selected Alternative: The improvements selected by the System included:

- ♦Replacing the existing booster pumps with smaller, more efficient, booster pumps
- ♦Replacing the existing across-the-line booster pump starters with energy efficient Variable Frequency Drives (VFDs)
- ♦Installing pressure transmitters to monitor system pressure in real time
- ♦Site piping to abandon existing booster pumps and hydropneumatic tank

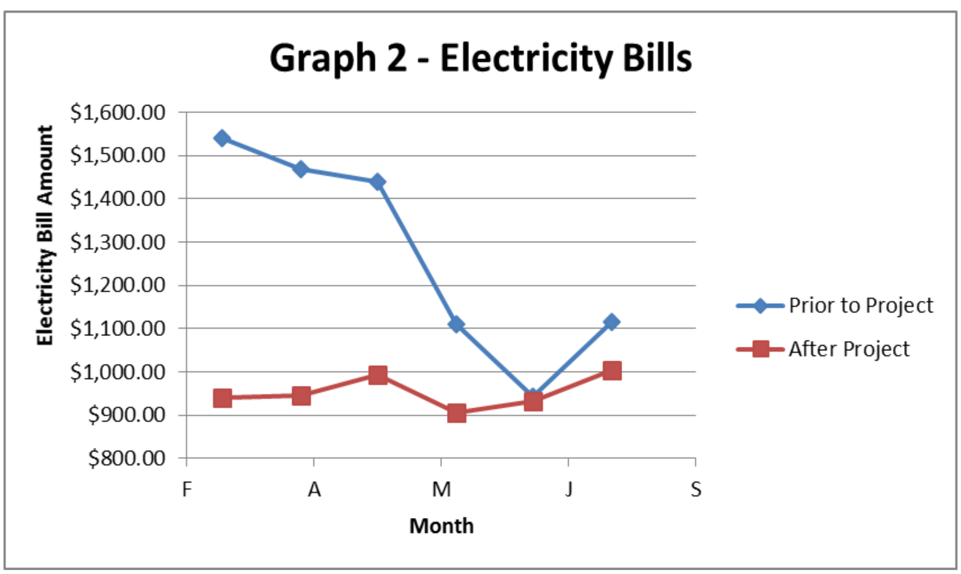
How It Works:

- ♦Pressure transmitters around the system report system pressure in real time to the VFDs. When pressure begins to fall due to customer usage, the VFDs slowly start the pumps, eliminating high amp starting. This greatly decreases the peak energy demands.
- ♦The VFDs, responding to system pressure, automatically adjust the speed of the pumps to maintain the predetermined system pressure.
- ♦When system pressure rises to the setpoint, the pumps slow down in response. This method of operation allows the system to eliminate the use of a hydropneumatic tank to maintain system pressure.
- ♦The booster pumps operate at the minimum speed necessary to supply water and maintain system pressure, further decreasing energy consumption.



Measureable Results:
The System's demand readings from March 2014 to August 2014 (Prior to the Project) and March 2015 to August 2015 (After the Project) are shown in Graph 1. The System has experienced consistently lower demand readings following the installation of the new pumping system. Additionally, customers at the far ends of the system have reported higher and more consistent system pressure.

Graph 2 displays the electric bills for the same time periods as the demand readings in Graph 1. Since the project has been installed, the System has experienced an average **decrease in the electricity bill of approximately $315 per month.** The cost savings would be greater, but the electric utility increased its rates during the intervening period.



Setting Water Rates

Often utility systems delay water and sewer rate increases to avoid creating a hardship for their customers. If regulated by the Public Service Commission, increases are sometimes postponed to avoid the time consuming rate approval process.

Help is available through several avenues to assist utilities in determining fair rate structures. The Louisiana Rural Water Association offers free rate setting assistance to their members. The non-profit Community Resources Group completes utility rate studies on a direct fee basis. The Environmental Protection Agency (EPA) offers pamphlets and guidance to small systems also. American Water Works Association members have access to free rate review computer software. Each of these channels for implementing rate adjustments employ a similar strategy – planning for normal operation and maintenance costs along with periodic equipment replacement.

Whether we are prepared for the inevitable or not, all equipment will eventually fail. With proper planning and foresight, adequate savings can be set aside for repair and replacement when this unavoidable event occurs. All utility systems contain mechanical and consumable items which will eventually require replacement at the end of their useful life. For any utility to have adequate reserves available for repair and replacement, the key ingredient is planning.

Steps to Setting Fair Rates:

1. Determine your current costs. Look at water system costs over the last 5 years. Compare budgeted costs to actual costs. Review budget line items for trending increases or decreases in anticipated costs.

2. Set aside reserves for repair or replacement of wearable items. Develop an inventory of all system assets. Record the condition, age, and expected useful life of each major item. From there, determine anticipated costs for asset rehabilitation or replacement as the assets age. Determine how much should be set aside to pay for issues as they occur.

3. Based on Items 1-2, determine how much revenue is needed from the system's customer base. Review the current revenue stream including each available source. The main sources are typically income due to usage, fees for utility related services and interest on savings. While funding may be available from future LGAP or CWEF funds, these funds should not be included in the budget unless they are guaranteed to be there when needed.

4. Design a rate structure to cover system costs with an allowance for contingency items and inflation until rates will be adjusted again. Minimum bills should cover the principal and interest payments on outstanding or proposed loans. Review the rate structure against average residential and commercial usage to get an idea of customer impacts. Customers may find minor annual rate increases preferable to large rate increases implemented at long intervals.

5. The next step is to place the rates in effect. This may include simply taking the proposed rate structure to the governing body of the utility. Depending on your situation, the rate adjustment may require Public Service Commission approval. Public inclusion in the process is important. Rate increases are usually better received if the customer base is familiar with system revenues, costs and future needs. Public participation can be handled in a number of ways the most common of which are public meetings, customer mail-outs, local newspaper articles and advertisements.

6. Once the new rate is in place it needs to be reviewed annually. Is the rate structure covering the needs as planned?

Having adequate rates to support the needs of the utility is a time consuming effort to not only determine the utility needs, but also to communicate the needs with the public as rate increases occur. Having an appropriate rate with adequate reserves for replacement of those failing items allows for less stress for municipal and water utility leadership.

Fun Water Facts

1,000 gallons of water are required to produce one gallon of milk.

If a 20 oz. bottle of water costs $1, and tap water costs $5/1,000 gallons, then a person could refill the same water bottle out of the tap every day for 3 years, 6 months and 5 days before equaling the cost of another bottle of water.