

Fiber Optic SHM System for Monitoring Internal Pipeline Corrosion

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FOX-TEK Inc, located in Toronto, Ontario, Canada, manufactures fiber optic sensors for monitoring the effects of internal erosion and corrosion in pipelines. These FT sensors were successfully employed on an oilsands plant tailings line at Ft. McMurray, Alberta to detect wall thinning over a period of several months. The sensors were bonded to the external pipe surface in spiral and hoop wrap configurations to provide monitoring over pipe lengths of many meters. The sensors were connected to an FTI-3300 FT Sensor Scanner, and continuous remote monitoring was provided at the FOX-TEK offices in Toronto through a wireless internet connection. Recently, an FT coil sensor was developed to monitor local corrosion over a small surface area on “hot” elbow pipes in refineries. The coil sensor is fabricated with an adhesive mesh for easy installation and is bonded to a pipe, at ambient temperature, using a high temperature adhesive. In a typical application, several coil sensors are also used to monitor temperature (to 260°C) and line pressure fluctuations. Using software developed by FOX-TEK, threshold thickness limits are set by the user to provide a baseline reference for the SHM system. By managing the pipeline integrity, operational maintenance schedules can be optimized to reduce costs.