Should Your System Be Updated?

By Darrel Lockard, OAWU Circuit Rider

Now that I have traveled around the state for over a year now, there seems to be a reoccurring need for operators to focus on treatment process, knowing what each component does. Whether it is an old water plant being upgraded or new systems all together, some of them are not working up to their potential.

There are several reasons for this: design, equipment, training, chemicals, maintenance, etc. All of these and more play a huge part on performance of the treatment process. By knowing what the treatment process does by component helps us trouble shoot or modify systems to work more efficiently.

A lot of systems seem to just need to take a look at each piece of equipment and understand what its job does. For example I was at a plant and was asked why a flock basin was not performing. By just going through the system the operator and I found a list of changes to be made, most of them easy to do. One was changing the chemical injection point to give more time and energy for the chemical to work. Another was to resize the chemical feed pumps so that the chemicals did not have to be diluted wasting both man hours mixing and power to feed larger over sized feed pumps. Another benefit is the chemicals do not lose any potency by not being used in a day. Some mixing and day storage tanks are way to large to be use in a day or two. I have seen tanks that will last a week or more letting chemicals lose its desired effects.

A few other things were noticed that are not easy to fix but needed to be addressed. The flock basin was not designed with a flocculation unit, which was not allowing proper mixing and energy to occur. Another basin I saw did not have a drain installed to allow for maintenance, or sedimentation to be removed. Without removing sedimentation periodically it tends to build up reducing the volume of the chamber shortening treatment time, and in winter detention time is crucial.

Chlorine contact chambers seem to have their problems too. Most of which is just in design. The biggest set back most of all is that they are not baffled or they are baffled incorrectly to perform as required. Most people think if the tank is baffled and is 100,000 gal with a flow of 1400 gpm that they have 71 minutes of contact time. But if you take out the volume of its operating height and dead zones around the corners you may lose 35%-40% of contact time. Only a tracer study will give the accurate information that will be needed to know true contact time.

Some of the equipment that we are using is out dated. There are feed pumps, mixers, jar testers, chart recorders, and a lot of telemetry that needs replaced in order to work and be more reliable so as to reduce call out time (which always happens in the middle of the night).

While I am remembering jar testing I have seen a lot of dust on the equipment. That tells me one of two things, either we are very good at what we do and do not need them or we need more practice. I have found that it is a vital tool in which to utilize. A system that I operated did not have a bench top to use. There are several things to keep in mind when using this equipment. Two of the biggest are to mimic your plant and the next is choice of chemicals that we use. To find out what your plant is doing is probably the hardest to do. In the directions for the bench top they say to flash mix at 300 rpm for 45-60 sec and then stir at 35 rpm and wait for the flock to form. Well I tried this and got the results and guess what, it didn't work in the water plant. The reason was the high flash mix rate did not duplicate the hydraulics of the treatment system. The system was more like a flash mix of 200 rpm for 15-20 sec and a slow stir of 25 rpm. After I found out that information and that it was still a hit and miss whether the plant runs or not I tried different chemicals. Just because a chemical cost more per pound does not mean it is not economical to use. If you use less chemicals, the plant has longer run times, and lower spikes after back washes or flushes. You might just think about changing to a different product.

There are a host of other items but I think that we will save them for another time. Just wanted to help get the blinders off and a fresh look at what the process is. Hope this helps.