

2nd September 2010

"Structural Health Monitoring: The paradigm and the benefits shown in some monitoring projects."

Our directors were invited to present at the Special Session SS-3 on Seismic Structural Health Monitoring and Real-Time Data Broadcasting organised by Digitexx Inc. at the 14th European Conference on Earthquake Engineering held between August 30 and September 3 2010 in Ohrid, Macedonia. The topic of the presentation delivered in a jam packed room was "Structural Health Monitoring: The paradigm and the benefits shown in some monitoring projects".

The presentation first introduced Full scale Dynamics Ltd to the audience as the University of Sheffield spin-off company which, although new as a commercial entity in the field, has actually been supported by over 50 years of expertise of its worldwide renowned academic directors. Structural health monitoring (SHM) was then introduced in the context of large civil engineering structures as having two key elements, which require linking:

- automated continuous long-term monitoring, and
- off-line assessment.

Three case studies were then presented demonstrating key benefits of bespoke on-line monitoring systems which we have been designed, installed, commissioned, maintained, managed and from which data have been interpreted and reported by our directors in the last few years. There are:

1. The monitoring system installed on Tamar Bridge in Plymouth, UK, which features the world's first on-line and operator-free automatic system identification software for estimating and reporting of all relevant modal properties using ambient vibration data.
2. On-line vibration monitoring system installed on the old chimney at Rugeley Power station, which was used to monitor vibration performance of the chimney and confirm condition and effectiveness of the world's largest tuned mass damper ever installed on a such a chimney.
3. Monitoring of vibration properties of the 78 m tall Arts Tower at the University of Sheffield during its major £15m refurbishment in 2009 and 2010 involving replacement of the façade and removal of many internal partitions and walls. The latest phase of the development of this monitoring system, which will finish by the end of 2010, will involve Digitexx Inc. as provider of reliable data acquisition systems. The exercise will be used as a unique publicly accessible on-line showcase of the on-line vibration monitoring, analysis and reporting technology jointly offered by Digitexx Inc. and Full Scale Dynamics Ltd.

The presentation highlighted the rapidly increasing affordability of this new technology and its benefits, as well as the need for education about capabilities and limitations of SHM, for the benefit of construction professionals and other stake holders, such as owners, users, operators, insurance organisations, local authorities and regulatory bodies.

The business model operated by Full Scale Dynamics Ltd offers continuous on-line monitoring technology as an on-going service charge for real-time streaming of data and derived information in a manner similar to other regular service charges in buildings, such as electricity or water supply.