

## Precautionary steps to extend pump life

Conscientious pump technicians/owners/operators have a strong passion to properly care for the pumps under their safekeeping. The goal is to attain the highest possible level of machine reliability. Use this document as a guide for maximizing and extending pump run time between failures.



You selected the correct pump for the specific application.

You matched the system curve to the pump's best efficiency point and allowable operating region.

The pump is neither undersized nor oversized.

The impeller is in the proper range of Specific Speed for the application.

The impeller Suction Specific Speed is in an acceptable range and designed to preclude both discharge and suction recirculation cavitation.

You double checked that the net positive suction head margin was more than adequate to preclude cavitation.

The pump materials were selected/matched for reliability and long life based on the liquid properties.

The pump shaft was selected because of the low  $L^3$  over  $D^4$  ratio to mitigate deflection.

The variable frequency drive you added allows safe operation over a wide range of hydraulic conditions yet limits pump operation in areas and speeds that are bad for the pump.

Both the pump suction and discharge pressures can be read and recorded from the gauges/transducers you had installed.

The pump bearings and associated lubrication are of the highest quality.

You change the oil based on the manufacturer's recommendations.

You rigorously protect the oil from contamination both in the pump and storage.

The laser alignment of the driver to the pump is nearly perfect and allows for the anticipated thermal growth.

Prior to the alignment the equipment was thoroughly checked for soft foot. You also realize that soft foot can be one or a combination of several different things; that is, it can be the base itself and or the component foot. Additionally you realize soft foot can be parallel and/or angular.

The motor (driver) brake horsepower (bhp) rating is sized to be non-overloading across the curve for the impeller diameter with respect to the specific gravity and viscosity of the liquid.

The driver size also allows for the expected viscosity changes associated with the changes in product temperature.

You understand that operating the motor in the service factor is a poor practice.

You rigorously follow industry best practices, commissioning procedures and recommendations.

You would never start the pump with the suction valve closed.

The pump was properly vented and primed before start-up.

The driver's direction of rotation was verified before the coupling was installed and the mechanical seal was set.

The pump baseplate is both flat and level.

The mass of the pump foundation is over 3 times the combined weight of the pump, driver, and base.

The base is properly grouted to the foundation.

The pump, driver and base are properly grounded electrically.

For flooded suction pumps the suction pipe is sized larger than the pump suction to keep the liquid velocity less than 6 to 8 feet per second.

The suction line has 10 diameters of straight unobstructed length prior to the suction nozzle.

The self-priming pump has an air release valve and associated return line.

The liquid supply source for the pump has adequate level (Critical Submergence) to preclude vortexing and subsequent air entrainment.