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Bridge Inspection and Monitoring

Since the mid-twentieth century, the infrastructure construction sector has undergone a big development, generating a large volume of assets that need to be preserved and maintained. Bridges are a vital component of every infrastructure and their maintenance, inspection and monitoring are necessary to effectively manage repairs and ensure sustenance of the systems. Over time, bridges deteriorate due to load and under the influence of various external factors such as wind and rain. Public Administrators and Owners conduct regular inspections to determine the condition of their assets.

The bridge inspection services at Applus+ offer a mechanism of proactive condition assessment, preventing emergency shutdowns and enabling cost savings by being able to target work crews and budgets where they are needed most.

THE Applus+ SOLUTION

Applus+ provides comprehensive solutions for bridge inspection and monitoring during construction and in the operation phase.

We are specialists in civil structures inspection, with many references worldwide both in railways and road-related works. We are experts in structures intelligent monitoring using our own technology based on optic fiber.

Our multidisciplinary team integrates experts in different knowledge areas like civil engineering, telecommunications and structural engineering.

For bridge inspection, Applus+ portfolio includes:

- Asset inventory and data collection
- Bridge inspection programmes:
  - Initial detailed inspection

- Routine Inspections
- Annual inspections
- Detailed inspections
- Advanced special inspections

- Analysis of civil structures conditional rating system
- Analysis of civil structures appraisal requirements
- Additional measurements and testing techniques for detailed diagnostic of the integrity of structures. On-site testing: drill cores, jackhammer, corrosion and NDT
- Design and supervision of remedial or refurbishment measures
- Load tests

Applus+ provides bridge monitoring by using different sensors for measuring key parameters such as strain, displacement, force, temperature, inclination, alignment and settlement. Sensors are installed permanently for long-term health monitoring, temporarily for load testing and/or to ensure safe working conditions during repair or strengthening. Optic fiber is also used for this purpose providing a lot of advantages to conventional instrumentation:

- It allows big data volume transmission, long-distance with remote data transmission.
- Low energy demand supplied with no electric network connection, if needed (autonomous generators)
- Low number of sensors is needed with high accuracy, working as a distributed sensor allowing the use of a unique fiber.
- Optic fiber is lighter, long-lasting and more accurate than traditional sensors. It can be used after years of inactivity.
- Not affected by electromagnetic interferences, it is highly resistant to aggressive environments.
- Cable needs for sensors are minimized, being a cost-effective solution

Applus+ has developed its own software for monitoring. SIGTUN is an Internet-accessible data acquisition system that ensures that any significant change in the condition or behavior of the structure is logged, reported and efficiently monitored.

Applus+ is introducing new technologies for inspections, including Digital Twin and AI for defect detection, while still using conventional methods.