

Improving sustainable maintenance methods considering risk management

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1. Introduction

Japan's public capital stock was created concentrated in the high-speed economic growth period, and it is predicted that the problem of deterioration will become serious in the medium to long term. Thus, in recent years, service-lifetime extension plans have been enacted in various fields of public capital. It is predicted that when service-lifetime extension plans have been executed as part of maintenance work in the future, a serious challenge will be whether the PDCA cycle of work will be effortlessly sustained without facing excessive risk. At the NILIM, we have responded to awareness of such problems by conducting "research on methods of improving sustainability of maintenance incorporating the perspective of risk management" for 2 years beginning in 2014. And in August 2013, the in-house Stock Management Research Committee (Chairman: Executive Director for Research Affairs, members are representatives of various research departments) began preparing for research to begin in the next fiscal year.

2. Outline of research scheduled to start in FY2014

Since FY2006, this Research Committee has clarified the degree to which methods of conducting maintenance in the fields of inspections, soundness evaluations, predicting progress of deterioration, countermeasures, data base construction, clarification of management goals, etc. have been physically provided in all fields of public capital. Research since 2014, has proposed evaluation methods for each management body to self-inspect effective ways of performing maintenance work in addition to the evaluation axis to answer the question: do these function effectively from the perspective of appropriate risk management or sustainability.

3. State of study by the Stock Management Research Committee

The Research Committee has had research departments in the NILIM report on the present state of maintenance in various public capital fields (sewage

systems, river structures, road structures, dams and sediment control facilities, airports and ports, cities and housing, etc.) and has conducted discussions to abstract problems concerning the PDCA cycle of maintenance (sustainability and risk management). In this way, concerning present methods of inspecting or evaluating soundness for example, it is difficult to cover the entire fields managed, and fear that it could obstruct the PDCA cycle have appeared. And even regarding inspection and soundness evaluation methods, a disagreement has appeared concerning the point that concepts concerning improving efficiency or introducing new technologies should differ according to characteristics such as whether it is a facility to prevent disasters caused by abnormal weather or external force or is a facility that provides day-to-day services.

4. Future activities

In 2014, based on discussions by the Research Committee, work will begin in earnest. In this way, it will study differences in basic guidelines to maintenance that should essentially be part of each field while clarifying the degree of completeness of technologies applied—characteristics of the objects of management already explained, management body systems, inspections and countermeasures—or the degree of uncertainty. For example, questions such as whether to prioritize service life extension by inspections and repairs, to prioritize response through design such as providing easily-inspected structures, to prioritize restrictions on use or early reconstruction, or to prioritize corrective maintenance. The question of whether or not differences of this kind in basic policies are reflected in actual maintenance work will be verified by comparing fields through case studies and enacting an evaluation axis which should be newly adopted. We want to perform the verification with reference to case studies which include the private sector infrastructure field or the concepts of ISO5500X.