COMPARATIVE ASSESSMENT OF NOISE LEVELS IN VARIOUS LABORATORIES AND CONSTRUCTION SITE

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Abstract

Now a day's noise level has been increased due to increasing of urbanization, industries and vehicles. Assessment of noise levels was conducted in various places at day time with working condition. The selected spots are manufacturing laboratory, thermal laboratory, electrical machines laboratory-I, electrical machines laboratory-II, CAD laboratory and construction site. Those selected areas were surveyed and noted the noise levels in day time with working condition. Minimum 5 readings were measured in each areas and found mean value of areas. All measured values were recorded. The sound level meter was used for measure noise levels. All readings were subjected to statistical analysis. Maximum and minimum noise levels measured in laboratories and construction site at day time forenoon 3 hours and afternoon 3 hours, totally 6 hours. Those noise levels compared with OHSAS standards. Noise pollution was finally concluded, it was higher at day time in construction site and lower in CAD laboratory.

Keywords: *Noise pollution, Laboratories, construction site, OHSAS.*

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1. INTRODUCTION

Noise is an unwanted or damaging sound that may damage your hearing and cause other health effects such as stress, hypersensitivity to noise, increased blood pressure and increased heart rate. It can also interfere with communication at work, which could lead to accidents.

The normal range of hearing for a healthy young person is from approximately 20 Hz (Hertz) to 20,000 Hz (20 kHz).Our ears are more sensitive to the middle frequencies, which range from 500 Hz to 4000 Hz - the speech frequencies. Hertz is a measure of the pitch or frequency of sound, sometimes referred to as cycles per second.

Noise causes sound waves that make our ear drums vibrate. These vibrations are received by hair cells in the inner ear, which flatten according to the frequency and loudness of the sound and stimulate nerves that pass messages to the brain.
Word noise is derived from latin word "Nausea" implying 'unwanted sound' or unexpected' or unpleasant (Singh and Davar,2004).Prevent the noise pollution by increasing awareness among people including the government officials to control the long-term health risks (Mangalekar S.B et.al.,2012).

Noise pollution of fire cracker is one of the important environmental problems (Singh and Joshi,2010).Short rise time is a significant increasing the risk of hearing damage(Janzera,2001).

Main noise pollution sources are industries, transportation, urbanization and musical instruments (Gangwar et al.,2006). Psychological disorder, migraine, higher cholesterol levels, muscle tension, permanent hearing loss, high blood pressure and gastric ulcers are the health hazards to cause the noise pollution(Haines et al.,2005).Road vehicles are main source of noise pollution in urban areas(Behzad et al.,2007).Noise effects the communities and neighbourhoods. It creates the unhealthy environments to living citizens (Noise Free America,2010).

Noise pollution decrease the quality of living as well as to cause sleep loss, stress, cardiovascular problems, hearing loss and blood pressure(Schomer,2001). People giving first preferences to living away from nosy areas (Yilmaz and Ozer,1998).

The modern life of many types of high volumes of musical sound, vehicles, addition of constant noise in environment from variety of sources have generated a noise problem. Sound wave is generated when any object vibrates in air and disturbed air particles spread away from the object in the form of a wave.

Sound intensity is the average rate at which sound energy is transmitted through a unit area normal to the direction of sound propagation.

The harmful effects of noise depend upon a number of factors such as total length of exposure ,distance from the noise source noise frequency and intensity, length of exposure at a time.

However assess the noise levels in various areas of laboratories and construction site and to compare these levels with OHSAS standards with EPA.

2. MATERIAL AND METHODS

This research was conducted in various areas of laboratories and construction site on April 2014.Those selected areas were surveyed and noted the noise levels in day time with working condition. The selected spots are thermal laboratory, manufacturing laboratory, electrical machines laboratory-I, electrical machines laboratory-II,CAD laboratory and construction site.

Minimum 5 readings were measured in each areas and found mean value of each areas. All measured values were recorded. The sound level meter was used for measure noise level readings.

The sound level meter model was IEC 651 Type II and it was made by center 320 company. By using this meter can able to measure the noise in dB(A) and dB(c).This sound level meter measure the noise levels as low, medium and high.

It has features of slow and fast response to measure readings. Taken of minimum and maximum noise level readings should be comparison with OHSAS standards.

3. RESULTS AND DISCUSSION

Table 1 the comparison of manufacturing laboratory noise pollution with OHSAS standards and with each other. Maximum and minimum noise level measured at day time in manufacturing laboratory and it was recorded.

Table 1: Comparison of Manufacturing Laboratory Noise Level With OHSAS Standards (Day Parameters)

S.NO	Site/Machine	OHSAS Standards (6 Hours) (dBA)	Day Readings (FN-3 hrs,AN-3 hrs)	
			Minimum(dBA)	Maximum(dBA)
1	Lathe M/C	92	66.6	77.8
2	Drilling M/C	92	63.9	76.1
3	Planner M/C	92	65.1	79.5
4	Grinding M/C	92	77.3	90.1

Table 2 shows comparison of maximum and minimum noise pollution with OHSAS standards. In this area 4 stroke diesel engine exposed the maximum noise level.

Table 2: Comparison of Thermal Laboratory Noise Level With OHSAS Standards (Day Parameters)

S.NO	Site/Machine	OHSAS Standards (6 Hours) (dBA)	Day Readings (FN-3 hrs,AN-3 hrs)	
			Minimum (dBA)	Maximum (dBA)
1	4 Stroke petrol engine	92	71.4	86.7
2	4 Stroke diesel engine	92	75.3	87.1
3	Compressor	92	75.8	77.3

Table 3 shows that the maximum and minimum noise pollution on machines laboratory-I in day time.

Table 3: Comparison of Electrical Machines Laboratory-I Noise Level With OHSAS Standards (Day Parameters)

S.NO	Site/Machine	OHSAS Standards (6 Hours) (dBA)	Day Readings (FN-3 hrs,AN-3 hrs)	
			Minimum (dBA)	Maximum (dBA)
1	Single phase induction motor(AC)	92	64.4	68.6
2	Three phase induction motor(AC)	92	66.2	70.8

Table 4 describes the maximum and minimum noise level in the machines laboratory–II, which is compared with OHSAS standards.

Table 4: Comparison of Electrical Machines Laboratory-II Noise Level Pollution With OHSAS Standards (Day Parameters)

S.NO	Site/Machine	OHSAS Standards (6 Hours) (dBA)	Day Readings (FN-3 hrs,AN-3 hrs)	
			Minimum (dBA)	Maximum (dBA)
1	Series motor (DC)	92	61.1	64.3
2	Shunt motor (DC)	92	61.4	63.8

Table 5 shows the minimum noise pollution occurred out of other laboratories and construction site

Table 5: Comparison of CAD Laboratory Noise Level With OHSAS Standards (Day Parameters)

S.NO	Site/Machine	OHSAS Standards (6 Hours) (dBA)	Day Readings (FN-3 hrs,AN-3 hrs)	
			Minimum (dBA)	Maximum (dBA)
1	Desktop	92	35.8	41.6
2	Air conditioner	92	40.1	45.3

Table 6 shows the maximum noise pollution occurred out of the areas.

Table 6: Comparison of Construction Site Noise Level With OHSAS Standards (Day Parameters)

S.NO	Site/Machine	OHSAS Standards (6 Hours) (dBA)	Day Readings (FN-3 hrs,AN-3 hrs)	
			Minimum (dBA)	Maximum (dBA)
1	Constructing point	92	60.9	70.8
2	Pneumatic rock drilling M/C	92	81.9	94.3
3	Concrete mixing M/C	92	76.1	85.5

The outcomes of the assessment of noise levels were maximum in construction site at day time.

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