

# Pump Progress



Denver hotel upgrades wastewater pumps for easier maintenance & improved uptime

By Dawit Anteneh, Phoenix Sullivan & Ben Wells

**M**aintenance teams focus so much of their time and energy making sure equipment is running smoothly on a daily basis that they often do not have time to stop and consider opportunities to improve the efficiency of their day-to-day operations. About five years ago, one supervisor took the time, on top of his busy workload, to conduct extensive research that eventually enabled his company, the Sheraton Hotel, to upgrade its pumps. The supervisor at the hotel's central plant considered BJM Pumps and contacted Denver Industrial Pumps Inc. for support. Denver Industrial Pumps is an industrial equipment distributor and aftermarket service provider that has been supporting several industries in Colorado and Wyoming for the past 27 years.

The goal in searching for pumping solutions was to find new pumps that could operate reliably in the hotel's wastewater collection system. The wastewater collection system at the downtown Denver Sheraton utilizes three wastewater collection pits. Each pit had two vertical column pumps operating in a duplex arrangement, so that when the primary pump failed, the backup pump would start.

The vertical column pumps had been removed many times over the years. They were rusted, and so old they

were no longer worth maintaining. The hotel needed new pumps that could handle its wastewater collection needs with less maintenance.

The supervisor first came across the BJM Pumps line of submersible shredder pumps while conducting an internet search. After watching videos and reading about these pumps, the supervisor contacted an outside sales representative for Denver Industrial Pumps. The representative considered the hotel's most important needs:

- **Easier maintenance.** Vertical column pumps, which can be up to 15 ft long, can be difficult to remove and install, especially in a hotel, where access to this type of pumping equipment typically is located in tight spaces. The maintenance team needed a pump that would be easier to install and remove when maintenance was required.
- **Shredding capabilities.** With the increased use of "flushable" wipes and other hygienic materials, the sewage entering the hotel's wastewater collection pits is full of fibrous material. The old pumps frequently were clogged with these solids, so the new pumps would have to be designed to handle solids in the wastewater.

- **Reduced downtime and improved pump reliability.** Downtime puts stress on the system, creates headaches for maintenance teams who often work overtime to solve the problem, and results in unplanned expenses. It was critical to select pumping equipment that would operate reliably in the hotel's wastewater collection system.

The distributor worked with a representative from BJM Pumps to find the best pump for the Sheraton's wastewater collection system. It selected the SK110C-460T submersible shredder pump, which can handle up to 3.5-in. solids at 845 gal per minute with a maximum of 94 ft of head. When reviewing the pump with hotel officials, the manufacturer's representative shared the following qualities in his recommendation:

- **Compactness.** The SK110C is about 2 ft tall, and because it is a submersible pump, the motor and wet end are one unit. The pump would be easier to install, remove and maintain, saving the maintenance team a great deal of time and effort.

The shredder pump is engineered to shred solids, including wipes.



- **Engineered to shred solids.** The pump utilizes a cutting impeller with a tungsten carbide tip to continuously rip apart solids against a tooth-edged spiral-shaped diffuser plate. With 360-degree shredding action and non-clog, single-vane impellers, the pump would have the capacity to shred the wipes and fibrous materials being flushed through the hotel's sewage system.
- **Motor protection.** Manufactured with an abrasion-resistant stainless steel motor housing, the pump is built with three-seal motor protection. The motor is protected with double mechanical seals. The lower seal is made of silicon carbide and the upper seal faces are made of carbon and ceramic.

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An additional lip seal is installed above the impeller to help prevent unwanted materials from entering the seal chamber. The SK110C also utilizes winding protection and NEMA Class F motor insulation, allowing the motor temperature to reach up to 230°F. If the temperature or amp draw becomes too high, an automatic switch turns the pump motor off. The switch automatically resets when the motor cools, and the pump resumes operation.

After reviewing the pump specifications and other details, the Sheraton plant supervisor decided to purchase an SK110C-460T submersible shredder pump. The first pump was installed in 2011, and the maintenance team immediately acknowledged how much easier it was to install the pump into the 12-ft-deep wastewater collection pit. After observing the pump's performance for a year, the hotel systematically replaced the other five vertical column pumps in all the wastewater collection pits throughout the hotel complex.

The new pumps are a different style than the hotel had previously, and they have solved many of the problems the old pumps experienced, such as clogging and constant maintenance. Maintenance time and preventive maintenance costs have decreased.

There are many advantages to using submersible pumps:

- Minimal preventive maintenance and inspection are required because their bearings are permanently lubricated.
- They offer low true cost of ownership and less mean time between failure because of the submerged motor, which

allows heat generated during operation to dissipate, lowering the running temperature. A lower running temperature increases the lifespan of the motor's insulation, mechanical seals and bearings.

- Submersible pumps located in the liquid sump are not subjected to the temperature, elevation or height limitations of self-primers.
- Their compact rotating element makes them reliable.
- Their compact and portable features make bench-servicing easier.
- Liquid around the submersible pump isolates noise; therefore, the submerged motor and pump operate quietly.

In today's world, many maintenance teams face challenges when trying to upgrade their pumping equipment, so it is important to consider the cost of not upgrading. Embracing the technology shift and employing modern, highly engineered submersible pumping equipment can have a big impact on both the efficiency of day-to-day operations and long-term pump lifecycle costs. **IWWD**

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