Study on efficiency evaluation of operation & maintenance of sewerage facilities		
Whole term	2003.5～2005.3	

(Purpose)

Sewerage systems so far have been developed in a short time with the emphasis on the spread of facilities as important social infrastructures. However, the development thereof have been almost completed in and around large cities recently and the weight of efforts concerning sewerage systems is being shifted on maintenance and management of facilities, system management, etc. Moreover, efficient operation & management (O & M) of sewerage facilities are being urgently needed because of severe financial situation. Nonetheless, definite evaluation indicators for the O & M of sewerage facilities for this purpose have not been established yet.

With due consideration to this situation, this study has been carried out to grasp the current status of O & M of the services in large cities, to classify existing and new technologies possibly contributing to the increase of managerial efficiency with due concern to recent technological trend, to examine proper evaluation indicators for these technologies, and then to establish tools to evaluate technologies for this purpose as well as to systematize the method of evaluating technologies in order to judge comprehensively which technologies are to be introduced to the purpose of O & M efficiency.

(Result)

(1) Items studied

In FY 2003, current status of O & M and characteristic problems concerning O & M costs was classified, 50 technologies considered to contribute to enhance the O & M efficiency were identified based on the recent technological trend, and relationship between technologies and evaluation indicators was examined through case studies for 3 technologies among them. In FY 2004, moreover, case studies for additional 9 technologies among them were carried out in order to examine the relationship between technologies and evaluation indicators, and 'Guideline for Evaluation Method of Technologies to Increase O & M Efficiency' has been drafted by systematizing methods for evaluating technologies for this purpose.

(2) Case studies for technologies to increase O & M efficiency

Case studies have been carried out for 9 technologies seemingly contributing to the increase of O & M efficiency and the change of evaluation indicators before and after the introduction of each technology have been computed. As a result, technologies to reduce weight and volume of sludge have been found to contribute to the increase of O & M efficiency in several evaluation indicators such as O & M cost, amount of utilities, and environmental concern. On the contrary, technologies to store surplus electricity and that at nighttime have been found out to increase the exhaust amount of greenhouse effect gasses since they need additional electricity to heat storage battery.

(3) Examination of methods for evaluating technologies to increase O & M efficiency

Evaluation methods for each technology have been established by examining a way of quantifying effectiveness from its relevant evaluation indicators in terms of how much the technology is effective for each point of effectiveness, namely i) reduction of cost, ii) increase of O & M easiness, iii) reduction of amount of utilities, iv) O & M enhancement by information technology, v) increase of reliability, and vi) environmental concern, and by examining a way of weighting each point of effectiveness.

As a result, evaluation method of technologies, by using existing data and/or by carrying out simplified case studies, which were difficult to be compared quantitatively could have been established.

(4) Drafting of 'Guideline for Evaluation Method of Technologies to Increase O & M Efficiency'

By putting study results so far together, 'Guideline for Evaluation Method of Technologies to Increase O & M Efficiency' has been prepared as a handbook with respect to the evaluation of technologies for increasing O & M efficiency.

(Conclusion)

In this study, a tool capable of evaluating technologies quantitatively by using a simplified software in terms of which technology contributes most to realizing purposes of the increase of O & M efficiency which a manager of sewerage system demands, i.e. reduction of cost, increase of O & M easiness, reduction of amount of utilities, O & M enhancement by information technology, increase of reliability, and environmental concern, has been developed, and the draft of 'Guideline for Evaluation Method of Technologies to Increase O & M Efficiency' describing a way of using the tool and procedures of evaluation could have been prepared.

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key words	Effciency promotion of O & M, evaluation indicator, evaluation method, AHP(Analytic Hierarchy Process), BMPC (Band function Model Paired Comparison) value