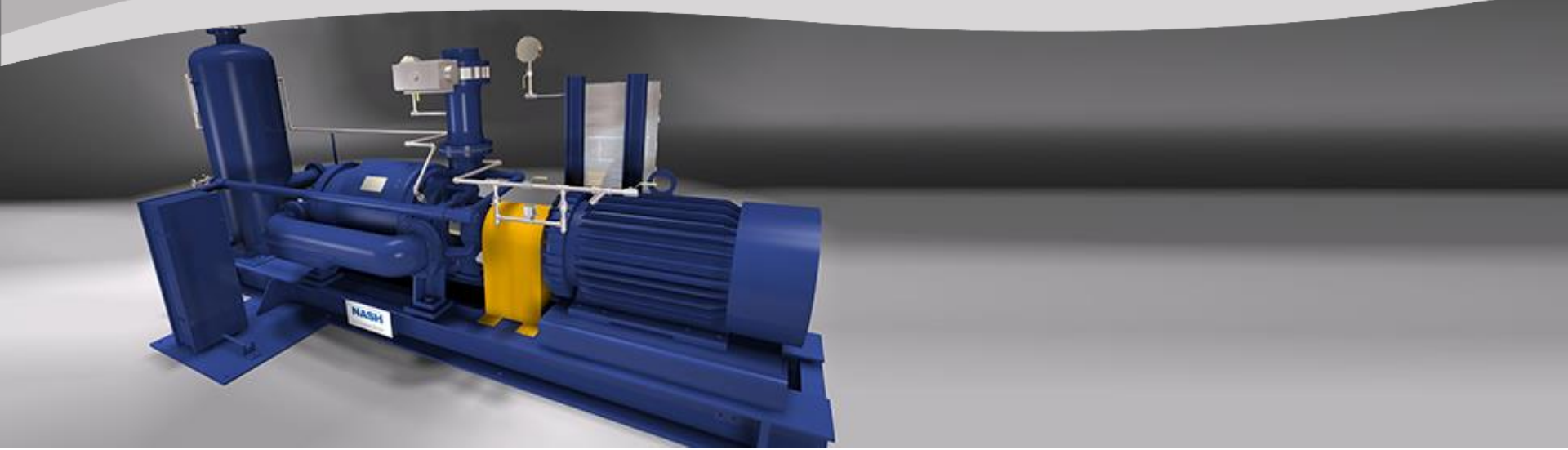
NASH
by Gardner Denver

NASH TC Upgrade – Anti Cavitation



NASH TC – Anti Cavitation Upgrade

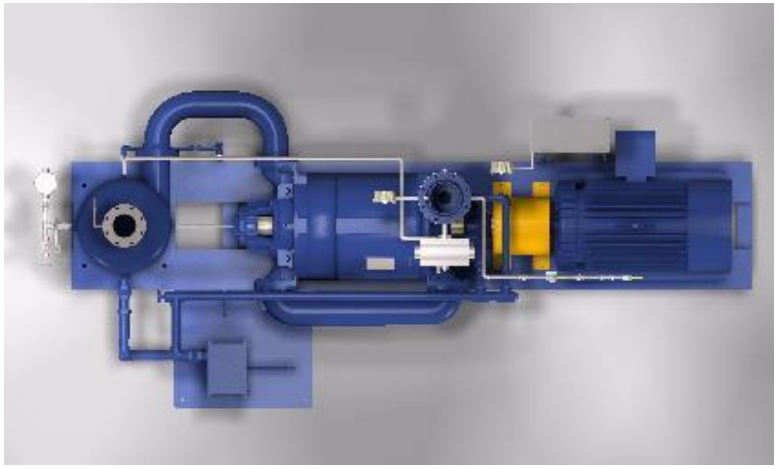
Double the useful life of your pump in cavitation prone operations.

Patent pending upgrade reduces cavitation and damage to your pump.

Why have the NASH TC Pumps been upgraded?

When you operate your power plant at partial load, it reduces the temperature differential between the vapor entering the pump serving as condenser exhauster and the water used to cool it.

With the operating temperature of the liquid ring pump closer to saturation, cavitation becomes more likely. The intent of this upgrade is to make the pump less sensitive to cavitation when operating at low load.

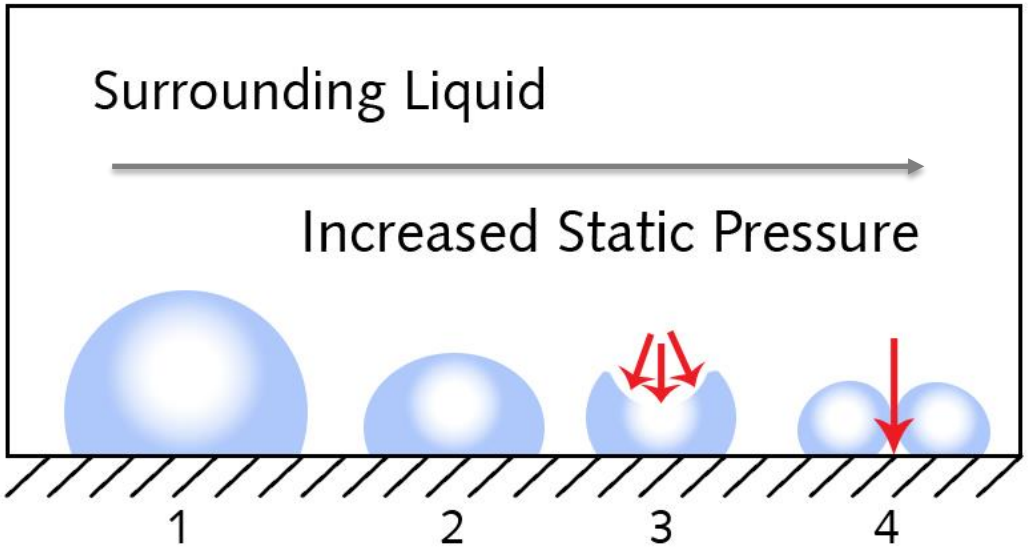


Benefits:

- Double the useful life of the pump
- Increase reliability – less downtime for repairs
- Reduced Maintenance Needs

NASH by Gardner Denver

What is Cavitation?



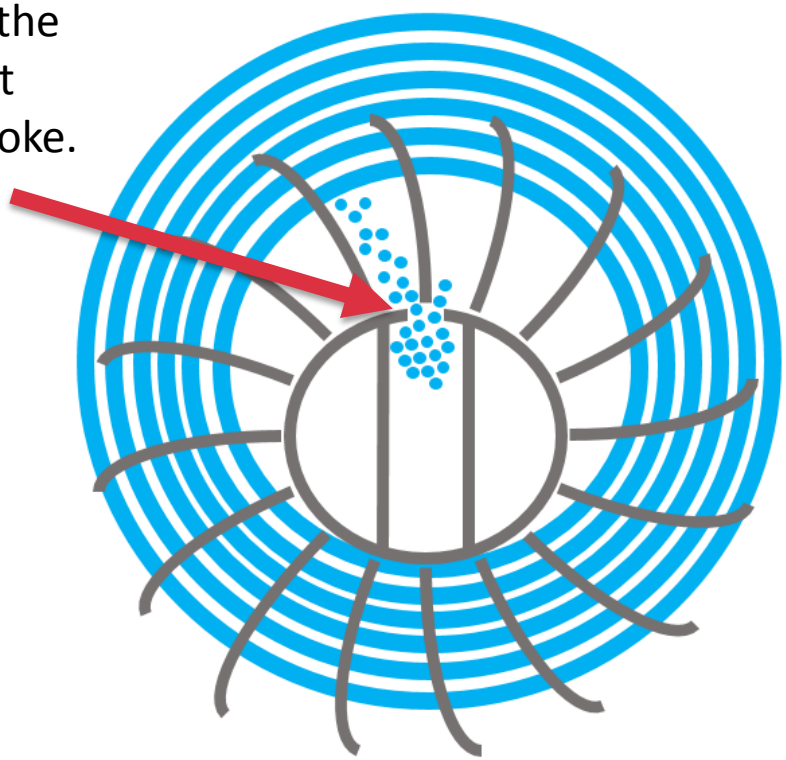
Cavitation bubble imploding close to a fixed surface generating a 560 mph jet (4) of the surrounding liquid.

Effects of Cavitation on the Rotor Taper Bore

NASH by Gardner Denver

Cavitation – how does damage occur?

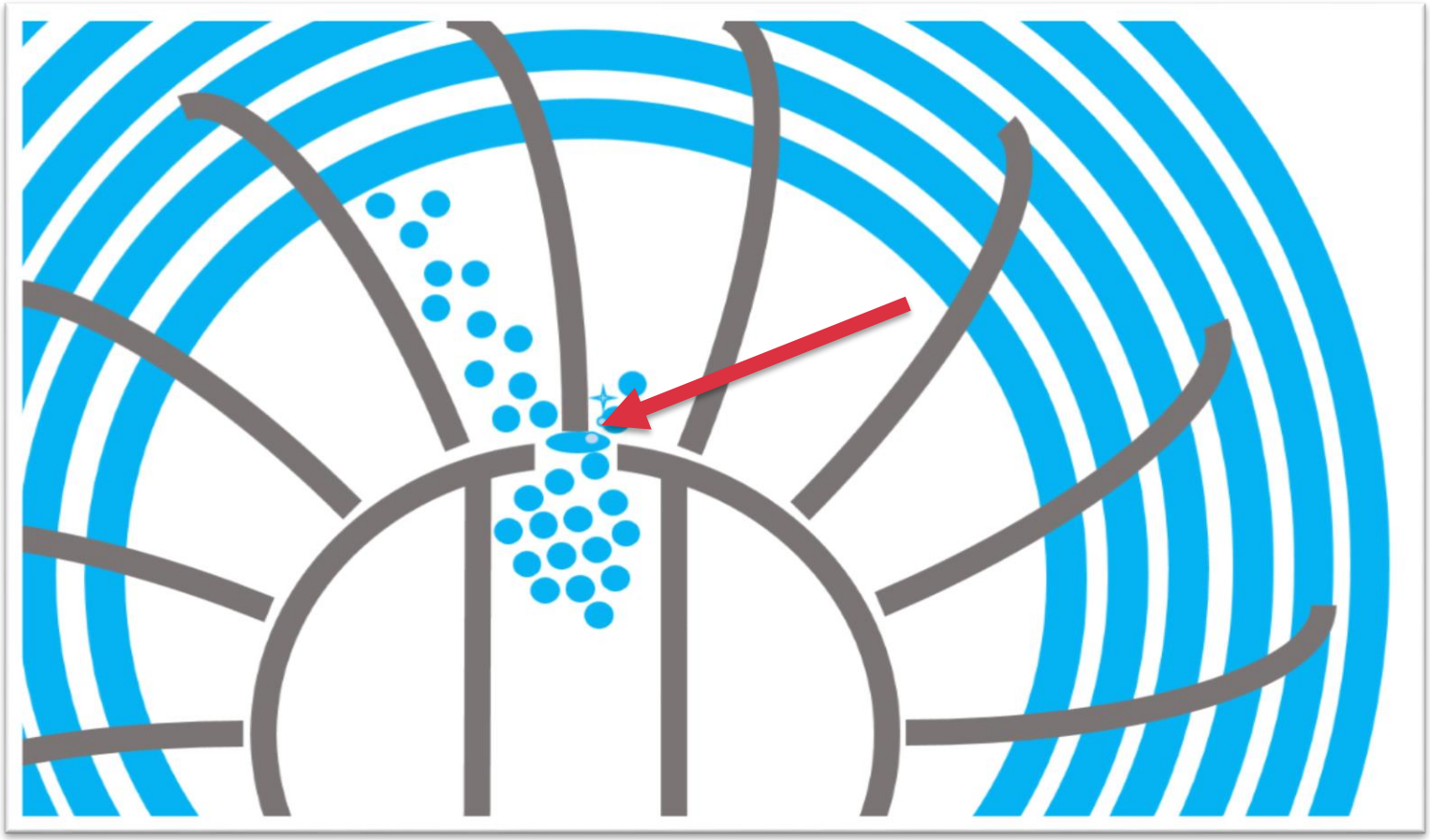
Water is introduced through the slot located between the inlet port and the compression stroke.



NASH by Gardner Denver

Cavitation

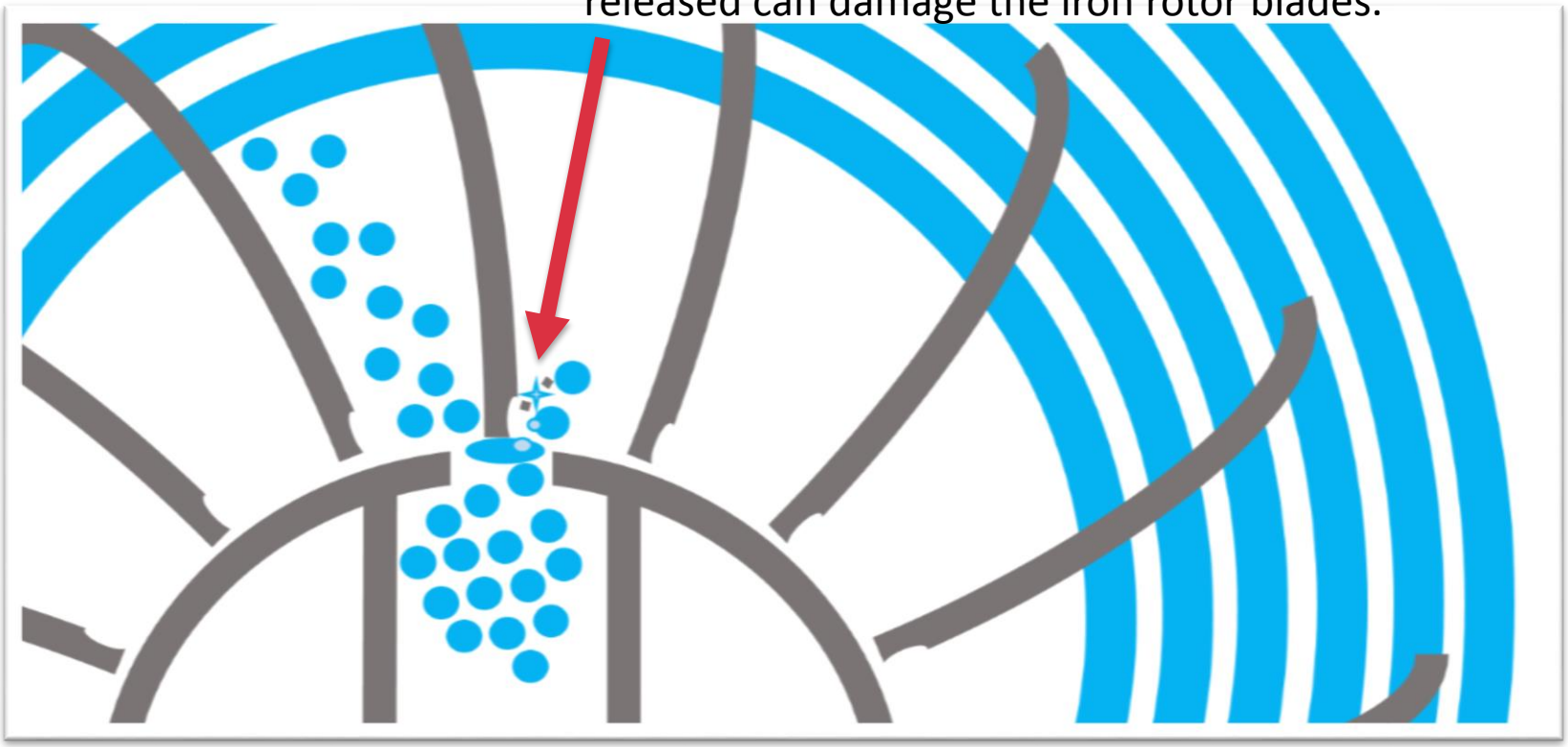
At conditions where the operating temperature approaches saturation temperature, the velocity of the rotor can create low pressure areas that allow cavitation bubbles to form.



NASH by Gardner Denver

Cavitation – how does damage occur?

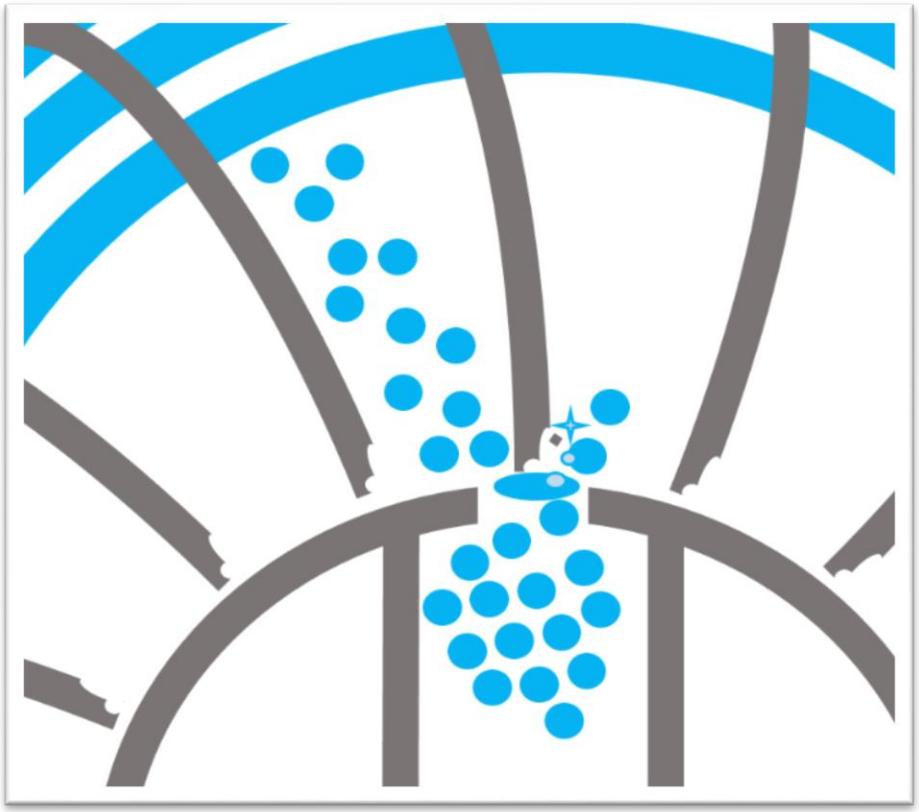
As the bubbles enter a higher pressure area behind the rotor blade, they collapse and the energy released can damage the iron rotor blades.

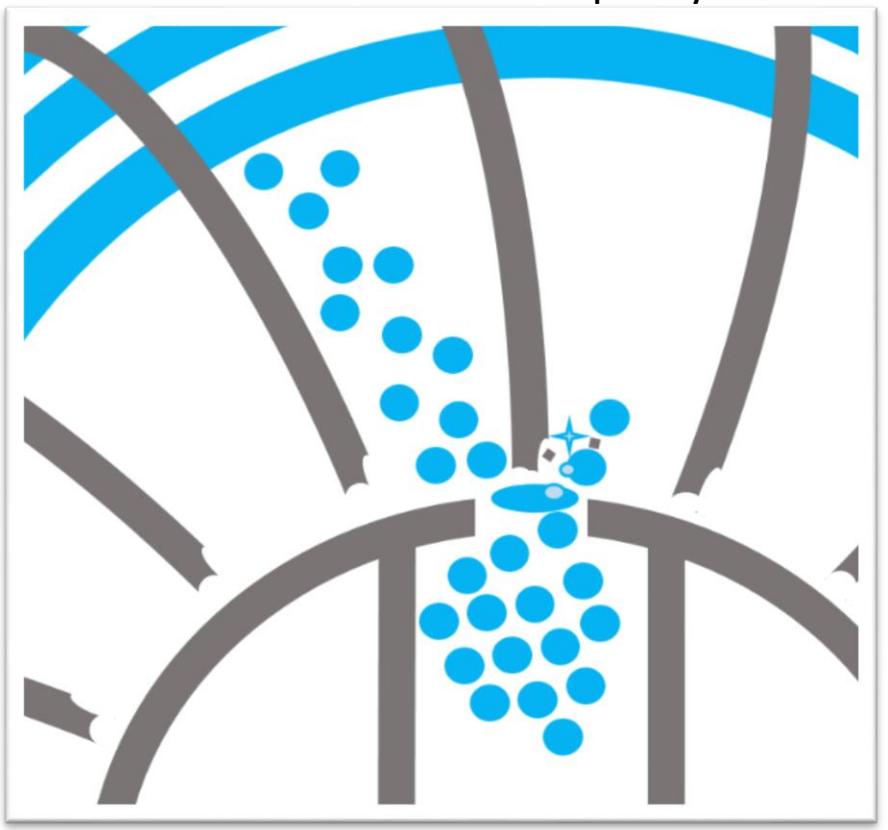


NASH by Gardner Denver

Damage continues

Continued cavitation can eventually remove enough material that the clearances are affected which reduces net capacity.



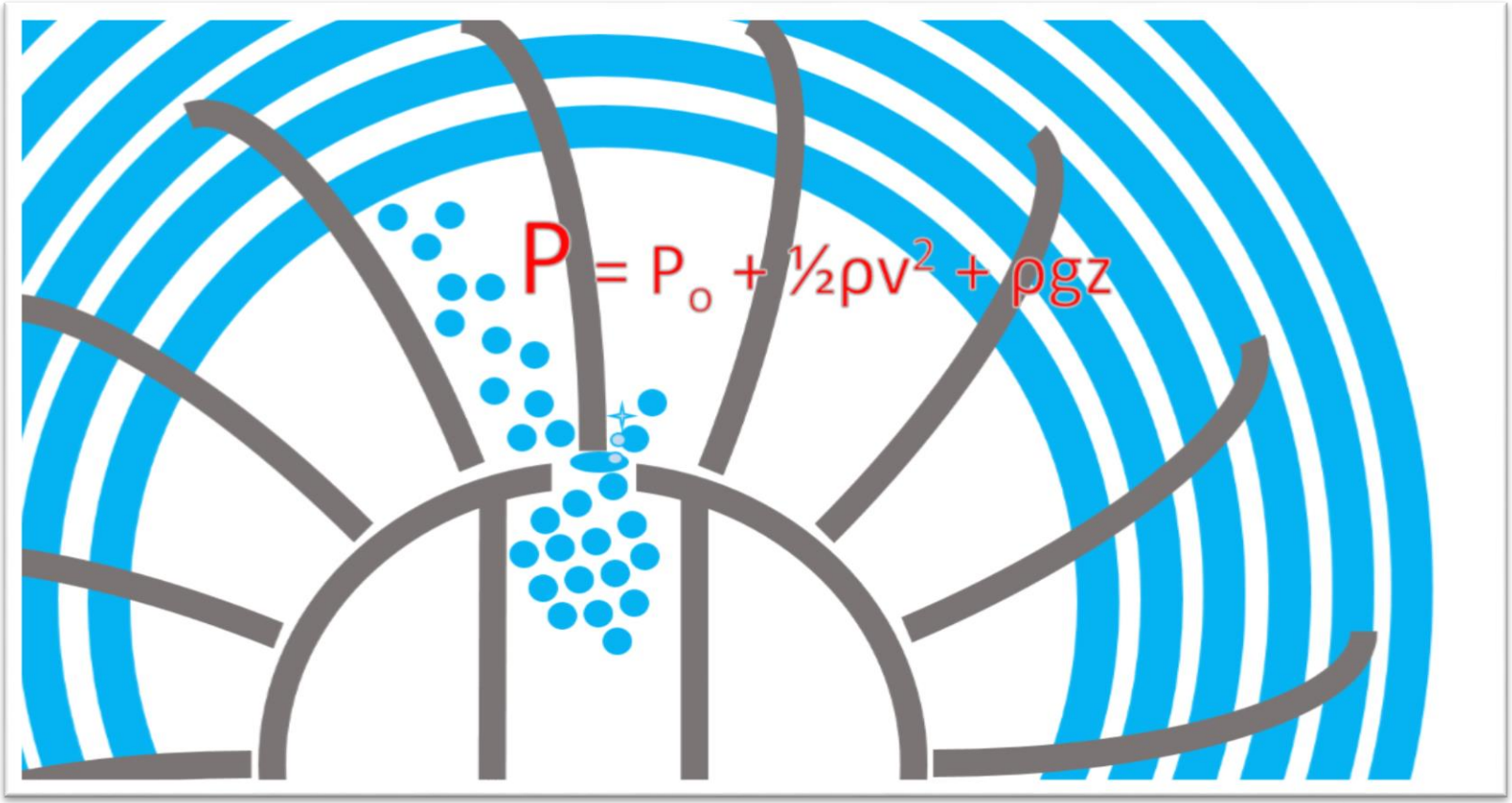


Material removed from the rotor can cause erosion damage in the pump.

NASH by Gardner Denver

TC Upgrade

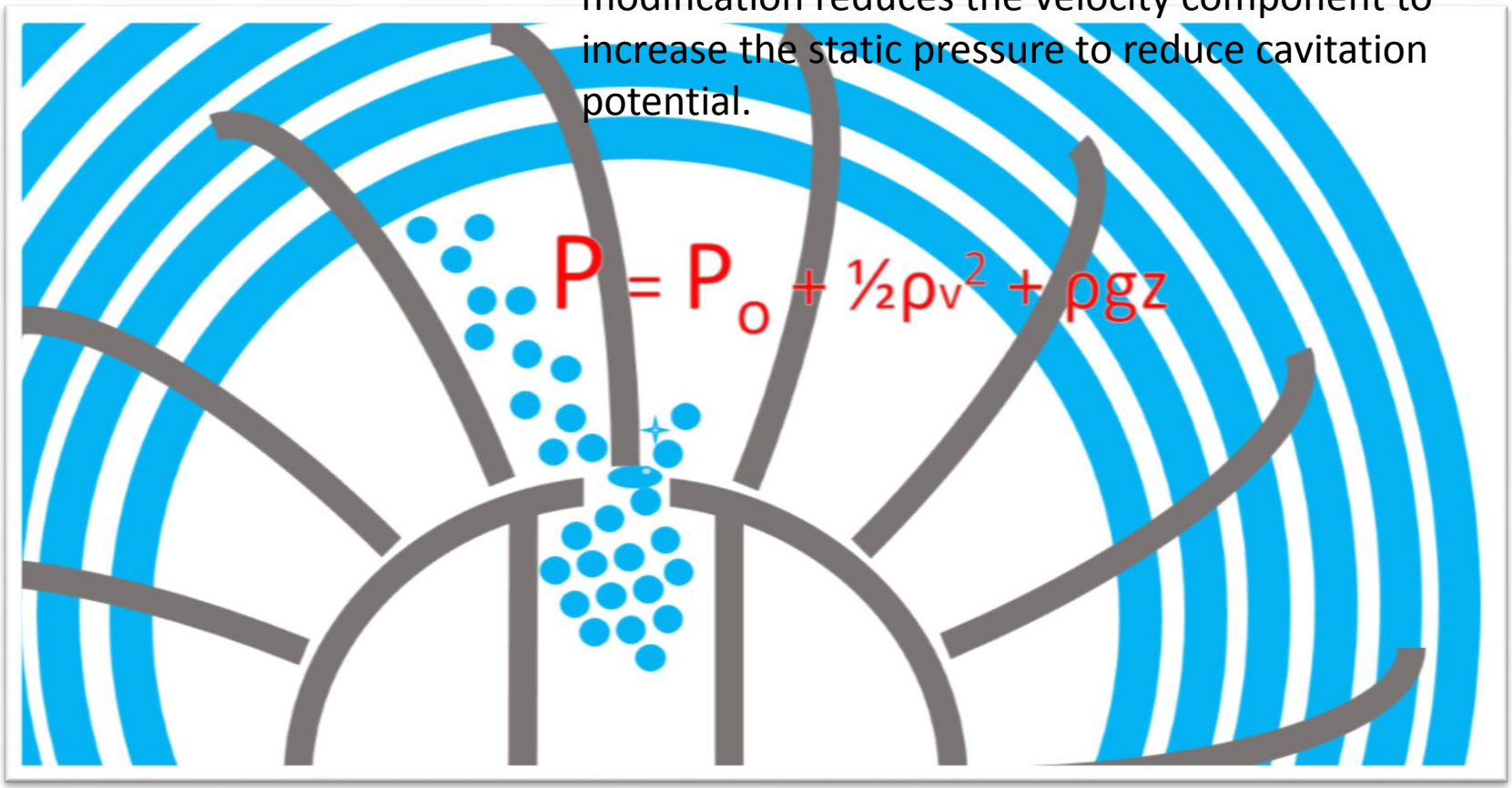
This affect can be explained using Bernoulli Principle which relates the total pressure of the media to a sum of the static pressure and a velocity affect.



NASH
by Gardner Denver

Reduce v

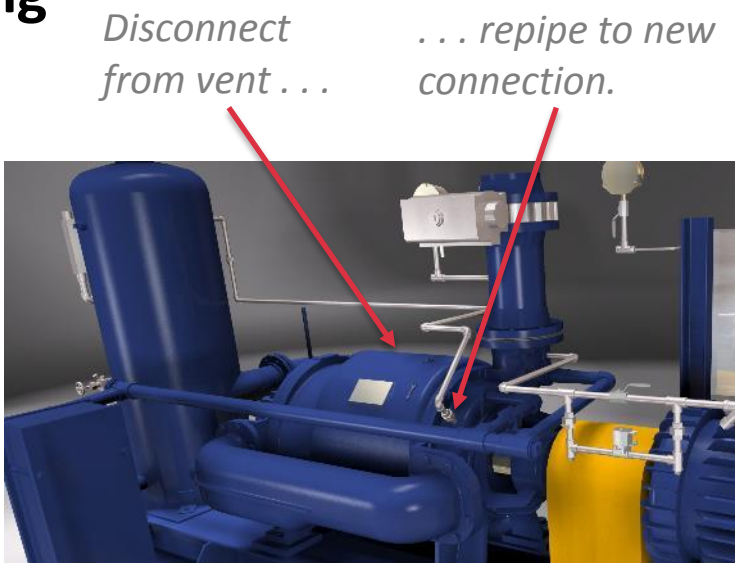
We do what we can in the system design to minimize operating temperature. The new modification reduces the velocity component to increase the static pressure to reduce cavitation potential.



NASH by Gardner Denver

Design/Installation Changes

- **NO effect on performance**
- **NO effect on power**
- **MINIMAL changes to existing piping**



NASH by Gardner Denver

NASH TC – Anti Cavitation Upgrade

Gardner Denver Nash has witnessed the damage caused by industry change, and has developed an innovation to make our TC line an even more sustainable and reliable option for today's demanding operating conditions.

The Benefits:

- Patent pending cavitation reduction feature
- Available as an aftermarket upgrade to existing TC pumps
- Can double the useful life of pumps run in cavitation prone duties
- No impact on capacity or power
- Same fit as the original TC
- Feature is also available on select new iron TC pumps

Increase reliability, reduce maintenance and downtime.

NASH by Gardner Denver