



## Improvement of Dry Air Injection System for main cables of Seto-Ohashi Bridges

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### Abstract

A “Dry Air Injection System for main cables (DAIS)” was developed by the Honshu-Shikoku Bridge Expressway Co., Ltd. (HSBE), in order to keep in sound condition of the main cables over the long term. And the DAIS was installed to the Akashi-Kaikyo Bridge as the first case in the world. In parallel with installation of the DAIS in new bridges, the HSBE also installed the DAIS in all the existing HSBE’s suspension bridges, in which progressive corrosion of the cable wires was observed. After approximately ten years of the DAIS installation, the monitoring data in the Seto-Ohashi Bridges showed that Relative Humidity (RH) of inside the cables still remained high in some portions. Through a trial and error process, we made improvements of the DAIS, which mainly composed of alteration of injection points, in order to keep RH of the entire length of the cables less than a target value (40%RH). This paper describes improvements of the DAIS and its results.

**Keywords:** dry air injection system; anti-corrosion; main cable; suspension bridge; monitoring

### 1 Introduction

The Honshu-Shikoku Bridge Expressway Co., Ltd. has been carrying out maintenance of the Honshu-Shikoku Bridges (HSB), which connects Japanese two major islands, Honshu and Shikoku, with three routes (Figure 1). The HSB consists of ten suspension bridges, five cable-stayed bridges, an arch bridge and a truss bridge, including the Akashi-Kaikyo Bridge, the world’s longest suspension bridge with the main span of 1,991m.

The HSB is the important parts of the national trunk road network in Japan, and no alternative route exists. Especially, since the Seto-Ohashi Bridges (SOB) is the world’s longest highway-railway combined bridges; it is indispensable infrastructure promoting for interregional exchange between Honshu and Shikoku.

Therefore, all bridges are required to be kept in sound conditions over the

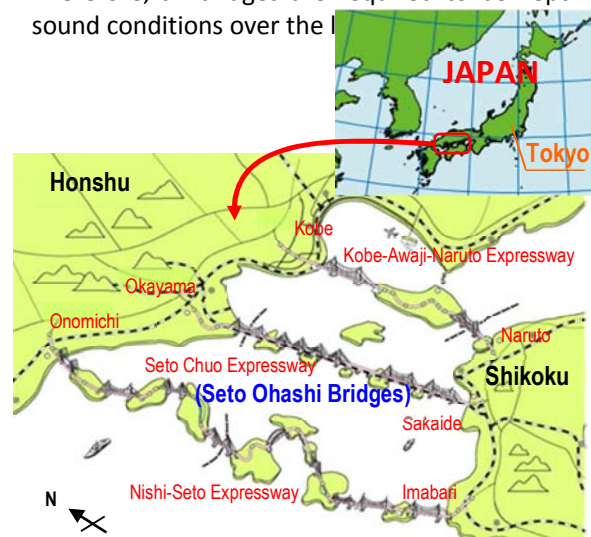


Figure 1. Outline of Honshu-Shikoku Bridges