

Empirical study on B-DASH Project (ICT-applied equipment deterioration diagnosis technology) (Study period: from FY2015)

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1. Introduction

In order to achieve cost reduction etc. in sewerage service by accelerating research and development and practical use of new technologies, the MLIT has been implementing the Breakthrough by Dynamic Approach in Sewage High Technology Project (B-DASH Project) since fiscal 2011 and NILIM has been serving as an implementing agency of this empirical study.

This paper introduces the outline of two technologies used to diagnose sewerage equipment deterioration using ICT.

2. Technologies to diagnose sewerage deterioration using ICT

(1) Empirical study on the deterioration diagnosis technology and the equipment inspection technology by sensor continuous monitoring and cloud server concentration

(Joint Research Organization of Swing Corporation and Sendai City)

These technologies are used for condition-based maintenance comprising deterioration diagnosis technology and equipment inspection technology that use the sensor monitoring data obtained by constantly monitoring the condition of equipment by the vibration method and the direct entry data obtained by daily inspection with a tablet terminal, both of which are efficiently concentrated on the cloud server (see Figure 1). In sensor monitoring, vibration and other sensors are installed on rotating equipment for continuous monitoring and obtained data is accumulated in the cloud server using wireless

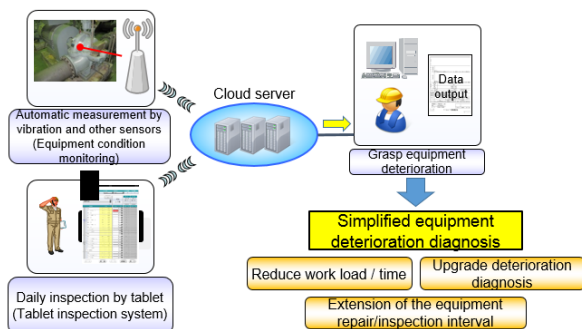


Figure 1: Continuous sensor monitoring and cloud server concentration technology

communication function. In tablet inspection, data is efficiently accumulated in the cloud server while reducing operation time by replacing the conventional method of recording in paper forms in daily inspection. For the data concentrated in the cloud server, data effective for equipment deterioration diagnosis is identified and visualized in order to raise the efficiency of condition-based maintenance by upgrading the deterioration diagnosis technology. Demonstration and introduction of these technologies are expected to contribute to reduction of maintenance cost and work load / time or appropriate equipment repair planning by upgrading deterioration diagnosis.

(2) Empirical study on technology for grasping / diagnosing deterioration of sewerage facilities by vibration diagnosis and big data analysis

(Joint Research Organization of Water Agency, NEC, Asahi Kasei Engineering, Japan Sewage Works Agency, Moriya City, and Hidaka City)

This technology is a combination of sensing technology and big data analysis technology and used to detect signs of abnormality and forecast deterioration by conducting big data analysis using continuous monitoring (sensing technology) data of rotating equipment and a large amount of operation data (big data) in the facilities, using vibration sensors. Condition-based maintenance of these technologies is expected to demonstrate the effective detection of abnormalities and the effect of reducing maintenance cost.

3. Future development

NILIM continues to lead the B-DASH project and promotes dissemination of the innovative technologies. This empirical study is going to continue data acquisition. We aim to contribute to reduction of maintenance cost and productivity improvement in sewerage service with these technologies developed from the results of the empirical study.

☞ See the following for details.

[Reference] Website introducing B-DASH

<http://www.nilim.go.jp/lab/ecg/bdash/bdash.htm>