5-2 DEVELOPMENT OF OPERATION NAVIGATION SYSTEM

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ABSTRACT

Bureau of Tokyo Sewerage has 13 wastewater treatment plants and 82 pumping stations.

In order to manage these facilities efficiently, collective operation in each treatment area is being promoted by making use of remote-control system.

Promotion of remote control system leads to concentration of facilities monitored or controlled from the master facility, and, therefore, increases tasks of each operator, enhancing possibility of his human error.

Also, due to pressing increase of age-limit retirees and strict restraint of employment, the number of operational staff is decreasing and, consequently, operational skills are being lost with veteran operators.

Automatic operation can save some load of operation, but it is limited in use because WWTP deals with uncontrollable materials, rainfall and sewerage.

As a solution to the problems, Operation Navigation System (ONS) was developed.

ONS, a computer system to make use of its performance and capacity, is a guidance system that has human-friendly interface and flexibility.

Developed ONS reduces operational tasks, functioning like car navigation. An operator can give operational instruction or action according to guidance message that is timely and pertinently shown on supervisory monitoring device.

The target of ONS is to establish safe and stable plant operation by inexperienced operational staff.

ONS uses data of the supervisory system to deduce the next action. The decision is shown as a guidance message or messages with other related information.

In contrast with automatic operation, which has restriction that it can be applied only to fixed operations, ONS can deal with operations that require operator's judgment.

To evaluate ONS, prototype ONS was installed in the Morigasaki WWTP. The field test, which was done from July 2005 to March 2006, demonstrated practicality of the guidance message system. We confirmed good consistency between ONS guidance and actual operation. For operations of indefinite timing, additional data from operator works.

For ONS, operation know-how expressed in a form, such as document, manual, or flowchart is vital. ONS also asks for substantial improvement of operational data.

Preparing the documented know-how and improving operational data is the key to introduce ONS to our WWTP.

KEYWORDS

Human interface, WWTP operation, Operation guidance system, Logic table expression, Guidance message