Quantification of remaining Lifetime of post-tensioned Concrete Bridges

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Summary

Conventional lifecycle models are based on the information provided by the respective databases. In order to introduce objective values for assessment monitoring results are utilized. In the following description this process is elaborated. The presented approach has been developed for Central European conditions and the related database and information structure. Nevertheless the principle can be applied globally when the respective interfaces are fitted for the specific purpose

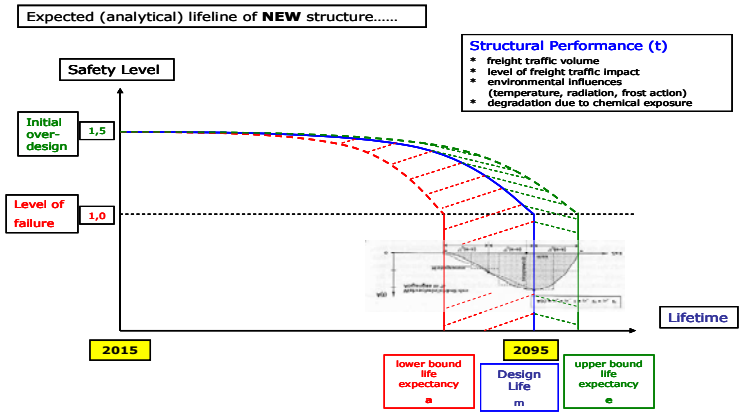
Keywords: Lifecycle, structural assessment, monitoring, data management

1. The determination/estimation of the design life of new structures

1.1 Primary load bearing structure

A tailor-made model was developed, which utilizes state-of-the-art information from literature (European, American & Asian) as well VCE's experience gained in the course of performing bridge monitoring and bridge inspection worldwide. This knowledge has been incorporated into the assessment procedure that is briefly described in the following.

Probabilistic methods are used for the service life calculations of the individual items. The reason is to cover occurring uncertainties which have to be also implemented into the established maintenance plan in terms of lower & upper bound of life expectancy.



The starting point of the bridge's service life – in terms of the safety level – is according to the initial overdesign and depends on the applied design code and certain safety consideration in the course of the static calculations.

Fig. 1. Expected (analytical) lifeline of new structures

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