

NOISE LEVEL OF DIFFERENT MACHINES IN THE SAWMILL OF N.W.F.P., FOREST DEVELOPMENT CORPORATION, MANSEHRA

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Abstract

A study was conducted on the noise level of different machines and exposure of workers to it in the Sawmill of N.W.F.P., Forest Development Corporation, Mansehra. The results of this study revealed that the noise level of all the machines in the nearest work positions and in most cases in the farthest work positions was higher than the allowable levels. The operators of machines were exposed to a higher noise level than the helpers. The daily and total expected exposure of the workers to this noise level was long enough to cause permanent hearing damage. Proper ear protection and maintenance of machines to reduce the noise level and risk of hearing disability to the workers are recommended.

Introduction

Better working conditions contribute to the efficiency, health and safety of workers. Therefore, it is essential that the existing state of work places in different forest industries in Pakistan must be investigated for their improvement to increase the work performance. The most important parameters for rating of work places are light, temperature and noise. Noise is defined as unwanted sound (STAUDT, 1984) and is the most important environmental hazard of modern life and a major component of work place conditions when the operations are to be performed by machines. A constant and disturbing noise produces adverse psychological, physiological and masking effects such as impaired alertness, disturbed sleep, feelings of stress, increased risk of accidents (GRANDJEAN, 1981) and a reduction in the efficiency of workers (ANONYMOUS, 1986).

The noise level at a work places is measured in decibels (dB) and a modern noise level meter measures the noise in decibels with filter A, expressed as dB(A). If the noise level in a work atmosphere is more than 85 dB(A) and the continued exposure of workers is 8 hours or more per day then there is every risk of permanent hearing disability to the workers (GRANDJEAN, 1981). The present study was carried out in the sawmill of N.W.F.P. Forest Development Corporation at Mansehra to measure the noise level of different machines, workers exposure to it and to suggest measures for its control.

Material and Methods

The experiment on the measurement of noise level was conducted in the sawmill belonging to the N.W.F.P., Forest Development Corporation at Mansehra in the month of May, 1987. The number of workers on which the noise level observations were carried out was 10 (1 operator and 1 helper/machine) out of a total of 35. These workers had an average age of 33 years.

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Noise level near to the ears of these workers was recorded in dB(A) with the help of a noise level meter "INDUNORM" and with respect to nearest and farthest work positions from a machine. Five noise level measurements were made for each worker in each work position. Duration of daily exposure and total exposure of these workers to the noise of machines was also recorded.

For purpose of this study, simple average and cumulative average of data on noise level of different machines were computed with respect to operator, helper and nearest and farthest work positions.

Results and Discussions

The average values of noise level experienced by the workers working on different machines is given in Table 1.

TABLE 1

Noise level of different machine in N.W.F.P. Forest Development Corporation
Sawmill, Mansehra.

Type of machine	Noise level dB(A)					
	Nearest Position			Farthest Position		
	Operator	Helper	Difference	Operator	Helper	Difference
Break Down Saw "SCHULTE" Reciprocating Frame (German)	97	90	7	86	86	—
Break Down Saw Horizontal Band 5 cm (Pak)	99	94	5	94	94	—
Resaw "BRENTA" Vertical Band 15 cm (Belgium)	101	101	—	85	85	—
Resaw vertical Band 5 cm (PAK.)	103	101	2	94	94	—
Edger	97	92	5	—	—	—
Cummulative average	99	96	3	90	90	—

Machines and Noise level

The contents of table 1 reveal that the average noise level of different machines as experienced by the workers in the nearest work positions is different, ranging between 97 to 103 dB(A), which was higher by 12 to 18 dB(A) than the threshold value of 85 dB(A) (GRANDJEAN, 1981) for continued exposure. The maximum noise level of 103 dB(A) is produced by resaw, vertical band (5 cm) Pak-made, followed by resaw (BRENTA) vertical band (15 cm) Belgium made and break down saw horizontal band (5 cm) Pak-made with a noise level of 101 and 99 dB(A), respectively. While the break-down saw "SCHULTE" reciprocating frame, German made and edger gave an equal and minimum noise level of 97 dB(A).

As all these machines were purchased new and became operative at the same time about 3 1/2 years ago, therefore, the difference in their noise levels was mainly because of their design and make. The results also showed that the vertical band saws as a whole produced a higher noise than the horizontal ones and even higher noise of Pakistani vertical band saw was probably due to narrow width of saw and imbalanced wheels.

The reported peak noise level in Sawmills is between 90 to 95 dB(A) (GRANDJEAN, 1981). But the peak noise level of different machines in this study ranged between 97 and 103 dB(A). This showed that the machines in Mansehra sawmill produced more noise than the reported range, which may be due to differences in design, poor maintenance and lack of sound proofing of work premises.

Workers and Noise Level

It is also evident from the contents of Table 1 that the operators of machines in the nearest work position experienced a noise level of 99 dB(A) (97 to 103 dB(A)), while helpers in their nearest work positions experienced a noise level of 96 dB(A) (90 to 101 dB(A)). The average noise level experienced by the operators in the nearest work position was higher by 3 dB(A) (0 to 7 dB(A)) than the helpers. In the farthest work positions the noise level experienced by the operators and helpers remained the same. However, it differed for different machines and the average for all machines was recorded as 90 dB(A) (85 to 94 dB(A)).

The reason for the higher noise level experienced by the operators in the nearest work position is that they have to stay much closer to the machines than the helpers. The level of noise at the farthest work position decreased with the increasing distance to which the workers moved away from the machines.

The daily and weekly exposure of workers to this noise level was 7 and 42 hours, respectively and the workers have been exposed to this noise level for 3 1/2 years.

Conclusion and Recommendations

The results of the study reveal that the noise level of different machines in the

sawmill of N.W.F.P. Forest Development Corporation, Mansehra is much higher than the threshold noise level of 85 dB(A) for continued exposure. Moreover, with a weekly exposure of 42 hours and a total service of about 30 years upto the retirement age, there is a great risk that most of the workers may develop a permanent hearing disability. In daily work higher noise levels produce psycho-physiological disorders with reduced working efficiency and increased risk of accidents. Following recommendations are made to avoid these and hearing disability of the workers.

- Proper ear protection devices such as ear plugs and muffles must be provided to all the workers working in the sawmills and wood working factories.
- Great care should be exercised in the selection of machines for their noise level and sound proofing arrangements.
- Due attention must be paid to the maintenance of machines, such as timely replacement of worn out parts, proper greasing and oiling. This practice on one hand shall greatly enhance the serviceability of machines and on the other shall also reduce the noise.
- If the period of exposure of workers to higher noise levels is not long, the hearing damage incurred is temporary and the recovery to normal hearing is very quick if the workers are shifted to the lower noise or noise free work places. Therefore, proper job rotation is an appropriate work organizational measure to reduce the risk of hearing damage to the workers.

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