**Probabilistic analysis of bridge failure and corresponding risk assessment under an influence of predictive climate models**

**Influence of different climate models on probabilistic analysis of bridge failure and corresponding risk assessment – A probabilistic approach**

Successful management of controlling deterioration of bridges requires the reliable prediction of damage due to climate change. The reliability of the damage prediction process can be significantly improved by information generated from downscaled prediction models of future climate for particular region and its corresponding river flow. Among the vast range of available climate models and their different downscaling methods and climate scenarios, most relevant selection was made to derive future daily and annual change in climate and precipitation and corresponding change in intensity of streamflow in river. This integration of predicted future data leads to a more accurate prediction of the time-dependent damage level and, eventually, to a better supported process to evaluate corresponding failure risk. In this paper, a probabilistic approach is provided to find risk profile based on failure profile for a bridge by integrating the available information from prediction of future climate data. This process results in risk profile which can provide managers the ability to make real –time decisions based on probabilistic results of failure. The integration of this future climate information and its impact on the life-time stability of the bridge are thoroughly investigated. Comparison is made between risk profile generated from real time data and data generated from climate models for certain time period. In addition, an existing bridge is used to illustrate the proposed probabilistic approach and