ANALISIS KEBISINGAN UNTUK MENGURANGI RISIKO PEKERJA PADA TURBIN AIR DAN *UNSAFE ACTIONS* MENGGUNAKAN HFACS

SKRIPSI
TEKNIK INDUSTRI

Diajukan untuk memenuhi persyaratan
memperoleh gelar Sarjana Teknik

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SUMMARY

Armelynda Beverly Supangkat, Department of Industrial Engineering, Faculty of Engineering, Brawijaya University, 2017, *Noise Reduction Analysis on Water Turbine and Unsafe Action Using HFACS,* Advisors: Sugiono and Dewi Hardiningtyas.

This research was held in a company which was located in Malang where the unit power plant has 13 units of hydropower. One of the hydropower plants located in Karangkates. The number of workers being studied are 46 workers. The operational activities of hydropower using machine equipment that cause noise is a turbine machine that produces sound exceeding the limit (NAB), which is 85 dB according to PERMENAKER No. PER.13 / MEN / X / 2011. Other than the noises, workers on the hydropower also often did unsafe actions by not using personal protective equipment (PPE).

In order to measure noise level, the method used was sound level meter with grid measurement in 21 point with a distance 7x7m. This measurement conducted for 3 days at 08.00,10.00,12.00-14.00 and the equivalent noise level was calculated using the formula according to KEP-48 / MENLH / 11/1996 then the noise mapping was made.

The methods which was used to find out unsafe actions are HFACS (Human Factor And Classification Systems). 18 independent variables on HFACS were used in making a questionnaire with a total of 101 questions. The questionnaire were distributed to 46 workers and then tested for validity and reliabilty. Meanwhile the dependent variable is an observation guide of 46 workers who perform unsafe acts. Furthermore, variables were tested for univariate / descriptive analysis, bivariate analysis using chi-square test. Univariate and bivariate analysis was done by using SPSS and a pareto diagram was made for the recommendation.

The results of this research showed the noise mapping result which has the highest noise level was at 14.00 WIB. From the results of bivariate analysis the independent variables that have a significant relationship to the unsafe actions are decision error, skill-based error, perceptual error, violation, physical environment, technological environment, personal readiness, inadequate supervision and resource management. From the pareto diagram the incidence of unsafe actions that has the highest effect is the physical environment. Recommendations that were given are engineering control using noise mapping which shows that the safest points for workers to do their work in point (2.3). Furthermore a bulkhead which was made of fiber glass with a thickness of 20mm and a diameter of 2400 mm and a height of 4550 mm should be made around the turbine engines. Adminstrative control with conduct training motivation and development and multiple safety sign placed in visible area. Finally, reinforce the implementation of procedure to use personal protective equipment by the supervisor and if violated, workers will be subject to penalty.

Keywords: *noise mapping,* HFACS, pareto.