


HOW SMOOTH DO YOU NEED YOUR SYSTEM TO BE ?

Generally accepted levels of residual fluctuation percentage allowed, to protect against the average level of the problems listed .

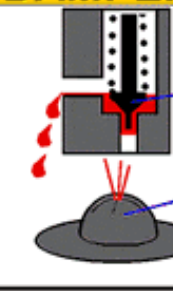
COARSE DAMPENING

STOP PUMP PARTS DAMAGE
 GEAR TOOTH WEAR, CHATTER, AND FRACTURE.
 DRIVE BELT SLIP, BURN-OUT, AND BREAK-UP
 CROSS-HEAD, ROD, AND YOKE DEFLECTION
KEEP PRESSURE VARIATION LESS THAN 12%



PmpPtsDm.bmp

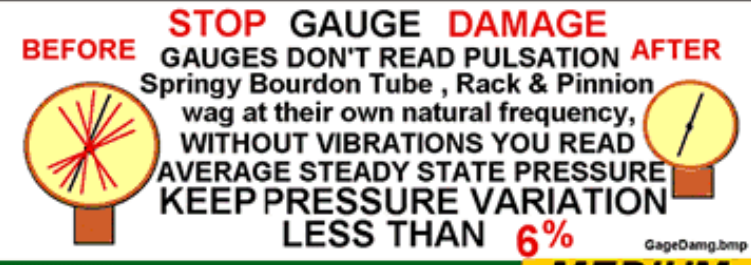
STOP WEEPAGE
 RELIEF VALVE WEEPING
 SURGES CAUSING PREMATURE LIFT
 FATIGUE CRACKING OF BURST DISKS
KEEP PRESSURE VARIATION LESS THAN 9%



RVBDweep.bmp

STOP GAUGE DAMAGE
 GAUGES DON'T READ PULSATION
 Springy Bourdon Tube , Rack & Pinnion wag at their own natural frequency, WITHOUT VIBRATIONS YOU READ AVERAGE STEADY STATE PRESSURE
KEEP PRESSURE VARIATION LESS THAN 6%

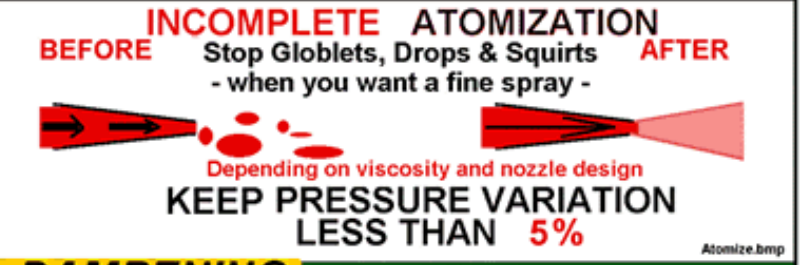
BEFORE AFTER



GageDmg.bmp

INCOMPLETE ATOMIZATION
 Stop Globlets, Drops & Squirts - when you want a fine spray -
 Depending on viscosity and nozzle design
KEEP PRESSURE VARIATION LESS THAN 5%

BEFORE AFTER

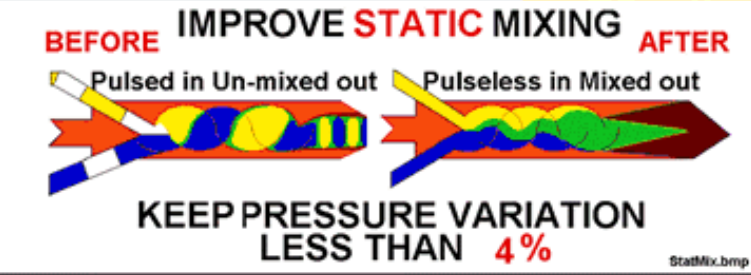


Atomize.bmp

MEDIUM DAMPENING

IMPROVE STATIC MIXING
 Pulsed in Un-mixed out Pulseless in Mixed out
KEEP PRESSURE VARIATION LESS THAN 4%

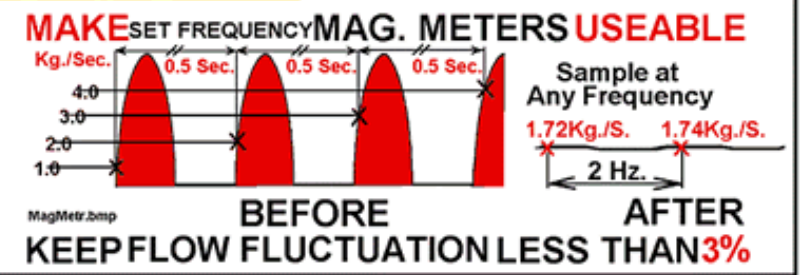
BEFORE AFTER



StatMix.bmp

MAKE SET FREQUENCY MAG. METERS USEABLE
 Sample at Any Frequency
 1.72Kg./S. 1.74Kg./S.
 2 Hz.
KEEP FLOW FLUCTUATION LESS THAN 3%

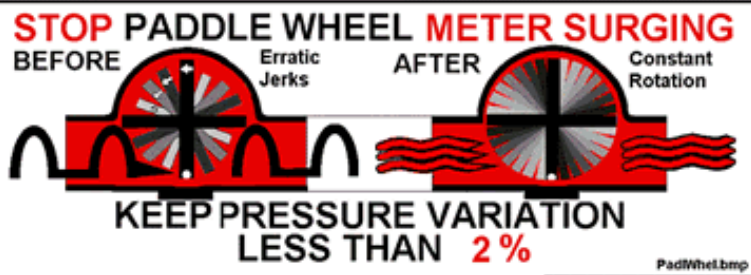
BEFORE AFTER



MagMetr.bmp

STOP PADDLE WHEEL METER SURGING
 Erratic Jerks Constant Rotation
KEEP PRESSURE VARIATION LESS THAN 2%

BEFORE AFTER



PadlWheel.bmp

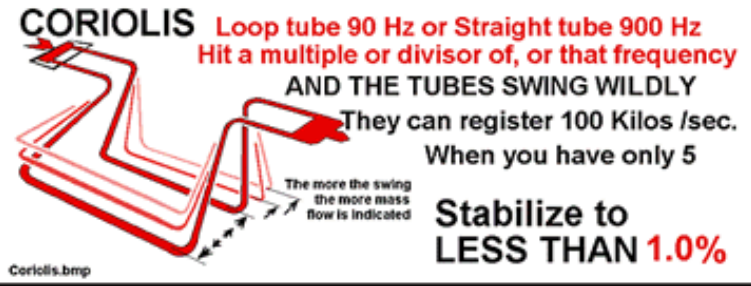
TURBINE SCREW METER "RATCHETING"
 KICK FROM PULSE STARTS THE SPIN WEIGHT OF SCREW BLADES & SHAFT KEEPS IT SPINNING, NEXT KICK GIVES OVERSPEED OR STOPS IT,
 SOON YOU HAVE NO ACCURACY
STAY LESS THAN 1.5%
 DEPENDING ON VISCOSITY



TurbMetr.bmp

FINE DAMPENING

CORIOLIS Loop tube 90 Hz or Straight tube 900 Hz
 Hit a multiple or divisor of, or that frequency AND THE TUBES SWING WILDLY
 They can register 100 Kilos /sec. When you have only 5
 The more the swing the more mass flow is indicated
Stabilize to LESS THAN 1.0%



Coriolis.bmp

NO NON-SENSE VORTEX SHEDDING
 VORTEXES, ARE MINUTE LOW PRESSURE ZONES AND ARE CREATED AT A RATE RELATIVE TO FLOW VELOCITY
 WITHOUT PRESSURE PULSATION "VORTEX SHEDDING" METERS WORK
GO LESS THAN 0.75 %

BEFORE [294.71] AFTER [75.5]



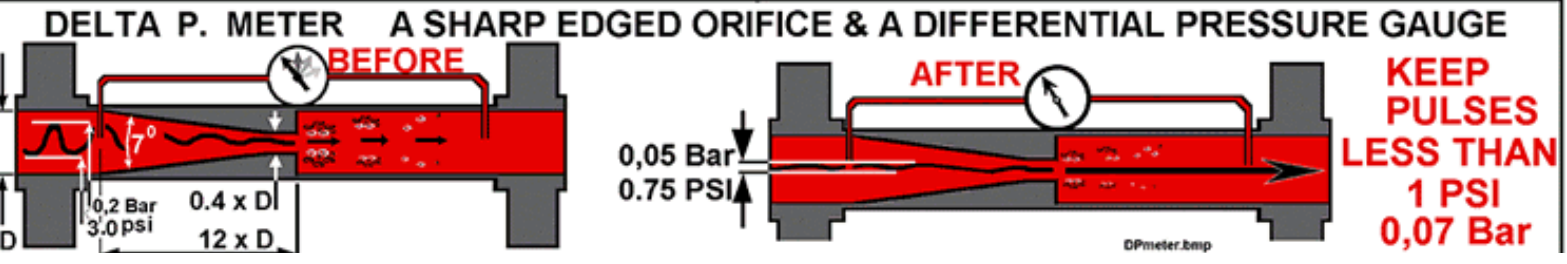
VortShed.bmp

DELTA P. METER A SHARP EDGED ORIFICE & A DIFFERENTIAL PRESSURE GAUGE

BEFORE AFTER

0,05 Bar 0,75 PSI

KEEP PULSES LESS THAN 1 PSI 0,07 Bar



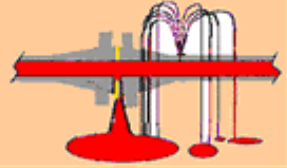
DPmeter.bmp

MECHANICAL DAMAGE PROTECTION

Pipe Shake, Fatigue, Weld Cracking, & Over Stress Unions, Flanges, & Fittings.



The level of allowable pressure pulsation, depends on three factors :
1. Diameter of pipe. 2. Operating Pressure. 3. Pulse Frequency.
A Nomogram - or " 3 axis Graph " - to help you specify allowable residual pressure fluctuation has been included.



Generally accepted levels of residual fluctuation percentage allowed, to protect against the average level of the problems listed.

COARSE DAMPENING

Stop Pump Parts damage, Gear tooth wear, chatter, and fracture, Drive belt slip, burn-out, and break-up, Cross-head, rod, and yoke deflection - Keep pressure variation less than 12%

Stop Weepage

Relief valve weeping, Surges causing premature lift, Fatigue cracking of burst disks - Keep pressure variation less than 9%

Stop Gauge Damage

Gauges don't read pulsation, Springy Zbourdon tube, rack, pinion, Wag at their own natural frequency. Without vibrations you read average steady state pressure - Keep pressure variation less than 6%

Incomplete Atomization

Stop goblets, drops and squirts, When you want a fine spraylift. Depending on viscosity and nozzle design - Keep pressure variation less than 5%

MEDIUM DAMPENING

Improve static mixing, Pulsed in un-mixed out, Pulseless in mixed outer lift - Keep pressure variation less than 4%

Make set frequency mag. Meters useable

Sample at any frequency - Keep flow fluctuation less than 3%

Stop Paddle wheel meter surging

Erratic jerks to constant rotation - Keep pressure variation less than 2%

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 - Stay less than 1.5% depending on viscosity

FINE DAMPENING

Coriolis, Loop tube 90Hz or straight tube 900Hz, Hit a multiple or divisor of, or that frequency, And the tubes swing wildly, They can register 100 kilos/sec when you have only 5, The more the swing the more mass flow is indicated - Stabilize to less than 1.0%

No nonsense vortex shedding

Vortex's, are minute low pressure zones and are created at a rate , Relative to flow velocity, Without pressure pulsation "vortex shedding" meters work - Go less than .75%

Delta P Meter a sharp edged orifice & a differential pressure gauge

Keep pulses less than 1psi (0.07 Bar)

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