

Case study



Future-Ready Steel Infrastructure with Smart Monitoring

How Villari's certified wireless crack detection technology transforms aging steel infrastructure by safely extending asset lifetime and optimizing maintenance.

Context

In the railway infrastructure sector, ensuring the structural integrity of bridges is key to ensure safety and operational efficiency. Bridges, especially critical members like the main girder, must be closely monitored for any damage or deformation, as these issues can lead to expensive repairs and possible downtime.

The Challenge

A railway bridge in the Netherlands faced a significant challenge after a truck collided with its structure, causing visible deformation to the bottom flange of the main girder—a critical component of the bridge. The deformation raised concerns about potential crack growth and initially a repair was scheduled - but it would result in excessive downtime and substantial expenses, making it a costly solution.

Villari's Solution

To avoid unplanned downtime and expensive repairs, Villari collaborated with the bridge's owner to implement a continuous monitoring system. The sensors were strategically placed on the deformed flange, a process that required minimal installation time and no surface preparation. The sensor system detects crack growth by monitoring changes in the ferro-magnetic field of the steel structure, providing real-time data on any structural developments.

Figure 1 (Left) This image illustrates a steel bridge. (Right) Villari's crack detection sensors are typically installed at critical stress points, to ensure continuous monitoring and proactive maintenance.



Impact and Results

The implementation of Villari’s sensor system unlocked a new level of data-driven asset management and maintenance. A continuous stream of data provides instant alerts when cracks start to develop. Maintenance costs and downtime were reduced and the EOL for each asset could now be precisely assessed – and increased in 15% –through the valuable data acquired.

Conclusion

Villari and Partner’s innovative approach not only addressed the immediate challenges faced by the steel manufacturer, but also paved the way for a more efficient and cost-effective future in crane maintenance. This case study exemplifies how proactive, data- driven solutions can revolutionize the management of aging assets; ensuring longevity and reliability in crucial industrial operations.

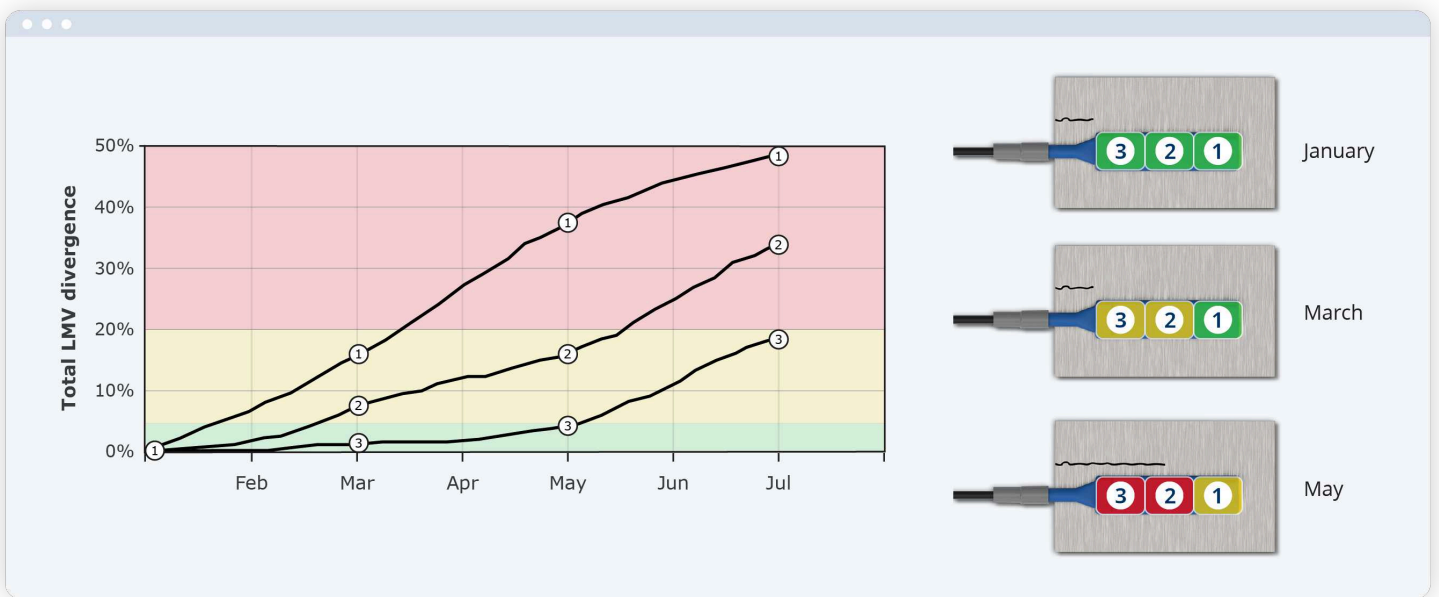


Figure 2 A graph illustrating the key outcomes of Villari’s sensor implementation. The data highlights Villari’s capability of early detecting crack growth and providing unique insights with continuous monitoring.

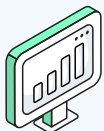
Key Numbers



10 min
Installation time/sensor



48 hours
Maximum response time



Up to 4.000
Measurements per year/sensor



Cost reduction
Cost of monitoring is negligible compared to repairing the weld



The future of structural health monitoring

Trusted by global industry leaders



Get in touch

Talk to one of our experts today

Are you ready to take your asset management and maintenance strategy to the next level?

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