**Integration of SHM into Bridge Management Systems: Case Study–Z24 Bridge**

E. FIGUEIREDO, L. RADU, G. PARK and C. FARRAR

**ABSTRACT**

Bridge Management System (BMS) is a decision-support tool developed to assist the authorities in determining how and when to make decisions regarding maintenance, repair, and rehabilitation of structures in a systematic way. However, despite the advances in BMS modeling, the condition assessment activities still rely heavily on visual inspections, which inherently produce widely variable results. On the other hand, the goal of Structural Health Monitoring is to improve the safety and reliability of aerospace, civil, and mechanical infrastructure by detecting damage before it reaches a critical state. To achieve this goal, technology is being developed to replace qualitative visual inspection and time-based maintenance procedures with more quantifiable and automated damage assessment processes. It is the authors' belief that for the activities related to bridge safety and maintenance should be based on visual inspections along with results from long-term monitoring. Over the last decade, the authors have realized that research in both fields has been conducted separately. Therefore, in order to develop a more reliable bridge safety and maintenance process, this paper summarizes the foundation of an approach to integrate both fields. The applicability of this approach is then demonstrated on data from the Z24 Bridge in Switzerland.

**INTRODUCTION**

The continuous condition assessment of bridges has been society-serving to face an aging infrastructure that endorses bridge collapses. Indeed, the recent collapses of the Hintze Ribeiro Bridge that killed 59 people in Portugal, and the I-35W Bridge over the Mississippi River that killed 13 people in the United States of America (USA), pointed out the need for new and more reliable tools to prevent these events. Herein, we propose to conceive a methodology that can make a major contribution to the prediction of bridge collapses.

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**Ключевые слова:**

**Содержание.**
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