

General Water Operation Center

Operations of the waterworks facilities owned by the City of Osaka (three purification plants and 14 distribution plants (pumping stations), and industrial water facilities (one purification plant and four distribution plants (pumping stations)) are under around-the-clock integrated remote control by the General Water Operation Center, which started operation in November 2019.

[Major functions of General Water Operation Center]

- Standardizing and optimizing operation management
- Water purification and distribution operation management in accordance with ISO 22000
- Mitigating and preventing accident risks
Promptly responding to an emergency by flexibly employing mutual support between purification/distribution systems
- Knowledge management
Promoting concentration, development and succession of know-how related to water purification and distribution

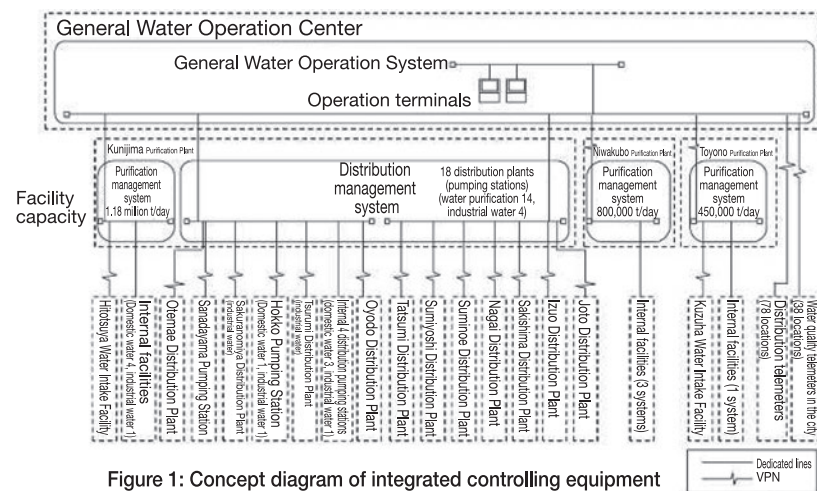


Figure 1: Concept diagram of integrated controlling equipment



Water Distribution Information Center



Water Distribution Information System



The Water Distribution Information Center monitors the status of water distribution using the water distribution telemeters (flowmeters, water pressure gauges) placed on distribution pipes of the entire City area, which are used in examination of water service stoppage and resumption, etc. at normal times and formulation of emergency water distribution plans in an emergency, such as an accident or disaster.

The data gathered and processed at the Water Distribution Information Center are available for viewing on terminals of the water distribution information system or the disaster information system of each staff in charge, water purification plants, waterworks centers, water examination centers, and facility maintenance centers.

For the key water distribution telemeters, such as the telemeters installed at the guiding station for distribution pump operation, uninterruptible power systems and duplex communication lines have been introduced as earthquake-proofing measures.

At distribution plants and pumping stations, in order to stabilize the water pressure of distribution pipes as much as possible, pumping operation is automatically controlled so that the water pressure of the guiding station for distribution telemeters placed around the City is always at a certain level.

Number of water distribution telemeters installed
(as of the end of fiscal 2018) 104

(Reference)
Industrial water supply system
Number of water distribution telemeters installed
(as of the end of fiscal 2018) 7

Water Supply Equipment Improvement Project

Osaka City basically considers water supply equipment as personal property. However, from the viewpoints of preventing water leakage and improving customer service, the City replaces water supply pipes on or under roads at the expense of the Waterworks Bureau under certain criteria set by the City.

In the third and fourth Water Supply Equipment Improvement Projects from fiscal 2002 through fiscal 2013, priority was given to the replacement of lead water supply tubes that had been used for an extended period of time, while Osaka City promoted the prevention of water leakage, elimination of poor water service, improvements in earthquake resistance, and replacement of water pipes. Since fiscal 2014, though the Project was completed, Osaka City has continued the efforts to eliminate lead water pipes.

Project	First Water Supply Equipment Improvement Project	Second Water Supply Equipment Improvement Project	Third Water Supply Equipment Improvement Project	Fourth Water Supply Equipment Improvement Project
Business year	FY1993-1996	FY1997-2001	FY2002-2006	FY2007-2013
Project cost	13.3 billion yen	27.0 billion yen	26.3 billion yen	40.5 billion yen
Major project contents	<ul style="list-style-type: none"> Prevention of water leakage Elimination of poor water service 	<ul style="list-style-type: none"> Prevention of water leakage Elimination of poor water service Improvement in the earthquake resistance of water supply equipment Improvement in maintenance of water supply pipes to eliminate hindrance in maintenance control 	<ul style="list-style-type: none"> Prevention of water leakage Elimination of poor water service Improvement in the earthquake resistance of water supply equipment Improvement in maintenance of water supply pipes to eliminate hindrance in maintenance control Promoting replacement of lead water supply pipes 	

Replacement of lead water supply pipes

Seeing water supply standards for lead becoming increasingly stricter, Osaka City considered countermeasures and formulated basic policies from the viewpoints of both hardware and software.

- Suppress lead elution by adjusting pH of water
- Survey on all households concerning the use of lead water supply pipes according to the construction completion drawings of water supply equipment
- Provide customers with information by direct mail

Along with the above initiatives, Osaka City advanced the Water Supply Equipment Improvement Project as its fundamental approach against lead water supply pipes. Osaka City has attached priority to and already completed the replacement of lead water supply pipes at kindergartens, nursery schools, and other similar institutions based on the knowledge that lead has a particularly adverse effect on the health of infants.

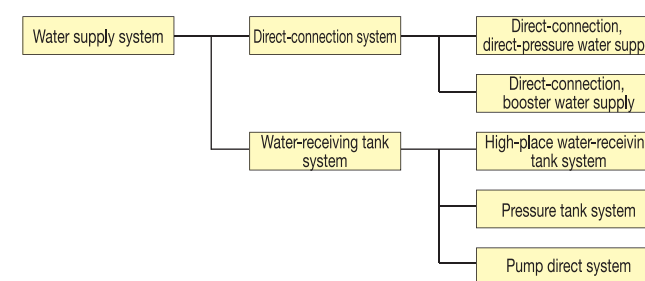


Replacement of lead water supply pipes

Expanding the range of direct water supply

In response to the Ordinance of the Ministry of Health, Labour and Welfare, which was promulgated in 2002 for partial amendments to the Waterworks Law Enforcement Regulations of the Waterworks Law, Osaka City revised the municipal ordinance on water supply on March 31, 2003. Since then, the City has enhanced efforts to educate those installing water-receiving tanks concerning the hygienic management of water-receiving tanks. And the City has been working to expand the range to which the direct water supply system without using water-receiving tanks is applicable, with the aim of eliminating hygienic problems resulting from inappropriate management of water-receiving tanks, especially small tanks.

At present, the range to which the direct water supply system is applicable is as shown below. Currently, Osaka City's water supply systems are classified into the direct-connection type that utilizes the water pressure on water distribution pipes and the water-receiving tank type that stores water once in water-receiving tanks before supplying water.



Direct-connection, direct-pressure water supply (System to supply water directly with the water pressure on water distribution pipes)

At present, direct-connection, direct-pressure water supply is available in Osaka City if the conditions below are satisfied.

- Direct-connection, direct-pressure water supply is available when:
 - the meter diameter is 75 mm or less,
 - maximum water supply height is 8.0 m, and
 - water supply is possible according to a hydrologic calculation.

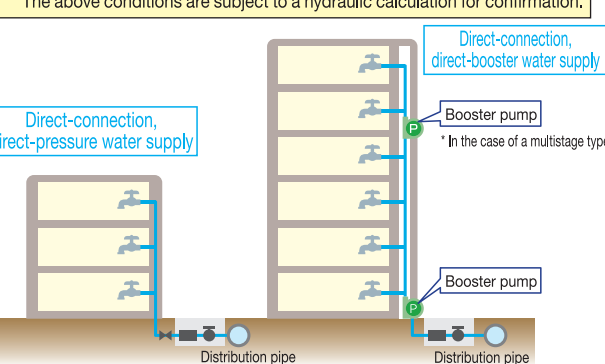
Even when the water supply height is over 8.0 m, direct water supply is available if it satisfies certain conditions for urban environment improvements.

*Since October 1, 2007, direct-connection, direct-pressure water supply has been applicable to four- or five-story buildings in areas with high pressure on water distribution pipes under certain conditions.

Direct-booster water supply (System to supply water using booster pumps)

It is possible to supply water directly from water distribution pipes to buildings with 200 households by using booster pumps in addition to the pressure on the distribution pipes. At present, direct-connection, direct-booster water supply is applicable if the conditions below are satisfied.

- Direct-booster water supply is available when:
 - the meter diameter is 75 mm or less,
 - the maximum instantaneous flow rate is 666 L/min.,
 - water can be supplied with a booster pump with a maximum operating pressure of 0.75 MPa, and
 - the building has no segments of which the purpose of use is unclear at the time of application.



Numbers of facilities with direct-connection system and facilities with water-receiving tank system

