The e-Water project was a large-scale project which was researched and developed by Japan Water Research Center (JWRC) as a three-year project from 2002 through 2004. The project was funded by the private companies and subsidized by the Ministry of Health, Labour and Welfare. The total numbers of all professors and engineers were approximately 200, and the direct research funds excluding personnel costs amounted to 6 million dollars.

This project is commonly called "e-Water project" which is a part of its official name, the Research and Development on Environmental, Ecological, Energy saving and Economical Water Purification System. This project was divided into the following 3 Research Groups and subjects.

1. Research on the development of technology of large scale membrane filtration.

2. Research on the development of a total water purification system.

3. Research on the monitoring system for water sources.

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Introduction

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Results & Discussion

Joint Experiment at Ayase, Kanagawa

We designed four experiment flows: (A) Coagulating sedimentation + membrane filtration, (B) direct filtration + membrane filtration, (C) rapid mixing activated carbon filtration + membrane filtration, and (D) direct raw-water membrane filtration, and established various operation conditions for the experiment.

- Pre-treatment held down a rise in membrane differential pressure by 40 to 60%.
- Pre-treatment held down a rise in membrane differential pressure even at a high turbidity.
- Short-term high-turbidity water was successfully purified by changing the cleaning frequency.

Individual R&D

Twenty-six individual researches and developments were carried out by participated companies in fifteen fields throughout Japan.

Research Results

The outlines of research results are as follows.

1. "The collection of e-Water guidelines"
   - (1) "Guideline for introduction of membrane filtration facilities" (A) The introductory situation of the membrane filtration facilities in Japan, (B) How to plan, design, (C) Operation and maintenance, etc.
   - (2) "Guideline for use of iron-based and organic-polymer coagulants" (A) The standard of the coagulant for waterworks, (B) About iron-based coagulant and organic-polymer coagulant (how to use, important notices for use, jar test method, and dosing facility), etc.
   - (3) "Guideline for introduction of Ultraviolet-Rays (UV) disinfection" (A) Application to water purification technologies, (B) Cost calculation, (C) The example of a design, (D) Examples in Japan and overseas, etc.
   - (4) "Manual of integrated treatment for sludge from water purification plant and sewage treatment plant" (A) Situations which surround integrated treatment for sludge, (B) Related statutes, (C) Domestic and overseas examples, (D) Case study, etc.

2. "The technical document for introduction of large-scale membrane filtration facilities" (1) Examples of introduced membrane filtration plants, (2) Trial calculation for costs, etc.

3. "The evaluation method" (technical document) Application of life cycle assessment (LCA); quantification in environmental load in each stage of material production / construction / running / maintenance of water purification facilities, etc.

4. "The collection of functional improvement/remodeling examples" (technical document) (1) A result of having carried out questionnaire investigation and hearing investigation, (2) The database which collected the technologies and the products of many company, etc.

5. "The technical document about the monitoring system of water source for the purpose of safe water supply" (1) Establishment of monitoring system on water quality in water source, (2) Technical proposal of remote monitoring system for a small-scale water purification plants, etc.

Fundamental Researches

The experts of universities and institutes who participated in e-Water project performed fundamental researches on 21 themes.

Conclusions

The e-Water project was based on joint research system of private companies, public utilities, and academic circles, which was remarkable in Japan and overseas. Three guidelines, one manual and four technical documents were published as research results. You can find out further information and order these books to visit our website www.jwrc-net.or.jp.

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