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Structural Health Monitoring Of World'S Longest Suspension Bridge: 1915 Çanakkale Bridge

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Structural Health Monitoring (SHM) for Long Span Bridges is a challenging and multi-faceted problem. In this paper, the world's longest suspension bridge is presented along with the design, implementation and operation strategies of the SHM system. The suspension bridge has a 2023 m long main span and 770 m long side spans. The bridge girder is of twin stiffened steel box girder construction, with stiffened steel plate decks with asphalt surfacing. The bridge, which has a total length of 3563 m, has a design service life of 100 years. A dedicated department of Operation and Maintenance will the in charge of the routine maintenance as well as via the replacement of elements associated with design service lives below 100 years. It is expected that the SHMS shall be providing input to data-driven decision making affecting the maintenance strategy of the bridge and timing the replacements. In this paper, the design of the SHM system, its implementation at the site and utilization of the system for decision making will be discussed along with the some of the special analysis methods, considerations, and activities for routine as well as extreme event activities. The paper will present advanced methods and also critical considerations for useful field implementations based on the recent experience and observations.