Valve & Hydrant Group

THREE COMPANIES = ONE TEAM

FIRE HYDRANT PRESSURE MONITORING BASIC TRAINING

History

17th – 18th centuries (larger cities)

- Society required more advanced fire protection systems

Piping systems put in place

- Hollowed out wooden logs
- Dug down, split the wood, repaired with a “fire plug”

Canvas cisterns were used to fuel bucket brigades

19th Century (Improvements)

Cast iron replaces wood pipes

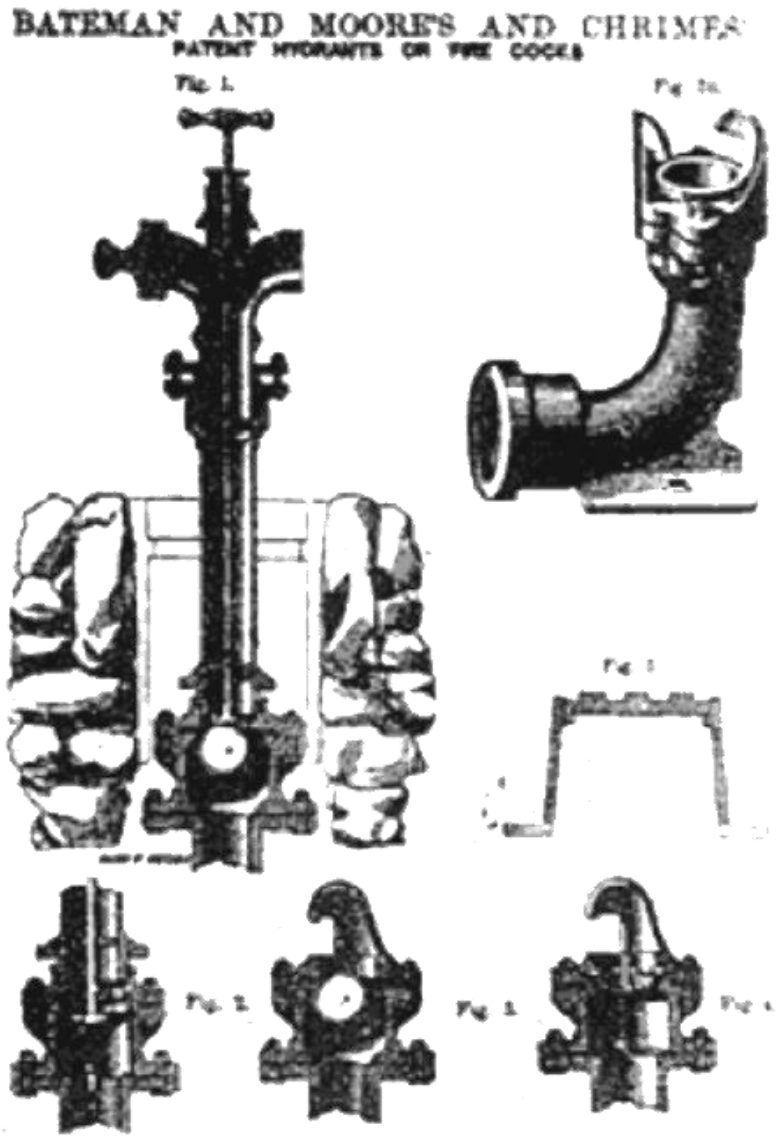
New need for foundries

More permanent connection sites are required

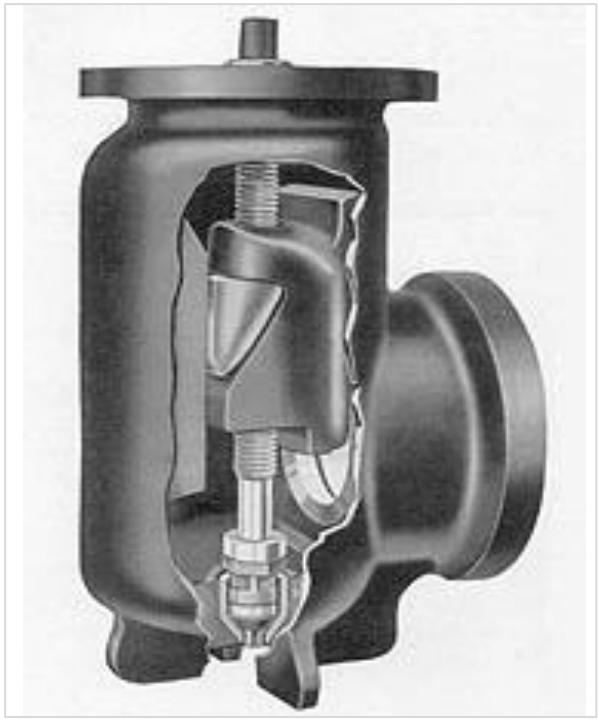
- Tees
- Standpipes
- Valves
- Pumps

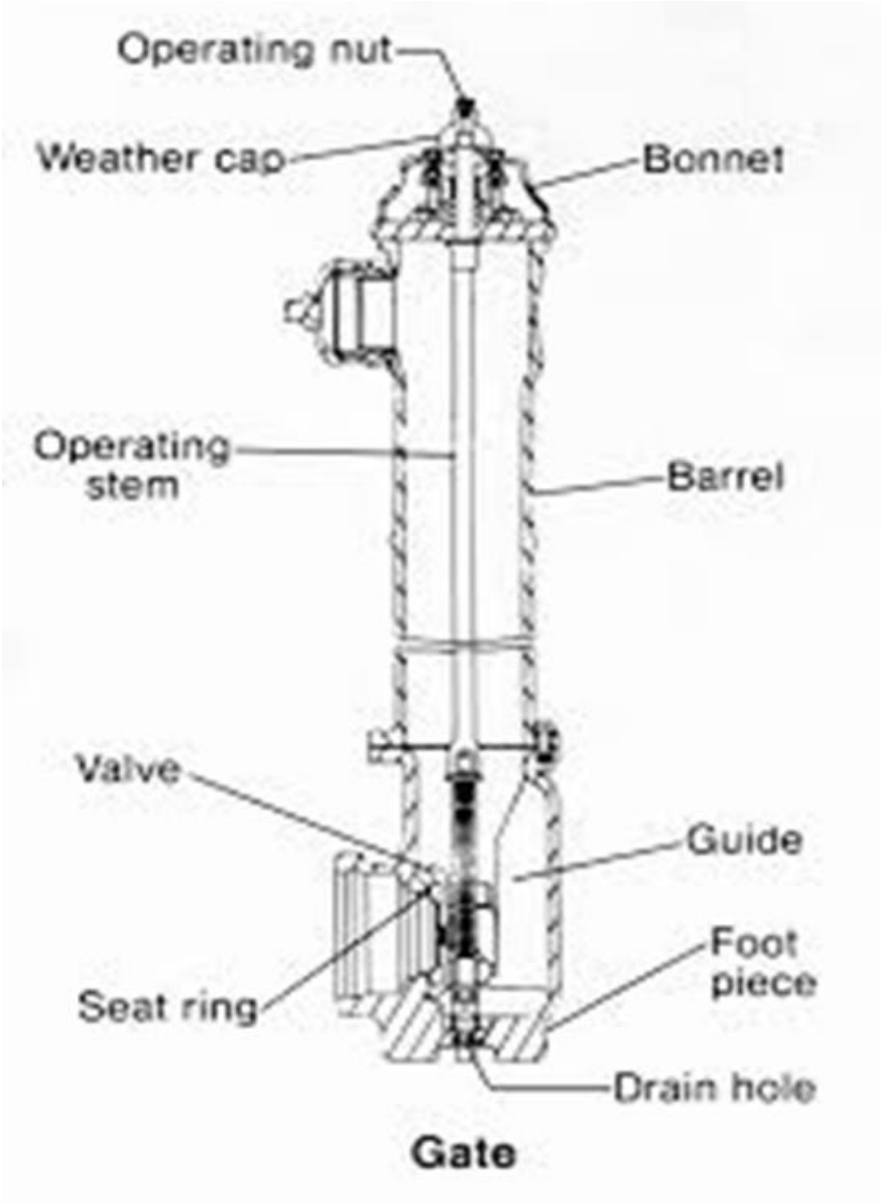
Ball Hydrant — patented 1850s

A ball is moved downward, which allows for the flow of water



20th Century (Improvements)





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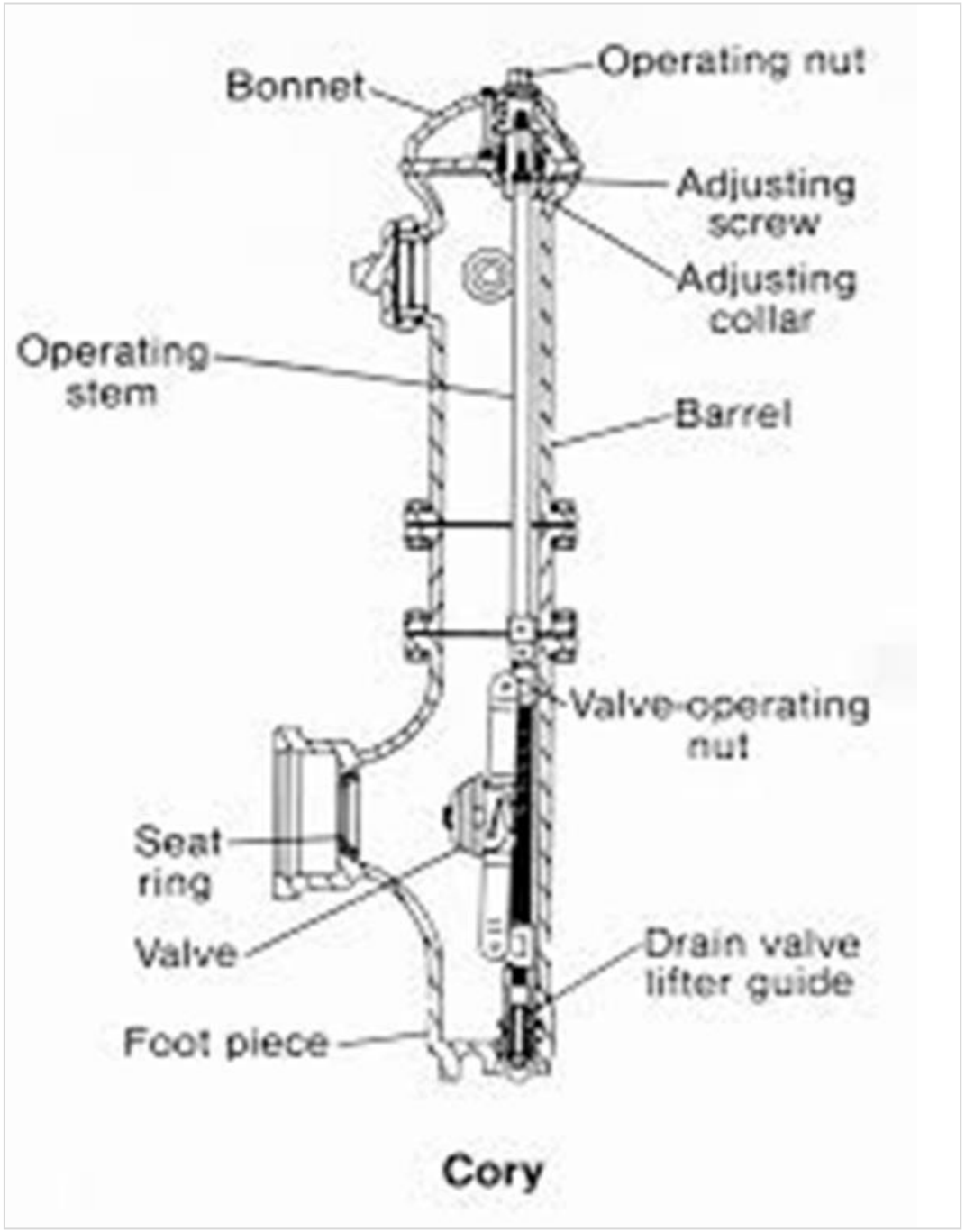

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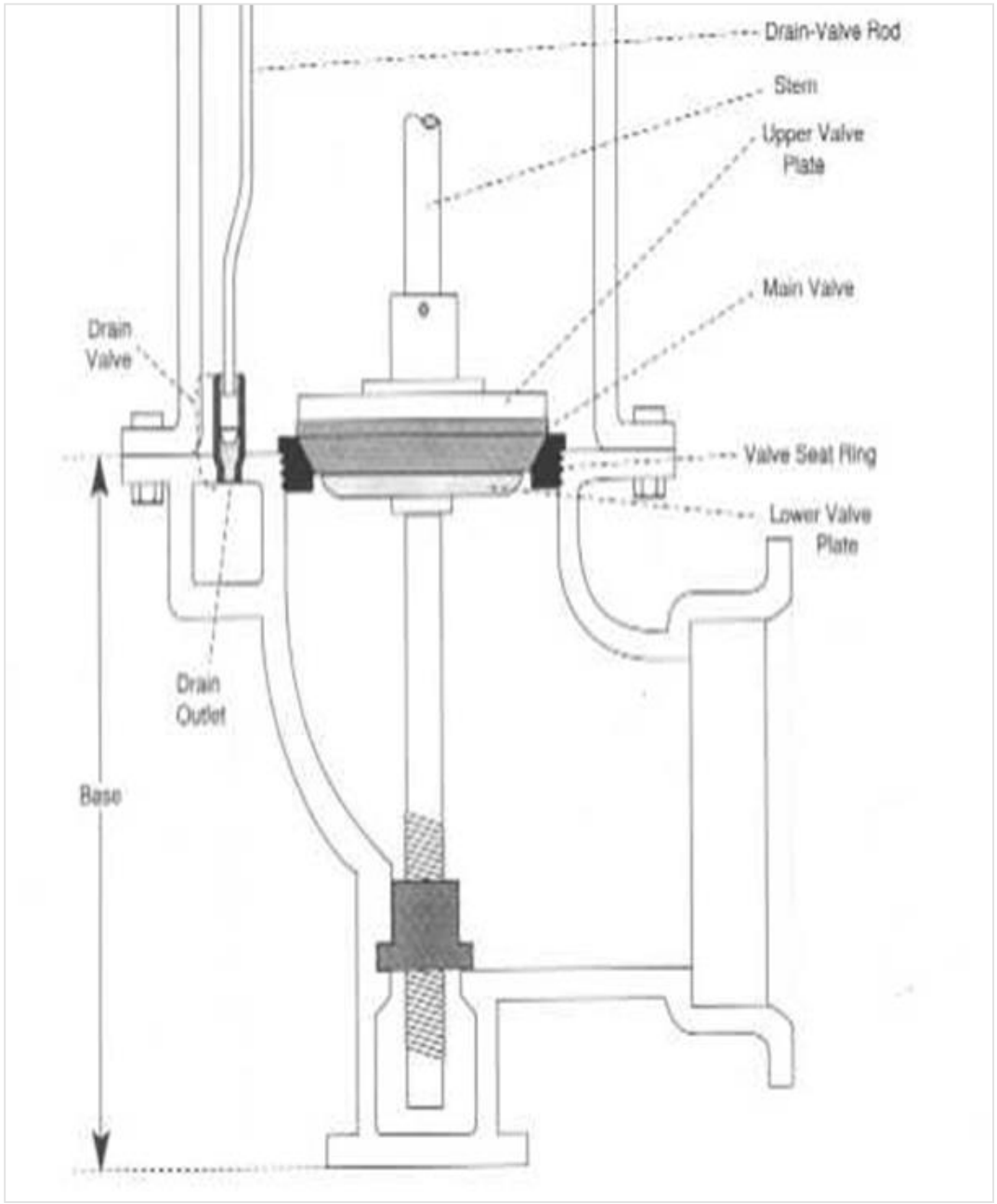

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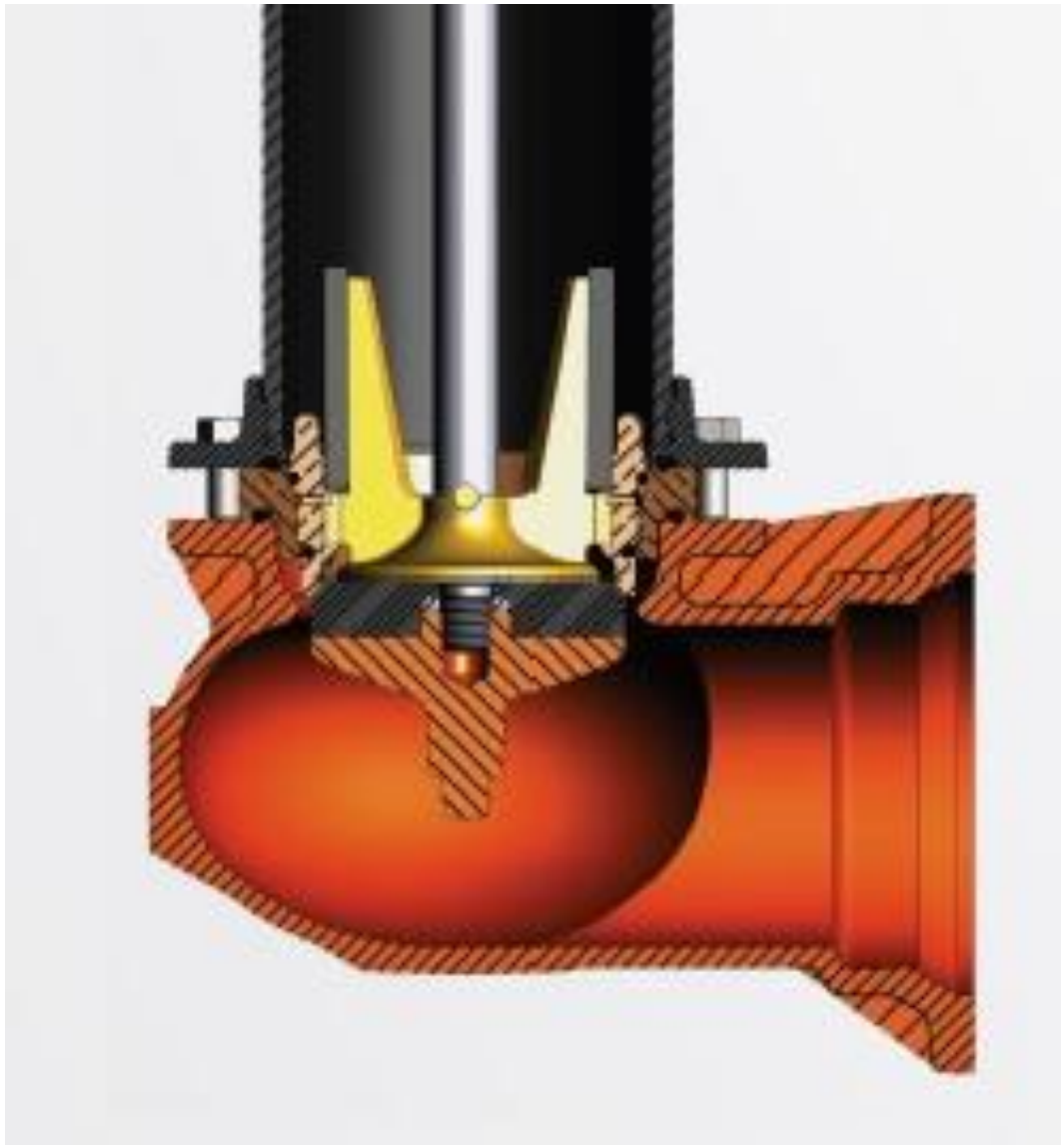
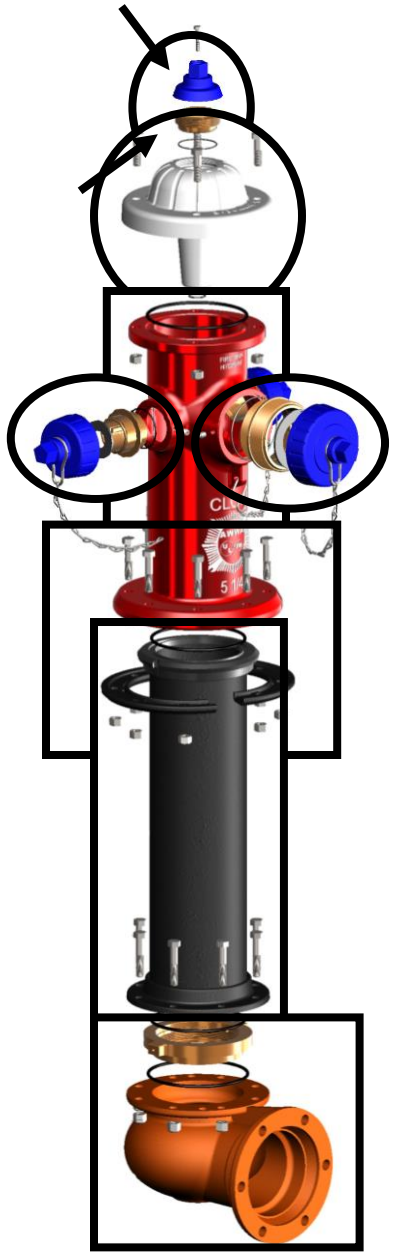
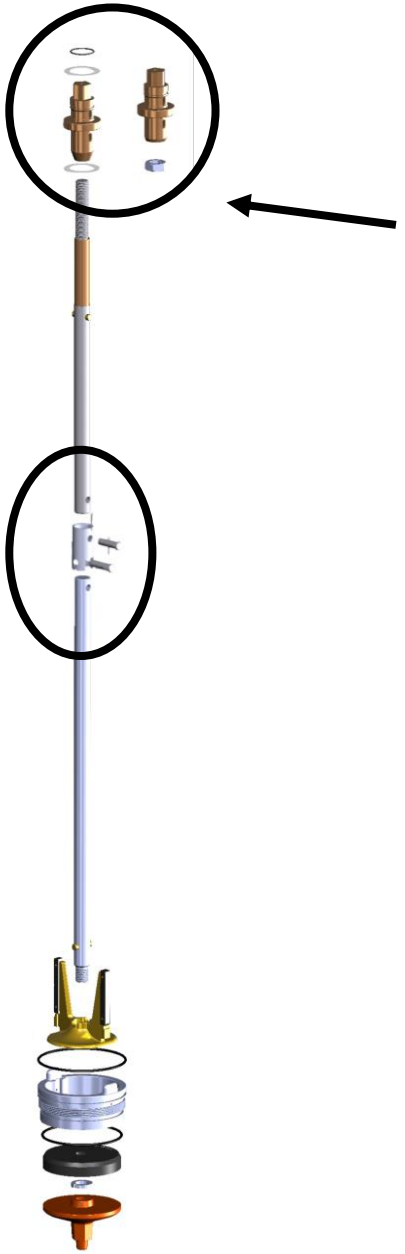


FIRE HYDRANT DAMAGE ALMOST ALWAYS STARTS WITH THE MAIN SEAT RUBBER!

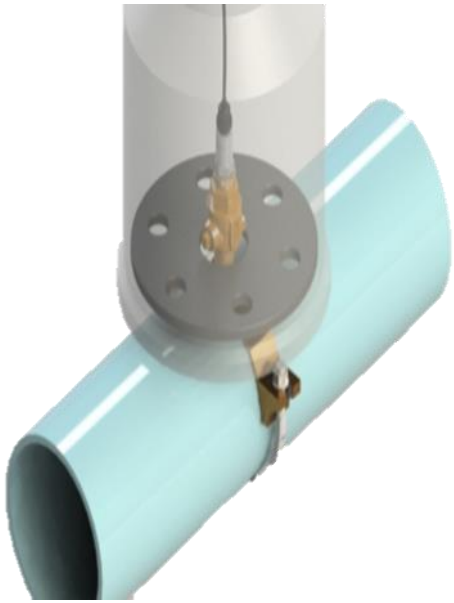
Fire Hydrant Components

- Operating nut
- Weather shield
- Thrust nut
- Travel stop nut (optional)
- Bonnet (cover)
- Nozzle section
- Pumper nozzle & cap
- Hose nozzles & caps
- Break flanges
- Lower barrel/standpipe
- Shoe/Boot/Bottom
- Break (traffic) coupling
- Break-away/solid bolts





Pressure Monitors (The Past)



Pressure Monitors (The Future)

Why Pressure Management?

Maintaining pressure within an optimal range within the entire water distribution system.

Effective pressure management can…

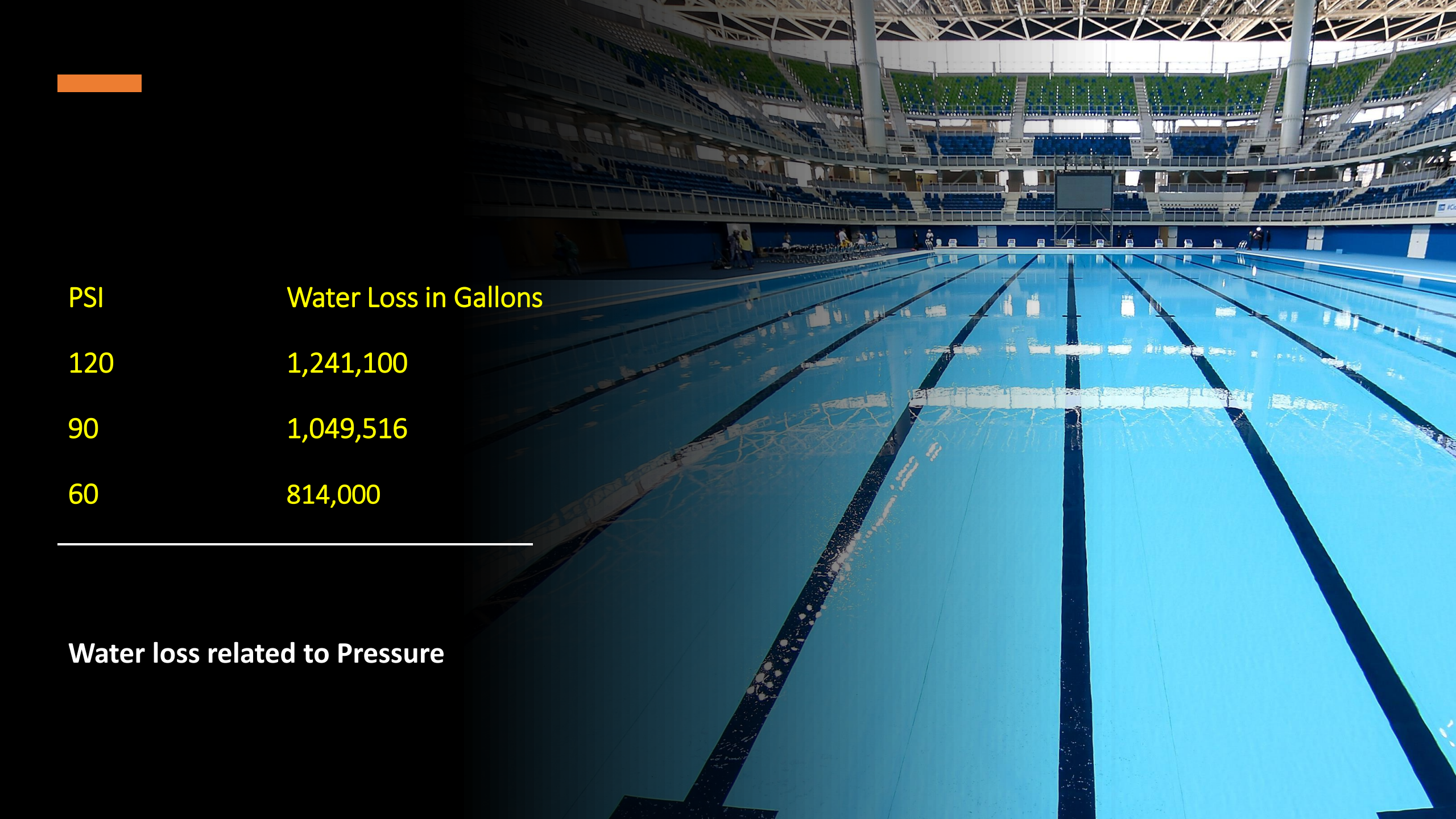
Reduce Energy Costs by 20-40%

Reduce Water Loss by 40%

Reduce New Breaks by 53%

Reduce risk of water contamination

Reduce consumer disruptions



PSI	Water Loss in Gallons
120	1,241,100
90	1,049,516
60	814,000

Water loss related to Pressure

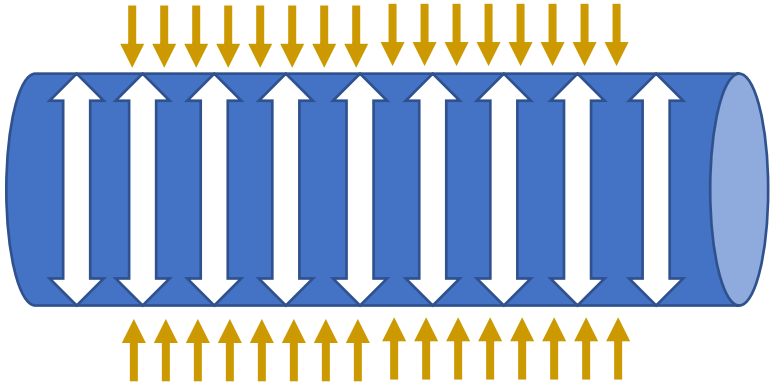
When Pressure is too high…

- Increases stress on water pipes, reducing lifespan of infrastructure
- Increases water loss
- Increases main breaks, new leaks

When Pressure is too low…

- Risk meeting state mandates for fire fighting
- Customer Complaints
- Risk compromising water quality

How does Pressure affect water quality?



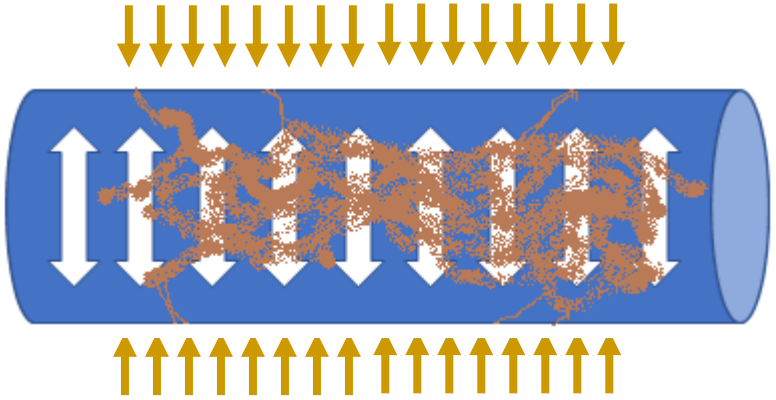


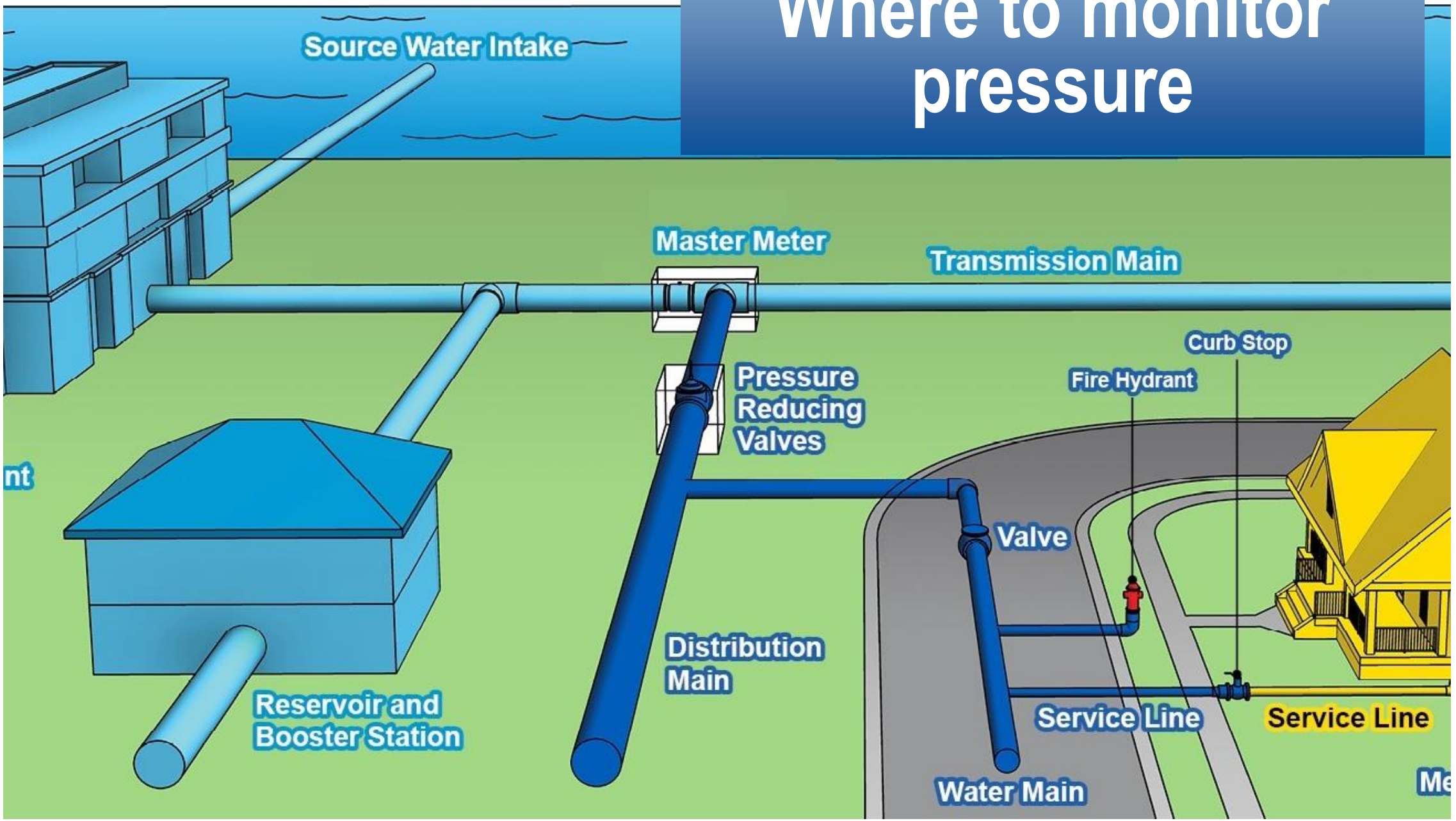
Figure 4. Leaky water pipe laid next to a sewer pipe
(Source: Opflow 1999)

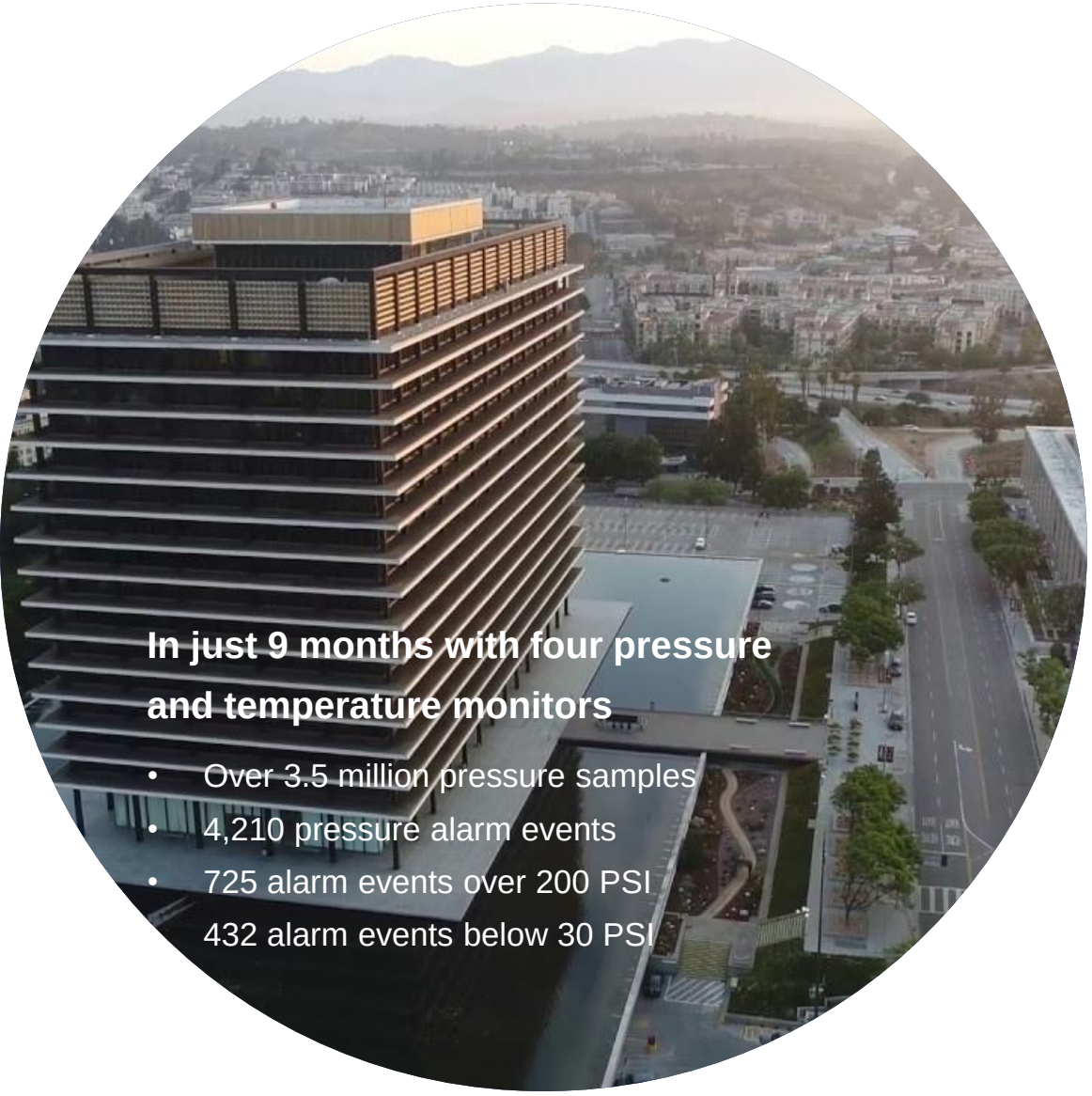
EPA boil advisory <20 psi over an hour

What affects pressure?

- Demand
- Topography
- System Design
- Inlet Pressure
- Pipe Size and Condition
- Operating practices
- Distance
- Flow Rate
- Storage Tanks

Where to monitor pressure

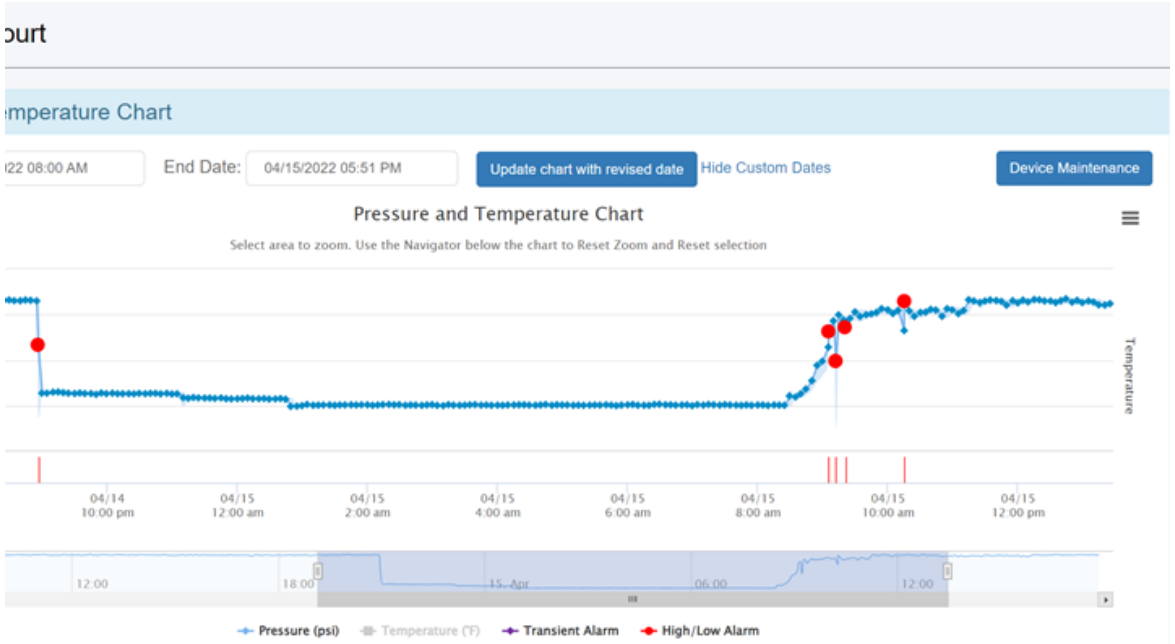




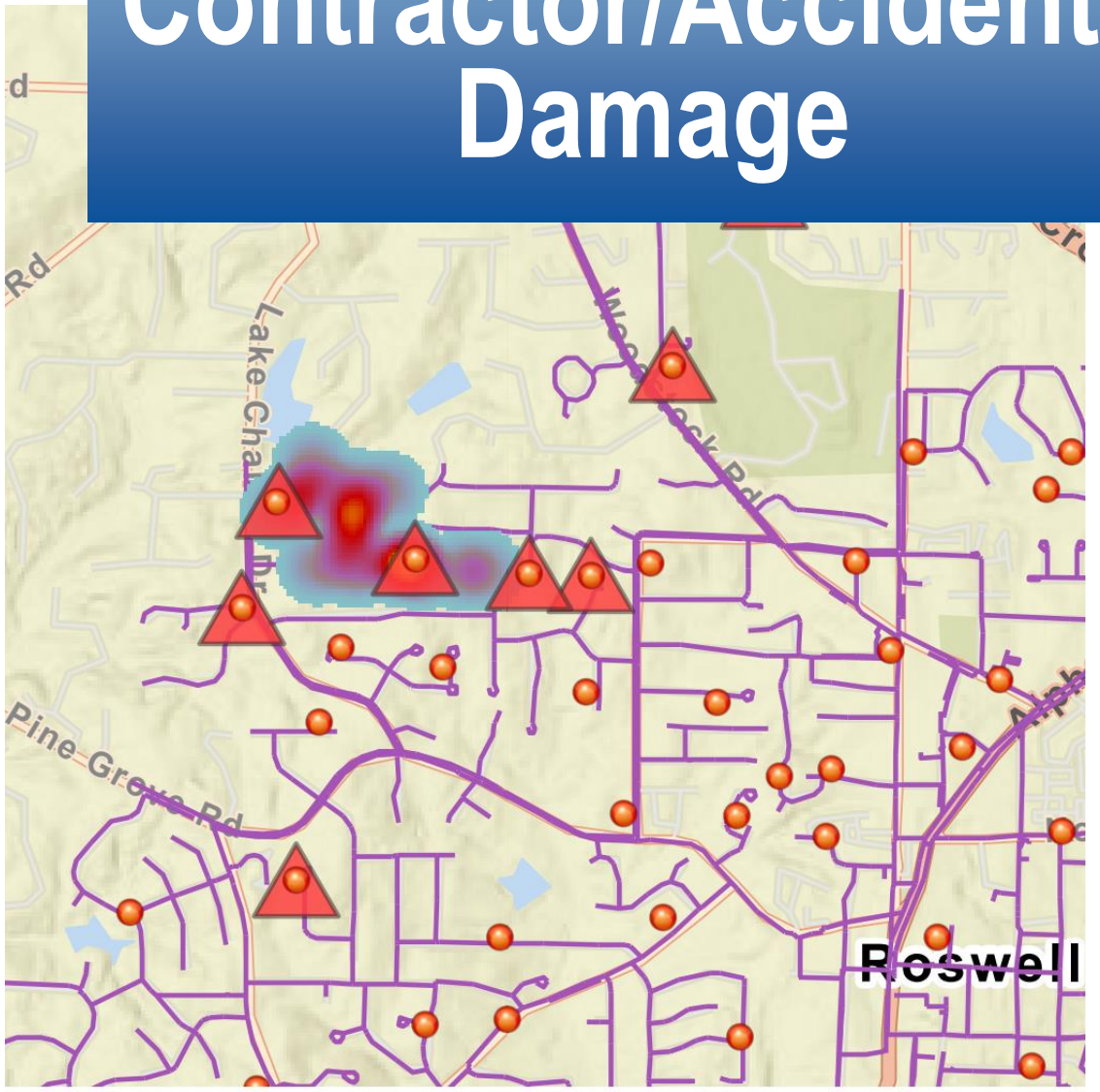
System Optimization

- Actuators
- Pressure Reducing Valves (PRVs)
- Pump Optimization
- Control Valves
- Variable Frequency Drives

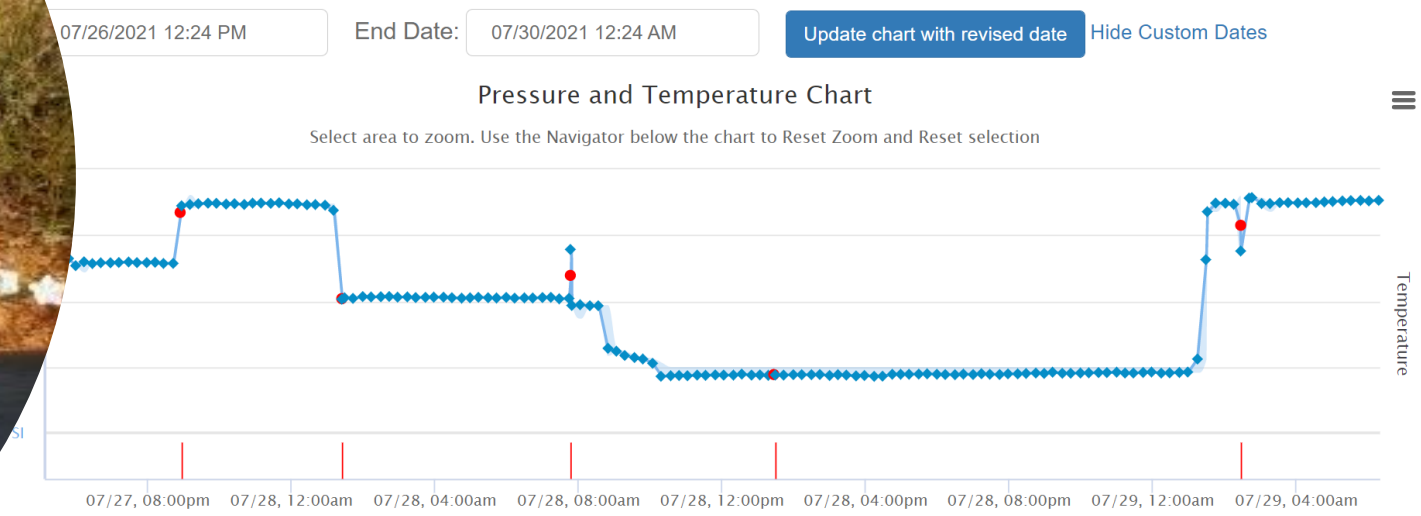
Benefits of Real Time Pressure data



Contractor/Accidental Damage



Monitor Remote transmission lines

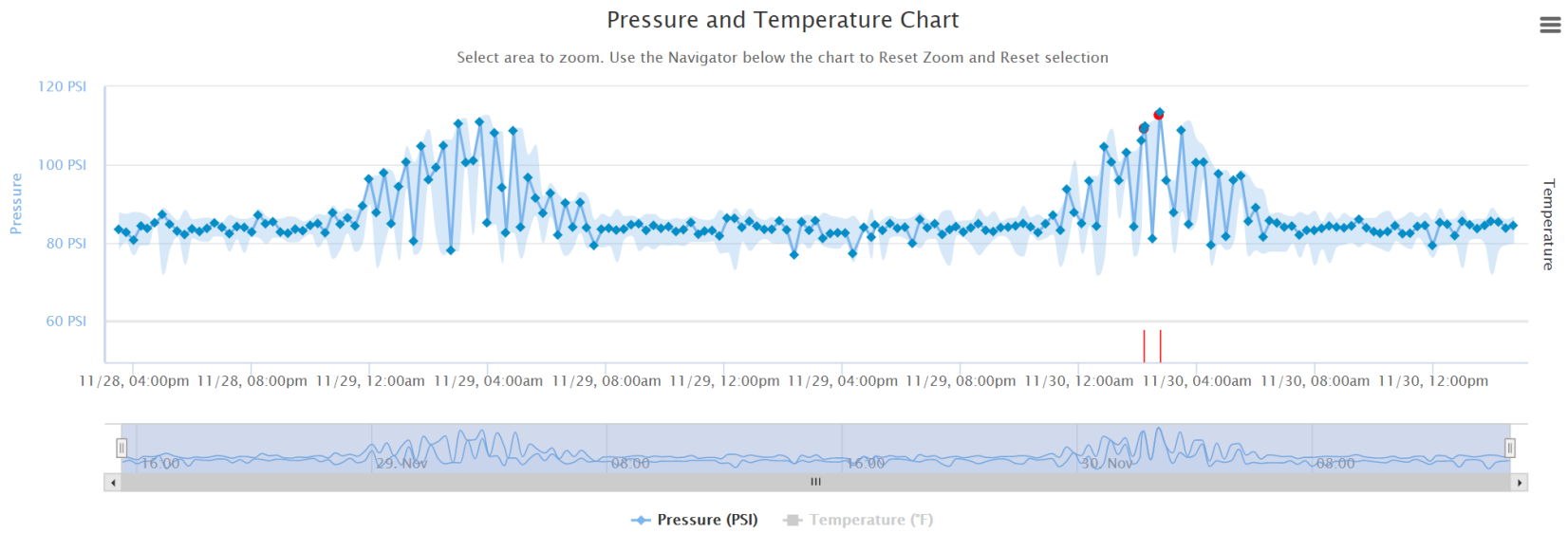


Pressure Reducing Valve Failure

95 Circuit Ave

Pressure & Temperature Chart

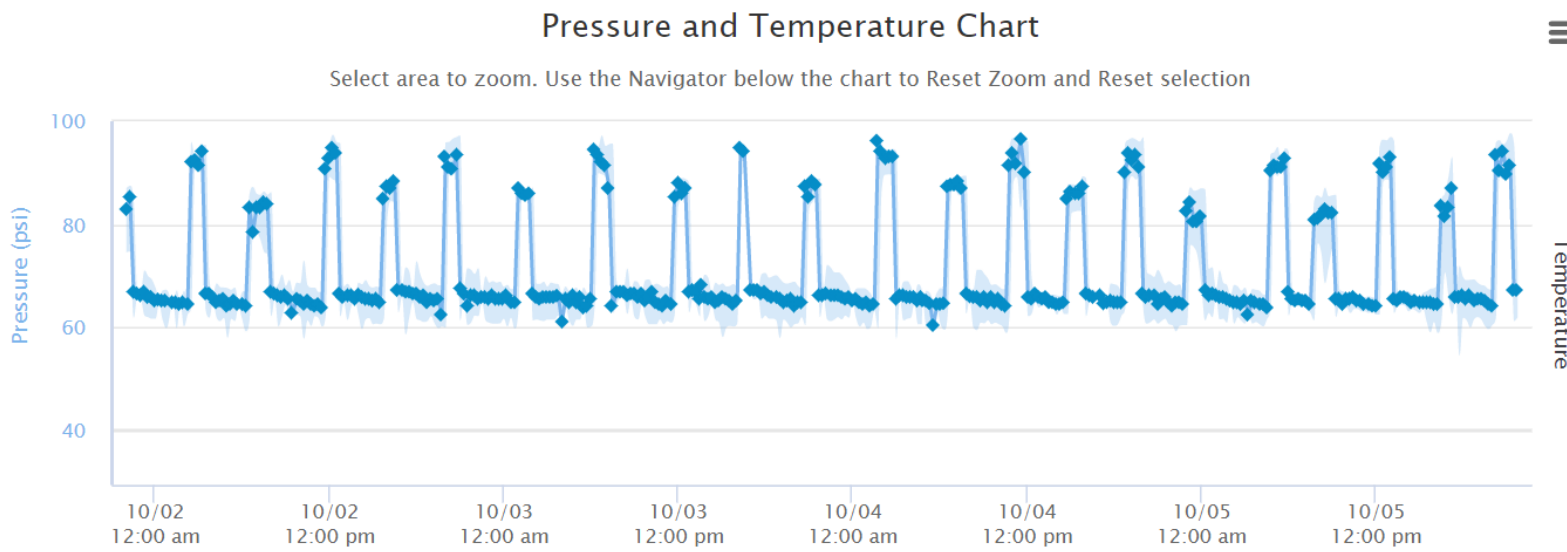
Select Duration: 2 day(s). Custom Dates



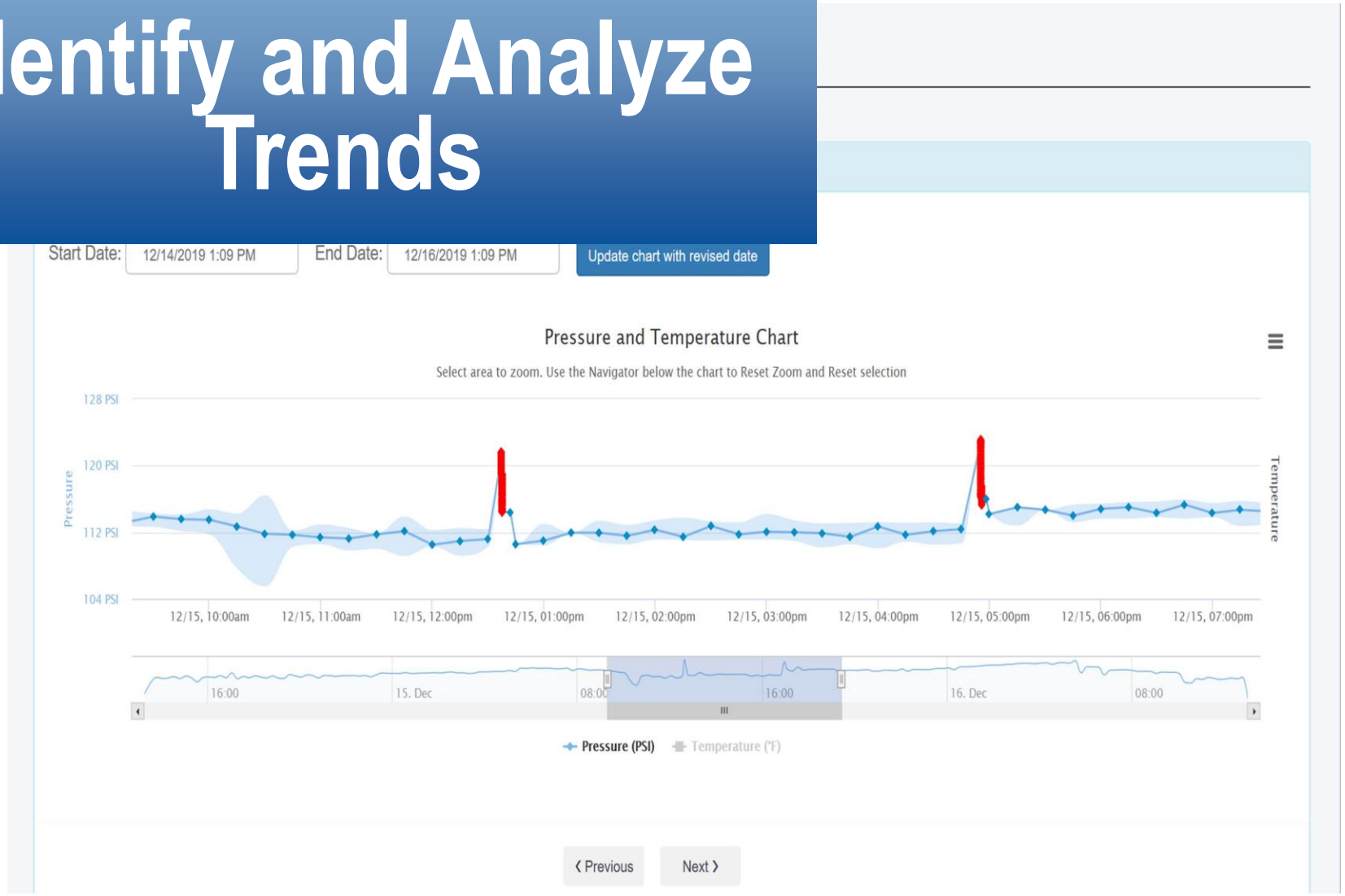
Variable Frequency Drive Malfunction

Pressure and Temperature Chart

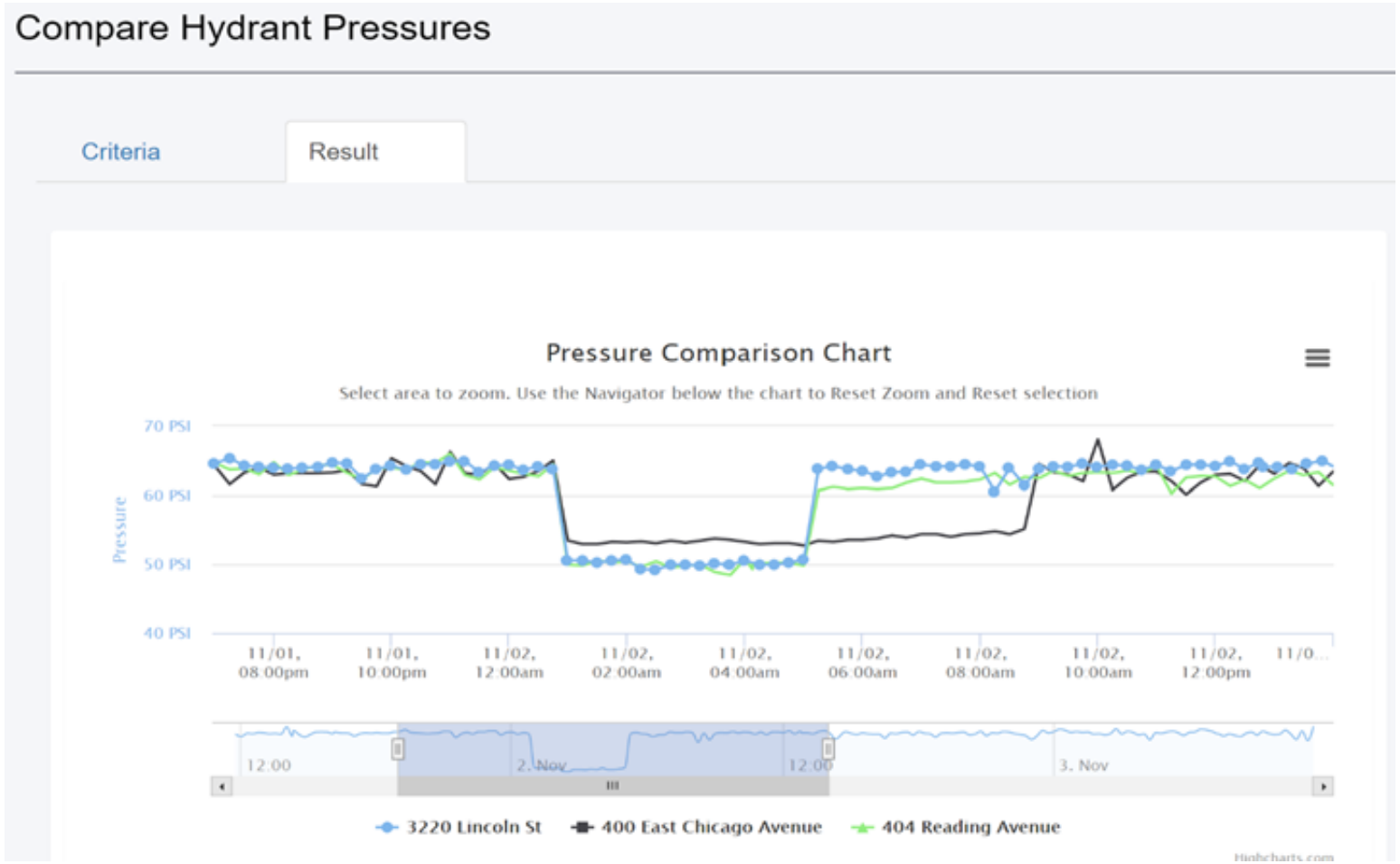
Start Date: 10/01/2020 05:57 PM End Date: 10/05/2020 05:57 PM Update chart with revised date Hide Cus



Identify and Analyze Trends



Identify unknown issues



Challenges with Pressure Monitoring

Lift and shift

Challenges with Pressure Monitoring

- **Devices that require digging or tapping a pipe**

Challenges with Pressure Monitoring

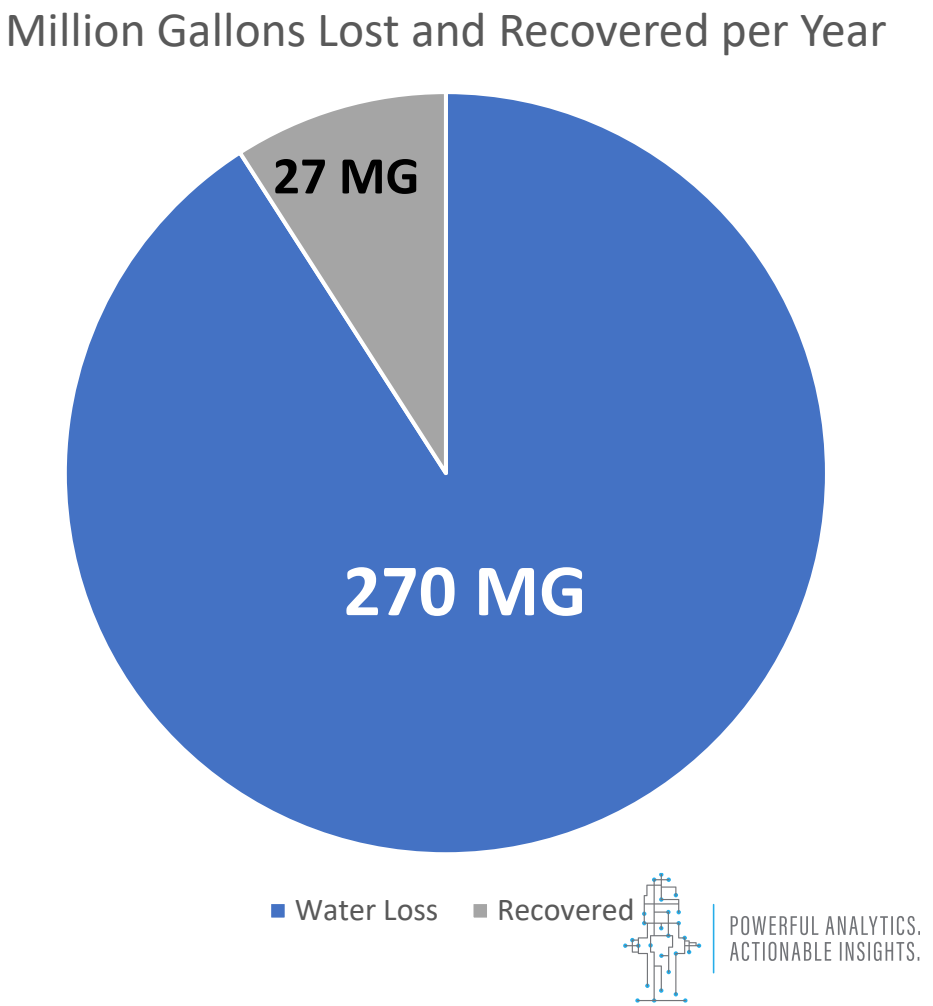
Communication

Challenges with Pressure Monitoring

- Interferes with normal hydrant operation

Water loss recovery

Total supply	1,329 MG
Water loss at 20.3%	270 MG
Production cost	$1,041/MG
Main Breaks	50 per year
Water loss on 6hr 8” main break	977,346 Gal
Water loss savings 1 hr	163,000 Gal
Prevented 25 main break savings	$212,900
10% Water Loss recovery	$ 28,100
Annual Savings	**$241,000/yr**



iHydrant

POWERFUL ANALYTICS. ACTIONABLE INSIGHTS.

In Hydrant Pressure Monitoring IS the FUTURE, but this will necessitate the need to approach repairs with more knowledge.

Delicate Components

Polycarbonate Covers

Sensors & Unique Parts

Electronics & Batteries

Internal Wiring & Cables

Questions?