

# THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000

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### MISCELLANEOUS

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## THE NOISE POLLUTION (REGULATION AND CONTROL) RULES, 2000

**S.O. 123 (E), dated 14th February, 2000.**<sup>1</sup>-Whereas the increasing ambient noise levels in public places from various sources, inter-alia, industrial activity, construction activity, generator sets, loud speakers, public address terms, music systems, vehicular horns and other mechanical devices have mysterious effects on human health and the psychological well being of the people; it is considered necessary to regulate and control noise producing and venerating sources with the objective of maintaining the ambient air quality standards in respect of noise.

1. **Published in the Gazette of India, Extraordinary, Pt.II, Sec. 3 (ii) dated 14th February, 2000.**

Now, therefore, in exercise of the powers conferred by Cl. (ii) of sub-section (2) of Sec. 3, sub-section (1) and Cl. (b) of sub-section (2) of Sec. 6 and Sec. 25 of the Environment (Protection) Act, 1986 (29 of 1986) read with rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby makes the following rules for the regulation and control of noise producing and generating sources, namely: -

**1. Short title and commencement. -**

- (1) These rules may be called the Noise Pollution (Regulation and Control) Rules, 2000.
- (2) They shall come into force on the date of their publication in the Official Gazette.

**2. Definitions. -** In these rules, unless the context otherwise requires,-

- (a) "Act" means the Environment (Protection) Act, 1986 (29 of 1986);
- (b) "Area/zone" means all areas which fall in either of the of four categories given in the Schedule annexed to these rules;
- (c) "Authority" means any authority or officer authorised by the Central Government, or as the case may be, the State Government in accordance with the laws in force and includes a District Magistrate, Police Commissioner, or any other officer designated for the maintenance of the ambient air quality standards in respect of noise under any law for the time being in force;
- (d) "Person" in relation to any factory or premises means a person or occupier or his agent, who has control over the affairs of the factory or premises;
- (e) "State Government" in relation to a Union territory means the Administrator thereof appointed under Art. 239 of the Constitution.

**3. Ambient air quality standards in respect of noise for different areas/zones. -**

- (1) The ambient air quality standards in respect of noise in different areas/ zones shall be such as specified in the Schedule annexed to these rules.
- (2) The State Government may categorize the areas into industrial, commercial, residential or silence areas/zones for the purpose of implementation of noise standards for different areas.
- (3) The State Government shall take measures for abatement of noise including noise emanating from vehicular movements and ensure that the existing noise levels do not exceed the ambient air quality standards specified under these rules.
- (4) All development authorities, local bodies and other concerned authorities while planning developmental activity or carrying out functions relating to town and country planning shall take into consideration all aspects of noise pollution as a parameter of life to avoid noise menace and to achieve the objective of maintaining the ambient air quality standards in respect of noise.
- (5) An area comprising not less than 100 meters around hospitals, educational institutions and courts may be declared as silence area/zone for the purpose of these rules.

**4. Responsibility as to enforcement of noise pollution control measures.-**

- (1) The noise levels in any area/zone shall not exceed the ambient air quality standards in respect of noise as specified in the Schedule.
- (2) The authority shall be responsible for the enforcement of noise pollution control measures and the due compliance of the ambient air quality standards in respect of noise.

**5. Restrictions on the use of loud speakers/public address system. –**

- (1) A loudspeaker or a public address system shall not be used except after obtaining written permission from the authority. -
- (2) A loud speaker or a public address system shall not be used at night (between 10.00 p.m. to 6.00 a.m.) except in closed premises for communication within, e.g. auditoria, conference rooms, conference rooms, community halls and banquet halls.

**6. Consequences of any violation in silence zone/area.-**Whoever, in any place covered under the silence zone/area commits any of the following offence, he shall be liable for penalty under the provisions of the Act :-

- (i) Whoever, plays any music or rises any sound amplifiers,
- (ii) Whoever, beats a drum or tom-tom or blows a horn either, musical or pressure, or trumpet or beats or sounds any instrument, or
- (iii) Whoever, exhibits any mimetic, musical or other performances of a nature to attract crowds.

**7. Complaints to be made to the authority-**

- (1) A person may, if the noise level exceeds the ambient noise standards by 11) dB (A) or more given in the corresponding columns against any area/zone, make a complaint to the authority.
- (2) The authority shall act on the complaint and take action against the violator in accordance with the provisions of these rules and any other law in force.

**8. Power to prohibit etc. continuance of music sound or noise.-**

- (1) If the authority is satisfied from the report of an officer in charge of a police station or other information received by him that it is necessary to do so in order to prevent annoyance, disturbance, discomfort or injury risk of annoyance, disturbance, discomfort or injury to the public or any person who dwell or occupy property on the vicinity, he may, by written order issue such directions as he may consider necessary to any person for preventing, prohibiting, controlling or regulating: -
  - (a) The incidence or continuance in or upon any premise of-
    - (i) Any vocal or instrumental music,

- (ii) Sounds caused by playing, beating, clashing, blowing or use in any manner whatsoever of any instrument including loudspeakers, public address systems, appliance or apparatus or contrivance which is capable of producing or re-producing sound, or
- (b) The carrying on in or upon, any premises of any trade, avocation or operation or process resulting in or attended with noise.
- (2) The authority empowered under sub-rule (1) may, either on its own motion, or on the application of any person aggrieved by an order made under sub-rule (1), either rescind, modify or alter any such order:

Provided that before any such application is disposed of, the said authority shall afford to the applicant an opportunity of appearing before it either in person or by a person representing him and showing cause against the order and shall, if it reflects any such application either wholly or in part, record its reasons for such rejection.

## SCHEDULE

(See rule 3 (1) and 4 (1))

### Ambient Air Quality standards in respect of Noise

Area Code	Category of Area/Zone	Limits in dB(A) Leq*	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

- Note:**
- 1. Day time shall mean from 6.00 a.m. to 10.00 p.m.
  2. Night time shall mean from 10.00 p.m. to 6.00 a.m.
  3. Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions and courts. The silence zones are zones, which are declared as such by the competent authority.
  4. Mixed categories of areas may be declared as one of the four-abovementioned categories by the competent authority.
- \*dB (A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.  
 A “decibel” is a unit in which noise is measured.  
 “A” in dB (A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

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- (viii) Motor Vehicles Act and Noise
- (ix) Factories Act, 1948 and Noise Control
- (x) The Air (Prevention and Control of Pollution) Act, 1981 and Noise Control

1. **General.** -Noise is unwanted sound. Ambient noise is all encompassing noise associated with any given environment and is usually a composite of sounds from many sources near and far. Any abnormal sound which irritates human being is called as noise pollution.

Noise is one of the undesirable products of technological civilization. Admits this civilization, wherever we go, noise surrounds us. The roar of traffic, the passage of trains and aeroplanes, the bustle of crowds and the working of industry and the public utilities deafens our ears. Even home is invaded by noise. The noise from whatever source it comes from is undoubtedly, physiologically as well as psychologically harmful. Invading environment in dangerous proportions,

it is an invisible but insidious form of pollutant Noise as a potentially harmful pollutant is being recognised as a great nuisance these days affecting the quality of life, particularly, in urban areas.

The Environment (Protection) Act, 1986, under Sec. 6 has mentioned “Rules to regulate environmental pollution”. This section has explained the maximum allowable limits of concentrations of various environmental pollutants (including noise) for different areas.

- 2. The noise nuisance.** -Noise is not only a nuisance; it is a health hazard, Indians who have the dubious distinction of being amongst the noisiest people in the world-are deaf to this fact.

Addressing the Indian Science Congress' annual convention in January 1981, its president, Prof. A.K. Sharma, said, “in the absence of any preventive measures, Indian towns are noisier than those in the West. Calcutta, Bombay and Delhi are regarded to be among the noisiest cities in the world, where the average noise level even 10 years back was 90 decibels. (Decibels is a unit of noise on a logarithmic scale.)”

In addition to factories, automobiles, trains and aeroplanes, religious and social ceremonies are also a noise nuisance. “Perhaps the most important source of noise of immediate concern in our country, is that associated with the social and religious ecstasies patterned by us notes a study made by SOCLEEN. A noise level survey by-SOCLEEN in the most crowded localities of Bombay during the Ganpati-festival in 1980, found levels upto 97 decibels. The noise level at airports measures about 90 decibels”.

Loudspeakers are a big way of expressing mutual favour in India. Births, marriages, deaths, all appear to be apt occasions for their use. “Loudspeakers wars” between temple and mosques are known to have sparked communal riots.

Prolonged exposure to noise levels about 90 decibels can cause permanent deafness-factory workers show neurological, digestive and metabolic disorders under such conditions. Researchers claim that if present noise levels continue unchecked, further generations may be born deaf.

In the West, noise pollution is checked by legislation. In India, we do not have any law regarding noise levels. Says Dr. V.D. Kulsreshtha of the Indian Law Institute at New Delhi. “A separate legislation in India to control noise sources is extremely significant and timely”. But no amount of legislation will help, unless we are convinced that noise is a menace and take steps to curb it.

- 3. Noise and psychology.** -The most common and best-understood physiological effect of noise is hearing impairment-either temporary or permanent. The amount of permanent hearing loss produced by sufficient exposure to high-level noise depends on the nature of the noise, the time distribution of Particular exposures, the total duration of the exposure over a lifetime, and individual susceptibility. For essentially continuous types of noise, such as that in many factories, enough research has been done to permit some statistical prediction of the risk of hearing damage. More research is needed, however, to predict damage, which results from noise of a discontinuous nature.

Noise is known to produce various temporary changes in man's physiological state, in particular a constriction of the smaller arteries. This can mean a speeded up pulse and respiration rate. Some medical authorities believe that continued

exposure to loud noise could cause chronic effects such as hypertension or ulcers. Startling noises elicit involuntary muscular responses. Research is still necessary to permit quantitative prediction and understanding of the extra-auditory physiological impact of noise.

4. **Concept of noise pollution.** -The word noise which is derived from the Latin word 'nausea', has been defined in different ways. In law, noise may be defined as an excessive, offensive, or startling sound. In short, the best definition of noise is 'sound which is undesirable-by the recipient'. This subjective definition of noise differs from the scientific description of noise. An objective definition of noise coupled with measure and assessment techniques is yet to be drawn up by the law.

A legally significant objective definition of noise is a complex and difficult to discern, for noise is not purely a matter of acoustics but of psychology. Subjective factors such as mental attitude, environment, time and place, etc., are important in the determination of actionable noise, which differ and are hard to quantify. The law cannot take into account every unwanted noise. On the other hand, any sound, which becomes excessive, unnecessary or unreasonable, has to be put under regulation in order to shield public against unbearable and harmful noise or for its cessation. Scientific methods to that extent may be useful in determining situations where noise steps out from its background and becomes actionable.

Noise becomes a pollutant when it contaminates the environment, which becomes a nuisance and affects the health of persons their activities and mental abilities. In other words, noise pollution is unwanted sound which is dumped into the atmosphere without regarding to the adverse effects it may be having.

Noise though not defined in any statute, but it is now included as an environmental pollutant in Section (a) of the Air (Prevention and Control of Pollution) Act, 1981 and hence, recognised as a kind of air pollution.

## TABLE

### Ambient Air Quality Standards in respect of Noise

Area Code	Category of Area/Zone	<u>Limits in dB(A) Leq*</u>	
		Day Time	Night Time
(A)	Industrial Area	75	70
(B)	Commercial	65	55
(C)	Area Residential	55	45
(D)	Area Silence Zone	50	40

**Note: -**

1. Day Time shall mean from 6.00 a.m. to 10.00 p.m. (16 hours)
2. Night Time shall mean from 10-00 p.m. to 6.00 a.m. (8 hours)

3. Silence zone is defined as an area comprising not less than 100 meters around hospitals, educational institutions and Courts. The silence zones are zones, which are declared as such by the competent authority.
4. Mixed categories of areas may be declared as one of the four-abovementioned categories by the competent authority.

\*dB (A) Leq denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

A “decibel” is a unit in which noise is measured.

“A”, in dB (A) Leq, denotes the frequency weighting in the measurement of noise and corresponds to frequency response characteristics of the human ear.

Leq: It is an energy mean of the noise level over a specified period.

5. **Combating the smog and noise in cities.**<sup>1</sup>-The pollution caused by the explosion in the number of automobiles in cities can be reduced by upgrading the quality of Indian fuel, enforcing higher emission standards and regulating traffic, write DILIP BISWAS, Chairman, and S.A. DUTTA, Scientist, of the Central Pollution Control Board.

In the last two decades the urban population in India has nearly doubled, from 109.5 million in 1971 to 217.0 million 1991 and it is expected to reach 325 million by the turn of the century. With the increasing urbanisation along with a conglomeration of industries and commercial activities in the urban areas, the transport demand has also consequently increased. Due to an inadequate public transport system, the use of personalised vehicles has been steadily increasing. The total number of vehicles has been steadily increasing. The total number of vehicles in India has increased from about 11 million in 1986 to more than 21 million in 1991. About one fifth of the vehicular population in India is concentrated in the major majoropolitan cities.

**1. Vide the Hindu Survey of the Environment, 1994, pp .41, 42, 43 and 44.**

6. **Measurement of the intensity of sound.**<sup>1</sup>-The ISO (International Organization for Standardization) defines noise intensity level as:

$$L_p = 20 \log_{10} \frac{p}{p_0} = 10 \log \frac{I}{I_0}$$

Where p equals the measured sonar pressure level given in N/m<sup>2</sup>

I equal the measured intensity of sound given in W/m<sup>2</sup>;

P<sub>0</sub> equals the pressure level at the limit of audibility for the normal ear when the frequency of emission is 1000 cycles per sound.

I<sub>0</sub> equals the intensity of sound at the limit of audibility for the normal ear when the frequency of emission is 1000 cycles per second.

The relationship between sound pressure, sound intensity and intensity level is given as follows :

Sound pressure N/M <sup>2</sup>	Intensity W/M <sup>2</sup>	Intensity level Decibels (dB)
2 x 10 <sup>-5</sup>	10 <sup>-12</sup>	0

$2 \times 10^{-4}$	$10^{-10}$	20
$2 \times 10^{-3}$	$10^{-8}$	40
$2 \times 10^{-2}$	$10^{-6}$	60
$2 \times 10^{-1}$	$10^{-4}$	80
$2 \times 10^0$	$10^{-2}$	100
$2 \times 10^1$	$10^0$	120
$2 \times 10^2$	$10^2$	140

**1. Vide India's Environment (Health), 1984-85.**

**TABLE**

**Weighted sound levels and human response**

Sound Source	dB(A)*		Response Criteria
Carrier Deck Jet Operation	—	150	Painfully Loud
Jet Takeoff (200 feet)	—	140	Limit Amplified Speech
Discotheque, Auto horn (3 feet)	—	130	may Maximum Vocal Effort
Riveting Machine		120	Very Annoying
Jet takeoff (2000 feet)			Hearing Damage (8 hours)
Shout (0.5 feet)		110	Annoying
N.Y. Subway Station	—	100	Telephone use difficult Intrusive
Heavy Truck (50 feet)	—	90	Quiet
Pneumatic Drill (50 feet)	—	80	Very Quiet
Freight Train (50 feet)	—	70	Just Audible
Freeway Traffic (50 feet)	—	60	Threshold of Hearing
Air Conditioning Unit (20 feet) Light Auto Traffic (50 feet)	—	50	
Living Room	—	40	
Bedroom		30	
Library		20	

Soft Whisper (15 feet)		10	
Broadcasting Studio		0	

\*Typical A-Weighted sound levels taken with a sound-level metre and expressed as decibels on the scale. The “A” scale approximates the frequency response of the human ear. Source : Department of Transportation

7. **Sources of noise pollution.** -The following are the possible sources of noise

### **TABLE**

#### **(i) Noise limits for domestic appliances**

Domestics appliances	Limits in dB (A) Sound pressure Level at one metre Distance from the Operating appliance
(a) Window Air conditioners of 1 Ton to 1.5 Ton	68
(b) Air Coolers	60
(c) Refrigerators	46

Apart from above sources, crowding with the increase of population and urbanisation, community activities such as political and public meetings religious functions, weddings, festivals, etc., have been contributory factors in rising environmental noise pollution.

- (ii) **Noise due to loud speakers.**-Extensive and common use of loud speakers whether for political meetings, marriages, religious functions, musical nights, advertising, etc., are most disturbing source of noise to the urban dwellers in particular. Though the use of loud speakers is governed by administrative restrictions and some laws but their widespread use remains continuing, as the restrictions and the laws are not seriously imposed. If loud horns are used near hospital zones, they disturb the patients and also doctors at serious operations. Loud horn noises in school zones, create disturbance in teaching work.

#### **Statutory Control on loud speakers. -**

- (i) The permitted strength of the power amplifier should be adjusted to cover the audience, and noise level beyond the boundary limit of the noise source premises should not be increased by more than 5 dB above the ambient noise level.
- (ii) Licence must be obtained by all parties intending to use loud speakers or public system for any other occasion.

- (iii) Public address system and loud speakers should not be used at night between 9.00 p.m. to 6.00 a.m. except in closed premises.
- (iv) Loud speakers should be directed at the audience and not away from audience (i.e., not towards the neighborhood).
- (v) Loud speakers should not be allowed for advertisement and commercial activities.

**(iii) Noise due to bursting of crackers. -**

- (a) Manufacture and sale of crackers having an impulsive noise of more than 90 dB at 5 meters distance from the site of bursting should be banned.
- (b) Manufacture and bursting, of joined crackers should be banned.
- (c) Bursting of crackers during night between 9.00 p.m. to 6.00 a.m. should be banned.
- (d) Bursting of crackers should be permitted only during public festivals.

**Source: Annual Report of Central Pollution Control Board (1989-90) at p. 47-48.**

**(iv) Noise due to vehicles. -**The noises from individual vehicles includes

- (1) Noise from engine, transmission.
- (ii) Exhaust noise.
- (iii) Noise due to slamming of car doors.
- (iv) Use of horns.

The noises from Engine and transmission depend upon the support used for moving parts. Good quality has more efficient and elaborate system for dampening noises. Considerable improvements are being made to improve the mounting systems even in chapter vehicle. Exhaust noises have been brought under control to maximum extent by using efficient silencing system, which also do not effect the power out put of the engine. Prosecution, in Great for excessive noise from exhaust system does occur but seem somewhat illogical, as it being only the subjective judgment of the policeman.

The noise due to closures of car doors is intense, but intermittent. This noise disturbs the sleep. This problem can only be solved at the design stage. This is only possible by enforcing legislation on motor manufactures to produce noiseless door shutting devices. The motor cars are fitted with horns, to attract the attention of other movers. These horns when not used in proper way produce appreciable nuisance.

The table shows the relative noise of vehicle type. The tests are carried by the Motor Industry Research Association, using Test procedure as prescribed in BS 3425 (1965).

Luxury Limousine	77 dB
Small passenger car	79 dB
Miniature passenger car	84 dB
Sports car	91 dB
Motor-cycle (2 cylinder 4 stroke)	94 dB
Motor scooter (1-cylinder-2-stroke)	80 dB

The difference between the noise level of a standard small passenger car and a sports car is no less than 12 dB, which means the sports car is roughly 15 times more noisy than the saloon car. Motor cycles, with their exposed engines and inadequate silencing arrangements, are notorious noise producers, with a sound level roughly 30 times higher than that of a saloon car. Motor scooters, on the other hand, only produce the same noise as a motor car.

It is debatable whether there is any longer room on modern roads for fast motor-cycles and sports cars, which not only contribute excessive noise to the environment, but also figure prominently in road accidents. It can be argued with objective justification that these vehicles should be used only on enclosed race tracks, and not on the congested public highway.

### **TABLE**

#### **Noise Limits for Automobiles at Manufacturing Stage**

**(Achieved by the Year 1992)**

Categories of automobiles	Limits in dB (A)
(a) Motorcycle, scooters and three-wheelers	80
(b) Passenger cars	82
(c) Passenger or commercial vehicles of up to 4 MT	85
(d) Passenger or commercial vehicles of above 4 MT and up to 12 MT	89

It is worthwhile to emphasise here that the Air Act is not an adequate legislation to prevent and control the noise pollution. The Act suffers from inherent shortcomings and the standards for control of noise pollution thereunder remain unimplemented in the paucity of effective control mechanism.

- (v) **Noise due to trains.** -Noise from steam engines fast trains and railway operations has been a cause of great concern as the impact of the noise produced has been reported to be maximum in those areas where railway tracks pass through residential areas. The community response is denunciatory of the annoying noise and disturbing vibration emitted by the fast moving trains.

Railway noise is less annoying than aircraft traffic noise of equivalent noise level at least an L.A. eq. 24 hr of 50 to 65 dB. Further, it is an annoyance to a given observer as an incident event and when the train has passed the point, the ambient sound level is restored. These facts by themselves, do not mean that the noise control be ignored. On the other hand, in view of the increasing speeds and frequencies of the railway services, the community/ public needs protective attention from the point of noise control.

- (vi) **Noise due to aircrafts.** -This source of noise pollution has been increasing steadily during recent years and, especially close to international airports, already constitutes a very serious problem. This problem has mainly arisen because of the widespread use of heavy long-range jet aircraft. Noise made by jet planes is intrinsically more disturbing than that of propeller driven aircraft because it is of far higher pitch. jet noise is caused by the violent mixing of the jet of gases from the engine with the surrounding air, it is at a maximum during take-off when the engine must deliver maximum thrust, and falls away rapidly as the aircraft climbs. During landing, the main source of high-frequency noise is the whine of the air compressor and turbine blades at the engine is throttled back. Aircraft pass close to the ground for quite a distance during the landing operation and this noise often constitutes a more sustained environmental nuisance than the intense noise of shorter duration produced during take-off.

Military aircraft often cause annoyance in areas away from airfields because they have to be flown at low altitudes as part of normal training procedures. Little can be done about this national defence-even in peacetime-will always take priority.

The fast growth of air traffic, the invention of supersonic aircrafts and devices employed to scare birds have contributed to the creation of aircraft noise. Aircraft generate, generally unbearable roar during take offs and landings. Aircraft noise is obstructive, persistent and unpleasant besides being a serious health hazard for the communities living in neighborhood of airports.

### **Aircraft precautions. -**

- (a) Aerodrome should be- located away from the city and growth of the city should not be allowed to extend up to the aerodrome.

- (b) Aeroplanes should take off in direction radically away from the city.
- (c) During boarding and unboarding operations, the plane should be sufficiently away from the airport buildings.
- (d) Night-time operations of the aircraft should be minimised.
- (e) During maintenance and repairs of the aeroplane workers should use ear puffs.

Portable silencers should be used in the plane intake as well as exhaust during idling period at the air craft.

**(vii) Noise due to projection of satellites into space.** -The launching of satellites, a regular space activity these days, has now come to be recognised as a new source of air and noise pollution. Lifting of satellite with the aid of high explosive rockets produce deafening noise.

**(viii) Noise from construction and civil engineering works.**-Noise from construction sites is generally far worse than noise originating from factories. There are two main reasons for this. One is that wherever construction takes place like erection of roads, bridges and buildings noise emissions levels are higher. The other is that civil engineering equipment is inherently noisy. The worst of these pieces of equipment, from the noise generation point of view, are the following: -

Equipment	Noise levels t15m.
Tractor-scraper	93 dB
Rock drill	87 dB
Unmuffled concrete breaker	85 dB
Hand-held tree saw	82 dB
Large rotary diesel compressor	80 dB
1 <sup>1/2</sup> tonne dumper truck Diesel	75 dB
concrete mixer	75 dB

In the era of fast urbanization of buildings and roads, the demolition and the repair activities along with the huge machines used for the purposes create a great deal of noise to the annoyance of the people living near the sites of construction. Hence such works are also a potential source of noise pollution.

**Precautions in Construction Activities. -**

- (a) Acoustic barriers should be placed near construction sites.

- (b) The maximum noise levels near the construction site should be limited to 75 dB (A) Leg (5 min) in industrial areas and to 65 dB (A) Leg (5 min) in other areas.
  - (c) There should be fencing around the construction site to prevent people coming near the site.
  - (d) Materials need to be stockpiled and unused equipment to be placed between noisy operating equipments and other areas.
  - (c) Constructing temporary earth and around the site using soil etc., which normally is hauled away from the construction site.
- (ix) **Noise from industries.**-Noises in industry originate from processes causing impact, vibration or reciprocation movements, friction, and turbulence in air or gas streams.

Impact and vibration noises are considerably reduced if machines are mounted on flexible supports. In addition, vibration noises can be reduced by the mass, careful design of shape and arrangement of parts of machines so that resonance is avoided. Nevertheless, certain machines will remain inherently noisy, and demand to be surrounded with absorbent or insulating screens. Noise caused by gas stream can be attenuated or even eliminated by the use of suitable ducts and by correct design and positioning of inlets and outlets.

At the present moment industry is not making particular efforts to cut down pollution by noise, mainly because the laws which apply are not particularly stringent. This is yet another field in which there is scope and need for considerable improvement.

The textile mills are some of the noisiest workplaces in the country. The TLV is 85 decibels (dB), but mills invariably exceed this limit, as shown by an overview by the ITRC of health problems in the textile industry from 1925 to 1981. For instance, shuttle looms create such a din that workers usually communicate with each other by lip movements. The machinery in woollen and jute mills is even noisier than in cotton and silk. The noise level in a large weaving section ranges from 100 dB to 105 dB, and can cause permanent loss of hearing. In the US, no textile mill is allowed to exceed 100 dB for more than two hours a day-but Indian mills run three 8 hours shifts.

The situation elsewhere is similar. In the machine tool and automobile industries the maximum noise is caused by hammering in fertiliser factories, compressors make the biggest racket. No wonder that many Indian workers find themselves shouting even at home, out of the sheer habit says the ITRC : "The harmful effects of noise include increased annoyance, mental tension, irritability, and emotional disturbances at work and at home. Greater circulatory, heart and equilibrium problems were found in textile workers exposed to very noisy environments. The most pervasive and dangerous harm from noise hazard is the permanent, incurable deafness as a result of continued exposure to noise levels above 85 dB to 90 dB".

However, Dr. G. G. Davay, medical inspector of factories in Maharashtra, rules out the noise hazard in textile mills. "I have not yet come across any textile

millhand with loss of hearing due to overexposure to noise” he said a few years ago. “I do not mean that noise does not affect hearing. But in the absence of any direct proof, it is against the ethics of science to exaggerate the hazard. it will amount to creating a scare”. But in the very same breath, he admitted that his department was not equipped to measure and study the problem “as the scientific world has been seized of it only recently”.

In 1976, the Government includes “noise-induced hearing loss” as a fortifiable disease. Any medical practitioner who detects such impairment has to report the case to the chief inspector of factories; failure to do so can be punished. An official committee has suggested that such disability should be brought under the scope of the WCA as well.

Noise can often be checked by using attenuators between different sections in a factory and protecting the relatively quiet areas from the menace. The CLI has experimented with some attenuators and found that these do not only reduce dB levels but are also more economical because they raise workers' productivity sharply. Dr. Davay believes that “it is difficult to control noise in certain departments with the present technical knowledge”. But even simple precautions like issuing employees in noisy sections with earplugs or muffs are never taken.

Yet another occupational health is psychological, which medical experts would term, “behavioral toxicology”. Very often, such symptoms are early warnings of impending physiological trouble ahead. Furthermore, different dusts and chemicals affect workers behaviour in a wide variety of ways.

The earliest study was on manganese workers in 1958. Some of the common psychological symptoms were impotence, lack of concentration, irritability, insomatic somnolence, unmotivated, laughter, bad memory and depression. The lead storage battery units were exposed to levels higher than permissible and complaint number of mental symptoms. It was found that 375 workers suffered from impairment of visual intelligence their ability to react pictures.

Noise is an inescapable by-product of industrial environment, which is increasing very fast with the advancement in industrilisation. The workers are most readily sufferers to the noise hazards of industrial functioning. Industries located in the residential areas, particularly such as printing press agro-based industries, automobiles repairing, grinding' mills, general engineering, etc., are the sources of community noise affecting the public continuously, living in the vicinity.

## **TABLE**

### **Permissible Noise Exposure for Industrial Workers**

Exposure Time (in Friday)	Limit in dB (a)
8	90
4	93