Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)
www.abjournals.org

DETERMINATION OF NOISE POLLUTION BASE FROM WELDING AND FABRICATION WORKSHOP IN AKUNGBA-AKOKO, SOUTH WEST NIGERIA

Tomiwa Akinyemi C.[1] and Oladele Opeyemi O.[2]

[1&2]Department of Physics and Electronics, Adekunle Ajasin University, Akungba-Akoko, Ondo State, Nigeria.

Emails:
[1]akinyemi.tomiwa@aaua.edu.ng or tomiwaakinyemiclem@gmail.com and

[2]oluwatobilolaopeyemi@gmail.com

Cite this article:

Tomiwa, A. C., Oladele, O. O. (2024), Determination of Noise Pollution Base from Welding and Fabrication Workshop in Akungba-Akoko, South West Nigeria. Advanced Journal of Science, Technology and Engineering 4(4), 155-169. DOI: 10.52589/AJSTE-JKHUUS7D

Manuscript History

Received: 21 Jun 2024

Accepted: 22 Aug 2024

Published: 23 Dec 2024

ABSTRACT: *Determination of noise pollution base line of welding and fabrication workshop was carried out at some designated welding and fabrication workshops. These measurements was carried out in 10 different locations using the digital sound level meter of model 40773L. The sound pressure Level (SPL) was measured for every 2 minutes for 2hrs (120mins) and the equivalent noise level (Leq), Percentile (L_{10}, L_{90}) and the Noise Pollution Level (L_{NP}) was also calculated. Fast Fourier Transformation was used to interpolate between minutes to give value in seconds and transformed measured values of time to frequency domain. Graphs were also plotted for noise against time and for power against the transformed measured values which are in frequency domain. The result of the research show that the equivalent continuous noise level in the selected site are SITE A: 94.74Db, SITE B: 89.82dB, SITE C: 92.90dB, SITE D: 90.03dB, SITE E: 87.10dB, SITE F: 87.86dB, SITE G: 91.33dB, SITE H: 92.86dB, SITE I: 89.24dB, and SITE J: 89.02dB, showing that some sites are noisier than others and the sum of the average values of noise data in welding and fabrication workshop in Ondo State metropolis is 90.50dB Results obtained are above the FEPA recommended values 90 dB for 8hrs exposure time, which put limitations to effectiveness of signal transmissions that may lead to the possible health hazard. The noise level highlighted which include Annoyance, Cardiovascular disturbance, and impalement of task performance and induced hearing loss. Appropriate suggestions which include the use of ear muffs have been made in order to prevent these hazards.*

KEYWORDS: Welding, Noise level, Fourier transformation, Pollution, Signal transmission.

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)
www.abjournals.org

GENERAL INTRODUCTION

Noise is derived from the Latin word “Nausea”, implying unwanted sound or sound that is loud, unpleasant or unexpected (Birgitta and Lindvell, 1995).

Noise can be defined in communication as an unwanted introduction of energy tending to interfere with the proper reception and reproduction of transmitted signals (Tomiwa, 2023)

But according to Goines and Hagler, 2007, noise pollution is defined as a form of air pollution that is an audible, unwanted sound that poses a threat to a person’s health and wellbeing. Noise originates from human activities especially the urbanization and the development of transport and industry. Though the urban population is much more affected by such pollution however, small towns/villages along side roads or industries are also victims of this problem. Noise is becoming an increasingly omnipresent, yet unnoticed form of pollution even in developed countries (Birgitta and Lindvall, 1995). Noise is measured in decibel units and is denoted by dB. In work place areas such as factories, 85dB(A) noise is permitted for 8hr but for environmental point of view there should be 75dB(A) for day light hours and 70dB(A) for night time (Occupational Noise National Standard,2004) and 90dB for 8hours exposure was the recommended value in accordance to Federal Environment Protection Agency;FEPA (copy right© Nigeria Government ,2005)

Though noise pollution is a slow and subtle killer yet very little efforts have been made to ameliorate the same. It is along with other types of pollution has become a hazard to quality life (Kieman, 1997). Even relatively low level of noise affect human health adversely (Kieman, 1997). It may cause hypertension, disrupt sleep and can hinder cognitive development in children. The effects of excess noise could be so severe that either a permanent loss of memory or psychiatric disorder (Band, 1996).

Welding is the process of fussing two or more parts together using heat, pressure or both. Welding is a fabrication (the building of metal structures by cutting, bending and assembling process) or sculptural process that joins materials, usually metals or thermoplastics by causing coalescence (ASM, 2003)

This is often done by melting the work pieces and adding a filler material to form a pool of molten material that cool to become a strong joint, with pressure sometimes used in conjunction with heat or by itself to produce the weld (Cary and Helzer, 2005). Some of the best known welding method includes shielded metal arc welding, gas tungsten arc welding, gas metal arc welding, Hux-coreal arc welding, submerged arc welding, Electros leg welding (ASM, 2003). Many different energy source can be used for welding including a gas flame, an electric arc, a laser, an electron beam, friction and ultrasound, while often an industrial process. Welding may be performed in many different environment including in open air, under water, and in outer space (ASM, 2003).

Welding is a potentially hazardous undertaking and precaution are required to avoid damage, inhalation of poisonous gases and fumes and exposure to intense ultraviolent radiation (Cary and Hezler, 2005).

The study is designed to determine noise pollution baseline of welding and fabrication workshops in Akoko metropolis using a digital sound level meter model. This study will be carried out in some selected workshops in Ondo state metropolis (modern town and cites in

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)
www.abjournals.org

ondo state which included Owo, Akungba, Ikare and Akure) due to time factor and financial constraints. This research is aimed at determining the noise pollution baseline of welding and fabrication workshops environments using Akungba-Akoko as a case study.

Noise can be generated from various sources in our environment some of which includes: Industrial, Traffic and Ambient source. Like air and water pollution, noise constitutes health hazards since it disturbs man's rest, sleep and communication, damages his hearing and evokes other psychological, and possibly pathological reaction (Singal, 2000).

Spectral Characteristics of Noise

A noise Signal can be characterized through its amplitude/energy content and frequency composition. Expressing the noise Signal in the form of a sinusoidal Signal as shown in Figure 1 (although in practice a noise Signal is very complicated), the amplitude/energy content in the Signal can be expressed in various forms like root mean square value, peak value, crest factor, form factor etc. the following are the ways to describe these quantities.

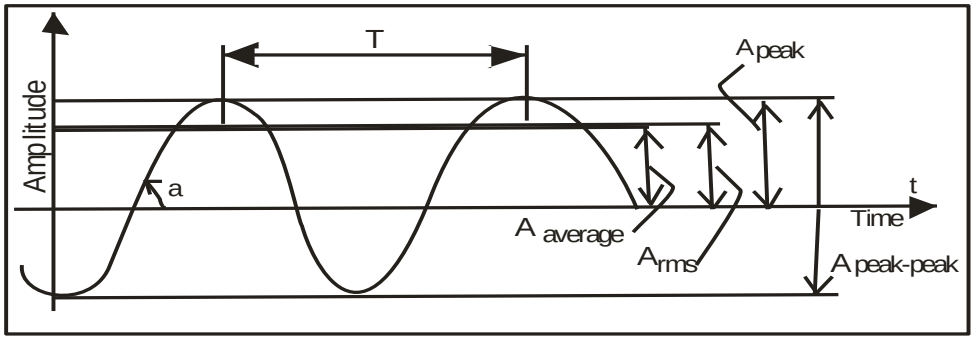

Figure 1: Pure, simple, periodic sinusoidal sound Singal.

i. Root mean square (rms): This is one of the most important and most often used measures of amplitude. It can be expressed as

$$A_{rms} = [\ 1/T\ {}_0\int^T a^2(t)dt\ ]^{1/2} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (1)$$

Where T is relevant time period over which the averaging takes place and *a(t)* defines instantaneous amplitude. Other measures of amplitude are

$$A_{rms} = 1/T_0\int^T |a|dt \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ (2)$$

ii. Peak value: This is the maximum amplitude reached by the Singal in the repetitive period. These are related to A_{rms} as follows:

$$A_{rms}\ [\pi/2(2)^{1/2}]A_{average}=[\frac{1}{(2)^{1/2}}]^r A_{peak} \quad \ldots\ldots\ldots\ldots\ldots\ldots(3)$$

iii. Crest and form factor: These gives a measure of the wave shape of the Singal and can be expressed as:

Crest factor, $F_c = A_{peak}/A_{rms}$,

Form Factor, $F_f = A_{rms}/A_{average}$,

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)

www.abjournals.org

So that F_c = 1.414(approx. equal to 3 dB)

And F_f = 1.11(approx. equal to 1 dB)

It has, however, been found that most of the sounds are not sinusoid and vary in both amplitude and frequency with time. A special case of non- periodic Singal is white noise, which has a completely flat spectrum and is of particular importance in both theory and practice

Any sound with a frequency below 20 Hz is known as an infrasound and any sound with a frequency above 20 000 Hz is known as an ultrasound. When a listener compasses two sinusoidal sound waves with the same frequency but different pressure amplitude, the one with the greater pressure amplitude is usually perceived as louder but slightly low in pitch (Jakorjevic *et al*, 2006).

Pitch is also used as characteristics of a Note (sound), which enable us to differentiate a high note from a low note (Hanes *et al*, 2001).

Note is a single tone of definite pitch made by a musical instrument or the human voice.

Notes have wave forms with changes which repeat regularly, so notes are easier to listen to. A high quality note contains fewer frequencies than a low quality note (Brethaupt, 1995).

Noise Pollution Level (L_{NP})

This is a noise ratio used for noise indexing. It takes into account the Leq and the magnitude of time variation in the noise level it is expressed mathematically as;

$$L_{NP} = Leq + K\delta$$

Where, K = constant

δ = Standard deviation of the instantaneous noise level during the measured period

Methodology and Scope of Research

The research site is focused on determining noise pollution from welding and fabrication workshop in Ondo state metropolis.

Below is table showing the workshops, their location and things around.

Table 3.1: list of welding and fabrication workshop monitored for the determining of noise pollution

S/N	Workshops	Location	Things around
1.	Nurudeen Welding and fabrication Workshop	Adeye street Akure south, ondo State	Hotel, Agro Miller, restaurant
2.	Kola Welding Workshop	Cele Road Akure, Akure south, Ondo State	Housing Residences, Provision shop, ChurchGrinding

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

			Shopp, Vulcanize shop
3.	Royal King Welding and fabrication workshop	Off ikare market ikare Akoko, Ondo State.	Workshop, Road, Restaurant.
4.	Custom construction limited	No, 25 olusegun obasanjo way beside Akure south local government secretarial	Akure south local government Secretariat, Restaurant,
5.	Engineer kay Welding and Fabrication technology workshop	No, 50 dapo street Akure, Ondo State	Electrcal Store, Residents, Small
6.	Solotech welding and metal construction	Kabba , Bolorunduro- Owo Road	Church RCCG Upper Room Assembly, Hair Dressing Salon
7.	Oka Boy welding service	No, 27 Ikare Lokoja Road, Akoko, Ondo State	Mechanic shop, carpentry workshop
8.	Ololaoluwa metal welding and fabrication	Ilekun Government housing Estate, Akure, Ondo State	Shops (Building materials), residencies, carpentry shop
9.	Asunne metal welding and fabrication	No. 19a Obanla Street, Akure, Ondo State.	Building material shop, exotic dressing home, house resident, mega store, global venture
10.	So welding metal construction and fabrication	Iselu Road, Owo, Ondo State.	Restaurant, church (power house of solution)

Measuring instruments

There are different types of equipment or instruments used for measuring sound level. These instruments have different sensitivity and processions. Some of the instruments used in the assessment of noise level/noise pollution are Sound Level Meter (SLM), Noise dosimeter, Noise recorder, and Audiometer. Irrespective of the choice of instrument to be used, measurement must conform to the international standard noise measurement. For the purpose of this research, I used the digital sound level meter, model 407736.

Digital Sound Level Meter

In this study a digital sound level meter (Extech model 407736) had a range with low frequency with 35m90dB and high frequency within 75~130dB a type II standard with an accuracy of ±1.5 dB over the temperature range of 0^{O}C to 40^{O}C and IEC 651 was used. The meter was used in the determination of noise from welding and fabrication workshop study.

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)
www.abjournals.org

The meter metal consist of microphone, electric circuit and a read-out display power off and range select switch, A/C weighting and calibration switch, calibration adjust screw for 794dB. Reset key (reset max hold reading). AC/DC analog output. 3.5mm phone jack,

Figure 2: Digital Sound Meter

RESULTS

The data/readings found in Table 1, were obtained by measuring the noise level at the various sites listed. All the ten (10) sites are given alphabetical names as sites; A, B, C, D, E, F, G, H, I, and J respectively.

Interpretations of Sites

The site were represented as:

A = Nuruden welding and fabrication workshop, Adeyeye Street, Akure.

B= Kola welding and fabrication workshop, Cele Road, Akure, Akure south

C= Royal king welding workshop Ikare, Akoko, Ondo State.

D= Engineer Kay welding and fabrication workshop, No50 Dapo Street, Akure Ondo state.

E= Solotech welding and metal construction, Kabba, Bolorundoro- Owo Road Ondo State.

F= Custom Construction limited, No, 25 Olusegun Obasanjo way, Besides, Akure south Local Government Secretariat

G= So welding construction and fabrication workshop, Iselu Road, Owo.

H= Asunne welding Engineering construction and fabrication, 19a, Obanla Street, Akure Ondo state.

I= Olaoluwa welding and fabrication, ilekun Government Housing Estate, Ondo State.

J= Oka Boy welding service, No, 27 Ikare Lokoja Road, Akoko, Ondo State.

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)

www.abjournals.org

Table 2: Average values of noise level data of Welding and Fabrication Workshops in Ondo State Metropolis:

SITES	Leq (dB)	L_{90} (dB)	L_{10} (dB)	L_{NP} (dB)
A	94.74	101.02	92.30	126.97
B	89.82	96.92	85.12	122.18
C	92.90	99.94	88.80	125.41
D	90.03	94.56	88.14	120.88
E	87.10	90.96	84.92	116.41
F	87.86	91.62	87.00	117.40
G	91.33	99.04	88.24	123.07
H	92.86	99.70	89.50	124.78
I	89.24	94.76	85.80	120.19
J	89.09	96.76	84.92	120.71

Source: Field Survey.

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)
www.abjournals.org

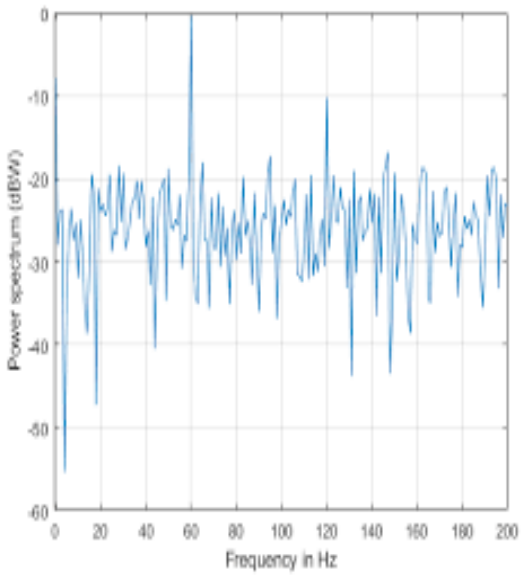

Fig. 3: Transformation of noise from time to frequency domain in Site A

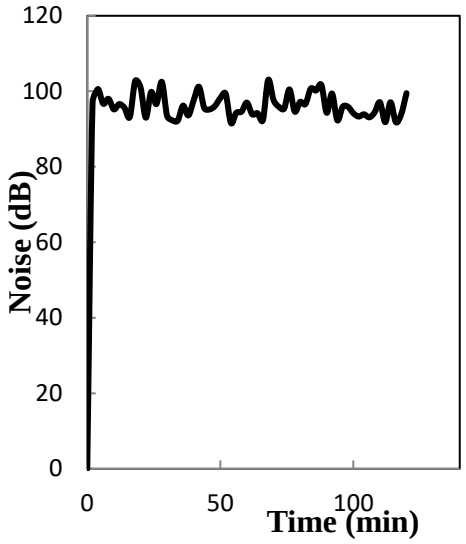

Figure 4: Equivalent noise level against time at Site A

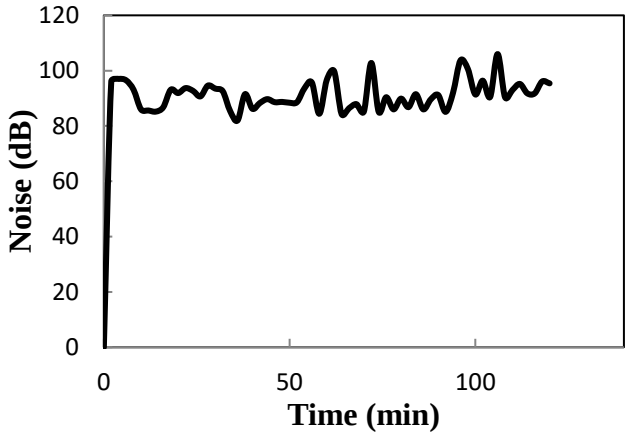

Figure 5: Equivalent noise level against time at Site B

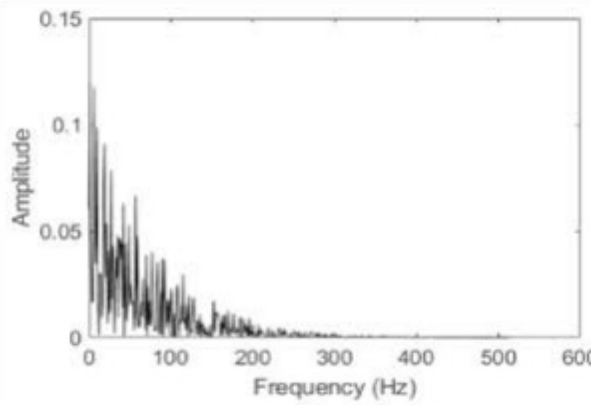

Figure 6: Equivalent noise level against time at Site C

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)
www.abjournals.org

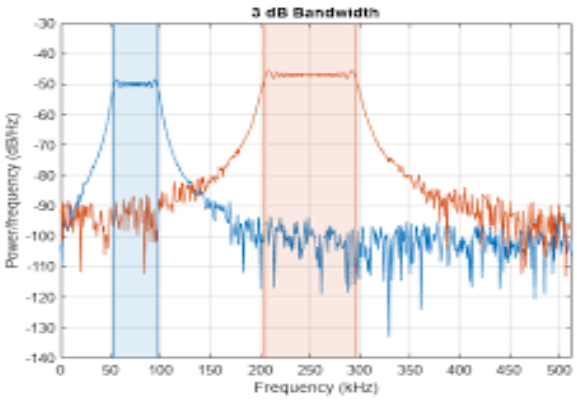

Figure 7: Equivalent noise level against time at Site C

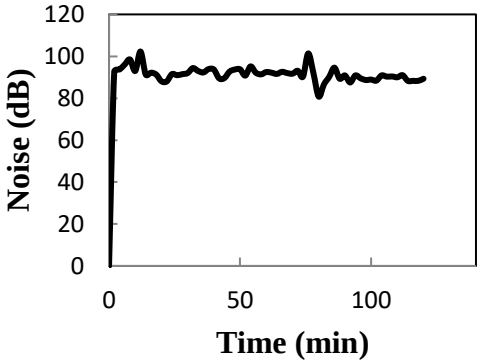

Figure 8: Transformation of noise from time to frequency domain in Site C

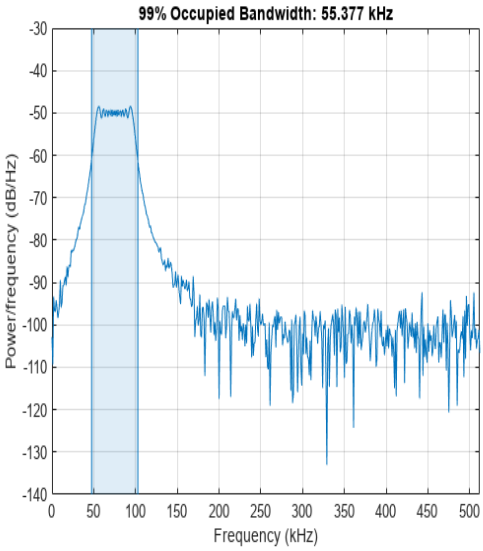

Figure 9: Equivalent noise level against time at Site D

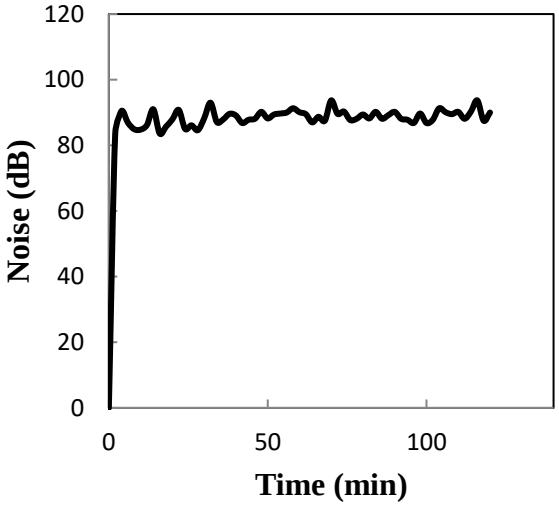

Figure 10: Transformation of noise from time to frequency domain in Site D

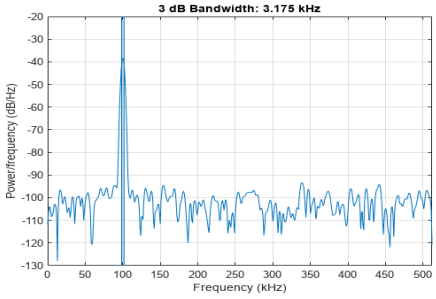

Figure 11: Equivalent noise level against time Site E

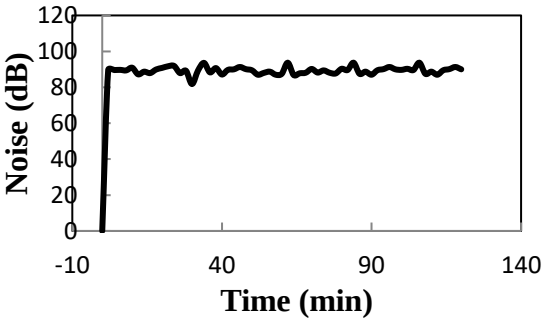

Figure 12: Transformation of noise from time to frequency domain in Site E

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)
www.abjournals.org

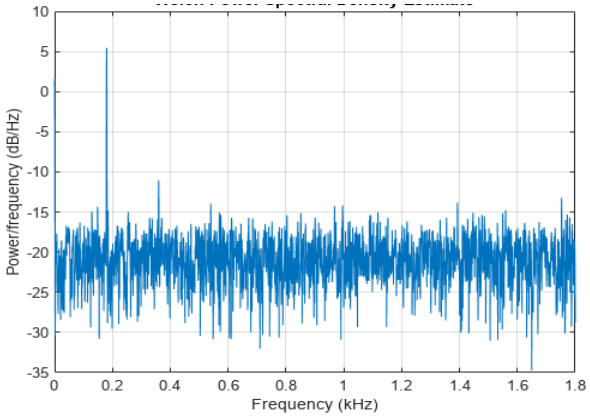

Figure 13: Equivalent noise level against time at Site F

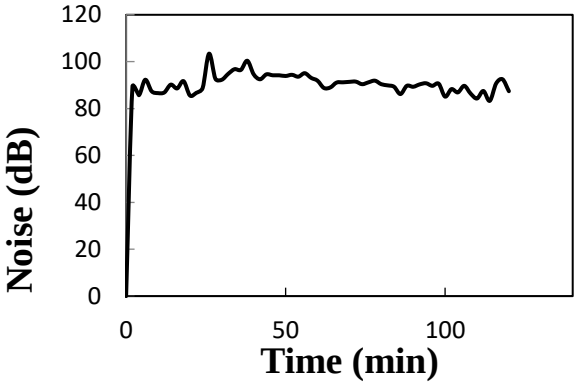

Figure 14: Transformation of noise from time to frequency domain in Site F

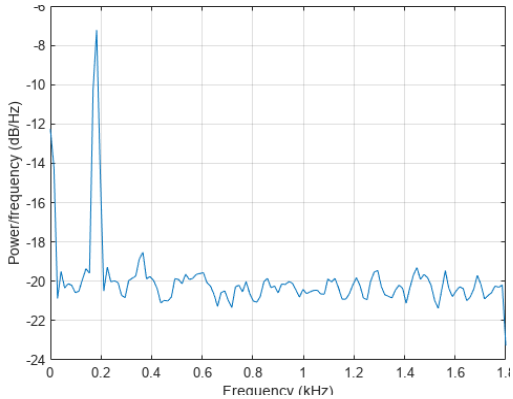

Figure 15: Transformation of noise from time to frequency domain in Site G

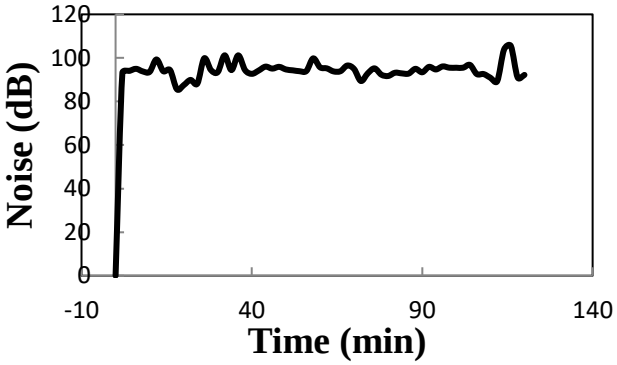

Figure 16: Equivalent noise level against time at Site G

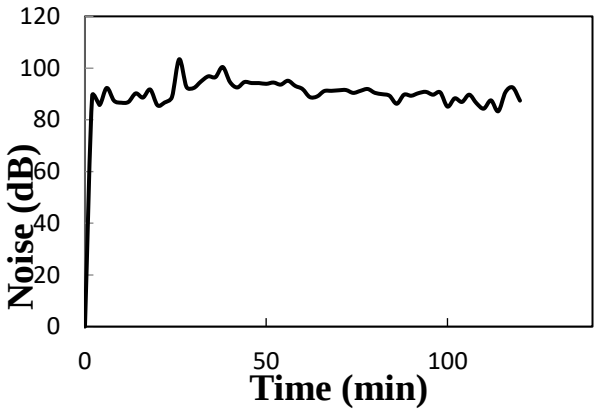

Figure 17: Transformation of noise from time to frequency domain in Site H

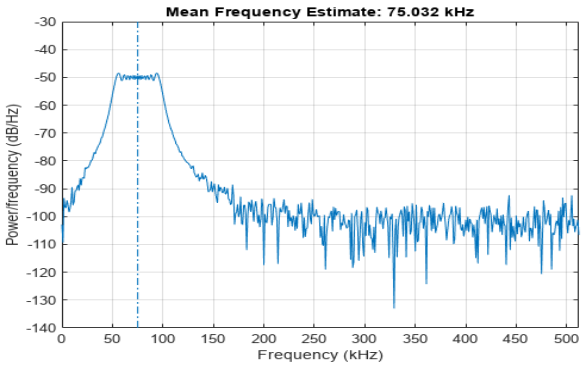

Figure 18: Equivalent noise level against time at Site H

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)

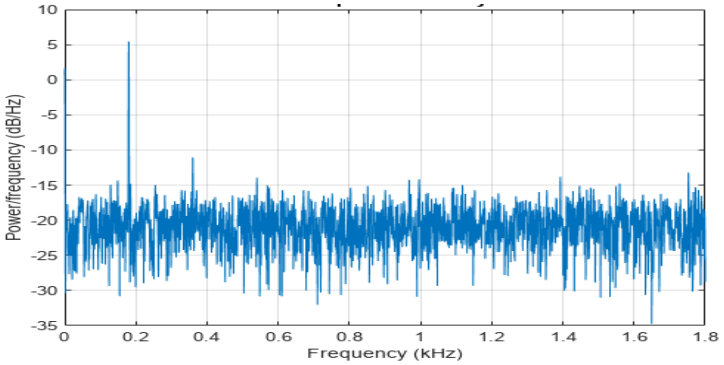

Figure 19: Equivalent noise level against time at Site I

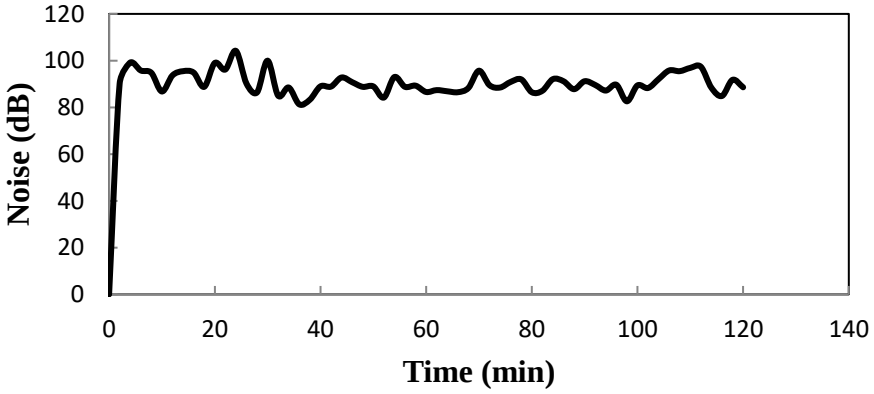

Figure 20: Transformation of noise from time to frequency domain in Site I

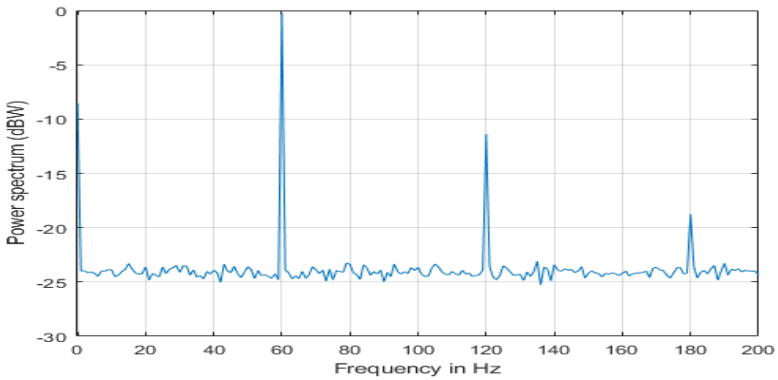

Figure 21: Equivalent noise level against time at Site J

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Advanced Journal of Science, Technology and Engineering
ISSN: 2997-5972
Volume 4, Issue 4, 2024 (pp. 155-169)

www.abjournals.org

DISCUSSION

The study is to determine noise pollution baseline from welding and fabrication workshops in Akungba-Akoko, Ondo state and its environ. A sound level meter was used to determine the noise level in the selected ten (10) different sites which includes,

A = Nuruden welding and fabrication workshop, Adeyeye Street, Akure.

B= Kola welding and fabrication workshop, cele Road, Akure, Akure south

C= Royal king welding workshop Ikare, Akoko, Ondo State.

D= Engineer Kay welding and fabrication workshop, No50 Dapo Street, Akure Ondo state.

E= Solotech welding and metal construction, Kabba, Bolorundoro- Owo Road Ondo State.

F= Custom Construction limited, No, 25 Olusegun Obasanjo way, Besides, Akure south Local Government Secretariat

G= So welding construction and fabrication workshop, Iselu Road, Owo.

The results shown in table 2 above shows the average or equivalent continuous noise level in decibels for the various sites.

At Site A; the sound pressure level were almost consistent and the dispersion of the peak values was a maximum of 102.5dB at 28 minutes and a minimum of 91.8dB at 112 minutes and 116 minutes as seen in figure 3. While the fast Fourier transform showed that the measured data were almost consistent and that the dispersion of peak values was a maximum of -55 and minimum of 0 dB/hr as represented in figure 4 above. Whereas, the equivalent continuous noise level is 94.74 dB as shown in table 2 which is not a match to the FEPA recommendation standard noise level of 90dB for 8hrs exposure and is posed to result to health hazard.

At site B: the sound pressure was measured to have a maximum of 106.0dB at time interval of 36 minutes as shown in figure 5. The fast Fourier transformation showed that the measured data were almost consistent whereas the equivalent continuous noise level is 89.82dB as shown in the table compared to the 90 dB recommended by FEPA.

At Site C: the sound pressure level was measured to have a maximum of 104.7dB at time interval of 74 minutes and a minimum of 83.9 dB at a time interval of 118 minutes as shown in Figure 6. The fast Fourier transformation measured is as shown if figures 8 and 9 from time to frequency domain in this site. Results shows that the equivalent continuous noise level is 92.90dB which shows that it is above the FEPA recommended noise level (90dB) for 8hrs exposure.

At Site D: the sound pressure level was measured to have a maximum of 102.3dB at time interval of 12 minutes and a minimum of 80.8dB at a time interval of 8 minutes as shown in Figure 9. The fast Fourier transformation measured in Figure 9 of noise from time to frequency domain in this site shows that the data was almost continuous and the dispersion of peak values was a maximum of -50 dB/Hz and a minimum of -135 dB/Hz as represented in

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Fig 4.8 above. Whereas the equivalent continuous noise level is 90.03 dB which shows that it is above the FEPA recommended noise level of 90 dB for 8 hours exposure.

At Site E: the sound pressure level was measured to have a maximum of 93.7dB at time interval of 70 minutes and 106 minutes, a minimum of 83.5dB at a time interval of 2 minutes as shown in Figure 11. The fast Fourier transformation measured in Figure 12 of noise from time to frequency domain in this site shows that the data was almost continuous and the dispersion of peak values of about 100 dB. Whereas the equivalent continuous noise level is 87.10 dB which shows that it is below the FEPA recommended noise level of 90 dB for 8 hours exposure.

At Site F: the sound pressure level was measured to have a maximum of 93.7 dB at time interval of 62 minutes, 84 minutes, 102 minutes, and a minimum of 81.8dB at a time interval of 30 minutes as shown in Figure 13. The fast Fourier transformation measured in Figure 14 of noise from time to frequency domain in this site shows that the data was almost continuous. The equivalent continuous noise level is 87.86dB which shows that it is below the FEPA recommended noise level (90dB) for 8hrs exposure.

At Site G: the sound pressure level was measured to have a maximum of 103.0dB at time interval of 6 minutes and a minimum of 80.7dB at a time interval of 72 minutes as shown in Figure 15. The fast Fourier transformation measured in Figure 16 of noise from time to frequency domain in this site shows that the data was also continuous and the dispersion of peak values was a maximum of -10 dB/Hz and a minimum of -21 dB/Hz. Similarly, the equivalent continuous noise level is 91.33dB which shows that it is slightly above the FEPA recommended noise level 90 dB for 8hrs exposure.

At Site H: the sound pressure level was measured to have a maximum of 105.5dB at time interval of 116 minutes and a minimum of 85.6dB at a time interval of 18 minutes as shown in Figure 17. The fast fourier transformation measured in Figure 18 of noise from time to frequency domain in this site shows that the data was almost continuous which is similar to previous results. The equivalent continuous noise level is 92.86 dB which shows that it is far above the FEPA recommended noise level (90dB) for 8hrs exposure.

At Site I: the sound pressure level was measured to have a maximum of 103.4 dB at time interval of 26 minutes and a minimum of 83.3dB at a time interval of 114 minutes as shown in Figure 19. The fast fourier transformation measured in Figure 20 of noise from time to frequency domain in this site shows that the data was almost continuous and the dispersion of peak values was a maximum of 5 dB/Hz and a minimum of -32 dB/Hz as represented in Figure 20 above. Whereas the equivalent continuous noise level is 89.24 dB which shows that it is below the FEPA recommended noise level 90 dB for 8 hrs exposure.

At Site J: the sound pressure level was measured to have a maximum of 104.2 dB at time interval of 24 minutes and a minimum of 81.3dB at a time interval of 36 minutes as shown in Figure 21. The fast Fourier transformation of noise from time to frequency domain in this site shows that the data was almost continuous and the equivalent continuous noise level is 89.02 dB which shows that it is slightly below the FEPA recommended noise level 90 dB for 8hrs exposure.

These result from diverse variation like the air flow, traffic and mechanical fluctuation of the workshop machine like Drilling machine, filling machine, Generator, and other machines

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

used. The interpolated value recorded from the study were 3920 with the graphs showing the fourier analysis of noise pollution baseline of welding and fabrication workshops in all the measured sites in Akure metropolis of Ondo State.

CONCLUSION

A sound level meter was used in measuring the noise emitted from welding and fabrication workshops in Akoko metropolis. The assessment of noise level in welding and fabrication workshops in Akoko metropolis has revealed that the equivalent noise level in the selected sites are as follows: are SITE A: 94.74Db, SITE B: 89.82dB, SITE C: 92.90dB, SITE D: 90.03dB, SITE E: 87.10dB, SITE F: 87.86dB, SITE G: 91.33dB, SITE H: 92.86dB, SITE I: 89.24dB, and SITE J: 89.02dB, which are approximate, below or above the Federal Environment Protection Agency (FEPA) safety standard of 90dB for 8 hrs exposure time and these has adverse effects on the workers and neigbhours like annoyance, cardiovascular disturbance, impairment of task performance, induced hearing loss and these has been seen to constitute noise pollution to the environment with a negative imparts effects on communication.

In conclusion, the noise pollution baseline of welding and fabrication workshop in makurdi metropolis of Benue state has an average value of 90.50 dB which shows that it is above the FEPA recommended value (90dB) for 8 hours of exposure; hence it is essential to adopt the FEPA recommendation value of 90dB for 8 hours of exposure. Tackling the problem of noise pollution in welding and fabrication workshop is a great task that cannot be left for the public alone as individuals.

REFERENCES

American National Standards Institute, American National Psychoacoustic Technology "S8.20, 1973, American Standard. How Noisy Neighbours Blight Millions of Lives, The Daily Express.

ASM International (2003) Trends in Welding Research

Band, Micheal: plagued by Noise, New Scientist, November, 16:14-15 (1996)

Birgitta Berglund and Lindvall Homes; CA Draft Document of Community Noise, (1995)

Breithanpt, J. (1995): understanding physic for advanced level, 3rd edition Stanley Thornes Ltd. Chaltenhem

Brethaupt J. (1995): Understanding Physics for Advanced Level, 3rd edition Stentley Thornes Ltd, Cheltenham.

Cary Howard B., Helzer Scott (2005). Modern Welding Technology Upper Saddle River

Goines L., Hagler L., Noise Pollution: A modern plague. Southern Medical Journal. March 2007; 100(3); 287 – 293

Hanes M., Stensfeld S., Job S., Berglund B., Head S., Chronic aircraft Noise Exposure, Stress Responses, Metal Health and Cognitive Performance in school children. Psychological medicine. 2001; 31:265 – 267

Hygge S. Noise Exposure and Cognitive Performance – Children and the Elderly as Possible Risk Groups. University of Gaule, Sweden March. 2003: 1 – 19

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D

Jakovljevic B., Belejevic G., Pavnovic, Stojanov V. Road traffic Noise and Sleep Disturbance in an Urban Population: cross sectional study. Croatian medical jurnal. Feb 2006; 47 (1):125-135

Kieman Vincent: Noise Pollution robs Kids of language skills: New Science. May 10:5(1997)

Singal S. P (2000): Noise Pollution and Control. Narose Publishing House, New Delhi. Pp 265.

WHO Guidelines for Community Noise: Summary in Noise/News International: March 2000. Information Transfer in Noise Sciences N/WI. J

Article DOI: 10.52589/AJSTE-JKHUUS7D
DOI URL: https://doi.org/10.52589/AJSTE-JKHUUS7D