

ABSTRACT

This study aims to analyze the risks and potential occupational hazards for employees at CV. San Teknik Bengkel Bubut using the Hazard and Operability Study (HAZOP) and Bowtie Analysis methods. The background of this study is the still high potential for work accidents in the machinery industry sector, mainly caused by the lack of awareness of the implementation of Occupational Safety and Health (K3). The HAZOP method is used to identify hazard sources and assess the level of risk, while the Bowtie method is applied to determine the causes, consequences, and effective mitigation measures to prevent and control these risks. The study was conducted through field observations, distributing questionnaires to employees, and interviews with management. Data were analyzed using the Frequency Index, Severity Index, and Mean Probability Impact Index (IMPI) to measure the level of risk in each work machine. The results showed that based on the HAZOP analysis, there were six machines included in the high-risk category, namely electric welding machines, grinding machines, oxygen-acetylene welding machines, drilling machines, milling machines, and press machines. Meanwhile, the extreme risk category was found in lathes. Further analysis using the Bowtie method identified two machines with significant risk categories: an electric welding machine with an IMPI value of 50.28% and a lathe with an IMPI value of 44.07%. The main risks identified include skin peeling and visual impairment due to welding light, as well as injury or amputation of fingers due to contact with the workpiece. Companies are advised to ensure the use of PPE, conduct regular inspections, and strengthen OHS supervision. The HAZOP and Bowtie methods have proven effective in identifying hazards and designing appropriate mitigation. This study can serve as a reference for implementing an OHS system and a basis for further research with a broader scope and variables..

Keywords: *BowTie, HAZOPS, IMPI, Safety and Health Index (K3).*