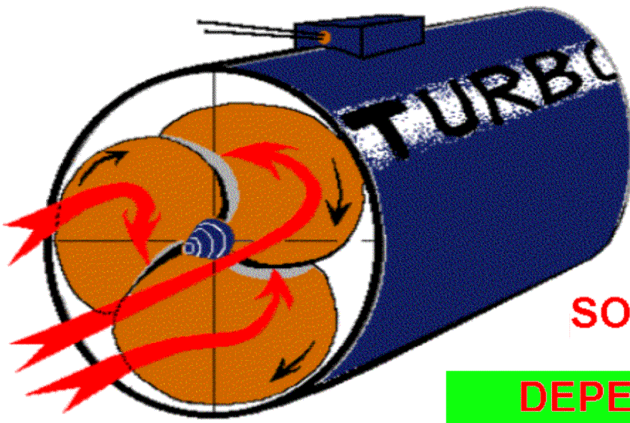


TURBINE FLOW METER ACCURACY

TURBINE SCREW METER "RATCHETING"



KICK FROM PULSE STARTS THE SPIN
WEIGHT OF SCREW BLADES & SHAFT
KEEPS IT SPINNING, NEXT KICK GIVES
OVERSPEED OR STOPS IT,

SOON YOU HAVE NO ACCURACY

**DEPENDING ON VISCOSITY
STAY LESS THAN 1.5%**

Pressure spikes, like all forms of shock, are highly directional. This is because according to the compressibility of the liquid, the pressure transfer wave speed, that produces the "acoustic frequency", is typically in the order of 3,500 mph or 1400 meters per second. At these velocities a pressure wave may ricochet, but otherwise not change direction.

Pressure wave pulsation, may come back from the system to the meter at a frequency where it gives a boost to the speed of rotation at which the blades are spinning. Alternately there can be a reflection from the other side, which may stop or slow the spin. Additionally the blades can be fractured or the shaft bent.

The worst results are experienced in systems with oversized pipe. Where pipes are sized, depending on liquid viscosity, for 0.6 to 1.5 meters per second flow velocity on the suction side of a pump, and for 3 to 5 meters per second on the discharge side of a pump, a small amount of pressure drop from flow friction, works wonders. The system becomes dissipative, so not an amplifier. The turbine meter turns fast - has a flywheel effect, and is consequently stable. The pipes cost a lot less because they are smaller, and if a pulsation damper is required at all, its cost will be greatly reduced.



PulseGuard

