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INDUSTRIAL NOISE IN BAGHDAD

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INTRODUCTION

Industrial noise problem in the Republic of Iraq,as any other developing country,has been not yet taken into a serious consideration. This is because of: 1.the priority of interest of the managements of all factories is confined into the quality and quantity of industrial products; 2.lack of knowlege concerning the effect of noise on general health,occupational safety,hearing conservation and skill and/or technical capability of the workers; 3.workers are used to and/or have to accept the high occupational noise; 4.lack of specialists for the noise control in the country; 5.acoustic and noise control treatments for the factories are generally a very costy and a long time consuming job. On the other hand,claims of labor against high occupational noise level have been always arised,whilst the management's reply was always that there is no effective solution of this problem,and nowadays extra allowance for compensation is paid wherever the noise level is exceeding the national standard on occupational noise exposure limit (85 dB(A) for 46 h/w). The problem of high occupational noise level can logically never be solved with payment of extra allowance. At the same time, according to the results of questionnaires distributed among some workers in some factories,most of the workers prefer strongly to work in quiet factories rather than to get extra allowance. Therefore,we carried out this work in order to find a proper solution for the already existing factories and to recommend some useful conditions for the establishment of new factories to the local authority for approval in order to overcome this problem in Iraq for the future.

EXPERIMENTAL TECHNIQUE

Sound pressure levels of the occupational noise at the possible positions of worker's ears were simply measured by a precision sound level meter with fast response in dB(A) for overall audio frequencies and for each of the important octave bands (63-8000 Hz). Questionnaires,covering all

possible informations required were distributed among some of workers (approximately 750) working in some factories, in which the SPL of noise is ranging from 84-110 dB(A).

RESULTS AND DISCUSION

All SPLs of occupational noise measured in 23 factories (or industrial sites) can, unfortunately, not be given in this paper because of the limitted space. However, the maximum SPL averaged for each factory can be given, as listed in the table, in order to realise the occupational noise level in some factories in Baghdad. These values allow one to asses their effects on hearing conservation, general health, technical skill and capability of workers in such a noisy atmosphere, and consequently, on quality and quantity of industrial products. The time exposure was usually 46 h/w, whereas it is now in the order of 52 h/w due to the present circumstances. The highest SPL of the occupational noise measured was 110 dB(A) in the metal press section of the General State Enterprice of Electrical Industries. The type of noise was considered as impulsive with a maximum periodicity of 34 impulses per minute. The maximum SPL of such impulsive noise should be 10 dB(A) less than those limits approved by the ISO [1,2]. If we consider the ISO R 1999, the SPL of occupational noise exposure limit for such impulsive noise should be of the order of 75 dB(A) for 40 h/w [1,2]. The limit of 85 dB(A) for 46 h/w is adopted by the Iraqi authority. Accordingly, the workers in this place are suffering from a very high SPL of noise, which exceeds the national and international standards on occupational noise exposure limits by 35 dB(A). This means that the exposure time limit for such an impulsive noise, according to the increment of 3 dB(A) per each halfing of the exposure time, should be less than 34 s/w (or say 1 m/w), whilst the usual exposure time in this factory is in the order of 52 h/w. No wonder that all workers in this section are suffering from serious hearing losses as we have already tested. However, the lowest maximum SPL of occupational noise measured was 84 dB(A) at the Eastern Drinks Factory. The noise type was continuous with a fluctuation in the SPL of less than 5 dB(A). Therefore, the noise level was found to be acceptable according to the national noise exposure criterion. On the other hand, the noise levels in all other factories are appreciably and/or considerably exceeding the national noise exposure criterion, ranging between both the highest and the lowest SPL cases discussed above. Furthermore, no acoustical treatments in all these factories have been yet carried out due to some reasons mentioned above.

The results of the questionnaires of about 750 workers in most factories with SPL of 84-110 dB(A) can of course not be given in details in this paper. However, the results indicate the following facts: 1. The majority of the workers are suffering from hearing loss, even those who are working at noise level of 84 dB(A). This was proved by our audiometric tests. 2. Most of the workers at noise levels exceeding 100 dB(A) for service periods exceeding 5 years are suffering from

severe hearing losses. This was proved too by our audiometric hearing tests. 3. The majority of workers are claiming that their general health is considerably deteriorated by their long service in such high noise levels. 4. Most workers,particularly those with service periods of less than 5 years,believe that their nervous systems are considerably exhausted,and they are often nervous. 5. The majority of the workers at noise levels of more than 90 dB(A),believe that the noise is untolerable, especially those with service periods of less than one year and the SPL of noise is exceeding 100 dB(A). Most of the workers at noise levels of less than 88 dB(A) or those with service periods of more than ten years at noise levels of more than 100 dB(A) find their occupational noise level is tolerable. 6. Most to all workers at noise levels exceeding 84 dB(A) prefer strongly the treatment of the high occupational noise level than receiving extra allowance,except those with severe hearing losses. 7. The majority of the workers believe strongly that high occupational noise levels are weakening their technical skill and capability;and consequently are deteriorating the quality and reduce the quantity of their industrial production.

Therefore,treatments of high occupational noise levels must be carried

Maximum SPL's and type of noise (A=impusive,B=combined & C=continuous)

Site No.	Factories (or industrial sites) in Baghdad	Type of noise	Max. SPL in dB(A)
1	General State Enterpr. for Electrical Industries	A	110
2	National Co. for Chemical and Plastic Industries	A	109
3	National Co. for Woolen Textile and Weave	C	105
4	14th Ramadhan Factory for Textile and Weave	C	102
5	Cement Factory	C	102
6	General State Enterpr. for Vegtable Oils Indust	B	102
7	Caps Factory for Pepsi-Cola	B	101
8	Puplic House for Press	B	101
9	1st June Factory for Textile and Weave	C	101
10	17th July Factory for Textile and Weave	C	100
11	Babylon Batteries Factory	A	100
12	Al-Hilal Co. for Air-cooler Industry	A	99
13	General State Enterprice for Iraqi Tabacco	B	98
14	Factory for Matches Industry	B	98
15	General State Enterprice for Sewing	C	97
16	Pepsi-Cola Factory	B	96
17	General State Enterprice for Leather Industry	B	96
18	Al-Thawra News Paper	B	95
19	Al-Noor Factory for Batteries	A	95
20	General Co. for Electronic Industries	B	95
21	Al-Hurria Printing House	B	94
22	General Co. for Mission Drinks	B	88
23	Eastern Drinks Factory	B	84

out,and special conditions must seriously be considered and approved by the national authority for the already existing and/or the new factories,which we believe to be as follows.

I. Already existing factories:

1.Vibrational and acoustical treatments for sound sources.
2.Sound insulation of the very noisy machines and/or tools.
3.Furnishing the ceiling,walls and partitions with proper sound absorbing materials.
4.Periodical test of noise levels at each factory must be carried out by the national authority in order to control the industrial noise.
5.Proper rules for working hours and working periods must strictly be followed.
6.Providing the workers with effective hearing protctors suitable for Iraqi weather,e.g.,E.A.R. plugs instead of ear muffs,which are untolerable for long periods in a hot weather.

II. New factories:

1.Only machines with noise levels of less than certain value are permitted to be introduced into new factories,otherwise,special sound insulation treatments must be carried out.
2.Installing of machines in new factories must be executed according to certain vibrational and acoustical conditions.
3.Acoustical treatment must be presented to the local authority at the design stage of the new factory for obtaining the official licence.
4. - 6. as above.

CONCLUSION

The maximum SPL's of industrial noise measured in most important sections of 23 factories in Baghdad are ranging from 84 to 110 dB(A). The noise levels at most factories are appreciably to considerably higher than the national standard on occupational noise exposure limit (85 dB(A) for 46 h/w),particularly when the noise is impulsive. None of the factories has any acoustical treatment. The results indicate that the majority of the workers are suffering from hearing loss,nerviness, and/or deterioration of general health condition due to the high noise level. They prefer strongly proper solutions of high noise level than receiving extra allowance. High noise levels affect considerably technical skill and/or capability of the workers,quality and/or quantity of production. Acoustical and vibrational treatments must be carried out,as well as some rules and conditions for the already existing and/or new factories must strictly be followed.

REFERENCES

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