



A paradigm shift in Intermittent Water Supply: The Downstream Control Concept

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inspiring change

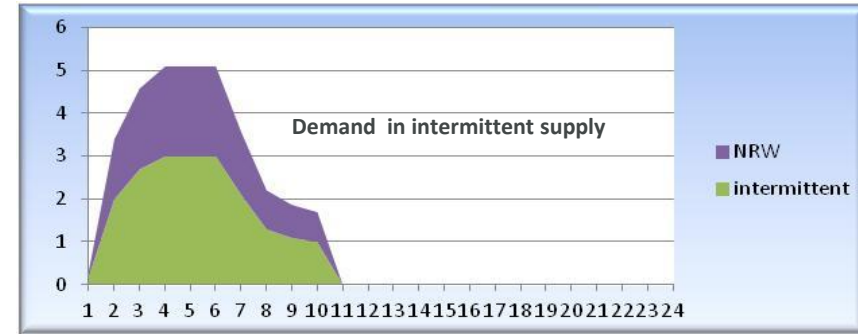
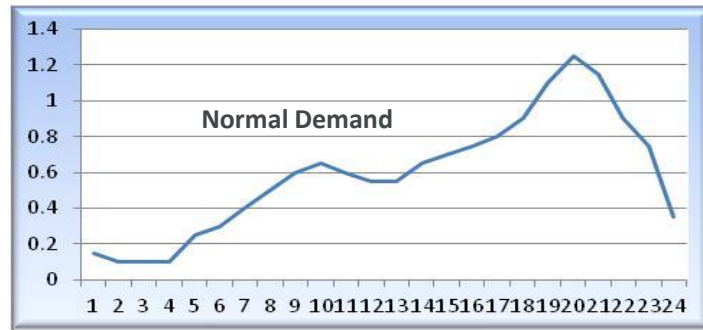


WATER SHORTAGE POSES A REAL CHALLENGE

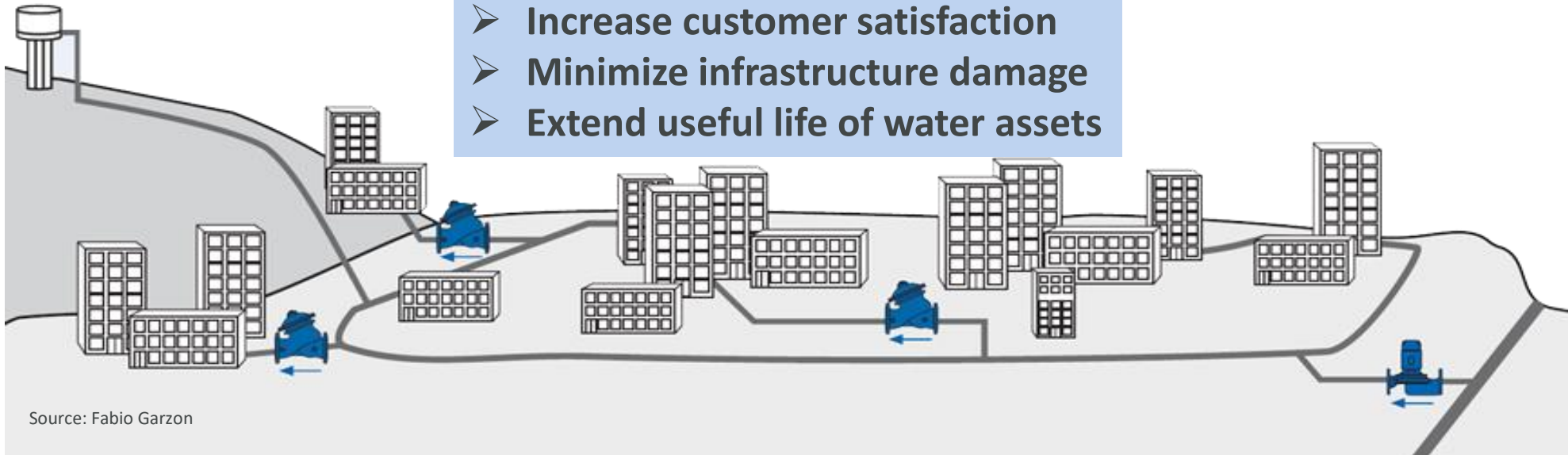
When attempting to transition from IWS to 24x7:

- Water supply may not be sufficient to fulfil customer demand.
- Leakage reduction may not provide the additional quantities needed.
- Controlled rationing becomes a plausible option.

IMPROVE IWS CONDITIONS – TAKE CONTROL OF THE TRANSMISSION & DISTRIBUTION SYSTEMS



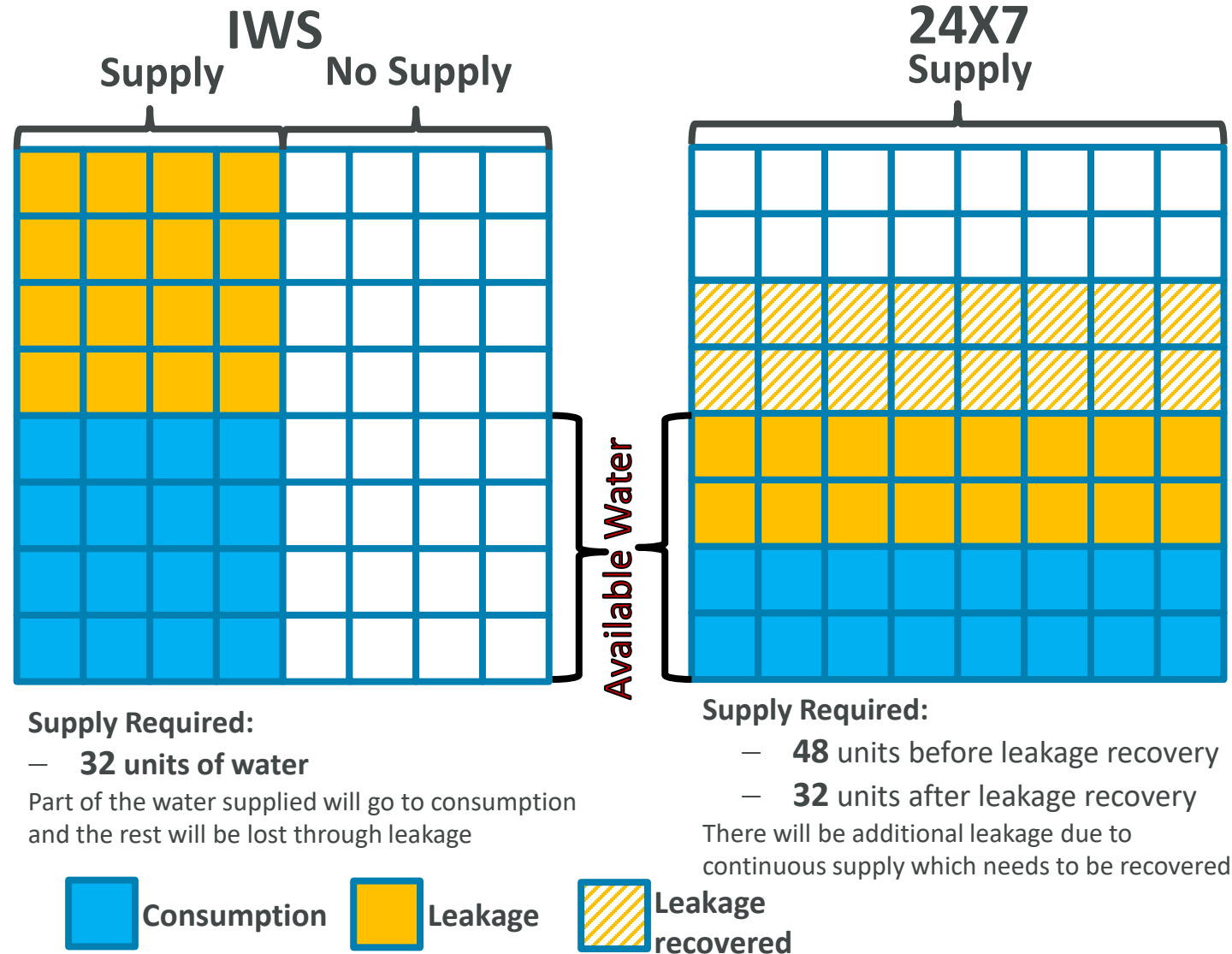
- Eliminate pipe refill time
- Reduce operational costs
- Increase customer satisfaction
- Minimize infrastructure damage
- Extend useful life of water assets



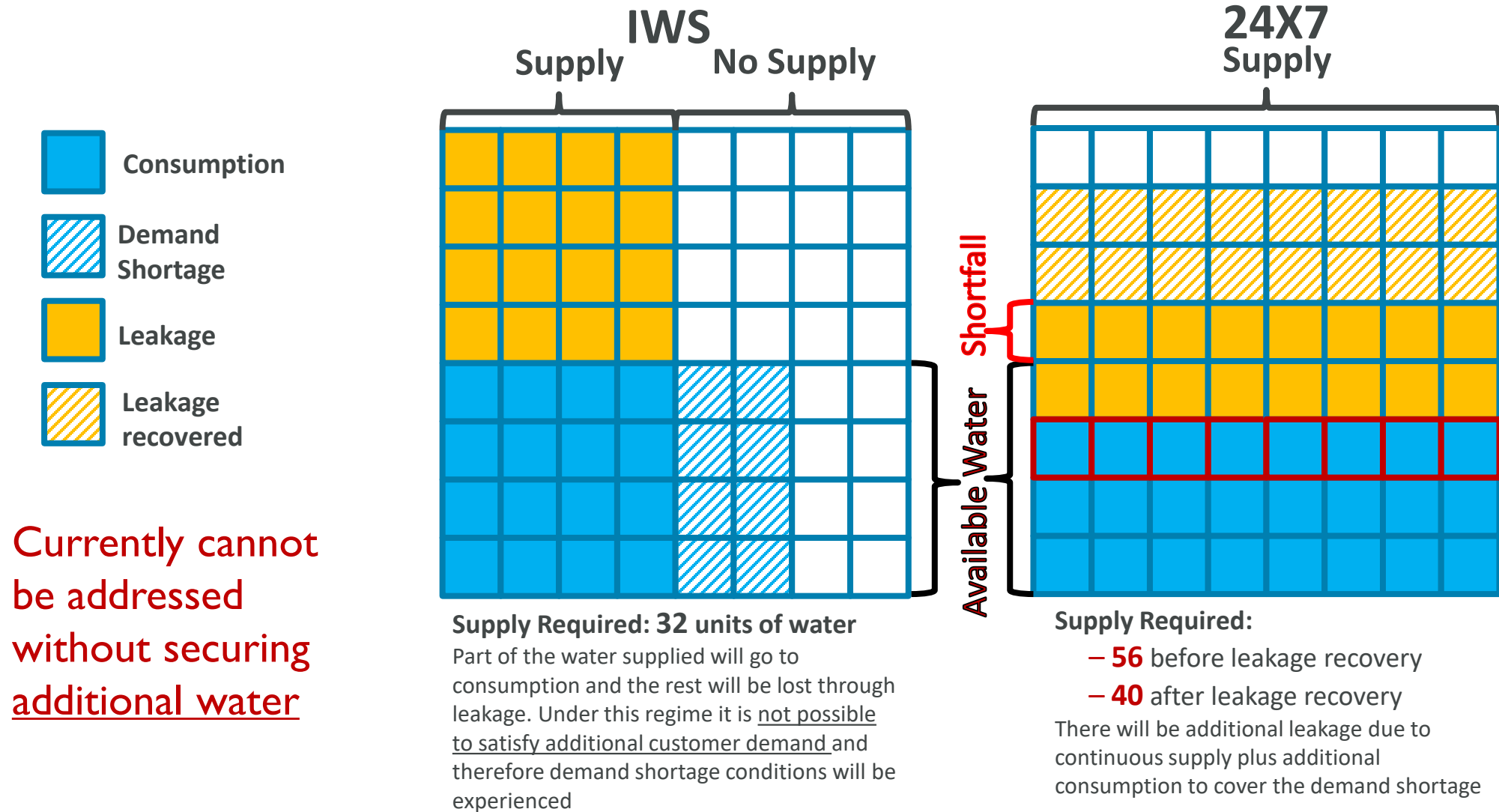
TRANSITION FROM IWS TO 24X7 – AN “IDEAL” SCENARIO

IMPORTANT:

- Consumption remains the same in both cases
- Water supply needed remains the same (and often lower)



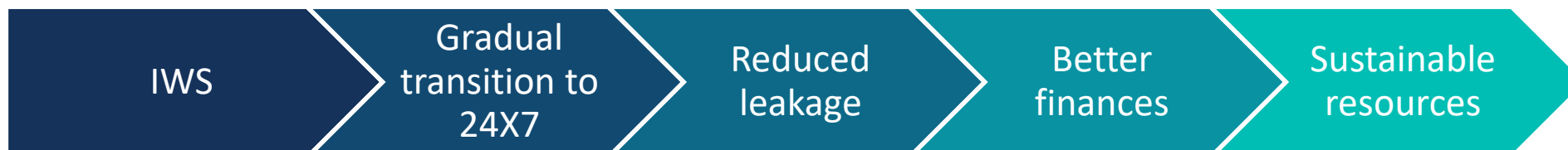
TRANSITION FROM IWS TO 24X7 –THE “DIFFICULT” SCENARIO



Currently cannot be addressed without securing additional water

WHAT IS DOWNSTREAM CONTROL (DSC)?

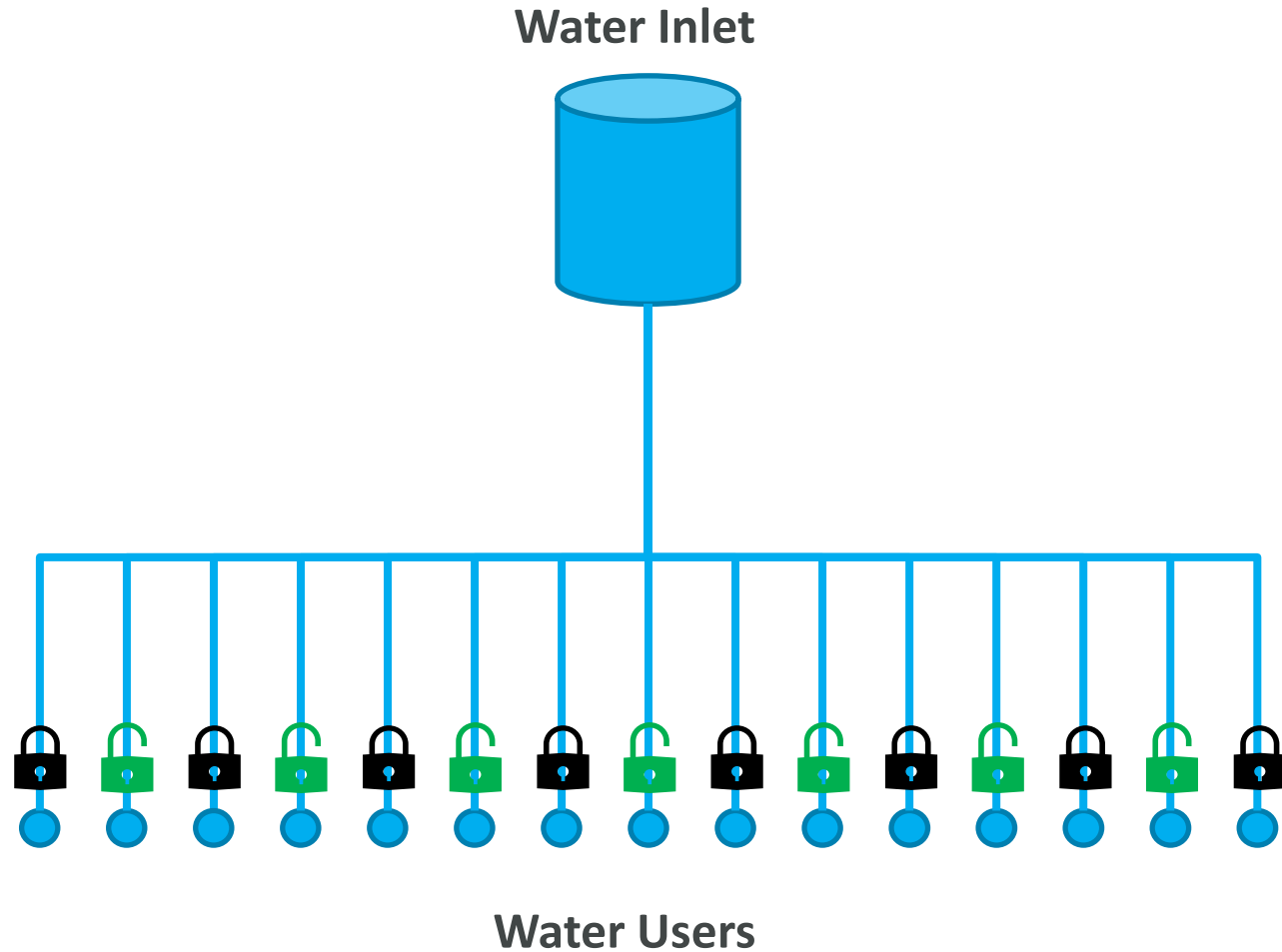
- **DSC is a concept that enables control of the water supply at the user end.**
- It is **a solution that could facilitate transitioning** from IWS to 24X7 even when additional water supply cannot be allocated at present.
- Additional water supply could later be allocated from **leakage reduction activities** as more network areas are transitioned into 24X7 thus **gradually taking control of the system.**
- More **financial resources** could be afforded given the **operational efficiency improvements** achieved in transitioning to 24x7 supply.
- **It offers the needed push to help utilities out of the vicious cycle of IWS.**



TIME OR QUANTITY CONTROL

DSC allows for water rationing by:

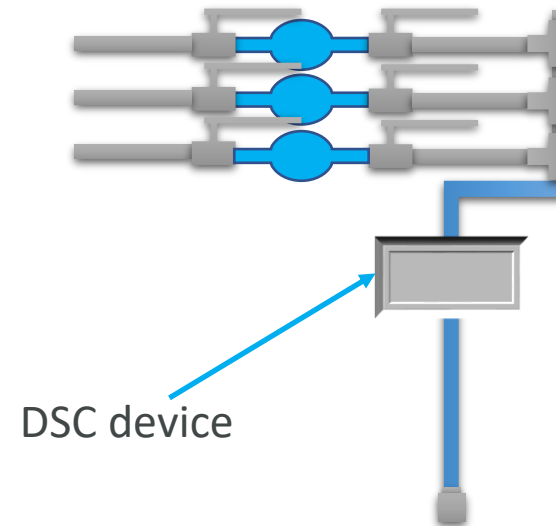
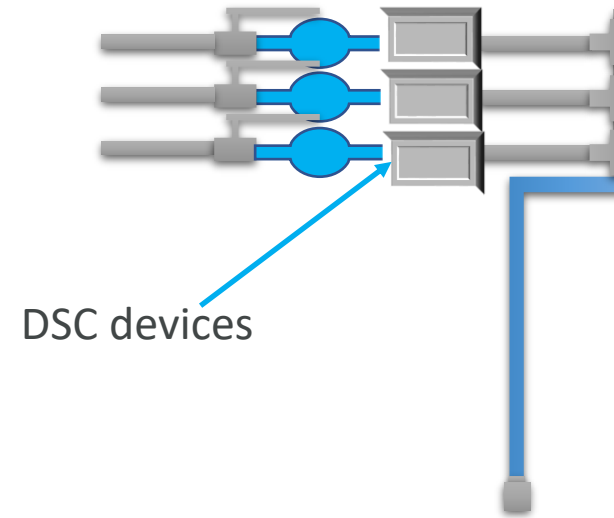
- **Time:** Local or remote control depending on time of day
- **Quantity:** Allocation of water quantity per customer



DEVICE INSTALLATION

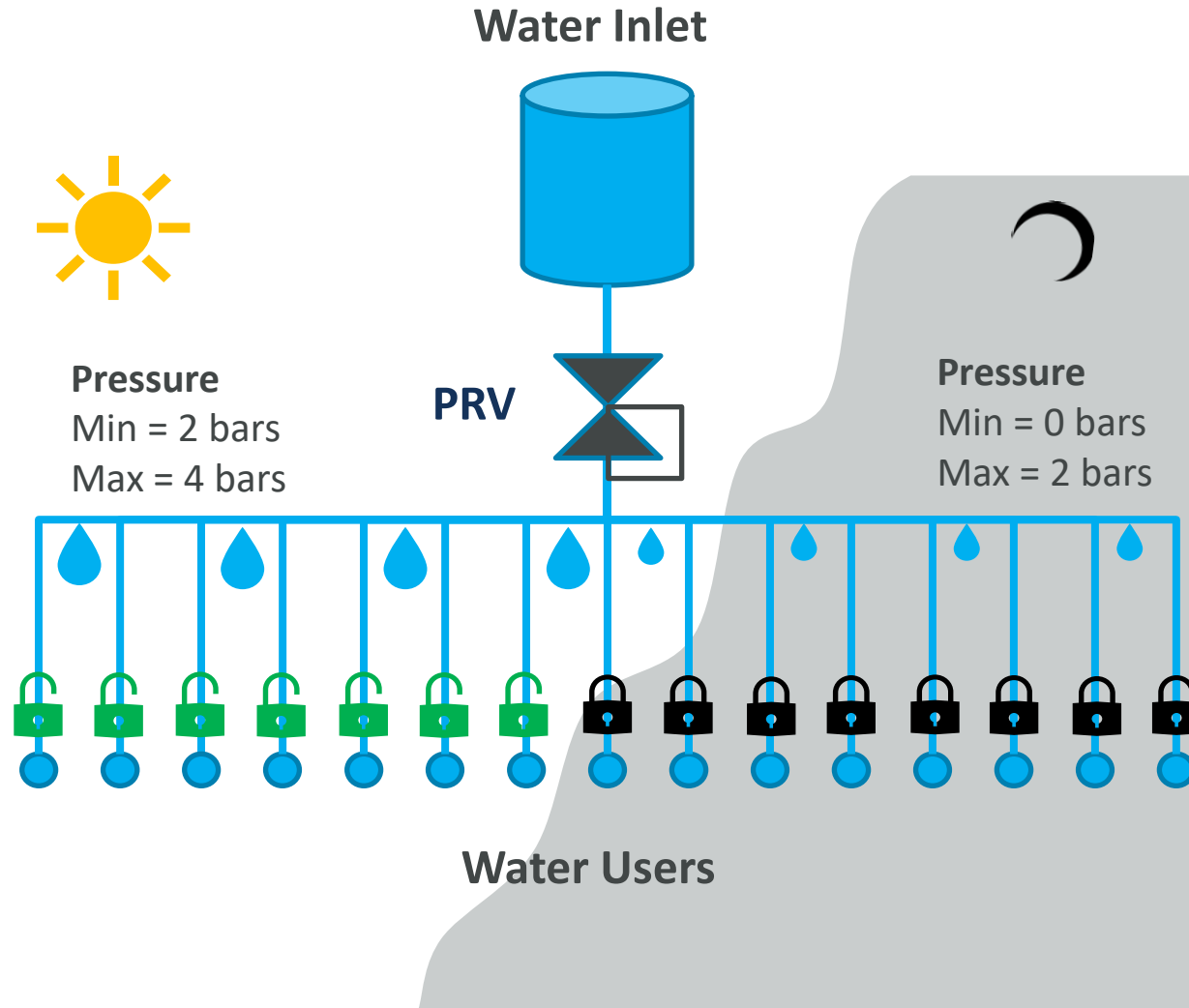
DSC devices can be installed in different ways:

- **Per customer:** Allows control at customer level and advanced smart options
- **On Service connections:** More affordable with similar benefit for transitioning to 24x7



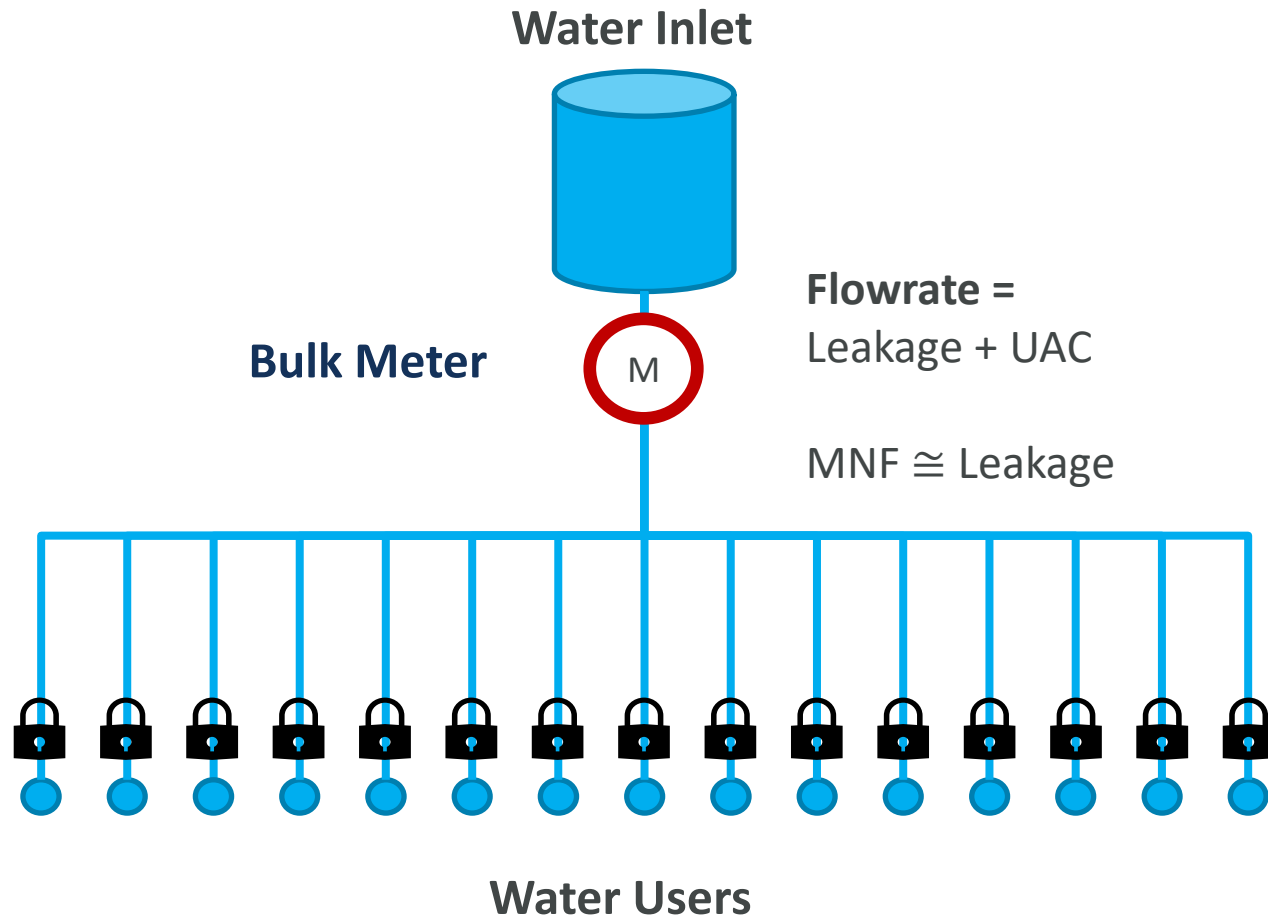
PRESSURE MANAGEMENT

DSC enables
application of
pressure
management to
optimum pressures
when customer
valves are either
open (supply mode)
or closed



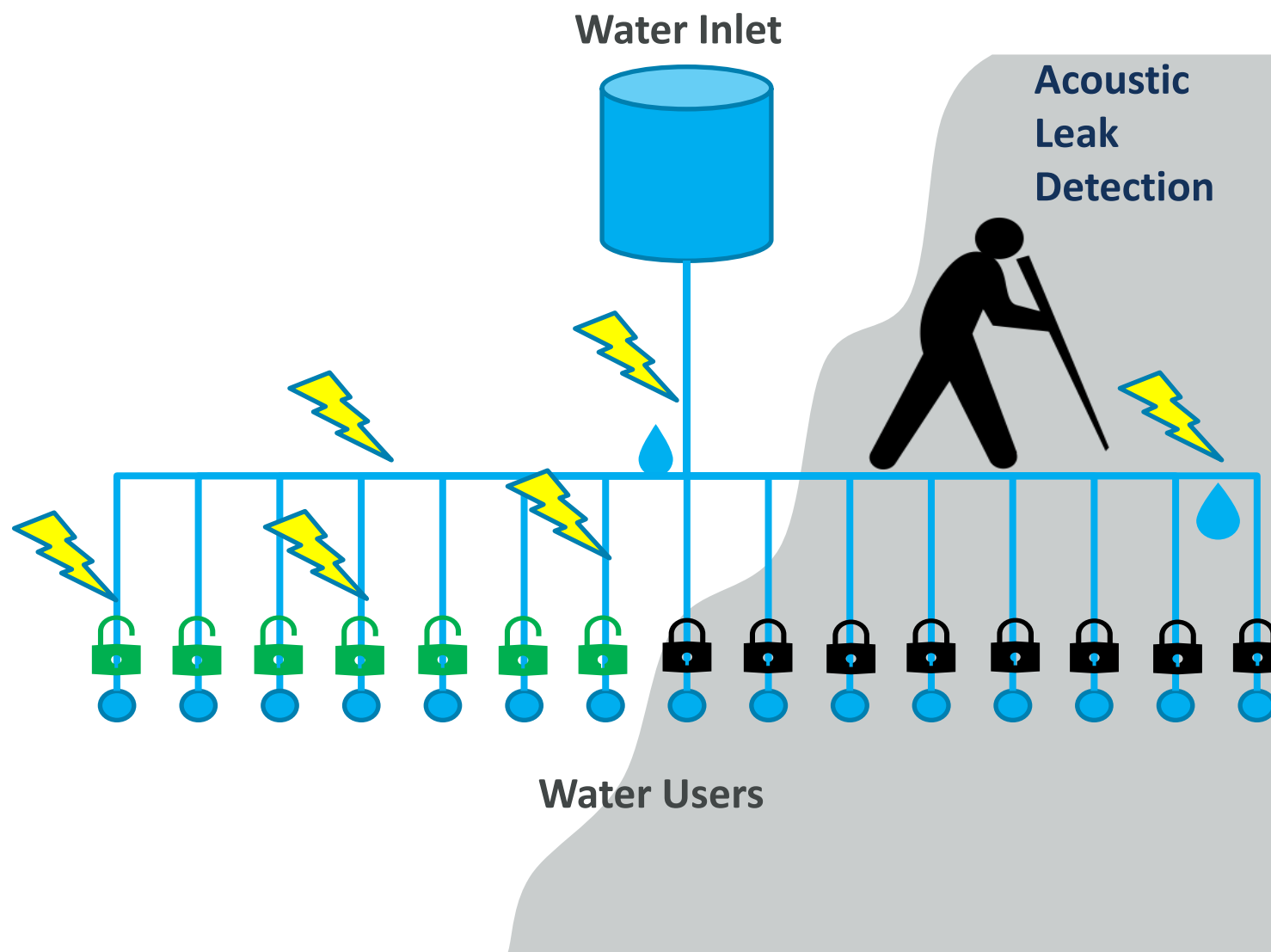
MEASUREMENT OF LEAKAGE AND UAC

DSC allows
accurate
measurement of
leakage and
unauthorized
consumption
(UAC) as well as
minimum night flow
(MNF) analysis



ACOUSTIC LEAK DETECTION

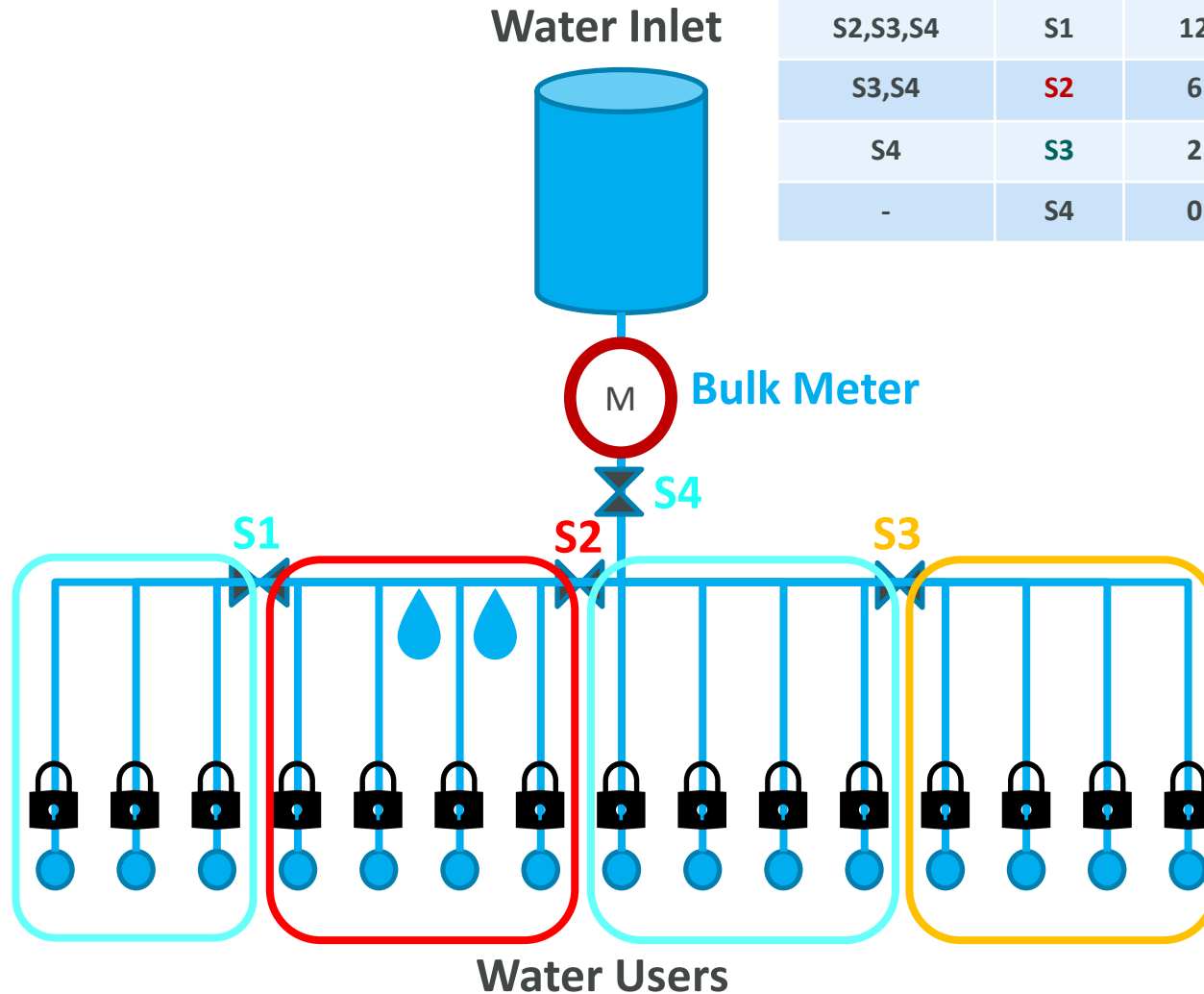
DSC improves
the duration of
acoustic leak
detection
methods



STEP TESTING

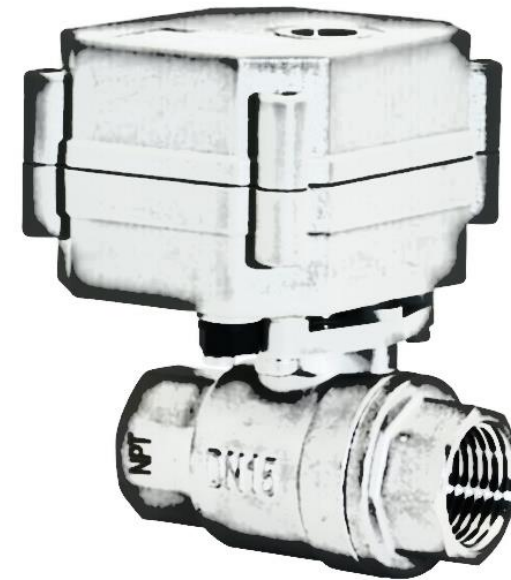
With DSC, step-testing becomes a very powerful and precise method for locating leaks, as well as many illegal connections and meter bypasses

Open	Close	Flow (m3/h)	Drop (m3/h)
S1,S2,S3,S4	-	13	-
S2,S3,S4	S1	12	1
S3,S4	S2	6	6
S4	S3	2	4
-	S4	0	2



CUSTOMER BENEFITS

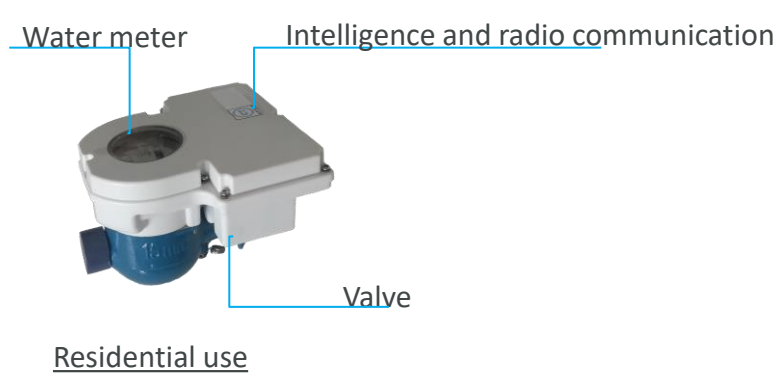
- Run multiple **supply control** scenarios
- **Manage customers** by categories
- Treat all **customers equally**
- **Inform customers** in advance
- **Keep water in the network 24/7:**
 - Improved water quality
 - Minimize health hazards
 - Control pressure variations
 - Avoid air measurement by meters



Source: Arnaud Brunelle, Power Point Presentation, 1st IWA IWS SG conference, Kampala, April 2017

THE TECHNOLOGY

■ Remotly controlled devices



■ Data communication

- LoRaWAN, GPRS, NB-IoT, etc.
- Frequent data communication
- Low power consumption

■ Analytics and control

- Data analytics capability
- Activity control platform
- Accessibility / cloud solution

CHALLENGES TO ADDRESS (1/2)

■ Utilities:

- Overcome reluctance to change
- Convince of the many advantages
- Prove technical viability of DSC
- Develop required skills and knowledge

■ Customers:

- Cooperate in applying DSC
- Incentivize efficient water use
- Improve plumbing installations



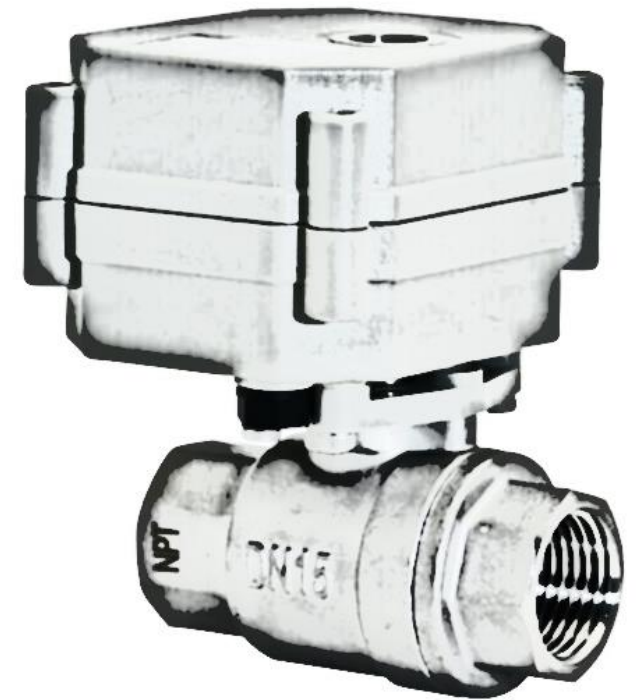
CHALLENGES TO ADDRESS (2/2)

■ Technology:

- Incentivize the industry to further develop DSC technologies
- Efficient battery use/battery recharge solutions
- Expand integration with smart meters
- Software solutions for effective management over large deployment

■ Funding:

- Perform feasibility studies that address total cost under IWS vs. 24X7+ DSC to prove the viability of the concept



Thank you!



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