

Abstracts for the Health and Safety Canada 2006 Conference Poster Presentation
Proposed Subject Area: Ergonomics or Process Safety

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**A Wireless Vibration Detector (WVD) in Prevention and Management
of the Risks Associated with Exposure to Workplace Vibrations and Joint Injury**

OBJECTIVE: Considering frequent exposure of workers to segmental, hand-arm, and whole body vibrations in industrial and everyday settings and the negative impact that vibrations have on human health and safety, the major objective of this project was the development of a diagnostic device for detection and monitoring of the vibrations produced during human working activities in industrial and/or clinical settings. More specifically, the main objective of this project was to design a multifunctional, modular wireless device for accurate and reliable detection and monitoring of the signals produced by the human joint itself, Vibroarthrogram (VAG) signals, as well as exposure to the other vibrations at the workplace.

RESULTS: Through this project the **Wireless Vibration Detector (WVD)** device was developed based on MEMS accelerometers (Kionix, KXM52-1050), and short range wireless protocol (A7eng eb505 Bluetooth) with a PC display interface. The developed solution provides the opportunity for modular cost effective upgrades to wide range network communication protocols as well as for development of the low-cost MEMS based diagnostic device for industrial machinery operations monitoring.

CONCLUSIONS: First experimental results indicate wide array of possible applications. The developed **Wireless Vibration Detector (WVD)** provides a solid base for quantitative assessment of the risks from vibrations at work and provides the data for evidence-based prevention of work injuries related to musculoskeletal disorders such as arthritis. The WVD device is in the early stage of experimental evaluation.