CB(1)851/15-16(03)

工務計劃編號196WC
建設智管網
立法會發展事務委員會

PWP No. 196WC
Implementation of
Water Intelligent Network (WIN)
Legislative Council Panel
on Development
26-4-2016

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工程背景
Project Background

- 在九十年代大量水管的使用期限快將屆滿，維修及保養它們越來越困難和昂貴。

  In the 1990s, maintenance of a considerable length of water mains approaching the end of their service life became increasingly difficult and costly.

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工程背景
Project Background

- 在這種情況下，大規模地更換及修復這些老化水管是最有效的方法更新供水管網。

  Given the poor condition of the water distribution network, replacement and rehabilitation of the aged water mains was the most effective solution to rejuvenate the water distribution network

- 「更換及修復水管計劃」在2000年展開，更換及修復了全港約 3000公里長的老化水管，現時該計劃已大致完成。而現在全港水管總長度約為8000公里。

  A programme of Replacement and Rehabilitation (R&R) of Water Mains was launched in 2000 to replace and rehabilitate around 3000 km of the aged water mains in Hong Kong. The Programme was now substantially completed. At present, the total length of water mains in Hong Kong is about 8000 km.

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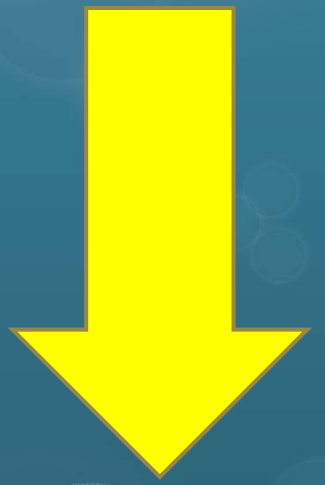
水管爆裂及滲漏次數
No. of Water Main Bursts and Leaks

年份 Year	爆裂的次數 No. of Bursts	滲漏的次數 No. of Leaks
2000	2538	22428
2001	2280	20787
2002	1924	23729
2003	1993	19703
2004	1923	17950
2005	1644	15626
2006	1581	12390
2007	1713	13612
2008	1531	14690
2009	1066	13305
2010	670	12460
2011	370	12392
2012	259	11675
2013	257	11031
2014	173	9831
2015	145	9322



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水管滲漏率
Water Main Leakage Rate

年份 Year	滲漏率 Leakage Rate
2000	>25%
2001	>25%
2002	25%
2003	25%
2004	24.5%
2005	23.6%
2006	23%
2007	22.5%
2008	21.8%
2009	21%
2010	20%
2011	19%
2012	18%
2013	17%
2014	16%
2015	15%

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「更換及修復水管計劃」之後
The Post-R&R Era

(成本)Cost

(影響)Disturbance

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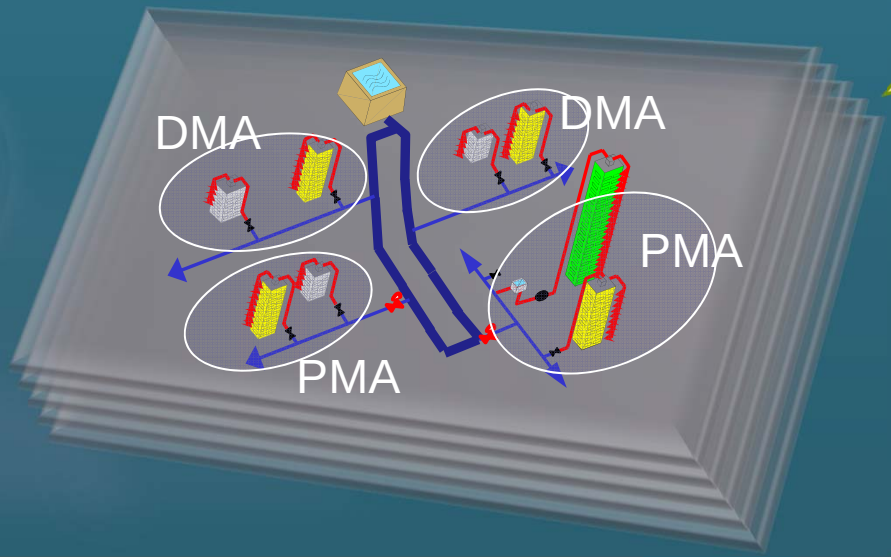
智管網 Water Intelligent Network (WIN)

全港水管
Water mains over the territory

本質:持續監測
Essence: Continuous Monitoring

水管隸屬於不同的配水庫供應區
Water Mains belonging to different Service Reservoir (SR) supply zones



配水庫供應區分為多個(全港劃成約2000個)監測區域和水壓管理區域
SR supply zones divided into various District Metering Areas (DMA) and Pressure Management Areas (PMA) (about 2 000 DMA/PMA throughout the territory)

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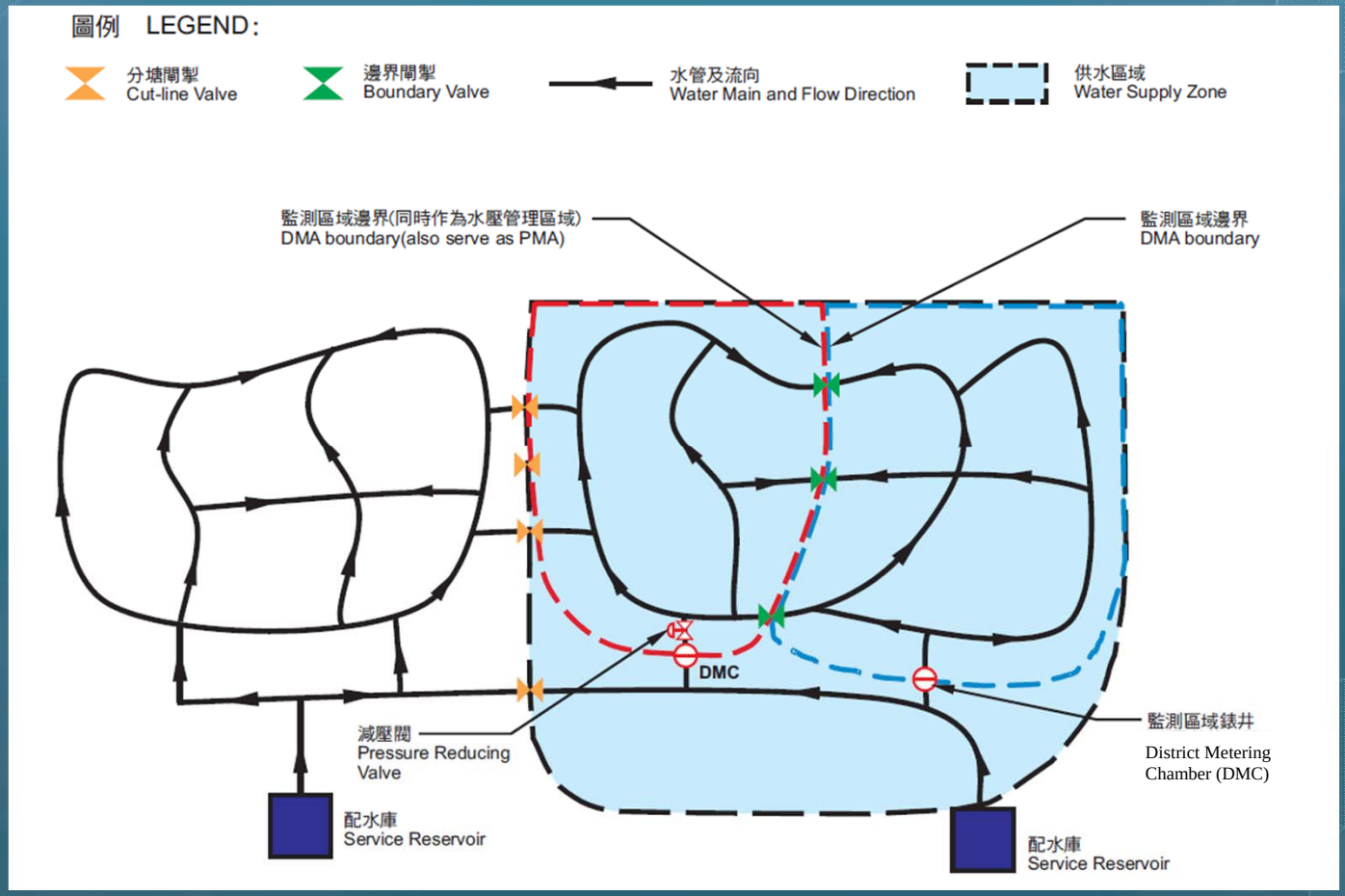
監測區域/水壓管理區域
District Metering Area (DMA)/Pressure Management Area (PMA)



監測區域/水壓管理區域示意圖 Schematic Diagram of DMA/PMA

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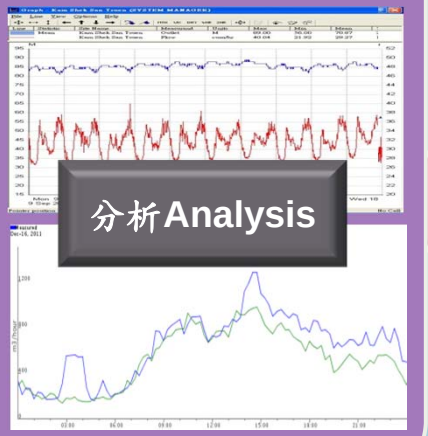
智能管網管理系統 Intelligent Network Management System

數據 Data

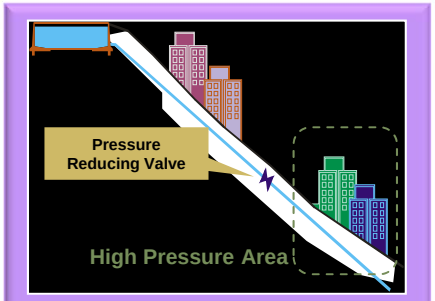
信息 Information



洞察 Insight

制定最有效的管網管理措施 Determination of the most effective network management measures

主動探測和控制滲漏
Active Leakage Detection & Control



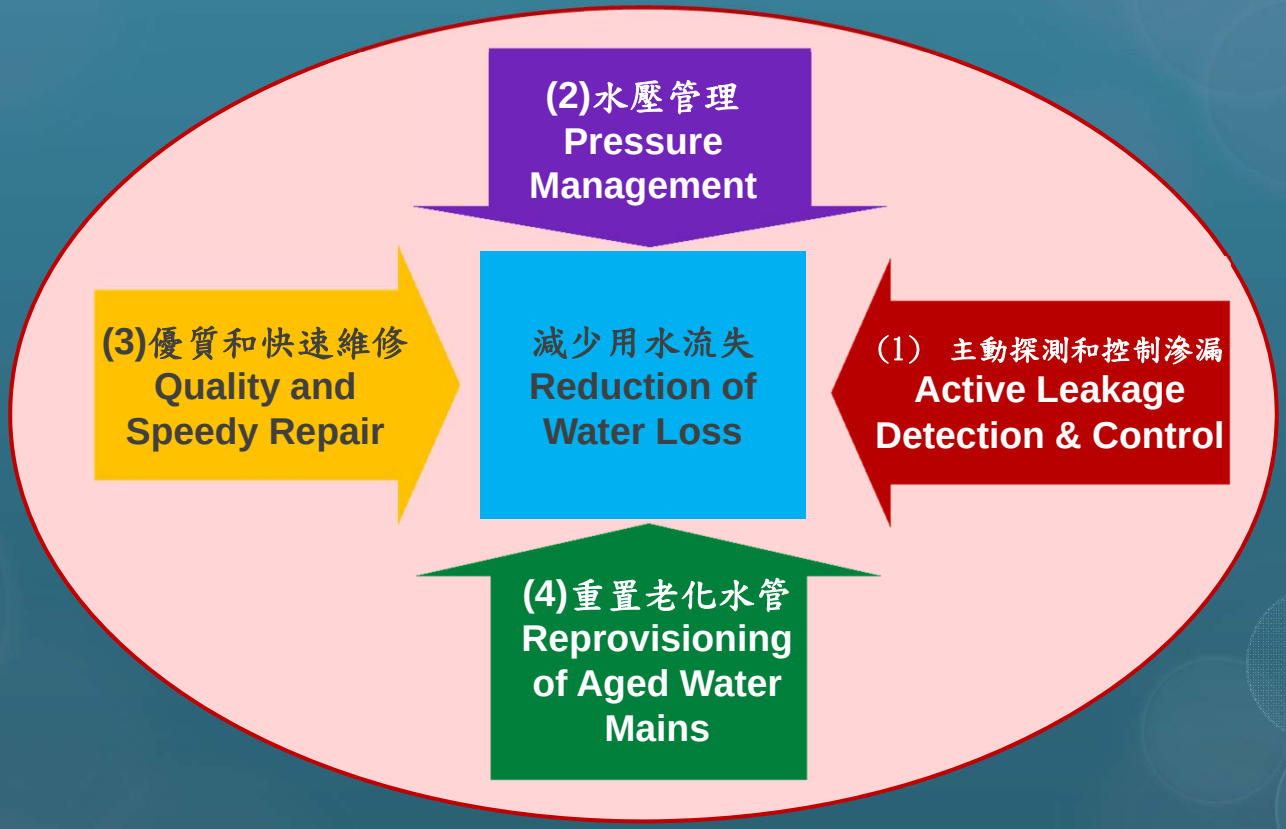
水壓管理
Pressure Management

優質和快速維修
Quality & Speedy Repair

重置水管
Reprovisioning of Water Mains

管網管理措施
Network Management Measures

四大支柱 Four Pillars



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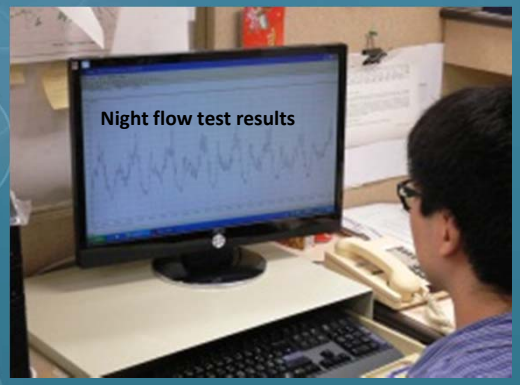
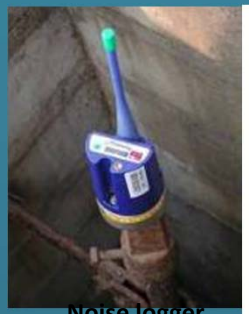
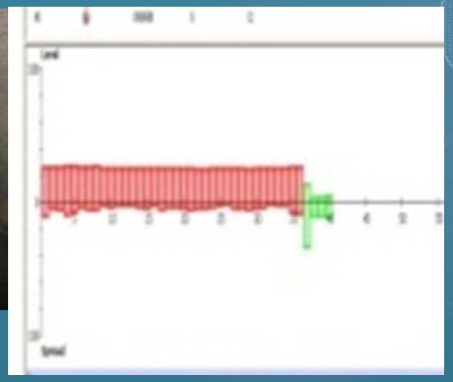
(1) 主動探測和控制滲漏
Active Leakage Detection & Control (ALDC)



(監) Monitoring





(測) Locating Leaks

(檢) Pin-pointing Leaks

(定) Confirming Leaks

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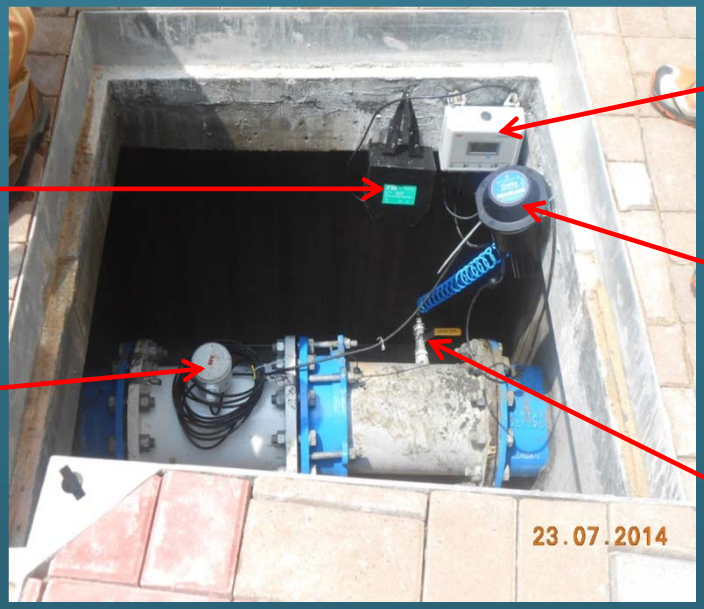
（1）主動探測和控制滲漏
Active Leakage Detection & Control (ALDC)

- 在監測區域基礎上，實施持續監測
- Continuous monitoring on a DMA basis

電磁流量錶的電池
Dry battery for electromagnetic (EM) flowmeter

電磁流量錶及感應器
EM flowmeter and its sensor



電磁流量錶的發報器
Transmitter of EM flowmeter

GSM 數據記錄儀
GSM data logger

水壓感應器
Water pressure sensor

典型的監測區域錶井 Typical setup of DMA chamber

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(2) 水壓管理
Pressure Management (PM)

- Installation of pressure reducing valve (PRV) 減壓閥的安裝

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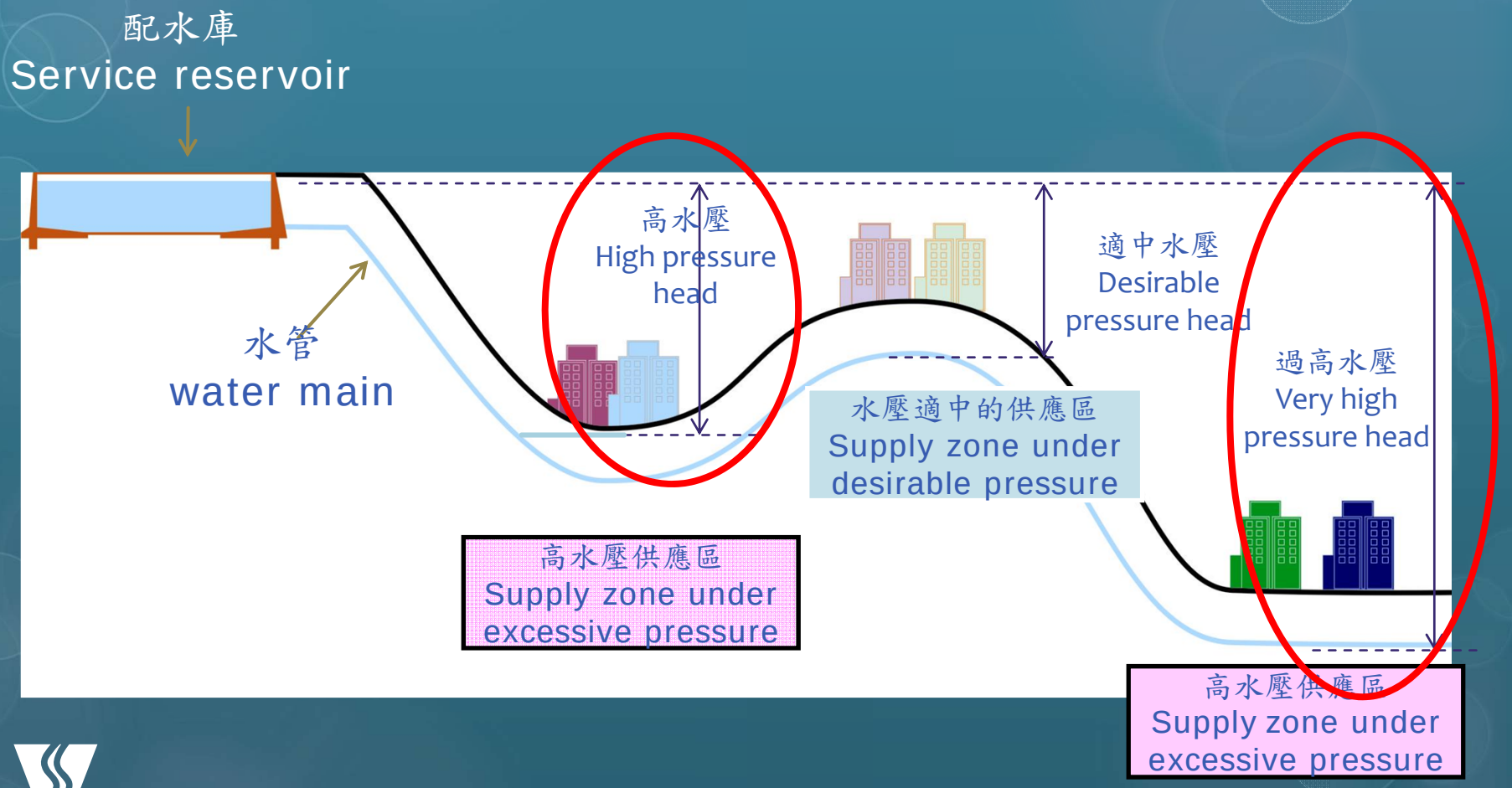
(2) 水壓管理
Pressure Management (PM)



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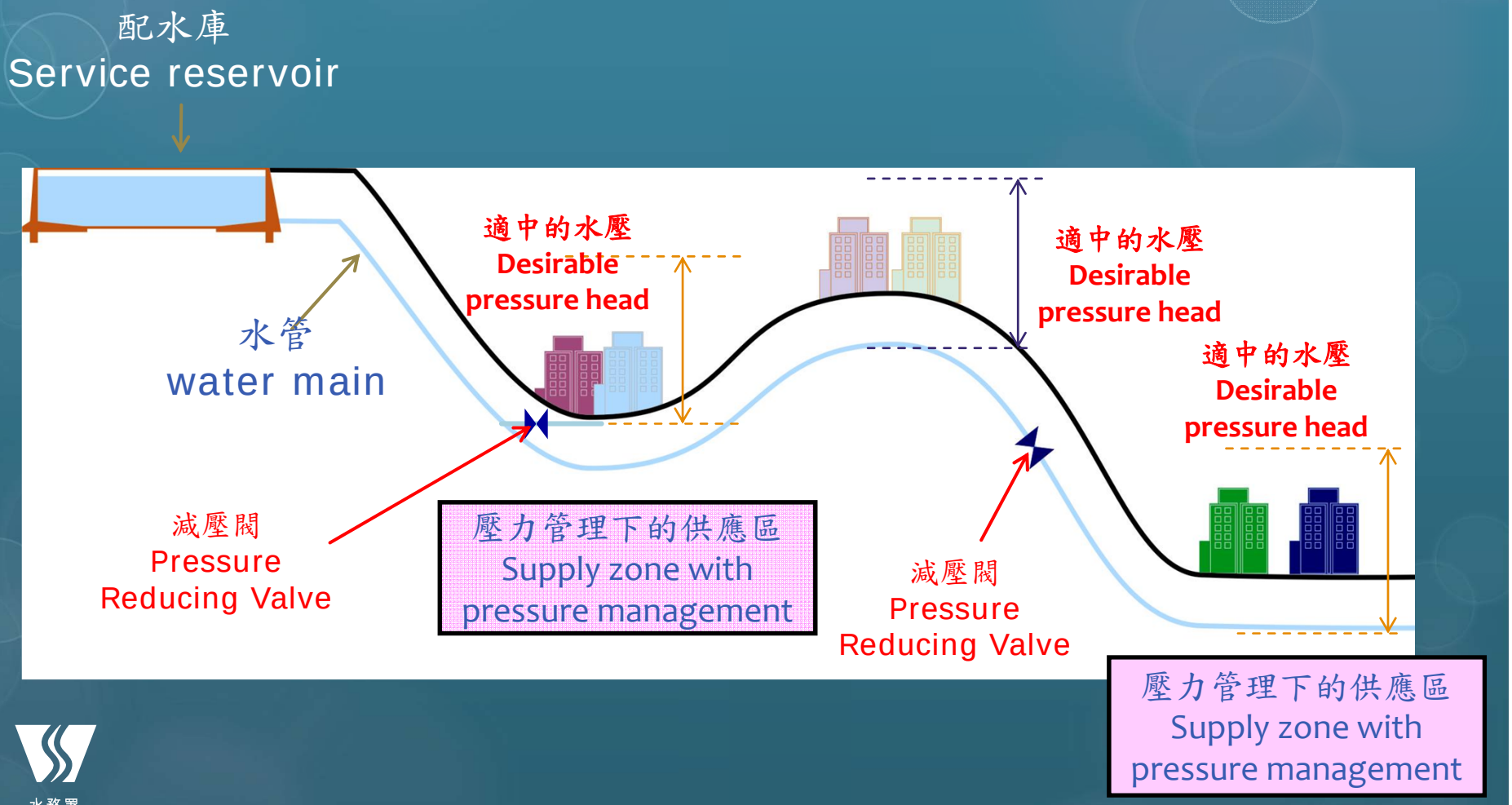
(2) 水壓管理
Pressure Management (PM)



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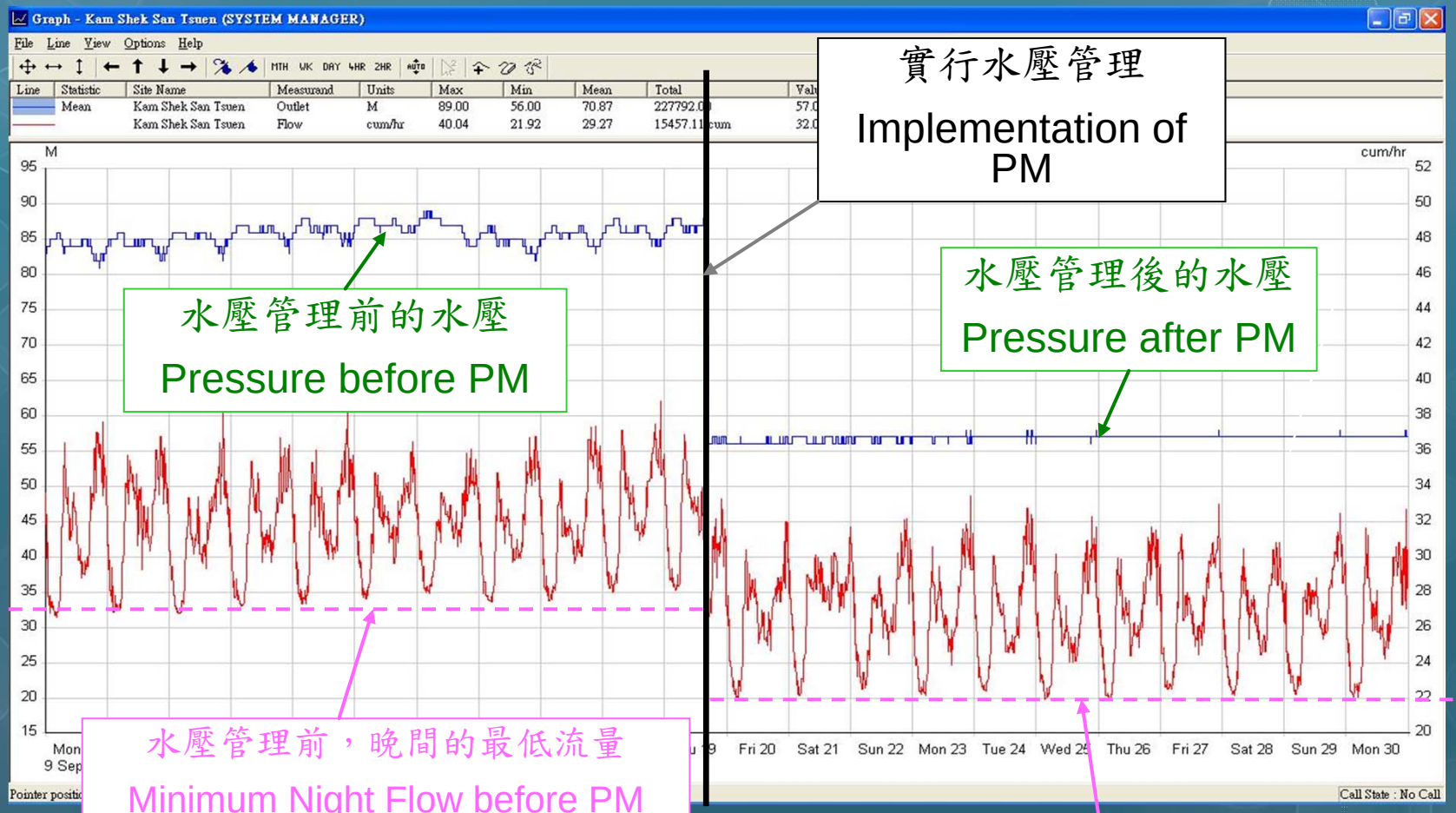
(2) 水壓管理
Pressure Management (PM)



實行水壓管理

Implementation of PM

水壓管理前的水壓

Pressure before PM

水壓管理後的水壓

Pressure after PM

水壓管理前，晚間的最低流量

Minimum Night Flow before PM

水壓管理後，晚間的最低流量

Minimum Night Flow after PM

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(3) 優質和快速維修
Quality and Speedy Repair (QSR)

時間對透過滲漏點流失水量的影響
Effect of time on volume of water lost through leakage

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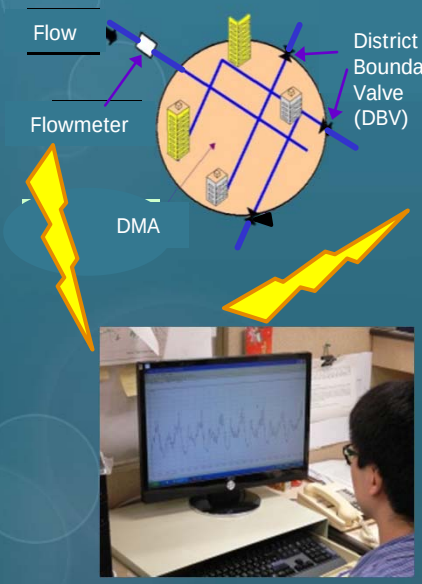
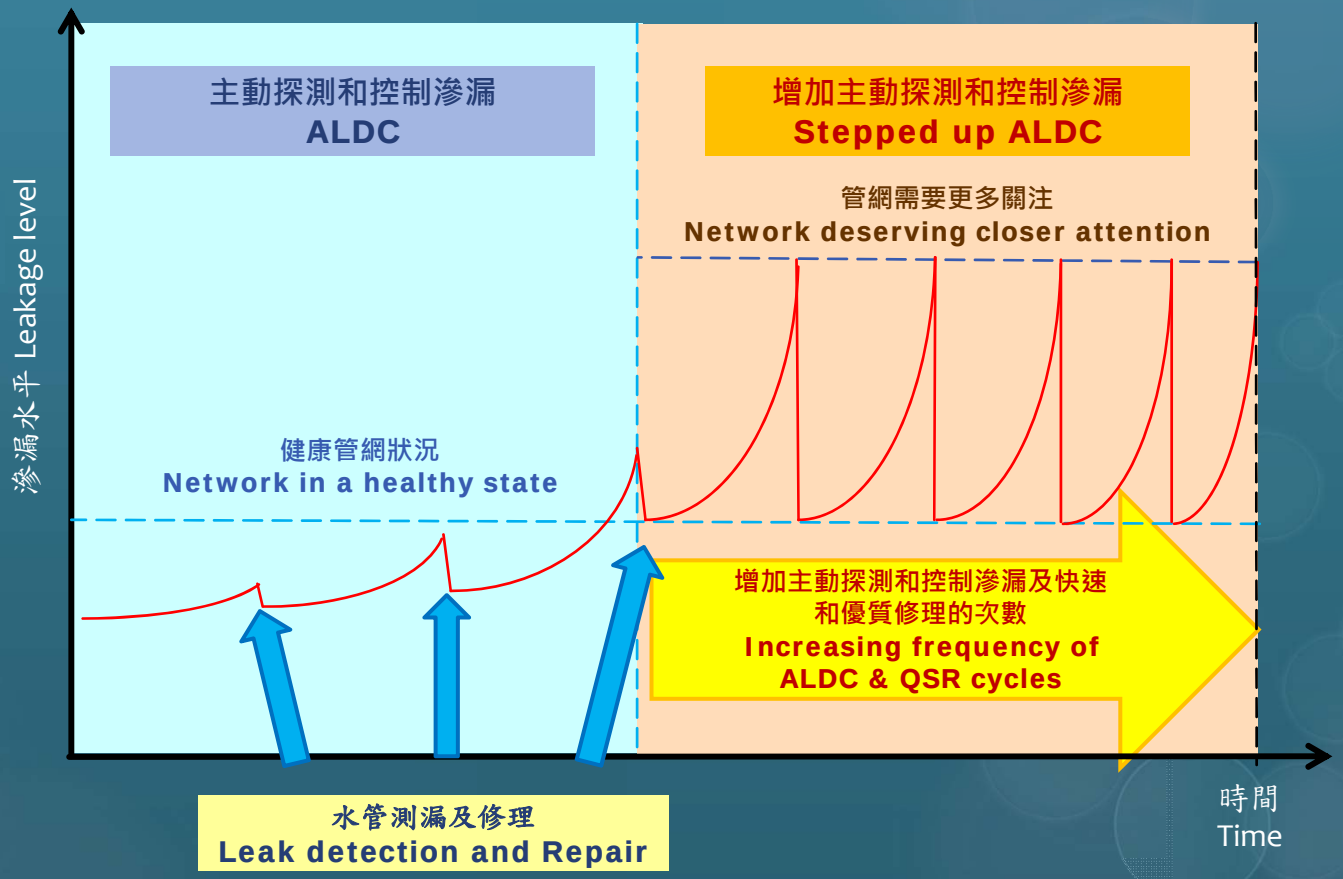
整合主動探測和控制滲漏及優質和快速維修
Combining ALDC and QSR





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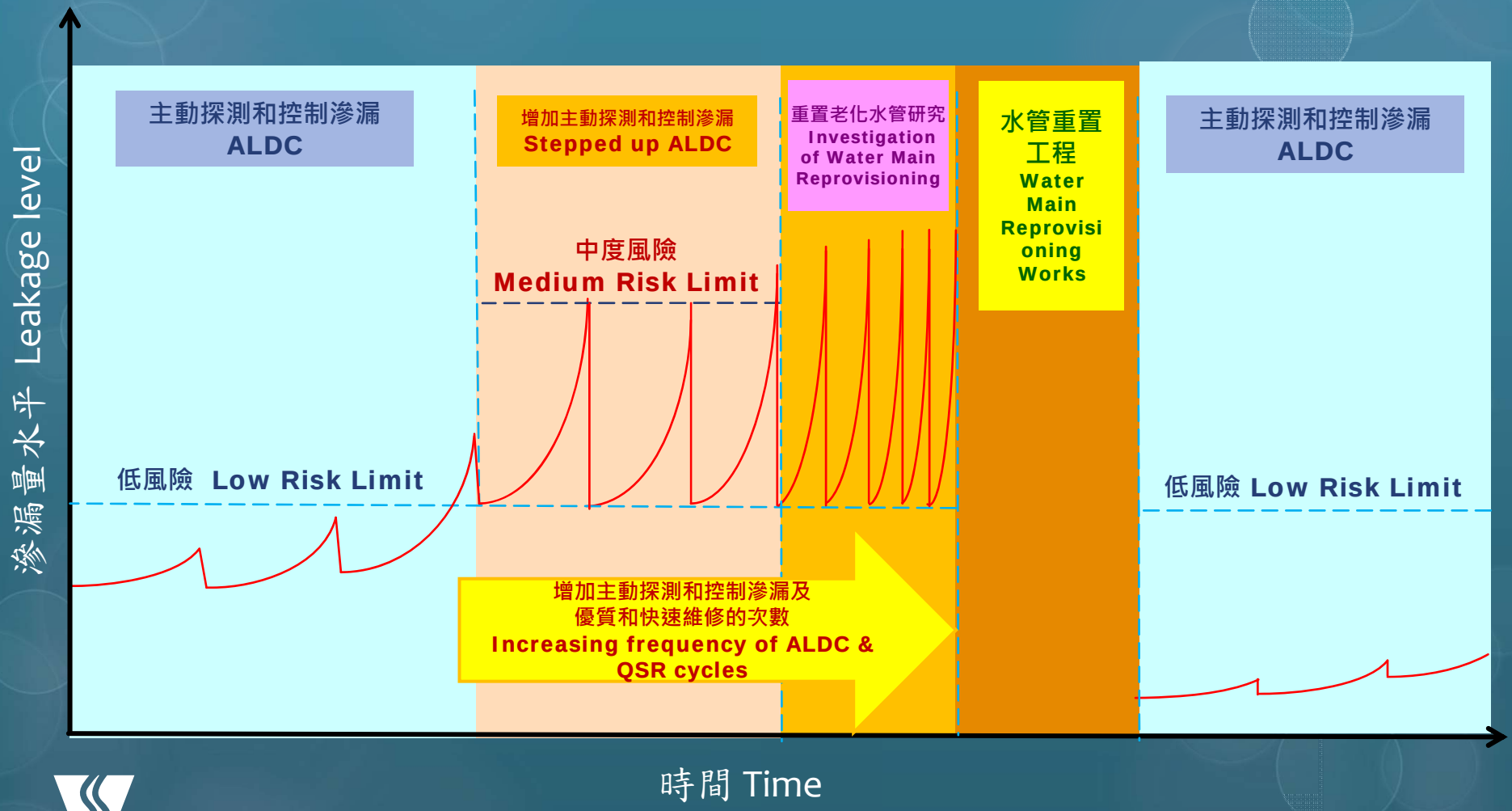
(4) 重置老化水管
Reprovisioning of Aged Water Mains



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智管網的效益
Effectiveness of WIN

- 智管網是較全面的管網管理模式
- 按各監測區域的狀況，制定最有效的管網管理措施，以及訂定工作優先次序
- 當主動探測和控制滲漏、水壓管理及優質和快速維修未能有效控制滲漏程度，才重置水管
- The Water Intelligent Network (WIN) represents a more holistic approach to network management
- WIN helps determine the priority and the most effective network management measures according to the network condition in each DMA
- Reprovisioning works will be the last resort when measures of ALDC, PM and QSR cannot contain the leakage level effectively

智管網

WIN

具成本效益的方案

Cost Effective Solution

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建設智管網時間表
Implementation Programme of WIN

工程項目 **Works Item**	**2016**	**2017**	**2018**	**2019**
(a) 85個監測區域及水壓管理區域 - 設立 DMA and PMAs - Establishment				
(b) 智能管網管理系統 Intelligent Network Management System				
(c) 515個監測區域及水壓管理區域 - 勘查研究及設計 DMA and PMAs – Investigation and Design				

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