



The ITU/WHO Safe Listening Standards

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Background

According to WHO, about 466 million people globally live with disabling hearing loss due to different causes, and about 1.1 billion are at risk of hearing loss. In particular, an increase in the number of young people with hearing loss worldwide is extremely alarming. In response to this situation, WHO launched its Make Listening Safe initiative in 2015 to educate people on how to enjoy music safely, and since October 2015, has collaborated with another UN agency, ITU (International Telecommunication Union) on standardizing metrics for personal music playing portable terminals (called Personal Audio System; PAS), and developed a new international standard ITU-T Rec. H.870, a WHO-ITU standard for safe listening devices and system.

This presentation introduces the background and technical details of this new international standard. The presentation also touches on other standards from ITU related to safe-listening, one of which is the standard on Personal Sound Amplifier (PSA).

Discussion

Temporary and permanent hearing threshold shifts from exposure to sound and noise is an increasing public health problem, particularly in children and adolescents. In fact, sound-induced hearing loss (SIHL) is the leading cause of preventable hearing loss in the world. From the early 1990s to 2000, it was estimated that the number of young people with SIHL has increased from 6.7% to 18.8%. Some of this can be attributed to the fact that in this day and age, young people are utilizing their leisure time with activities that expose them to high levels of music using PAS or attending communal events such as concerts, bars, clubs, etc. Despite this emerging epidemic, there are currently almost no standards set to limit sound exposure in non occupational settings, especially for PAS. This new standard, ITU-T H.870, addresses this standardization gap.

The term safe listening refers to listening behaviour that does not put peoples' hearing at risk. A person's risk of losing his/her hearing depends on how loud, for how long and how often the person is exposed to loud sounds. Such exposure may be through personal audio devices or in entertainment venues as well as in the surrounding environment, such as in traffic, in the workplace or at home.

This standard specifies the safety standard value of PAS sound volume based on the concept of the Equal Energy Principle, the assumption that the total effect of sound is proportional to the total amount of sound energy received by the ear, irrespective of the distribution of that energy in time. This standard defines the sound exposure dose based on this principle. A unit of sound exposure dose based on sound pressure is also introduced.

This standard is not applicable to the following types of devices:

- two-way communication devices (such as walkie-talkies, etc.);
- rehabilitative and medical devices (e.g., hearing aids, FM systems and other assistive listening devices (ALD) approved as part of hearing aid and cochlear implant systems, etc.);
- personal sound amplification devices;
- professional audio equipment and devices.



The most important aspect of this standard is its recommendation on two thresholds for sound dosage: a weekly threshold for sound exposure level considered safe for adults and that for children. Based on this standard, PAS manufacturers are expected to monitor the weekly sound exposure dose and to warn users appropriately. Some manufacturers have already implemented these features.

Another standard, ITU-T H.871, which can be considered a companion standard to H.870, describes safety requirements for personal sound amplifiers (PSA), including both personal sound amplification products (PSAP) and personal sound amplification apps (PSAA). Personal sound amplifiers are non-medical devices which amplify sounds picked up by a microphone. This device is intended for people with normal hearing and can: a) have a design physically comparable to a hearing aid, in which case it is called personal sound amplification product (PSAP) or b) simply be an application (app) on any smartphone or other device, in which case it is called a personal sound amplification application (PSAA). Currently there is no other international standard for PSAs. Thus this standard is needed to ensure that these devices, which are freely available in the market to anyone, are safe for users and do not further damage users' hearing.