Construction of the Wide-area Waterworks System in the Tama Area

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Tokyo Metropolitan Waterworks Bureau
Presentation Content

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2 Limitations of the existing waterworks system

3 Reconstruction of the wide-area waterworks system

4 Conclusion
Location and the History of Water Supply in Tama Area

Tokyo

Tama Area

Metropolitan Area
Outline of the Waterworks in Tokyo

<table>
<thead>
<tr>
<th>FY2006</th>
<th>Tama Area</th>
<th>Metropolitan Area</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal Government</td>
<td>25 cities</td>
<td>23-ward</td>
<td>23-ward, 25 cities</td>
</tr>
<tr>
<td>Supply Population</td>
<td>3,771,000</td>
<td>8,603,000</td>
<td>12,374,000</td>
</tr>
<tr>
<td>Supply Area</td>
<td>600.8 km²</td>
<td>621.8 km²</td>
<td>1,222.6 km²</td>
</tr>
<tr>
<td>Yearly Supply</td>
<td>428.3 Mm³</td>
<td>1172.3 Mm³</td>
<td>1,600.6 Mm³</td>
</tr>
<tr>
<td>Distribution Network</td>
<td>9,554 Km</td>
<td>15,919 Km</td>
<td>25,473 Km</td>
</tr>
</tbody>
</table>
Limitations of the Existing Waterworks System

• Comprehensive service areas regardless of city zones have not yet been fully established.
• There are many small and old water supplying stations.
  The facilities are managed inefficiently.
• The main transmission pipes are not networked.
• A broad-based and efficient operation system has not yet been established.
Reconstruction of the Wide Area Waterworks System in Tama Area

No1  Reorganization of the service areas

No2  Reform of water supplying stations

No3  Building of the transmission pipes

No4  Centralization and remote-control of operation management at water purification plants, water supplying stations, and pumping stations
Reorganization of the Service Areas

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Supply station</td>
</tr>
<tr>
<td>P</td>
<td>Pumping station</td>
</tr>
</tbody>
</table>

- **Natural flow** without boosting
- **Boosting distribution**
## Reorganization of the Service Areas

<table>
<thead>
<tr>
<th>Classification</th>
<th>Present</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Large-scale Service Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDWSV (\geq 10,000\text{m}^3/\text{day})</td>
<td>49 Areas</td>
<td>47 Areas</td>
</tr>
<tr>
<td><strong>Middle-scale Service Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10,000 &lt; MDWSV (\geq 3,000\text{m}^3/\text{day})</td>
<td>24 Areas</td>
<td>12 Areas</td>
</tr>
<tr>
<td><strong>Small-scale Service Areas</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MDWSV &lt; 3,000\text{m}^3/\text{day}</td>
<td>82 Areas</td>
<td>54 Areas</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>155 Areas</td>
<td>113 Areas</td>
</tr>
</tbody>
</table>

MDWSV: Design Max. Daily Water Supply Volume
Reform of Water Supplying Stations

We are doing:

(1) Building or reinforcement construction of water supplying stations

(2) Earthquake resistance evaluation of facilities
   If necessary, reinforcement construction

(3) Integration of small supplying stations
Reform of Water Supplying Stations

Old water supplying station
reservoir volume: 5,000 m$^3$
structure: prestressed concrete
water kept in tower

New water supplying station
reservoir volume: 15,000 m$^3$
structure: reinforced concrete
water kept underground
Building of the Transmission Pipes

Tama Area

Ozaku
Production Capacity: 280,000m³/day

Higashi-murayama
Production Capacity: 1,265,000m³/day

Metropolitan Area

Purification plants
Water supplying stations
Transmission mains
Pipes requiring construction

Tama Kyuryo Main Line
## Tama Kyuryo Main Line

<table>
<thead>
<tr>
<th></th>
<th>1ST stage Construction</th>
<th>2nd stage Construction</th>
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</thead>
<tbody>
<tr>
<td>Length</td>
<td>12.0 km</td>
<td>19.2 km</td>
</tr>
<tr>
<td>Inside Diameter</td>
<td>1,500 mm</td>
<td>1,500 mm</td>
</tr>
<tr>
<td>Construction Period</td>
<td>1997-2005</td>
<td>2002-2010</td>
</tr>
<tr>
<td>Construction Method</td>
<td>Shield tunneling</td>
<td>Shield tunneling</td>
</tr>
</tbody>
</table>
Centralization and Remote-control Operation Management

- There are 216 water facilities in Tama area

  - 66 purification plants
  - 85 water supplying stations
  - 65 pumping stations
Centralization and Remote-control of Operation Management

Number of manned plants

<table>
<thead>
<tr>
<th></th>
<th>FY 1973</th>
<th>FY 2004</th>
<th>FY 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Manned plants</td>
<td>50 over</td>
<td>14</td>
<td>6</td>
</tr>
</tbody>
</table>

Control center

Manned plant

Plant
Centralization and Remote-control of Operation Management
Conclusions

- Tokyo Metropolitan Waterworks Bureau has been working on a new reform project

  - The project is long-term
    It is progressing steadily

  - Our new reform project will be a good example for large-scale waterworks service organizations