

## **EVOLVING TECHNOLOGY TO MONITOR DYNAMIC BENDING STRAIN ON A CRANKSHAFT**

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This paper presents a technology developed by Southwest Research Institute (SwRI) to record dynamic strain during operation of a crankshaft. The method uses a strain gage mounted on the crank web; the time-varying strain is digitized and stored in a data acquisition system, which rides on the crankshaft. Data acquisition is triggered by a RF signal at a fixed point of crankshaft rotation, so that coherent data can be obtained from multiple devices. The device has on-board power and memory to run remotely for several days. Data is readily downloaded from the device.

The technology has potential to help evaluate design integrity of machines under development, as well as for condition monitoring of operating machines to guide maintenance decisions and help optimize life cycle costs.

Under combined support of PRC *International* (PRCI) and the Gas Machinery Research Council (GMRC), the device has been tested on a small single throw Ariel compressor, and on each throw of an integral HBA6 engine/compressor. The HBA6 tests included measurement of web deflection and strain during slow roll conditions before start-up. The paper presents the concept, development experience, and results from these tests. It interprets the measured data in the context of model predictions.