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DRAFT TANZANIA STANDARD

**ACOUSTIC- GENERAL TOLERANCE LIMITS FOR ENVIRONMENTAL AND
OCCUPATIONAL NOISE**

FOR STAKEHOLDER'S COMMENTS ONLY

Acoustics - General tolerance limits for environmental and occupational noise

0 Foreword

Noise pollution is essentially an urban problem. There are evidences suggesting that noise levels can cause various physiological and psychological health problems ranging from annoyance and disturbance to heart diseases. In addition hearing damage caused by loud noise can be irreversible.

Noise pollution may be regarded special mainly because personal and subjective judgment is a big part of recognizing a sound as noise pollution or not. In addition, the damage is localized and sporadic in comparison to other types of pollution, for example water and air pollution.

The problem of noise pollution is exacerbated by unplanned and uncontrolled urban development in most of our cities, municipalities and towns. This Tanzania Standard is developed partly due to the requirements of the law (EMA, 2004) and partly because of the public outcry on loud noise emanating from various locations including places of entertainment, industries and households. Therefore, the limit values provided by this Tanzania Standard will provide the basis for authorities to assess and manage environmental noise.

In preparation of this Tanzania Standard, considerable assistance was derived from Uganda National Environmental (Noise Standards and Control) Regulations of 2003. This assistance is gratefully acknowledged.

In reporting the result of a test or analysis made in accordance to this Tanzania Standard, if the final value, observed or calculated is to be rounded off, it shall be done in accordance with TZS 4 (see clause 2).

1 Scope

This Tanzania Standard specifies limits for environmental and occupational noise.

NOTE - In this Tanzania Standard, quantities are expressed as levels in decibels.

2 Normative references

The following referenced documents are indispensable for the application of this Tanzania Standard:

TZS 1703:2014 Rev IEC 61672-1, *Electroacoustics - Sound level meter- Part 1: Specifications*

EMDC 5(5225) , *Acoustics - Description, measurement, and assessment of environmental noise - Part 1: Basic quantities and assessment procedures*

TZS 934 (Part 2):2014, *Acoustics - Description, measurement and assessment of environmental noise – Part 2: Determination of environmental noise limits*

TZS 4 (2009): *Rounding of numerical values*

3 Definition of terms and phrases

For the purpose of this Tanzania standard, the following definition shall apply:

3.1 annoyance

feeling of displeasure evoked by noise, or any feeling of resentment, discomfort or irritation occurring when noise intrudes into another person's thoughts or mood, or interferes with any activity being done by the affected person.

3.2 A-weighted sound level

single number value of the magnitude of sound at a specific location and time which has been electronically filtered (or weighted) to approximate the frequency sensitivity of the human ear.

3.3 environmental noise (also called community noise, residential noise or domestic noise)

noise emitted from all sources except noise at the industrial workplace.

3.4 C-weighted sound level

standard weighting of the audible frequencies used for the measurement of Peak Sound Pressure level.

3.5 dBA

unit in decibel for an A-weighted sound level (for quiet sounds).

3.6 dBC

unit in decibel for a C-weighted sound level.

3.7 day time

time ranging from 6:00 am - 10:00 pm

3.8 decibel

unit used to express the intensity of a sound wave. This intensity in **dB** is equal to 20 times the common logarithm of the ratio of the pressure produced by the sound wave to a reference pressure (typically 1 micropascal at 1 metre).

3.9 disturbance

any act or instance of interrupting the rest, calm, attention or quiet of another person.

3.10 equivalent sound level ($L_{eq}(T)$)

level of a steady sound that has the same acoustical energy as does a time varying sound over a stated time period "T" (T is the time period in seconds, minutes, or hours; e.g., the hourly equivalent sound level is symbolized as $LA_{eq}(1\text{ h})$, the 20-minute equivalent sound level is symbolized as $LA_{eq}(20\text{min})$).

3.11 general environment

nonspecific elements of the organization's surroundings that might affect its activities

3.12 impulsive noise

noise consisting of one or more bursts of sound energy of duration of less than one second.

3.13 intermittent noise

noise whose level suddenly drops to several times the level of the background noise.

3.14 L_{max}

highest value of the exponential sound level over the period and is usually measured with a max hold function

3.15 night time

time ranging from 10:00 pm-6:00 am

3.16 noise

any unwanted and annoying sound that is intrinsically objectionable to human beings or which can have or is likely to have an adverse effect on human health or the environment.

3.17 noise pollution

release of uncontrolled noise (above the specified limits) to the environment.

3.18 permissible noise levels

levels of noise prescribed in clause 4.

3.19 sound

fluctuation in pressure, particle displacement, or particle velocity propagated in any medium, or the auditory sensation that may be produced.

3.20 place of entertainment

building or other place where activities of amusement, entertaining, playing of music, dancing, performing of shows takes place.

3.21 place of worship

place where prayers, singing, playing music are conducted and Public Announcement (PA) system are used.

3.22 work place

any premises or place where a person performs work.

3.23 factory

building or group of buildings with facilities for manufacturing of goods.

4 Requirements

Tolerance limits for environmental noise shall be as shown in table 1.1

Table 1.1 - Maximum permissible levels for general environment

COLUMN FACILITY	COLUMN NOISE LIMITS dBA (Leq)	
	DAY	NIGHT
Any building used as hospital, convalescence home, home for the aged, sanatorium and learning institutions, offices conference rooms, public library, and environmental and recreational site	52	42
Residential building	55	45
Mixed (with some Commercial, residential Entertainment and places of worship)	55	45
Residential and industry/small scale production and commerce	60	50
Industrial area	70	60

Measurement duration to be minimum 8 hrs (for each day and night)

Table 1.2 - Maximum permissible noise levels (continuous/intermittent noise) from a factory/ workplaces

COLUMN 1	COLUMN 2	COLUMN 3
Leq dBA	Duration (Daily)	Duration (Weekly)
85	8.00 hours	40.00 hours
88	4.00 hours	20.00 hours
91	2.00 hours	10.00 hours
94	1.00 hours	5.00 hours
97	30.00 minutes	2.50 hours
100	15.00 minutes	1.25 hours
103	7.50 minutes	37.5 minutes
106	3.75 minutes	18.75 minutes
109	1.87 minutes	9.37 minutes

Note:

Noise level limits for factory/workshop compound shall not exceed 75dBA

Table 1.3 - Maximum permissible noise levels for impact or impulsive noise

COLUMN 1	COLUMN 2
Sound Level dBA L_{max}	Permitted number of impulses or impacts per day
140	100
130	1000
120	10000

Table 1.4 - Maximum permissible noise levels for mines, quarries and surrounding areas

Facility	Limit value (L_{max}) in dBC
For any building used as hospital, school, convalescent home, old age home/residential building	109 dBC
For any building in an area used for residential and one/more of the following purposes: Commerce, production, entertainment, or any residential apartment in an area that is used for purpose of industry, commerce or small-scale	114 dBC

Table 1.5-Maximum permissible levels for public announcement system or device

Location	Day (L_{eq}) dBA	Night (L_{eq}) dBA
Any building used as hospital, convalescence home, home for the aged, sanatorium, conference rooms, public library, and environmental and recreational site	52	42
Residential building	60	50
Commercial	75	65
Industrial	85	75

Note:

Measurement duration

During day – 4 hours

During night – 2 hours

Table 1.6-Maximum permissible levels for places or area of worship.

Location	Day (L _{eq}) dBA	Night (L _{eq}) dBA
Residential	60	45
Commercial	75	50
Industrial	85	60

Table 1.7-Maximum permissible levels for Vehicles.

Location	dBA
Noise level in the cabin	70
Noise level outside the cabin	88

Table 1.8-Maximum permissible levels for Airports (Civil Aviation)

Location	Day (L _{eq}) dBA	Night (L _{eq}) dBA	L _{max} in dBA
Within Airport building	70	60	103
Nearest residence/offices	60	50	103

Note:

Nearest residence/offices- Area around airport and offices within airport premises
 Measurement duration to be minimum 8 hrs (for each day and night)

5 Monitoring

Measurement of noise levels shall be done at the receiving point. Measurement within buildings shall be done with windows and doors wide opened.

Personal noise measurements shall be done to workers at different sections through use of personal noise dosimeters.

Annex A (Normative)

Specification of noise limits

A.1 Sound sources and their operating conditions

The source(s) to which the noise limits apply shall be specified together with their conditions of operation.

NOTE - Special noise limits may be specified for periods during which the source is known to emit unusual types or levels of noise, e.g. when the source is undergoing maintenance.

A.2 Locations

The locations where the noise limits have to be met shall be clearly specified. They shall be appropriate for the measurement of the noise emitted by the source(s) under consideration. The height of the microphone above the ground shall be specified.

If these locations are subsequently found to be unsuitable for measurement of the noise emitted by the source under consideration, additional positions shall be specified where such measurements can be made (check points). Noise limits at the checkpoints shall be derived from the levels specified at the initial locations.

NOTE - When specifying limits, the importance of certain transmission paths should be considered. This may be of special importance for establishing limits for indoor receiver positions (e.g., transmission through open or closed doors and windows).

A.3 Meteorological conditions

A.3.1 General

For outdoor transmission, changes in meteorological conditions may influence the received noise level if the distance between the source and the receiver is about 30 m or more. In such cases, the noise limits shall be based on an average value for either all relevant meteorological conditions or for specified meteorological conditions only.

Since, for identical patterns of noise, the long-term average level will be different for the two cases, the noise limits should be fixed accordingly.

A.3.2 Averaging of levels for all meteorological conditions

In this case, the noise limits refer to noise levels averaged for all relevant meteorological conditions.

The measurements shall be made at times such that the results will be representative for the range of meteorological conditions for the site under consideration. The long-term average level may be calculated from the individual results, if required after weighting each result with a factor representing the fraction of the long-term time interval during which the corresponding meteorological conditions prevailed.

NOTE 1 - Under certain meteorological conditions, it may be difficult to determine the specific noise of the source under consideration if there is insufficient difference between the levels of this specific noise and the residual noise.

NOTE 2 - This technique has the advantage that it takes into account both variations due to meteorological conditions and variations due to meteorological conditions and variations in the source emission.

A.3.3 Determination of levels in specified meteorological conditions

In this case, the noise limits refer to noise levels in specified meteorological conditions. The meteorological conditions in which measurements are to be carried out shall be specified.

NOTE 1 - The conditions specified will usually be those for which the noise levels at the locations where the noise limits have to be complied with are the highest. In this case, the specified wind direction should form an angle of less than 45° with the direction from the source of these locations. Measurements during strong temperature inversions near ground should, however, be avoided.

NOTE 2 - Care should be taken to ensure that the specified meteorological conditions cover all relevant source operating conditions.

A.4 Criteria for assessing compliance with limits

In order to assess compliance with a noise limit, it will, in general, be necessary to consider the average of a number of measurements and their statistical distribution. Noise limit regulations should indicate how this information should be used for assessing compliance with the limits.

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Annex B (Normative)

Checking compliance with limits

B.1 Instrumentations

The instrumentation and its calibration shall comply with the requirements given in TZS 1703/ IEC 61672-1 (see clause 2).

B.2 Location of measurement positions

Measurement to be done at the nearest residents and or boundary of the premise which is producing noise

B.3 Measurement time intervals and meteorological conditions

Measurements shall be made over the time intervals and in the meteorological conditions specified in the TZS 934/ ISO 1996 (Part 1 and 2) (see clause 2). .

B.4 Presentation of results

The results shall be recorded in a report of the investigation of compliance with noise limits, which shall include at least the following information:

- a) the relevant section of the noise limit regulations in question;
- b) the date and time of measurements;
- c) the locations of measurement positions;
- d) the instrumentation used, details of its calibrations and the types of analyses carried out;
- e) meteorological conditions during the measurements (wind direction, wind speed, relative humidity, temperature, recent precipitation);
- f) operating and loading conditions of the sound source(s) under consideration;
- g) results of all acoustic measurements or calculations of the noise from the main source under consideration;
- h) noise due to other sources, if significant;
- i) any calculation methods used in evaluating the measurements;
- j) results and interpretation from an acoustical point of view;

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