INNOVATIVE PROCEDURE FOR MACHINE TOOLS DIAGNOSIS

Alina VINTILESCU[1]

Rezumat. *Achiziţia de date în vederea determinării comportării dinamice a maşinilor a stat dintotdeauna la baza aplicaţiilor din domeniul vibraiilor. Cu toate acestea, nu este suficientă achiziţia de date, este nevoie de analiză, procesare şi interpretare a datelor brute si transformarea lor în informaţii utile. Această lucrare prezintă importanţa înţelegerii diferitelor semnături ale vibraţiilor şi modul corect de extragere a datelor pentru a efectua analiza de trend. Având informaţiile corecte date de semnătură, devine posibilă realizarea unui plan de mentenanţă care să guverneze o fabrică şi procesul de producţie al acesteia.*

Abstract. *Dynamic data acquisition has always been at the heart of every sound and vibration application. However, it is not enough to simply be able to acquire data, you also have to be able to analyze, process, and interpret the raw data into meaningful content. This paper presents the importance of understanding the different vibration signatures and how to properly extract them for trending analysis. With proper signature information, it becomes possible to tabulate specific metrics which can drive plant maintenance or production schedules.*

Keywords: diagnosis, vibration level, frequency spectrum, envelope analysis, cepstrum.

1. Introduction

Rotating/reciprocating machinery produces vibration signatures depending upon the mechanism involved. Faults may occur at motor, rolling element bearings, gearboxes, belts, fans and other electrical/mechanical components. It is strongly necessary to detect these problems at an early stage and to avoid serious damage and catastrophic failure. The purpose of analysis is to identify the fault frequencies so that root cause can be addressed and corrective action can be taken. Vibration analysis is a way of getting information from the inside of operating machines without having to shut them down [2].

Knowledge of developing and existing causes of vibration leads to the possibility of establishing measures to eliminate or to reduce them, which would reflect the improvement of machine tool qualitative performances. The most common way of identifying the possible sources of vibration is achieved by studying the operating process; the identification is limited, in the frequency spectrum, at finding the main and harmonic frequencies specific to these sources.

---

[1]PhD Student, Faculty of Engineering and Management of Technological Systems, Department of Machine Tools and Manufacturing Systems, University "Politehnica", Bucharest, Romania, (alina_vinti@yahoo.co.uk).