

Analysis of metrological requirements in occupational health and safety regulations related to the emerging risk of exposure to vibrations

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Abstract-

In occupational exposure to vibration, the risk assessment process is defined through a regulatory framework that presents some relevant metrological problems. This framework considers methods based on estimation and on measurements. Estimation methods could employ existing information that is provided for each manufacturer to each individual tool or application to carry out such estimation. The use of estimation methods has some problems, such as substantial uncertainty. When using measurement methods, some metrological aspects are not fully defined. Therefore, a new and emerging risk appears due to certain methodologic limitations. Consequently, the variation between the estimated and the actual values could overestimate the level of occupational exposure to vibrations. Thus, with this paper, a critical analysis of this emerging metrological problem is provided. For this, a critical analysis of the metrological requirements regarding European standards is developed. To this end, the estimation method and measure method are investigated, considering, in both cases, the main factors related to uncertainty, reliability, and traceability. With this structure, a set of metrological limitations have been identified, thus pointing towards future lines of research that allow the improvement of the process of assessing the level of occupational exposure to vibrations.

Index Terms- vibration; metrology; emerging risk; occupational health; regulation

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