One common mistake many people make is to overlook Net Positive Suction Head (NPSH) when making a pump selection. When considering pump selections, the first thing we are taught is to look for a selection with high efficiency at the rated condition, and one where the rated condition falls close to the best efficiency point. When operating under an overwhelming mountain of new information, those who are new to the industry, and even some old timers will sometimes forget to make sure the Net Positive Suction Head Required (NPSHr) characteristics of the pump are suitable for the application throughout the expected range of operation.

While it's easy to understand how this happens, the selection of a highly efficient pump at the rated condition may not have favorable NPRHr requirements throughout the range of expected operation. Using the swimming pool industry and an example, a pump may provide acceptable performance and have favorable NPSHr requirements at the design point, the same pump may not be in a stable operating point when operating after a filter backwash. A pump that requires more NPSH than the system makes available will never operate as designed, and internal damage can be expected in relatively short order.

The internal damage that can occur is caused by cavitation [see Understanding Cavitation and How to Avoid It]

Ensuring the NPSH requirements of the pump are compatible with the NPSH made available by the system in which the pump is installed is a critical step in the pump selection process.