

Transfer Line Load Monitoring: Verification of Transfer Loads Using Signature Analysis

Overview:

Transfer lines are commonly employed in manufacturing processes to move parts on an assembly line from one stage to the next. The transfer lines are often subjected to substantial loads and forces during the transfer process. Recently, a transfer line that was being used to transfer automobile bodies on a body weld line began experiencing problems with pin shear as a direct result of the force required to move the parts.

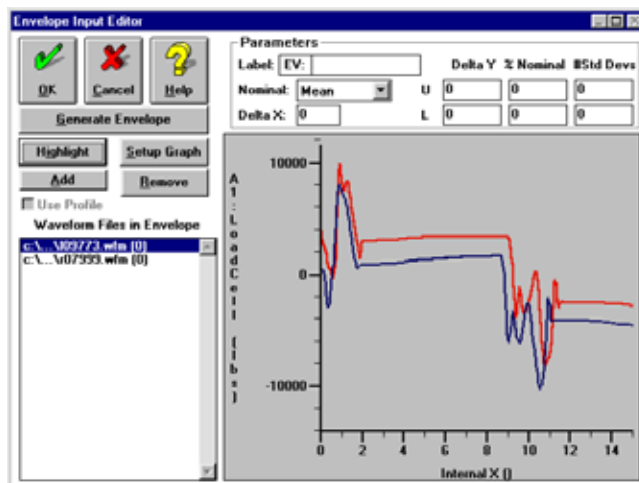
Highlights:

- Load balance verification
- Easy to configure
- Reduction in maintenance costs
- Less assembly line down-time
- Simple operator interface
- Fast and accurate fault identification

The transfer line consisted of a 200 foot long beam which raised the body panels approximately 24 inches, moved them horizontally, and then lowered the parts to the next station. To avoid damage to the system, a shear pin (designed to break if the force was too great) was used to connect the swing bar and the beam. The force required to complete the transfer process quickly became a concern when the manufacturer began encountering problems with pins shearing on a regular basis.

Sciometric®'s SigMETER® provided a quick and easy solution to the problem. A SigMETER® was configured to monitor and collect for fifteen seconds the compression and tension force data from a load cell configured on the transfer line (The entire transfer process occurred in eleven seconds). The peak values and data curve were then sent to the SigMETER® RDU (Remote Data Utility) software. Upon examination of the initial data obtained, Sciometric®'s unique Signature Analysis made it possible to quickly determine that the transfer line was experiencing a counterbalance issue at rest. The right side of the transfer line had been experiencing a greater load at rest than the left side (as shown in the screen below), and as a result was being subjected to a much greater load during the transfer process. The operator was then able to calibrate the compression and tension readings so that they were equivalent, minimizing the load on the system. During the transfer process, the SigMETER® ensured that a digital output was closed if specifically determined limits were exceeded, a fault signal was sent to the PLC if the load was too great in either direction, and a warning limit signal was sent if the fault limit was exceeded.

This application proved to be a tremendous success. Previous attempts by the integrator to solve the pin shearing problem had been futile. The final result was much less down-time on the assembly line and a substantial reduction in maintenance costs due to pin shear.



SigMETER Screen Showing Signature Waveforms Indicating Transfer Line Left and Right Side Counterbalance.