RTHK "Science in the Public Service" TV documentary: Water Intelligent Network of the Water Supplies Department (2 January 2022)
(English translation of the Chinese transcript)

Ms Ceci WU (Reporter)	:	Water is the basic necessity of life. Conserving the precious water resources has become a growing concern worldwide. Hong Kong's Water Supplies Department (WSD) provides water supply services to over seven million citizens through a network of more than 8 300 kilometres of water mains. However, water main bursts and leaks in the water distribution network not only lead to wastage of precious water resources, but also cause inconvenience to the public. Let’s see how the WSD makes use of smart technologies to effectively reduce water loss.
Super	:	Water Intelligent Network of the WSD
Ms Ansie WONG (Engineer/ Water Loss Management, WSD)	:	The hilly terrain of Hong Kong makes its water pressure generally higher than that of other cities. Also, most of the pipelines are laid underground. The vibration and disturbance brought about by the congested underground utilities, busy road traffic and frequent roadworks will affect underground water mains. All these factors contribute to an increasing risk of water main bursts or leaks, resulting in water loss.

Even if underground water main leakage has occurred for some time, it is hard to spot on road surface. As such, we have to test for water main leaks regularly with leakage detection sensor as a precautionary measure to prevent the leakage problem from worsening.

Unlike general regular tests, with the advancement in sensors, data transmission and analytics technology used in water distribution network, the WSD has been establishing the Water Intelligent Network (WIN) for real-time monitoring of the entire water distribution network, aiming to maintain the healthiness of the network and to reduce water loss. The concept of WIN is "Divide & Conquer" along with continuous monitoring of the entire network.

Super : About 2 400 District Metering Areas

Ms Ansie WONG (Engineer/ Water Loss Management, WSD) : The WIN divides the fresh water distribution network into about 2 400 discrete District Metering Areas (DMAs) and associated Pressure Management Areas (PMAs) with monitoring and sensing equipment installed in each DMA and PMA network to collect water flow and pressure data as well as other associated network data. The data collected will be used to analyse the network condition. PMAs are also equipped with devices for water pressure management to reduce leakage in water mains. As at end 2020, the WSD has established about 1 440 DMAs.

The data collected from WIN will be automatically stored in the intelligent network management computer system of the WSD for analysis. For instance, we will monitor the water flow of various DMAs in the early hours. If the water flow is relatively high, leakage is likely to occur in that DMA. The WIN helps the WSD to identify DMAs suspected with water loss, as well as to determine the priority of follow-up actions, including on-site detection for location of leaks to conduct speedy repair, implementation of water pressure management and replacement of water mains beyond economic repair.

Sometimes we have to search for the location of underground water main leaks on roads with heavy traffic. As the environment at night is relatively quieter, there are less interference to the leakage detection sensor. Moreover, we may need to conduct step tests and suspend the water supply temporarily. To minimise the inconvenience caused to the public, our staff will carry out leak detection and step tests for fresh water mains at night. Various detection devices will be deployed to identify the leak spots of the pipes, followed by repair works.

To further reduce water loss in the water distribution network, the WSD has set a target to reduce water leakage rate of government water mains from about 15% at present to below 10% by 2030. This is in line with the long-term strategy of

"containing growth of water demand through conservation and exploiting new water resources" as stated in the Total Water Management Strategy promulgated by the WSD. By containing fresh water demand growth, optimising diversified water resources and building resilience in fresh water supply, stable development of Hong Kong can be ensured.

Artisan, WSD : Here. We've found the leakage. Let's call our colleagues for repair.

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