Laser-View Technologies

Smart non-contact measurement solutions for industry

Application Brief:

Engineering & Construction

Bridge Structural Monitoring

Industry: Engineering & Construction

Application: Bridge Structural Monitoring

Summary: DIMETIX USA helped make history in 2010 by collaborating with Applied Geomechanics, Inc. to develop a system to monitor the lift and placement of steel bridge truss sections on the Huey P. Long Bridge over the Mississippi River in New Orleans. The project involved transportation by river barge, lifting, and placement of the pre-assembled bridge truss spans to reduce stress on the bridge and minimize interruption of traffic. Ten DLS-C15 laser distance sensors were lifted aboard the 2,700 ton trusses and were used in conjunction with specially fabricated targets and software developed to monitor beam deflection during the day long lift.

Overview

Challenge

As part of a historic bridge widening project, two steel bridge truss sections measuring 528 feet in length and weighing in at 2700 tons, were built on shore, transported on barges, and simultaneously lifted 130 feet and set in place on the Huey P. Long bridge in New Orleans. HNTB Corporation, the infrastructure solutions firm responsible for the project, required a real-time, remote monitoring system to measure truss distortions and to eliminate overstressing or buckling of the truss during the transport, lift, and setting operation. That remote monitoring system was developed through collaboration between collaborating between Applied Geomechanics, Inc. and DIMETIX USA.

Solution

A total of ten lasers distance sensors (five on each truss) were used to measure out-of-plane truss distortion. All sensors were hard wired to a data logger and transmitted to a laptop computer with multiple display panels under the bridge deck. Data were continuously transmitted and updated approximately every 5 seconds and were under constant review. Decisions for controlling lift were based on a graphical representation of truss tilt and deformation was developed to monitor these real-time truss tilt/deflection measurements.

Key Application Notes

- The laser-based monitoring system enabled adjustments to the attitude of the truss "on the fly" without slowing down the operation, which could not have been achieved with traditional survey methods
- Trusses were barged into place and connected to lifting tendons from the 900-ton strand jacks and successfully lifted 130 feet in 12 hours
- Truss deflection detected over long distances (150 feet), outdoors and on the water
- River closures minimized in the main navigation and auxiliary channels
- Maintenance free application– no moving parts to wear or string cables to break
- Economical, rugged, and compact package

Results

The laser-based monitoring system was vital to the lift operation. The project engineers were able to use it in real time to know exactly what was happening with the lift, making it possible to make "on the fly" adjustments to the attitude of the truss without slowing down the operation. According to John Brestin, Vice President and Bridge Group Director at HNTB, the system also allowed monitoring of the truss while it was sliding laterally into position over the bearings, which was as critical if not more critical to monitor than the lift itself.

Please contact **Laser-View Technologies** today to discuss your next application.

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