

CHARLOTTE-MECKLENBURG UTILITIES
ADVISORY COMMITTEE
MINUTES OF MEETING
October 18, 2012

The Charlotte-Mecklenburg Utilities Advisory Committee met Thursday, October 18, 2012, at 3:30 pm at 4222 Westmont Drive, Charlotte, North Carolina.

Members Present: Ron Charbonneau, Jim Duke, Frank McMahan, Ralph Messera

Members Absent: Eric Sieckmann, Jim Merrifield

Staff Present:	Barry Gullet	Director
	Kim Eagle	Deputy Director
	Barry Shearin	Chief Engineer
	David Czerr	CIP Manager
	Regina Cousar	Continuous Improvement Officer
	Vic Simpson	Internal Communications Manager
	Karen Whichard	External Communications Manager
	Myra Zabec	Lab Manager
	William Lee	Field Operations Supervisor

Safety Minute

The proper way to change a flat tire was discussed.

Minutes

A motion made by Ron Charboneau, and seconded by Ralph Messera, to approve the September 2012 minutes was agreed upon unanimously.

Water System Operation & Maintenance

How it works:

- The water from the river is treated in the treatment plant and flows into large storage tanks called clearwells. Water is pumped from the clearwells into the distribution system. The pumps pressurize the pipes in the system. If the pumps are pumping water at a higher rate than customers are using it, the extra water goes into the elevated storage tanks distributed through the county. If customers are using more water than the pumps are pumping, then water comes out of those tanks to make up the difference.
- The pipes that move water from one place to another, are referred to as “transmission mains” and are generally 12 inches, 16 inches or greater in diameter, with the largest being 72 inches.
- Because of the variation in ground elevations across the county, there are three pressure zones in the water system. The Franklin and Vest Plants are located in one of the zones and the Dukes Plant is located in a different zone. The third zone is supplied by pumping water from Franklin and Vest. Projections are that more water will soon need to be supplied to that zone than the current piping/pumping network can deliver. A new pipeline is planned that will generally run from the Franklin WTP east across the county. It is anticipated to be constructed in phases.

- Almost every street in Mecklenburg County has a water line in it, mostly smaller pipes ranging from two to eight inches in diameter.

Q: Are there any IBT issues associated with supplying the pressure zones?

A: Yes. When water from the Catawba is pumped to the east side of the county, it enters the Rocky River Basin and becomes part of CMUD's interbasin transfer (IBT).

Q: Is there a difference in usage in the night and day?

A: Yes.

- Several examples were presented. In the examples, the lowest rate recorded was 72 mgd at 3:00 am; at 7:00 am, the maximum rate recorded was 152 mgd, with an average of 110 mgd for the day. On August 20, 2007, the total water pumped was 170 mgd. At 3:00 am, the minimum usage rate was 123 mgd and at 7:00 am, the maximum usage rate was 242 mgd.. CMUD needs to maintain extra pumping capacity as a buffer to stay ahead of problems in the system so there is no pressure loss.

Q: What do you credit the peaks to?

A: Customers have changed their usage pattern, but the peaks are still around the same time.

- Challenges of a transmission system include usage and water pressure. If the water in the system is not moving, it is easy to calculate the pressure. The Pineville area has high pressure due to its low ground elevation. The North Tryon Street corridor and the Hidden Valley neighborhood are on relatively high ground and have relatively low water pressure. CMUD has evaluated changing pressure zone boundaries, but is being very cautious because moving pressure zones impacts customers, often in negative ways.

Transmission System

- In the transmission system, trying to move larger amounts of water through smaller pipes reduces water pressure at the delivery end of the pipe. In the past, CMUD struggled to keep up with the development, growth and demand and some customers lost water altogether for short periods of time when customers at the far edges of the system all used a lot of water at the same time.
- Redundancy of the transmission system – In most cases, the pipes form loops so CMUD can serve water from both directions. Water can move both ways in pipes depending on where the demand is taking place. If a customer opens a faucet, water moves in the pipes to serve the customer. Critical facilities such as hospitals and nursing homes depend heavily on water to sustain their operation and CMUD tries hard to make sure water service is not interrupted. Redundancy in the system also helps with fire protection.

Energy Management

- It takes a lot of electricity to pump water. Water treatment plants have different sized pumps to accommodate the needs of the system under different conditions. The water treatment plant staff analyzes the size and number of pumps in use at each plant to determine the most cost effective solution throughout the day.

Hydraulic Model

- A sophisticated computer model is used to simulate the hydraulics of the water system. This model helps optimize operation and is used to help determine when new pipelines are needed to maintain water pressures in the system as usage patterns grow and change.

Unaccounted for/Lost water

- Across the water industry, utilities are working hard to reduce “unaccounted for” or in modern terms, “non-revenue” water. AWWA M36 Standard describes a water audit process that CMUD and most other utilities are applying. This standard is essentially a water balance but requires more and more detailed data than most utilities have historically collected in order to be very precise.
- When the water balance process is applied, CMUD has to account for evaporation, leakage from reservoirs and plants, and use in the plants. Accuracy of meters, both customer and plant meters, is critical. Un-metered water is also used for flushing hydrants to improve water quality and flushing and disinfecting new lines by CMUD and others including Charlotte Fire Department, volunteer fire departments, etc. CMUD is working through a process to estimate what the actual nonrevenue water amount is and what can be done to drive the number down. Currently, we have estimated nonrevenue water at about 18%; some of which can be accounted for, but not all. Issues related to nonrevenue water include the cost of producing it, the potential revenue stream that is being lost, and conservation. CMUD is working to refine the assumptions that are used to estimate the non-revenue water and how to better determine the amount of authorized, non-metered water that is used in the system. Nonrevenue water is getting attention nationwide, not just in Charlotte.

Physical System

- When unlined iron pipe corrods, a process called tuberculation reduces the inside diameter of the pipe. The reduced diameter restricts the flow in pipes which means lost capacity and that the pumps have to work harder. If the tubercles are disturbed, they can break off the pipe walls and cause red water complaints by customers.
- Water main rehab is an ongoing effort for CMUD. Pipes can be cleaned and have an epoxy liner added that will prevent tubercles from reforming.
- Valves are an important part of the system, as well. Valves are generally made of iron and/or steel and have corrosion issues similar to pipes. The rehab process involves locating valves and making sure they work properly. The focus is more on large valves in the system. There are 40,000-50,000+ valves in system currently.
- CMUD’s rehab program is comprehensive in that it includes the pipes, hydrants, and valves.
- There are two ways to line water pipes in place – concrete or epoxy. The Charlotte water system was started in the late 1800s, but most of the pipe in the system is less than 30 years old. We do have small sections of wooden pipes left in system which are occasionally found during maintenance work and replaced. Most of the smaller sizes of pipe used in the 1950s-60s was galvanized iron, which doesn’t last very long. The pipe material of choice changed over time. One pipe material is asbestos cement pipe which was popular in ‘70s. It’s not as much of a water quality hazard, however it is not structurally stable over long time periods. Cast iron pipes are thick, but are brittle. Ductile iron pipe is thinner, but more flexible. Plastic pipe came next and there are several different varieties in the system today. CMUD spends about \$9.5 million per year on rehab, with about a third going toward relining of about 5 miles of pipe each year. In many cases, the pipes are either too small or made of galvanized iron and have to be replaced.
- Pre-stressed concrete cylinder pipe is another type of pipe material used. The pipe consists of a steel cylinder, a layer of concrete and pre-stressing wire. The Park Road failure was a 24” pipe

where the pre-stressed wire broke. When the pipe broke, it unfolded like a flap. CMUD made temporary repairs and the line was soon abandoned. .

- If water pressure in system gets too low, there could be backflow issues which can be very dangerous. The backflow prevention program began about 15-20 years ago. The backflow program required new commercial and irrigation service installations to have backflow prevention valves. There are still some unprotected areas in the system that have not been retrofitted. The water that leaves the water treatment plant is good quality, but many things can happen before it gets to customers. Discolored water from pipe corrosion is the most common cause of water quality complaints that CMUD receives. Flushing is sometimes necessary to keep good water quality. The rehab program has helped with a number of complaints over the years. When rehab occurs, it usually takes place in a neighborhood, not just one street.
- The lab staff collects samples daily and analyzes them to make sure the water meets EPA standards.
- Trihalomethanes (THMs) can occur in the system as a byproduct of the disinfection process
- Capital improvement projects for new transmission mains and rehab will be brought to CMUD Advisory in the future. The group will also discuss policy issues related to nonrevenue water .

Miscellaneous

Handouts:

- A report has been issued by Duke University on the water quality of Mountain Island Lake, including arsenic levels that the report attributes to coal ash ponds at power generation plants., CMUD's most recent water quality report includes a list of the chemicals we test for routinely, test results, and how the findings compare to EPA standards for safe drinking water.

Award:

- CMUD will be receiving the Platinum Award for Effective Utility Management at the American Metropolitan Water Association (AMWA) national conference in Portland on Monday. AMWA is a national group made up of major water systems. They will issue a news release next week and CMUD will conduct a Council presentation within the next two months. Ten cities are receiving the award this year, including New York City and San Diego.

Adjourned at 4:45 pm

Karen Baldwin