

Empirical study on B-DASH Project (ICT-applied deterioration diagnosis)

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1. Introduction

Since fiscal 2011, the Ministry of Land, Infrastructure, Transport and Tourism ("MLIT") has been implementing the "Breakthrough by Dynamic Approach in Sewage High Technology" (B-DASH) project to realize the reduction of cost, etc. in whole sewerage works, and NILIM has been serving as an executing agency of this empirical study. This paper introduces the outlines of two ongoing empirical studies on technologies to diagnose sewerage deterioration using ICT.

2. Technologies to diagnose sewerage deterioration using ICT

(1) 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. The sensing technology detects deterioration by continuous monitoring of rotating equipment using vibration sensors. The big data analysis technology detects signs of abnormality and forecasts deterioration by conducting big data analysis using a large amount of operation data for all facilities and vibration sensor data ("big data") retained by the facilities. We are demonstrating the effective detection of abnormalities and the effect of reducing maintenance cost by condition-based maintenance with these two technologies.

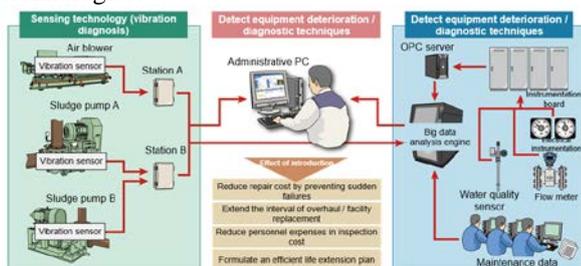


Figure 1: Sensing technology and big data analysis technology

(2) Empirical study on technologies for deterioration diagnosis and equipment inspection by sensor continuous monitoring and cloud server concentration (Joint Research Organization of Swing Corporation

and Sendai City)

This technology is a combination of equipment state monitoring by sensor using wireless data transmission and tablet inspection system.

Equipment state monitoring continuously monitors vibration with a sensor, and accumulates monitoring data in the cloud server. Tablet inspection efficiently accumulates inspection record data in daily inspection by introducing tablet system instead of recording in the conventional paper form.

Then, utilization of the maintenance data accumulated with the technique to diagnose equipment deterioration in combination of these two technologies contributes to the establishment of an appropriate maintenance / renewal plan for equipment and demonstrates the effect of reducing work hours for vibration measurement and maintenance cost.

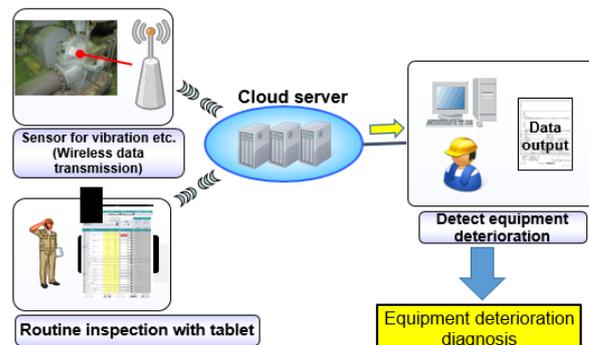


Figure 2: Sensor continuous monitoring and cloud server consolidation technique

3. Future development

NILIM continues to lead the B-DASH project and promotes dissemination of innovative technologies obtained from the project. For this empirical study, we also continue to obtain data and organize the findings so far obtained and aim to contribute to reduction of facility maintenance cost and improvement of the productivity in whole sewerage works.

[Reference]

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