# Water Leakage Summit Middle East

Singer Valve Inc.



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75% percent of the earth's surface is covered by water. 97.5% of this water is contained in oceans, hence salty and unsuitable for drinking or irrigation.

Of the remaining 2.5 % of freshwater, only 0.3 % is found in rivers and lakes, the rest is frozen in icecaps and glaciers and found in underground aquifiers



Cartoon from: Water & Sanitation Program of World Bank

# **Squeezing the Box – Real Losses**

#### The Principal Leakage Reduction Measures



**UARL** – Unavoidable Annual Real Losses – calculation based on main length, number of services, customer meter location and average pressure

- Consist of leakage from system and or overflows at storage tanks
- Causes include poor operations and maintenance, inadequate leakage control & poor quality of underground assets
- Commercial (Apparent Losses) or Unbilled Authorized Consumption

## **Pressure Management**



### Background Leakage

Un-reported and un-detectable using traditional acoustic equipment.

#### Tools

- Pressure stabilization
- Pressure reduction
- Main and service replacement
- Reduction in the number of joints and fittings

### **Un-reported leakage**

Often does not surface but is detectable using traditional acoustic equipment.

### **Reported leakage**

Often surfaces and is reported by the public or utility workers.

#### Tools

- Pressure stabilization
- Pressure reduction
- Main and service replacement
- Reduction in the number of joints and fittings
- Proactive leak detection

#### Tools

- Pressure stabilization
- Pressure reduction
- Main and service replacement
- Optimization repair time

## **Saving Water by Pressure Management**

- FACT A 1% reduction in pressure will result in an approximate savings of lost water of 1.15%
- FACT Many water utilities world wide are currently over pressuring their infrastructure!
- FACT Most water utilities do not fully understand the magnitude of their water losses unless they have done a complete water audit.



# **Reduce Pressure, Reduce Pipe Breaks** \*study by Lambert and Thornton

- Studied 112 systems in 10 countries, mains and/or service lines.
- Median of all data A 33% reduction on maximum pressure resulted in a 50% reduction in new pipe breaks!
- A 10% reduction in pressure will typically result in a mean decrease in pipe breaks of 14% (7 – 28%)
- Fact: Reduced Pressure = reduced pipe bursts!



### **Pressure Management Benefits**

- Leakage Volume Reduction <u>Lower Operating Pressures</u>
- Decrease in New Break Frequency <u>Lower Operating Pressures</u>



The lowest achievable night flow is reduced The rate of rise of unreported leakage is also reduced, leading to fewer economic interventions to find unreported leaks

# **DMA Overview**

- Ideal number of service connections within a DMA is 500 – 3000. Ideal number varies by consultant and system constraints
- Establishing DMA's is extremely difficult
- Single point feeds into a DMA is preferred for metering and pressure management purpose
- Key Criteria ease of establishing boundary & utilities criteria for detecting smallest leak



# Actual DMA - PRV & Metering Station Pre - Installation



### **Who Is Singer Valve Inc.**



- Canadian Company started in 1957 – Vancouver Canada
- Manufacturing in Canada with assembly and distribution points in Malaysia, USA, UAE
- Specializes only in Pilot Operated Diaphragm Control Valves & High efficiency strainers!
- Result based Solutions, Globally

## **Singer Valve Middle East**

- Business in the Middle East since the mid 1990's
- Location in UAE since 2005
- Large inventory locally in the GCC time zone
- Staff and Technical support locally
- Arabic, English, Hindi and Tagalog & Spanish spoken by Singer Valve Middle East team



## Local Support 24/7



- We specialize in advising and offering informed solutions
- Singer Valve has over 2500 designs for a variety of pilot systems and distinct solutions
- Performance Guarantee Present your problem in writing and the Singer engineering team will review and present solutions in writing and guarantee those solutions if within scope!

# Where can you find Singer Valve Solutions?

- DEWA Knowledge Village, UAE
- Tabreed Projects, UAE
- GTC 222 Qatar
- GTC 299 Qatar
- Holy Haram Makkah, KSA
- Riyadh Water Authority, KSA
- Salalah Water Authority, Oman
- Khalid Tower, Kuwait
- SEWA -Shawkat Project, UAE

- New York City DEP
- Toronto Waterworks
- K-Water Seoul S. Korea
- Selangor Kuala Lumpur
- MWA Bangkok
- Brisbane, Australia
- Los Angeles, California
- Reykovick, Iceland
- Barcelona, Spain
- Gliwice, Poland
- Vancouver, Canada
- DeBeers Mines, South Africa

### **Known as Innovators - Worldwide**

- All Valve 150 mm to 1200 mm use only Single Rolling Diaphragm Technology!
- Used since 1980's
- Reliable stable flow, even at the lowest flows as opposed to flat diaphragms.
- No Bypass Valves Require for lower flows!
- Ideal for DMA's & night flows!
- Single Rolling Diaphragms!



# Pressure Management Valves Ideal for Waterloss and DMA Applications

Variety of Models Different Features & Benefits

### **Standard Pressure Reducing Valve**

- One pilot & one pressure setting, manually adjusted, reliable
- Adjusted pressure on downstream remains constant and does not fluctuate with upstream pressure changes.
- Requires 10 psi (.6 bar) minimum pressure differential across valve to function most effectively
- In developing countries if inlet pressure drops below 10 psi (.6 bar) at high demand, valves will start to close due to the weight of the moving parts and closing spring (if fitted)



### **Low Pressure - Pressure Reducing Valve**



- Small PRV pilot controls pressures at low flow, high pressure periods
- Large modified altitude pilot allows main valve bonnet to vent to atmosphere at high flow, low pressure periods – main valve opens fully on manually adjusted low pressure set point.
- Minimal pressure loss through valve at high flows
- Main valve opens fully even with pressures as low as 2 psi (.13 Bar)

# Time Based PRV's – Two Set Points Battery Operated

- Battery Operated (2 9V DC batteries) – low voltage, simple!
- Latching solenoid with very little electrical draw
- Submersible (IP 68 rated electronics)
- Batteries must be changed annually
- Economical and ideal if power is not available





# PRV's – Self Adjusting Pressure Based on Flow (Flow based pressure modulation)

- Set the lowest night time pressure for the critical point, then set your pressure increase required for day time flow
- 100% mechanical, no electronics
- Pilot responds to flow-increasing pressure at high demand and lowering pressure at low demand
- Requires approximately 3 bar (45 psi) minimum pressure at inlet
- Can increase pressure by up to 2 bar (30 psi) downstream depending on flows and pressure differentials
- Pressure ranges adjustable
- Patented!





# **Third Party Controls - PRV**

- Numerous Third Party Manufacturers Worldwide have used their equipment very successfully on Singer products for time based control or flow/pressure modulation!
- I2O
- Technolog
- Halma/Palmer
- And many more!



# PRV – Motor Driven Pilot Interfacing with SCADA (4 – 20 mA) – remote pressure control

- 24 VDC (AC Option available)
- Pressure and flow transmitters can be used in each DMA to relay real time data to Scada
- Motor device interfaces with adjustment on pilot
- Slow RPM (1 rpm/minute)
- Power failure results in constant pressure at last setting
- Submersible IP-67 or 68
- Continuous adjustments of flow based on changing pressures – Flow Modulation





# **Metering Ability & PRV in One Valve!**

- New Technology Insertion Electro Magnetic Meters – Accuracy 2% Full Range or Better! Fully NIST Traceable! Proof of accuracy!
- Exclusive Partnering with McCrometer USA!
- PLC based control with solid state electronics
- Can be programmed to control multiple processes (e.g. combination Reducing, Sustaining, Level Control and Flow Control, etc.) & Metering!
- Eliminate Numerous valves, Save Space!





# Pressure Relief, Pump Control & Altitude

All Relate to NRW, Waterloss and Leakage!

## **Pressure Relief and Surge Anticipating**

- Can Quickly Open and Discharge Pressure if pressure above or below operating pressure range.
- Ideal for power loss, surge and transients
- If sized and selected properly can help reduce or eliminate surge, pipe bursts and over stressed pipes!



## **Pump Control (Single Speed Motors)**



- Allows Pumps to start slowly and shut down slowly.
- Not required usually on VFD's but should be considered on Single Speed Motors!
- Can avoid surges and transients associated with pumps starting and stopping!

## **Altitude Valves & Overflowing Tanks!**

- Altitude Valves are Repeatable within centimeters and very Accurate!
- 100% mechanical, no electronics required
- Many advantages over traditional float valves – all service at ground level, not in the tank!
- If using level sensors and electronics, can use as a mechanical backup in the event of power outage!





# Singer Valve Introduces the New ZS Strainer



- 80, 100,150 & 200 mm
  Strainers
- Greatly Reduced Lay lengths
- Reduces Chamber Sizes
- Z style Strainers for greater strainer surface area
- Gage Taps to monitor differential pressures and indicate flushing times
- Two flushing ports

# Thank you!

