

POSITION PAPER FOR NOISE POLLUTION BY PRESSURE HORNS



**Pakistan Environmental Protection Agency
Pakistan Environment Programme**

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INTRODUCTION

Noise is an unwanted, unpleasant and annoying sound caused by vibration of the matter. Vibrations impinge on the ear drum of a human or animal and setup a nervous disturbance, which we call sound. When the effects of sound are undesirable that it may be termed as “Noise”. Noise from industry, traffic, homes and recreation can cause annoyance, disturb sleep and affect health. Thus, sound is a potentially serious pollutant and threat to environmental health.

The response of the human ear to sound depends both on the sound frequency (measure in Hertz, Hz) and the sound pressure, measured in decibels (dB). A normal ear in healthy young person can detect sounds with frequencies from 20Hz to 20,000 Hz.

Noise measurements are expressed by the term Sound Pressure Level (SPL) which is logarithmic ratio of the sound pressure to a reference pressure and is expressed as a dimensionless unit of power, the decibel (dB). The reference level is 0.0002 microbars, the threshold of human hearing.

$$\text{Decibel } L_{eq} = 10 \log_{10} L/L^{\circ}$$

L_{eq} = Equivalent Noise level

L = Sound Intensity

L° = Reference level

If a measurement of noise emission is required a sound level meter is used. A measure of the level of sound is called the decibel. The zero of the decibel scale is the hearing threshold. Sounds at 0–10 decibel are so quiet that they are almost impossible to hear, while at the top end of the scale, at around 150 decibel, it can damage your eardrums. (<http://www.epa.vic.gov.au>)

1. CLASSIFICATION OF NOISE

There are two kinds of noise:-

1.1 Community Noise/ Environmental Noise

1.2 Occupational Noise

1.1. COMMUNITY NOISE

Community noise (also called environmental noise, residential noise or domestic noise) is defined as noise emitted from all sources, except noise at the industrial workplace. Main sources of community noise include road, rail and air traffic, construction and public work, and the neighbourhood (<http://www.who.int>). Typical neighbourhood noise comes from premises and installations related to the catering trade (restaurant, cafeterias, discotheques, etc.); from live or recorded music; from sporting events including motor sports; from playgrounds and car parks; and from domestic animals such as barking dogs. The main indoor sources are ventilation systems, office machines, home appliances and neighbours.

1.2. OCCUPATIONAL NOISE

The many and varied sources of noise in industrial machinery and processes include: rotors, gears, turbulent fluid flow, impact processes, electrical machines, internal combustion engines, pneumatic equipment, drilling, crushing, blasting, pumps and compressors. Furthermore, the emitted sounds are reflected from floors, ceiling and equipment. Noise is a common occupational hazard in many workplaces. Occupational exposure limits specify the maximum sound pressure levels and exposure times to which nearly all workers may be repeatedly exposed without adverse effect on their ability to hear and understand normal speech. An occupational exposure limit of 85 dB for 8 hours should protect most people against a permanent hearing impairment induced by noise after 40 years of occupational exposure.

Occupational noise can be two of types

1.2.1 CONTINUOUS NOISE

It is produced by machinery that operates without interruption in the same mode e.g. blowers, pumps and processing equipment.

1.2.2 INTERMITTENT NOISE

When machinery operates in cycles or when single vehicles or aeroplanes pass by the noise level increases and decreases rapidly.

2. EFFECT OF NOISE ON PUBLIC HEALTH

The recognition of the noise as a serious health hazard as opposed to a nuisance is a recent development and the health effects of the hazardous noise exposure are now considered to be an increasingly important public health problem, as stated below:-

- Globally, some 120 million people are estimated to have disabling hearing difficulties.
- More than half citizens of Europe live in noisy surroundings; a third experience levels of noise at night that disturbs sleep.
- In the USA in 1990 about 30 million people were daily exposed to a daily occupational noise level above 85 dB, compared with more than nine million people in 1981; these people mostly in the production and manufacturing industries.
- In Germany and other developed countries as many as 4 to 5 million that is 12-15% of all employed people, are exposed to noise levels of 85 dB or more. In Germany, an acquired noise-related hearing impairment that results in 20% or more reduction in earning ability is compensable; in 1993, nearly 12 500 new such cases were registered (<http://www.who.int>).

Many medical investigations have proved that noise can cause physiological stress reaction such as blood pressure and increased heart rate. Noise also causes speech interference and disturbs sleep and rest. Human ear as a sound receiver has to operate under a wide range of conditions. Under favorable conditions like excessive noise, its hearing mechanism could damage permanently or temporary, depending on type, intensity and time of exposure to noise (PEPC Draft report).

- Noise can adversely affect performance, for example in reading, attentiveness, problem solving and memory. Deficits in performance can lead to accidents.
- Noise above 80 dB may increase aggressive behavior.
- A link between community noise and mental health problems is suggested by the demand for tranquilizers and sleeping pills, the incidence of psychiatric symptoms and the number of admissions to mental hospitals.

3. NOISE STANDARDS IN PAKISTAN

Noise is a disturbance to the human environment that is escalating at such a high rate that it will become a major threat to the quality of human lives. In the past thirty years, noise in all areas, especially in urban areas, has been increasing rapidly. In Pakistan, there is no legislation to deal with noise emanating from railway engines, air crafts, airport or industrial or construction activities. Public complaints on noise pollution are often received in the federal and provincial environmental protection agencies, but in the absence of national standards for noise, these agencies are handicapped to take any legal action. Aircraft noise is another source of pollution which has so far remained unchecked (PEPC Draft report). In Pakistan, where most major civil airports lie in heavily populated areas, no such precautionary measures have been taken. Airlines, other than PIA, continue to operate old Russian commercial aircrafts which are exceptionally noisy (<http://www.pakistantimes.net>). Road Traffic Noise is another most widespread source of noise nuisance in the urban areas of Pakistan. The situation is getting alarming with increase in traffic density on city roads, particularly in Karachi.

The Pakistan Environmental Protection Agency (Pak-EPA) exercising its power under clause (d) of Section 6(1) of the Pakistan Environmental Protection Ordinance (PEPO), 1983 with the approval of the Pakistan Environmental Protection Council(PEPC) established National Environmental Quality Standards(NEQS), inter alia, for motor vehicle exhaust and noise. Pakistan NEQS for motor vehicle noise allows the maximum permissible noise emission limit of 85 dB (A) for new vehicles at a distance of 7.5 meters from the source without specifying the type of motor vehicle and measuring technique (Shaikh, *et al.*, 1997).

Table 5: National Environmental Quality Standards for Motor Vehicle Exhaust and Noise

S. No	Parameter	Standards (maximum permissible limit)	Measuring Method
1	Smoke	40% or 2 on the Ringelmann scale during engine acceleration mode	To compared with Ringelmann Chart at distance of 6 meters or more.
2	Carbon monoxide	<u>Emission Standards:</u> New Vehicles 4.5% Used Vehicles 6%	Under idling conditions: Non dispersive in infrared detection through gas analyzer.
3	Noise	85 dB (A)	Sound meter at 7.5 meters from the source.

Source: National Environmental Quality Standards (S.R.O 742(I)/93), 29th August 1993

At present there exist no national standards for prescribing noise limits for residential areas, industrial areas, commercial areas or silence zones. Most of the areas particularly to the urban side are subjected to unacceptable noise conditions due to construction, manufacturing, traffic and recreational activities. No national survey has been conducted to assess noise level in cities. However, random tests in different cities showed that the noise level in most of areas was as high as 70-90 dB (A) which is much higher than the acceptable limits.

3.1 MOTOR VEHICLE RULES, 1969

Section 154:

2) No motor vehicle shall be fitted with and multitonned horn giving a succession of different note or with any other sound producing device giving an unduly harsh, shrill, loud or alarming noise on other similar vehicles of such sound signals.

Section 155:

1) Every motor vehicle shall be fitted with a device (therein after referred to as a silencer) which by means of an expansion chamber or otherwise reduce as far as may be

reasonable and practicable the noise that would otherwise be made by the escape of exhaust gases from the engine.

Section 158:

Every motor vehicle shall be so constructed and maintained as not to cause undue noise when in motion.

4. STUDIES AND DATA FOR REMOVAL OF PRESSURE HORNS IN DIFFERENT CITIES OF PAKISTAN

4.1 ENVIRONMENTAL PROTECTION AGENCY, NWFP

According to Environmental Protection Agency, NWFP Government, campaign was started against noise pollution and use of pressure horns by public and private vehicles in Peshawar. During the whole campaign (1999-2002) total 3804 pressure horns were removed from 6068 vehicles in 178 working days. Moreover, this Agency have been checked 6630 Rickshaw for noise pollution during Jun-11997-2005, in which 3979 did not qualify the NEQS (85 db) while 2651 Rickshaws qualified NEQS.

4.2 ENVIRONMENT PROTECTION DEPARTMENT, PUNJAB

Government of Punjab constituted a committee to address the issue of use of pressure horns. A no. of meetings had been held in the past and more than 80% illegal horns were removed from intra city route buses of Lahore.

Following decisions were taken in a meeting of committee held on 11-02-2002 under the chairmanship of Mr. B.A. Nasir, Secretary, Provincial Transport Authority, Punjab.

- i) Out of four new samples, committee has approved only one single stage sample named "Ceeti Horn" after its practical demonstration. Other three samples were rejected on the ground that all those horns were multi-stage which are not allowable under the law.
- ii) Mr. B. A. Nasir, Secretary, Provincial Transport Authority, Punjab directed all horn manufacturers in the Punjab to get them registered with the Transport Department Punjab immediately. Otherwise they will not be allowed to

manufacture any kind of horn in future and in case of non-compliance, strict action will be taken against the defaulters.

- iii) The chairperson also assured the “Horn Manufacturers Welfare Association” to contact the concerned Department of other Province and Federal Government for similar exercise in their areas of jurisdiction to discourage the production and use of illegal multi-stage horns.

Now again a special joint campaign has been started w.e.f. 01-08-2005 in major cities of the Punjab on Chief Secretary Punjab directive and more than 20,000 vehicles have been challaned.

5. MAJOR STEPS TAKEN BY MINISTRY OF ENVIRONMENT

- a. Continuous campaign against pressure horn launched since couple of years and which have proved substantial results. Thousands of pressure horns were removed during this campaign through out Pakistan.
- b. The horns so removed during these campaigns were crushed in public to give a strong message to the users of pressure horns.
- c. A dialogue was initiated with the manufacturers of pressure horns to stop manufacturing of multi stage pressure horns. Through these deliberations the manufacturers of pressure horns are now manufacturing single stage horn. The sound level of which is within the permissible limit.
- d. Awareness raising of the traffic police, NGOs and other section of civil society is regular feature and all mediums including print and electronic are being used in this activity.
- e. Blue area has been declared as silence zone (no horn blowing allowed) and efforts are underway to declare other silence zone.

REFERENCES

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