Vending Servo Motor: Subjective Gear Noise Audit

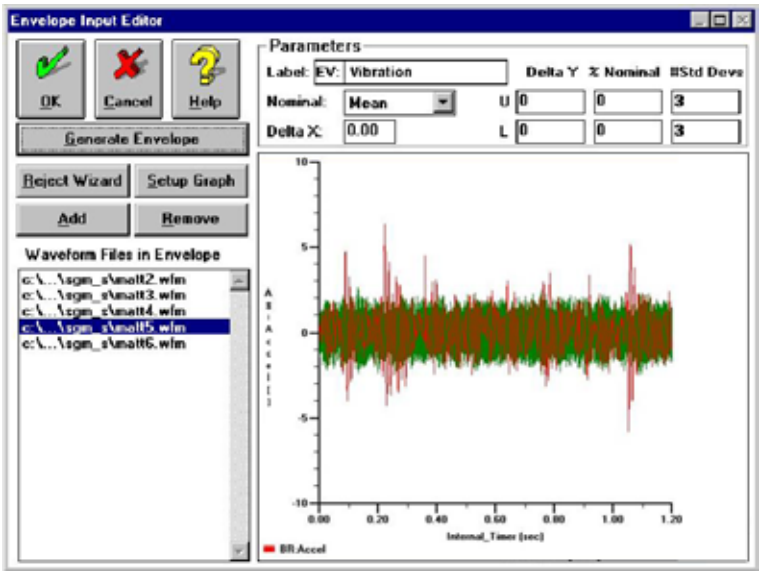
Highlights:

- Detects gear train defects
- Verifies torque and angular position
- Reliable 100% testing
- Immediate PASS/FAIL indication
- Advanced signature analysis identifies root cause defects
- Application Wizards simplify setup

Vending machines are a common sight on the sidewalk, and other public spaces. The ambient noise masks the various clangs and thumps that occur when the machine dispenses its products, and it seems natural to have a satisfying “thunk” when a can of soda pop rolls down the chute. Unfortunately, when the same machines are brought into an office or a hotel lobby, the noise becomes objectionable and poses a significant problem to the vendor.

Vending machines employ numerous complex electro-mechanical devices to deliver the product, and the case is in effect, a large sheet metal box. The components are usually connected to the side of the box and the slightest noise is amplified, like tapping on an oil drum. One such device contains an AC synchronous motor driving a simple set of reduction gears to increase the available output shaft torque. Imperfections in the gear train can be heard or felt readily when the motor is installed, but not necessarily on the production line. This adds repair costs and lowers the overall production rate.

An ideal solution is to build the experience of the best operators into a compact intelligent instrument capable of performing the test function quickly and reliably on the motor production line. The Sciemetric SigMETER® provides the best of all worlds: accuracy, stability, rapid 100% testing and low cost, without the inaccuracy and variability caused by human fatigue. Nicked gears cause the housing to ring at low frequencies, and the complex vibrations are picked up by a special low frequency accelerometer and fed to the analog input of the SigMETER®. The built-in computer, running under Configurator software, uses advanced Signature Analysis techniques to compare the results with known, good units. The derivative functions of the instrument can enhance the signal and make the defect more visible. If the Model 1103 SigMETER® is used, motor torque versus encoder position can be monitored via the second input. The operator receives a simple PASS/FAIL and can confidently accept or reject the unit.



SigMETER Screen showing Detection of Unacceptable Noise Defects

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