

Exemplary Service@Gov - Tuen Mun Hydropower Plant and The Odour Squad

English voice over script and super:

Super: Civil Service Outstanding Service
Video Series 2015

Super: Water Supplies Department
Tuen Mun Hydropower Plant

MVO: Not only do the staff of the Water Supplies Department ensure that the supply of wholesome drinking water to the public, but they also build the first hydropower plant in Hong Kong with their creativity.

MVO: The treated drinking water for Tuen Mun area comes from Tuen Mun Water Treatment Works with raw water drawn from Tai Lam Chung Reservoir via a 7-km long underground aqueduct.

MVO: Tai Lam Chung Reservoir is geographically around 40 metres higher than the Water Treatment Works. When the water level of the reservoir rises, it successively builds up a high pressure at the regulating valves of the Inlet Reception Tank at the Water Treatment Works, which accelerates their normal wear and tear in time.

LI Ching-shui
Assistant Inspector
(Maintenance Division)

Water Supplies Department: The worn-out valves need to be fixed frequently. They may not seem to be a big concern to the public, but in long run, the breakdown and hence the repair costs public money. So we ought to come up some feasible solutions to improve the situation.

LEUNG Man-hon
Chief Electrical and Mechanical Engineer
(Projects Division)

Water Supplies Department: The flow of water by gravity is a source of energy. In light of the operating mode of the water treatment works, we started to explore the feasibility of building the first hydropower plant in Hong Kong. Firstly, we divert the raw water from the reservoir to a turbine generator before entering the Inlet Reception Tank, and, by applying the "reverse pumping" mode with the turbine, we are able to convert the residual water energy

into electrical energy. This also greatly solves the wear and tear problem of the valves.

MVO:

The completion of this project would not be a success without the collaboration of various divisions of the Water Supplies Department, namely the Construction, Operations, Development, Maintenance and Projects Divisions.

WONG Dik-chi

Engineer (Construction Division)

Water Supplies Department:

There is only very limited space in the water treatment works, with an area of about 10 metres by 12 metres available for building a hydropower plant. And we also have to divert the underground pipes prior to the construction works.

WOO Hei-ming

Assistant Inspector

(Operations Sections)

Water Supplies Department:

The primary objective of the Water Supplies Department is to maintain a stable supply of drinking water to the public. Throughout the stages from constructing to operating the hydropower plant, we have to ensure that water supply has to be maintained normal with no interruption.

MVO:

Electricity generated from the hydropower plant would all be consumed in the water treatment works. By doing so, they estimate that about \$2.4 million of electricity cost will be saved annually. This is also equivalent to a reduction of carbon dioxide emissions by 2,000 tonnes or planting about 11,000 trees.

LEUNG Man-hon

Chief Electrical and Mechanical Engineer

(Projects Division)

Water Supplies Department:

The success of the hydropower plant project counts very much on the concerted effort of our staff who would like to go the extra mile and to take a positive step further with their creative mind to help protect the environment.

MVO:

Before reaching the households, drinking water must be treated at water treatment plants. The quality of drinking water in Hong Kong has always complied with the requirements of the World Health Organisation

(WHO). Yet the Water Supplies Department is still devoting its efforts to improve the quality of drinking water.

Super: Water Supplies Department
The Odour Squad

MVO: In the summer, algae grow in the reservoir and release odour. Though the odour is harmless, in order to improve the aesthetic quality of drinking water and confidence of the public, the Water Supplies Department specifically set up the Odour Squad to remove such odour.

LEE Chi-kin

Waterworks Chemist

Water Supplies Department: In general, the public judges the quality of drinking water by its clarity and whether it has any odour. When they detect odour in the water and inform us about it, we will not just tell them no need to panic nor worry. We are obligated to solve this problem.

MVO: To remove odour, we can dose powdered activated carbon into the water, but this will increase the cost of water supply. To make it cost effective, the staff of the Water Supplies Department need to judge in advance whether the raw water entering and the drinking water leaving the treatment plant has any problematic odour. And this is the greatest challenge to them.

LEE Chi-kin

Waterworks Chemist

Water Supplies Department: If the public can detect odour in the drinking water, so can our colleagues. However, the problem we face is that few water supplying agents in the world adopt such a technology. So we had to look everywhere and study other industries that use Olfactometry. We then apply our creativity to develop this device.

MVO: The Olfactometer must be designed to be user friendly. After repeated testing, the Odour Squad eventually developed this cost effective device. Now, our colleagues only need to utilize their sense of smell with this device to carry out several simple procedures in ten or more minutes to determine whether there is odour in the raw water and drinking water and the need to dose powdered activated carbon timely. As a result, each year the Water Supplies Department can save some \$800 thousand on

powered activated carbon and water testing.

LEE Chi-kin

Waterworks Chemist

Water Supplies Department:

At the time we developed the device, we were not experts in ergonomics, nor experienced in developing industrial devices. We also had no extra resources. So it was really difficult to us. However, the greatest motivation came from the fact that we and the public both wanted to drink safe and wholesome water without odour. So no matter what difficulties we met, we tried our best to overcome them.

MVO:

The Odour Squad of the Water Supplies Department will continue to improve the Olfactometer and will also study the trends of odour in water, so as to more effectively protect the aesthetic quality of water.

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Acknowledgement:
Water Supplies Department

Super:

Civil Service Bureau
The Government of the Hong Kong Special Administrative Region

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