



Condition Assessment of Timber Structures – Quantifying the Value of Information

Mislav Stepinac, Vlatka Rajčić

University of Zagreb, Zagreb, Croatia

Daniel Honfi

RISE Research Institute of Sweden AB, Goteborg, Sweden

Contact: mstepinac@grad.hr, daniel.honfi@ri.se

Abstract

Advanced inspection techniques, non-destructive (NDT) and semi-destructive (SDT) testing methods and structural health monitoring (SHM) are increasingly important for the preservation of both old and new timber structures. However, e.g. the application of SHM within the context of timber structures is not adequately represented in strategic documents. COST Action TU1402 is trying enhance the benefit of SHM by novel utilization of applied decision analysis on how to assess the value of SHM – even before it is implemented. The present paper illustrates how pre-posterior decision analysis can help quantifying the Value of Information (Vol) obtained by the condition assessment of timber structures and thus help select appropriate assessment procedures and subsequent maintenance actions. As a case study a timber exhibition hall in Zagreb, Croatia is investigated in the context of Vol analysis.

Keywords: timber structures; assessment; value of information; heritage; NDT; SHM.

1 Introduction

As a structural material, timber is one of the oldest, but still modern, building material. However, timber is often considered less durable than other traditional construction materials, e.g. steel and concrete, and timber structures are thus associated with shorter service life. Nevertheless, there are numerous examples of timber structures which are defying time, and which are still standing despite aggressive climate and/or frequent and no adequate use [1]. This need for maintaining the built environment is supported by the global policy of the Kyoto protocol 1997 and all further World

Climate Summits on existing buildings and engineering works also with regard to the protection and conservation of heritage buildings built in timber. Sustainable development is a long-term goal of the global policy which results in modification or extension of existing buildings rather than demolition and substitution.

Advanced inspection techniques, non-destructive (NDT) and semi-destructive (SDT) testing methods and structural health monitoring (SHM) are increasingly important for aiding the preservation of both old and new timber structures. With the help of regular condition assessments and