

# **CLOUD-BASED CONTINUOUS ONLINE ASSET MONITORING - A PRACTICAL IMPLEMENTATION**

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The first decade of the 21st century saw a dramatic increase in computer power with a tremendous reduction in the size of electronic instrumentation. These two factors made possible the commercial deployment of powerful NDT instrumentation capable of producing detailed high-resolution images of defects in industrial assets, such as pipelines and pressure vessels. The availability of producing NDT data with such granularity allowed for better maintenance and repairs these assets and even to estimate extend their remaining operating life, with the help the fitness for service and risk-based inspection, among other methodologies. Never the less, even with these technological advances, the traditional paradigm of inspection at regular intervals changed very little. Lately, ubiquitous internet connectivity, further electronics miniaturization and the availability of advanced batteries and energy harvesting methods has created the conditions necessary for on-line continuous monitoring of industrial assets. However, even under these conditions, implementation of practical on-line continuous monitoring remains a challenging proposition. In this presentation, several examples of on-line continuous monitoring implemented on bridges and electric power utilities are discussed. These projects required the development not only of specially designed instrumentation but also of machine learning algorithms for the automated analysis of acoustic signals and of special web application for the visualization of asset status. The examples presented in this paper illustrate very clearly the state of art of on-line continuous asset monitoring at the beginning of the third decade of the 21st century, which incorporates smart sensors, remote wireless data acquisition and cloud data computing.