

A Study of Noise Pollution in An Oil Refinery Manufacturing Industry

Muhammad Zarif Roseli^a, Zitty Sarah Ismail^a

Structured Abstract

Background: Defined as an unwarranted sound or a combination of sounds with detrimental effects on human well-being, noise poses a pervasive challenge in industrial work environments due to their inherent nature. The rapid growth of Malaysia's industrial sector has also brought risks to industrial workers' occupational health, such as noise-induced hearing loss (NIHL). The purpose of this study is to ascertain the extent of noise exposure at the oil refinery in Port Klang, Selangor, and simultaneously, to determine the personal noise exposure of workers while establishing the noise mapping level.

Methods: To determine the degree of noise exposure in the manufacturing of oil refineries, walkthrough inspections will be used for area monitoring. The utilization of a Sound Level Meter (SLM), Noise Calibrator, and measuring tape will enable the monitoring of noise sources emanating from machinery. Then, data on personal noise exposure will be gathered using the noise calibrator and the noise dosimeter. Finally, noise mapping was developed to visualize the work area and exposure to noise level on an overall layout design for the workplace.

Results: Area monitoring was conducted to determine the noise level in working area P (Refinery First Floor) and area R (Loading Bay). This result shows the noise level from the 10 points in the manufacturing industry varies between 76.8 dB(A) to 88.2 dB(A). The highest noise level recorded is 86.8 dB(A) at (P8) in area R exceeding noise exposure limit (NEL) (>85 dB(A)). The noise level at (P9) from area Q and noise level at (P3) and (P4) from area P also exceeding noise exposure level (>85 dB(A)) hence it is not compliance with OSH (Noise Exposure) regulation 2019. Next, personal noise monitoring was carried out among selected employees in the Loading Bay and Refinery Plant working area. Personal noise level received by the employee during working time is between 75.9 dB(A) to 82.7 dB(A) exceeding the noise exposure level (>82 dB(A)). Lastly, noise mapping shows that 4 out of 10 machines monitored had noise levels exceeding the noise exposure limit (> 85 dB(A)) indicating that it is in the red zone. 3 out of the 10 machines under observation had noise levels that fell into the moderately concerning yellow zone which exceeding the excessive noise (>82 dB(A)).

Conclusion: In conclusion, the noise level generated by the noise source in working area P and R of the manufacturing industry at Port Klang, Selangor has been measured and recorded through area monitoring. Next, personal noise monitoring was successfully conducted and the data on noise level received by the employee during working time was recorded. Noise mapping was also successfully established to visualize the work area and exposure noise level on the overall workplace layout.

Keywords: Industrial Noise, Noise Exposure Levels, NIHL, Manufacturing Industry

*Correspondence: zitty@uitm.edu.my

^a School of Chemistry & Environment, Faculty of Applied Sciences, Universiti Teknologi MARA, Shah Alam, Malaysia