



Pump Up the Power

Using a different kind of pump can help turn around plant performance

By Vito Gullo, Metro Pumps and Systems Inc.

An industrial pump is a small component in a power plant that may operate 24 hours a day, seven days a week over extensive periods. But failure of that small pump can cause catastrophic problems – even if a backup pump is available. Combined with decreases in power plant manpower in recent years, it becomes prudent to give careful consideration to selecting the right kind of pumps throughout the plant.

Choosing the right pump can allow an owner to focus on meeting the needs of the plant without being interrupted by sudden and unexpected malfunctions. Self-priming pumps can move an operator in the right direction by allowing effective preventative maintenance, therefore providing cost-cutting efficiency. Upgrading to a different pump design may be all that's needed to achieve significant savings, less stress and a lower total cost of ownership.

Saving Manpower on Repairs

Aside from emergency pump repairs that present unique labor challenges themselves, the challenge of managing physical labor in the power sector is more intense today than ever before. Like most other segments, the industry is faced with manpower

reductions. And as manpower continues to be stretched, using physical resources to maximum advantage becomes even more important. From a labor standpoint, the goal should be to improve the type of maintenance associated with your plants' critical equipment.

One way to do that is to replace the common submersible – or line shaft sump – pump with self-priming pump technology. When a traditional sump pump gets clogged, it takes time and manpower to remove and clear it. And if the pump has suffered any long-term damage from being clogged, it may need major repair.

A typical power plant uses a wide range of pumps. Pumps are used for boiler feed, in the boiler circulator, for cooling water, screen wash, condensate, chemical injection, fuel oil, seal water, lube oil, storm water, sump dewatering, in the oily water separator and in pollution control systems. Self-priming pumps are especially valuable in applications where a product must be lifted from a tank and sump, or when the material being pumped contains heavy solids and debris.

The advantage of self-priming pumps is that the complete pump and motor are above grade and easily serviceable. Whether a 4", 6" or 8" pump, foreign debris and objects can be easily removed from these pumps, without removing anything from the wet well. Because of the pump's accessible cleanout points,

debris removal is possible without any repairs. This means the plant no longer needs to send the pump – or pumps – to a service shop. That equates to big savings in terms of time and money for a plant with minimal staff.

In short, installing a line of pumps you can rely on, even if clogging occurs, allows better use of personnel in areas

obstructions that can clog and damage pumps. And when a power plant pump fails and a wet well can't be de-watered, the contaminated water endangers surrounding equipment and plant staff. The purpose of the sumps in which these pumps operate is to collect the oils, caustics, waste, salt water and various other chemicals lost or produced during

levels within the plant itself. In the end, these plants are formulating plans that call for installing backup pumps on different elevations within the plant. In the event of a flood, these plants will be better able to de-water the main level and restore power more quickly to the population, industry and services that depend on that plant.

And when considering new pumps, remember that different plants must pump different types of debris, meaning pump applications can be highly plant-specific. While existing pumps may get the job done, having the right pumps at each location improves efficiency. Many pumps, for example, are designed specifically for unique solids and/or liquids.

The capital cost of self-priming pumps compared to line shaft pumps is about the same for most standard applications, so long as the application is in a location six- to eight-feet deep. Line shaft pumps, however, will become more expensive as the sump, well or tank deepens. In most cases, self-priming pumps will lift up to 25 feet. And if the product being pumped requires pump materials to be made of 316 SS alloy or higher, the longer the pump, the greater its cost will be compared to the self-priming. The main reason is that with the self-priming, only the above-grade liquid end of the pump must be made of the special alloy needed for the material being pumped, whereas the line shaft pump will require an upgrade to the special alloy for all below-grade material.

The beauty of a self-priming pump above the sump is that when repair is needed, the rotating assembly comes out by removing several bolts. In the case of small pumps, this can generally be done by one person. The rotating assembly can then be inspected and repaired on a bench with full access to the bearings, impeller, shaft and seal.

Having a feasible backup plan – and the right equipment to implement it – can help avoid high-cost equipment losses associated with natural disasters and emergencies. This applies to power plant pumps. When faced with the decision to install above-grade technology versus below-grade pumps, power plants may well benefit from the lower total cost of operation associated with self-priming technology. **pe**

Author: Vito Gullo is President of Metro Pumps and Systems, Inc. and has experience in industrial pump sales and application engineering. The company's expertise includes power generation, chemical plants, refineries, tank farms, waste water plants and municipal water treatment.

Dealing with water in a power plant also means dealing with anything that slips into the water: oils, rags and other obstructions that can clog and damage pumps.

where they're needed. And time needed to get pumps back up and running – which might include sending them out for repair – can be saved for more critical initiatives.

Line shaft sump pumps tend to make unexpected failures more likely because operators can only see and maintain what's above the grade. With line shaft sump pumps, the discharge piping, the motor, pump coupling and sump base plate aren't visible. As a result, unexpected downtime can be common. It's the moving parts of the pump that can't be seen that typically reduce plant productivity. If the plant has stockpiled spare parts, it might be possible to repair a failed pump quickly. But not knowing the true condition of the pumps installed, multiple pumps can fail at the same time. Such failures can lead to equipment loss, flood damage and other general damage to the immediate area.

Because of their above-grade design, self-priming pumps are easy to maintain and can be supported by electronic monitoring that alerts the plant team to subtle changes in vibration and power consumption. These features alone allow the crew to anticipate potential pitfalls before they strike. Electronic monitoring also allows for early intervention and hands-on maintenance, so plants can catch problems before they occur and repair or replace parts before they seriously damage other equipment.

Keep It Clean

Dealing with water in a power plant also means dealing with anything that slips into the water. That means all types of debris including oils, rags and other

operation of the plant.

To remove a pump for repairs and service, plant personnel must wear protective clothing and also make sure that residual spills and oil residue don't affect the surrounding environment. With self-priming pumps, workers are not subjected to such adverse repair conditions. They do not have to deal with a pump that is completely submerged in whatever liquid might be in the wet well. In the end, failures are prevented in a way that promotes a safer, more environmentally sound environment.

When choosing equipment for a power plant it is prudent to select a credible manufacturer. Plants should be aware of the capabilities of the manufacturer in terms of replacements parts, equipment and repairs. At the very least, emergency situations may call for some sort of backup plan or policy. Finding partners – both distributors and manufacturers – that support the plant in this way may prove invaluable in certain situations.

In the case of power plants, it is especially important to maintain an extensive on-site inventory of spare parts. Some component suppliers maintain significant investments in spare parts inventories and make that inventory available to customers on a 24/7 basis.

Some power plants are planning ahead for large disasters by trying to anticipate potential outcomes associated with possible scenarios. For many plants, those efforts include a transition toward self-priming pump technology to offset dangers associated with a loss of power due to a quick and unexpected rise in water