New technologies to optimize reliability, operation and maintenance in the use of Machine-Tools

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Abstract

European manufacturers of machine tools are positioned in the manufacture of high value-added products. Goratu, in particular, is designing and manufacturing machines capable of producing ever larger parts with tighter tolerances as a differentiating factor. The fact that customers buy machines with high added value means that these machines are used in critical processes and therefore expect machines free of failures.

Machine spindle defects are responsible for the most common and cost-intensive downtimes in machine-tools. The normal strategy to keep these production systems in good conditions is to apply preventive maintenance practices and complement it with a supportive workforce "reactive" in the case of clearly detected malfunctions. This impact on quality, cost and in general, productivity. Added to this, the uncertainty of machine reliability at any given time, also impacts on product/production delivery times.

The use of intelligent predictive technologies could contribute to improve the situation, but these techniques are not widely used in the production environment. Sensors and other monitoring techniques required for the production environment are not so standard and require costly implementations.

The paper presents a proactive maintenance strategy based on:
- Spindle health assessment using the Electric Signature Analysis technique
- Machine working condition monitoring
- The collection and analysis of data at the fleet level

This paper is a research activity, part of a larger research work still in progress.

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