

Joint research regarding information systems required for early restoration of functionality in the event of a large-scale disaster and their construction

Year of Research

2012 • 2013

Promotion of earthquake disaster prevention

(Purpose)

Japan often experiences earthquakes, heavy rains, and other natural disasters. As such, Japan has a history of implementing countermeasures against those occurrences and has put the hardware required to prevent damages from such occurrences into place from the perspective of disaster prevention. However, the 2011 Tohoku earthquake and tsunami caused significant damages to many infrastructure facilities, including wastewater facilities. As a result, additional earthquake countermeasures have been recommended and the improvement of both hard and soft countermeasures is currently needed. This research was conducted for the purpose of determining and organizing the requirements for information systems needed to quickly restore the functionality of wastewater facilities that are damaged in the event of a large-scale disaster through the use of wastewater BCP, based on the evidence that organizations with sufficient BCP planning and other such soft countermeasures were able to quickly restore such functionality.

(Results)

We organized the desired functions for systems that could effectively restore functionality to facilities in the event of a large-scale natural disaster based on wastewater BCP and hearings with municipalities in damaged areas and how to construct those systems (**Figure 1**). The important factors to consider for this research and for the implementation of these systems are smooth operation during a disaster, B/C, and other similar conditions in the event of a disaster and that the systems can also be used effectively during normal operation. This research was conducted based on requirement ranks to determine what can be implemented by the most municipalities possible.

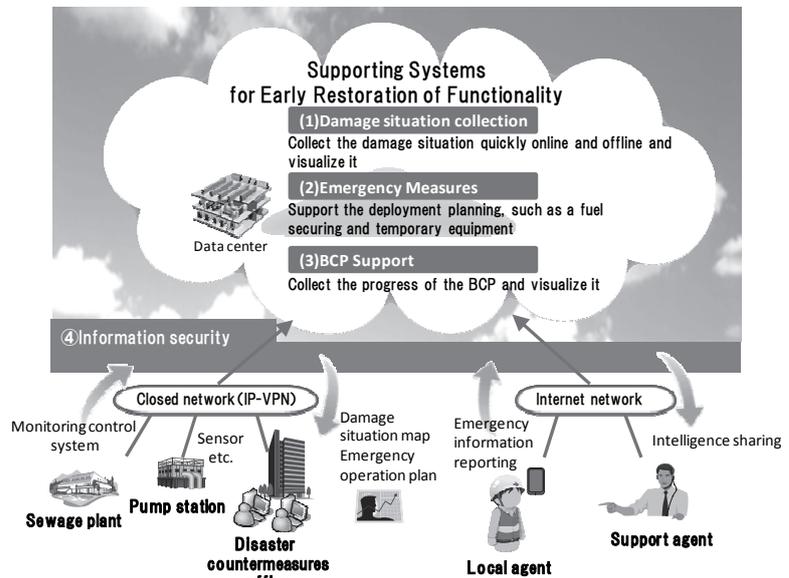


Figure 1 - Overview of Supporting Systems for Early Restoration of Functionality.

(1) Damage situation collection

The systems must be able to quickly gather data on the state of damages and support the sharing of all such collected data. Fast data collection is made possible by utilizing mobile devices to collect data on-site.

(2) Emergency Measures

The purpose of these systems is to extract the required information for quick recovery and speed up the process of determining what actions to take in response to natural disasters when they occur, as well as to support the proposal of plans for emergency measures and damage assessment. The systems are designed to support the decision-making process without complete knowledge of the devices that need to be restored.

(3) BCP Support

These systems must support the ability to assess problems and the transparency of wastewater BCP and disaster training. Storing the results of disaster training to these systems can also be used when reviewing wastewater BCP.

(Summary)

This research investigated concepts for information systems that can be used not only for the speedy restoration of wastewater functions damaged by a natural disaster, but for asset management during normal operation as well. The implementation of such systems can also help in the review of already established wastewater BCP. It is hoped that these technologies can be utilized by local municipalities and that the adoption of these systems can help with risk management in the wastewater industry.

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Key words

Earthquake countermeasures, information systems, early functionality restoration