

Is turning a commercial pool off at night a good idea?

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The Florida Department of Health (DOH) 64E-9 code allows commercial pool pumps to be shut down three hours after closing, as long as they are turned back on three hours

before opening the pool to patrons. Why, you ask? So that you can save some energy. However, this is a more complex subject than meets the eye; let's look into it.

How much can you save?

- Assuming a 10 HP pump at a \$.10 per kWh electrical cost, and an open time of 8:00 a.m. to 6:00 p.m., the circulation pump can be shut off between 9:00 p.m. and 5:00 a.m., or for eight hours. The monthly cost of running that pump would be \$555, so shutting it down for eight hours or one-third of the time would provide a savings of about \$185 per month, or \$18.50 per HP.
- This process must be controlled via a time clock per the DOH code. Also, the code specifies: "Exception: vacuum DE systems are excluded from this allowance."

What are the positives?

- The positives of shutting down are the energy savings, and
- Maybe saving a little wear and tear on the pump, although some may argue that turning the pump on and off creates some wear and tear of its own.

There are several negatives:

- Pools with vacuum DE filters would lose the "cake" on the filters when the pump is turned off, and the DE would fall to the bottom of the filter tank.

This would normally require a manual agitation and precoat cycle to properly coat the filters again, which requires daily human intervention...hence the reason for the DOH exemption?

- Pools with heavy bather loads require nighttime "recovery". So, ask yourself: How did the pool look at the end of the previous day? Lousy? How did it look the next morning? Much better? Well then, the night time "recovery period" where the one or two turnovers through the filters helped strain out some of the impurities and the treatment was allowed to further clean up the water, is beneficial to the water quality / clarity. This recovery cycle has been quantified by tens of billions of data point on thousands annually on real-time monitored pools.
- Turning off this "recovery period" leads to other problems. If recovery is not allowed to be completed, water quality deteriorates. Sometimes you can see it, but other times you can't, and it manifest itself in lower ORP levels, and/or an increase in the amount of chlorine/bromine (PPM) required to achieve a certain ORP. This normally indicates the pool is getting sicker and is developing a "chlorine demand" which can only be quantified in an expensive laboratory test but can consume chlorine, sometime exponentially, even when there is no one in the pool. Many times, you'll be the one paying for chlorine on a fixed rate contract.

Are there any alternatives?

- One proven alternative is to turn the pump down with a VFD device instead of turning it off. The DOH codes limit the extent of the turndown to "...equivalent of six hours of treatment at 100% design flowrate during the daily closed period, or at least one

complete water volume turnover, whichever is greater." Even with this restriction, the savings are pretty darn dynamic WITHOUT all the negatives. Since the pool will still be filtered and treated, the recovery process has been proven to work. And, even during a reduction of pump output to a very achievable 48 hZ, the owner can experience a pump operating cost of 51% of normal power. This needs to be controlled by a time clock and by programming the VFD to handle the daytime and off-peak speeds, depending on filter soiling, and some models just don't have the smarts to handle this.

- Another proven variation is to turn down the pump at night, but to have the pump output be controlled via the actual desired DOH flow rate. Only certain systems can achieve this as it is covered by some US patents, but it is commonplace in many hundreds of applications. Using this method, an off-peak mode with a clean filter will save even more than one with a partially soiled filter and you will continually be maximizing energy savings, and you're assured of proper DOH code compliance.

So, helping the customer save energy could backfire on the pool service professional. In some cases, the customer saves the energy, but the pool service company will pay the price with more water quality complaints and higher fixed costs and lower profits. The busier the pool, the bigger the problem.

If the pool is seldom-used, you can follow the code and probably help your customer save a few dollars. But, if the pool has a moderate to heavy bather load, you may be signing up for some bigger issues... unless you enlist newer technology on your side.