Recent Activities of TC28

(Discussion on Chapter1 of the Guideline)

ACECC TC28 Session of the 46th ECM on 29 Feb 2024 in Manila

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Recent Activity

◆Translation and distribution of the monitoring guideline

◆Questionnaire regarding Chapter1 of the guideline and other topics

<Contents of the questionnaire>

- 2questions: Questions on the state of maintenance and monitoring in each country
- 7questions: Questions on differences among countries regarding Chapter 1 General Provisions
- 6questions: Questions regarding current state, challenges, and objectives of monitoring in each country
- 3questions: Others

◆Discussion in TC meeting

ToC: Chapter1 General Provisions

- 1.1 Scope
- 1.2 Positioning of Monitoring
- 1.3 Monitoring plan
- 1.4 Definition of Terms

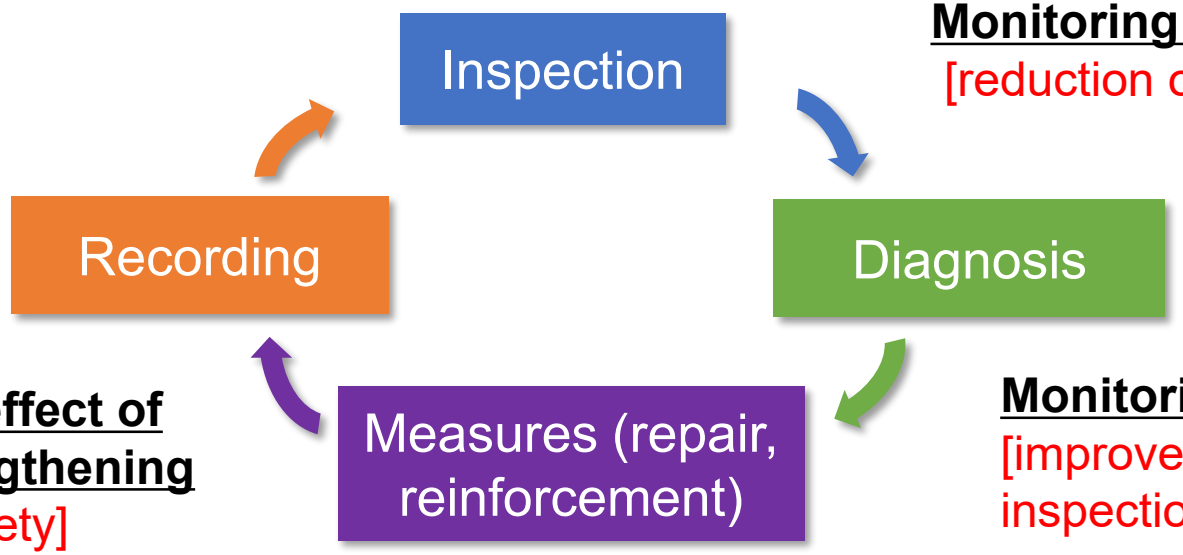
1.1 Scope:

The Guidelines for Utilization of Monitoring Technology (hereafter referred to as the Guidelines) apply to the monitoring of general road structures.

Example of question and answer (1)

Q. Please provide any additional information or suggestions for revision regarding the maintenance management cycle based on the actual situation and issues in your country.

Monitoring to assist emergency response
[improvement of efficiency, rationality, and safety]



Monitoring to assist inspection
[reduction of inspection cost]

Monitoring to assist diagnosis
[improvement of reliability of inspection and diagnosis]

Monitoring the effect of repair and strengthening
[evaluation of safety]

Example of question and answer (1)

Q. Please provide any additional information or suggestions for revision regarding the maintenance management cycle based on the actual situation and issues in your country.

（VFCEA）
It should have a starting point which can be “Inspection”.

（JSCE）
“Monitoring to assist in emergency response” is not related to the maintenance cycle.

（KSCE）

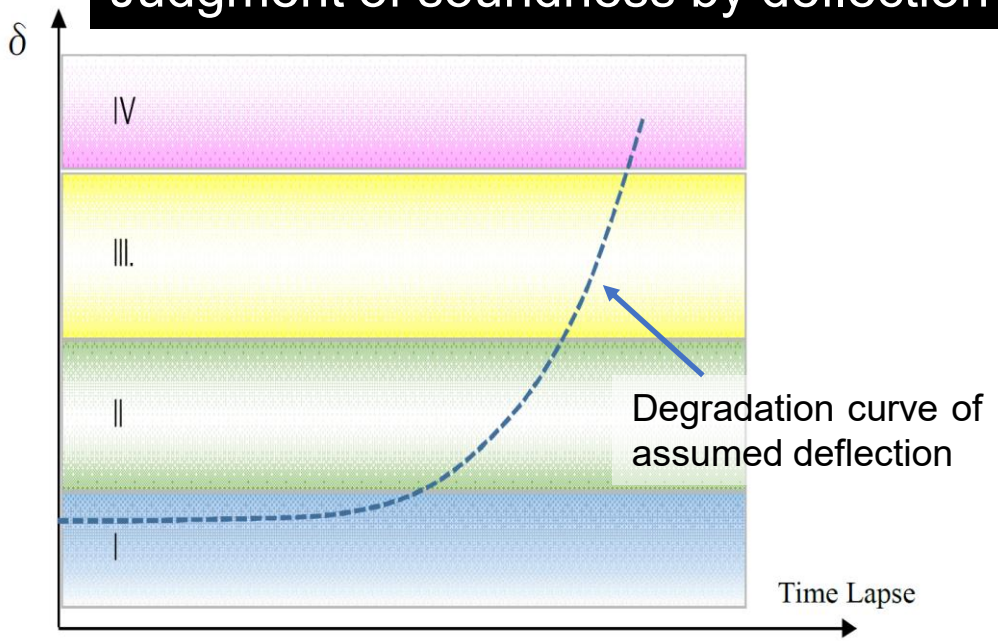
- Definition of the monitoring is needed. As-built information is very important at the beginning of the maintenance. So, it will be better to add the information delivery from project information to maintenance.
- Recently, digital twin models are actively developed for the life-cycle maintenance. So, we need to focus on KPI(key performance indicator) according to different structural types. Especially, time-depended performance needs to be monitored to update the analysis model. (ref. IBASE TG.5)

Example of question and answer (2)

Q. Control criteria are established to estimate the condition of structures based on measurements obtained from monitoring and to move to the next action according to changes in condition. Please provide any additional information or suggestions for revision based on the actual situation and issues in your country.

Soundness category (MLIT)	
I	Good
II	Preventive maintenance
III	Early rehabilitation
IV	Emergency rehabilitation

Judgment of soundness by deflection



Example of question and answer (2)

Q. Control criteria are established to estimate the condition of structures based on measurements obtained from monitoring and to move to the next action according to changes in condition. Please provide any additional information or suggestions for revision based on the actual situation and issues in your country.

（VFCEA）

This section is important but in practice, it is difficult to determine such control criteria due to the uncertainty regarding the current health of the structures. For example, before installation of the monitoring instrumentation, the structures could have deformed which may not known and any control criteria can not consider those prior deformations.

（KSCE）

- We need to define indicators for the control criteria. The indicators need to be derived from the baseline model. For cable-supported bridges, it is common to define upper and lower bound of the sensing data considering design conditions and environmental conditions.

Example of question and answer (3)

Q. Small bridges located in rural areas do not tend to be well-maintained using monitoring technology in any country. Is there a strong need to actively promote monitoring for such objects? Please also indicate the reasons for your answer.

（VFCEA）
Accidents/collapses occasionally happen to small bridges and monitoring can help reducing the consequences. With the advance in IoT BIM Digital Twin, the monitoring can be done with a reasonable cost.

（KSCE）
Some bridges already passed the design life. So, bridge owners should decide the new policy to manage the old and deteriorated bridges. Budget limit is a critical issue for the government or local government due to fast increase of demand.

（JSCE）
Due to insufficient budgets and shortage of engineers, there is a strong need to set labor-saving systems for maintaining structures in rural areas.

Example of question and answer (4)

Q. What are the obstacles for applying various monitoring techniques to manage road structures in your country? For example, lack of budget, lack of engineers, etc. Please share your thoughts on what is needed to remove these obstacles.

（VFCEA）
Lack of budget, approval procedure can be long and complicated.
Workshops to raise the awareness of the authority on the importance of the monitoring scheme.

（KSCE）
No regulations of monitoring systems for common bridges.
We need to define when the monitoring system should be installed. If the owner want to expand the service life, the monitoring system is essential to guarantee the safety.

（JSCE）
Additional cost need to be paid to install monitoring technologies, but B/C is not calculated well. Monitoring technologies would be adopted more if we know the B/C correctly.

Summarization

- **Problems and issues on maintenance and monitoring have been shared in TC members through some meetings.**
- **We will continue to make the ACECC version of monitoring guidelines.**

Thank you for listening!