SOLID BLEND
WATER MANAGEMENT SOLUTIONS

certified WBENC WOMEN'S BUSINESS ENTERPRISE

Safe. Clean. Sustainable.

Closed Loop Mechanical Seal Failures

THERE ARE MANY REASONS WHY MECHANICAL SEALS FAIL

Mechanical seals are sometimes considered to be the weakest links in a fluid-handling system. They can fail for a variety of reasons, which sometimes makes it difficult to diagnose the problem. And of course, the longer it takes to diagnose the problem, the longer the system itself is out of service. That makes it important to understand the possible ways in which these seals might fail and take steps to prevent or avoid them.

WHY MECHANICAL SEALS FAIL

There are many reasons why mechanical seals fail. Many of those are related to installation or operational issues:

- **Installation issues**. Sometimes the seal is doomed from the start. That can happen if the wrong type of seal or seal material is chosen for the specific application, if the person who installs the seal uses too much force during the process, or if the pump is installed incorrectly or the installer shortcuts the procedure.
- **Operations issues**. Failing to operate the pump properly is another major source of failure. Mistakes like short-cutting the startup process or running the pump without water are common errors that can damage the seal.
- **Contaminants in the fluid**. Like any other component of a fluid-handling system, mechanical seals are susceptible to corrosion damage. If contaminants or corrosive materials begin forming in the gap between the stationary housing and the rotating shaft, the build-up can damage the seal and cause it to leak.
- **Age**. Like anything else, seals will wear down over time. The older the mechanical seal, the higher the probability of a failure.

THE IMPACT OF CORROSION INHIBITORS

We sometimes receive questions about whether corrosion inhibitors also contribute to seal failures. Industry studies indicate that this isn't a problem as long as the treatments follow the manufacturer's guidelines. A study by the National Association of Corrosion Engineers (NACE) task group T-7G-6 determined that Sodium Nitrate-based inhibitors could be used safely in concentrations at least as high as 4000 ppm NaN02 without causing measurable degradation in a mechanical seal. This implies that inhibitors can be used safely as long as the manufacturer's directions are followed.

The best practice for controlling corrosion is to follow a two-pronged approach. The first step is to treat the water with a corrosion inhibitor designed for your system. Inhibitors can block the chemical reactions that cause corrosive material to form and coat surfaces to prevent corrosive material from taking hold. The second step is to install side stream filtration to remove seal-damaging contaminants from the water.

CONCLUSIONS

There are many reasons why mechanical seals might fail. The majority of these can be minimized or prevented with proper planning and oversight. If you'd like to learn more, please feel free to contact Solid Blend for additional detail.