



IABSE Conference 2018 – *Engineering the Past, to Meet the Needs of the Future*
June 25-27 2018, Copenhagen, Denmark

The Structural Health Monitoring System of the Governor Mario M. Cuomo Bridge

Farreras-Alcover, Isaac ; Egede Andersen, Jacob

COWI A/S, Dept. International Bridges, Kgs. Lyngby, Denmark

Vineyard, Preston

COWI North America, Bridge Department, New York, USA

Contact: ifal@cowi.com

Abstract

The Governor Mario M. Cuomo Bridge, also known as the New NY Bridge is a twin cable-stayed bridge that replaces the Tappan Zee Bridge, in the USA. The bridge is equipped with a Structural Health Monitoring System (SHMS) consisting of more than 400 sensors deployed at relevant locations. The sensors capture environmental and operational conditions as well as the associated structural responses. The system is designed to process monitoring data to support data-driven management of the bridge. This is achieved through the system's different functionalities, which include real-time data visualization via an on-line graphical user interface, customized data processing routines, alert notifications whenever data-based thresholds are exceeded, automatic reporting of pre-defined parameters and characterization of structural responses during extreme events. The present paper describes, as a case-study, the motivation, architecture, functionalities and installation aspects of the SHMS.

Keywords: Governor Mario M. Cuomo Bridge, New NY Bridge, Structural Health Monitoring, SHMS.

1 Introduction

The Governor Mario M. Cuomo Bridge, also known as the New NY Bridge, is a twin cable-stayed bridge that replaces the Tappan Zee Bridge, in the USA. The bridge crosses the Hudson River approximately 25 miles upstream of New York City. The total length of the twin bridges is 5.2 km including both the approach and the cable-stayed spans, which have a main-span length of 366 m. In August 2017, the opening of the West Bound bridge took place. The East Bound bridge is expected to open in 2018.

COWI Group provided the design of the Structural Health Monitoring System (SHMS) as sub-consultant to HDR Inc. The bridge is being constructed by Tappan Zee Constructions, LLC. The detailed design of the SHMS and its installation including software customization were done by Geocomp Corporation, the system supplier. The bridge is owned and operated by the New York State Thruway Authority.

This paper presents the designed SHMS of the bridge including its motivation, architecture, sensor overview and system functionalities. Finally, a discussion on observed current trends in data-driven management of civil infrastructure is given.