World Health Organization

75 HEALTH FOR ALL

ITU

WHO-ITU Consultation on Make Listening Safe 9 June

World Health Organization 75 HEALTH FOR ALL

ITU

Group A: Gaming and eSports

Chair: Shelly Chadha

Start time: 10:00 am
Room: U1

Nicola Diviani
Sara Rubinelli
Stephen Wheatley
Sergi Mesonero
Melita Moore
Tatjana Sachse
Brian Schmidt
Jim Patsiantzis
Kuba Mazur

Thematic group A:

Gaming & esports

Review the current state of evidence, consider possible interventions, related to gaming hardware and software, for promotion of safe listening.

Gaming & esports

- Review WHO's investigations on gaming, esports and hearing
- Complete a stakeholder analysis to identify gaps and opportunities
- Conceptualize next steps: What does safe listening success in gaming and esports look like?
- Next steps to be taken in order to ensure safe listening in gaming and esports

1. Review WHO’s conclusions of the background study

- Literature review
- Gamer survey
- Stakeholder interviews

Conclusions

Highlights the need to prioritize hearing loss prevention through safe listening among gamers

- Consistent association between gaming and hearing loss and/or tinnitus
- Sound exposure often exceeds (or nearly exceeds) permissible levels
- *Published evidence is limited yet suggests that gaming is a common source of unsafe listening, particularly among young people.*

Overall implications

- The findings can inform the development of guidelines or standards for safe listening in the context of video gaming and esports.

- These guidelines could include recommendations for appropriate volume settings and listening durations, as well as strategies for taking breaks and minimizing exposure to potentially harmful sounds.

Specific implications

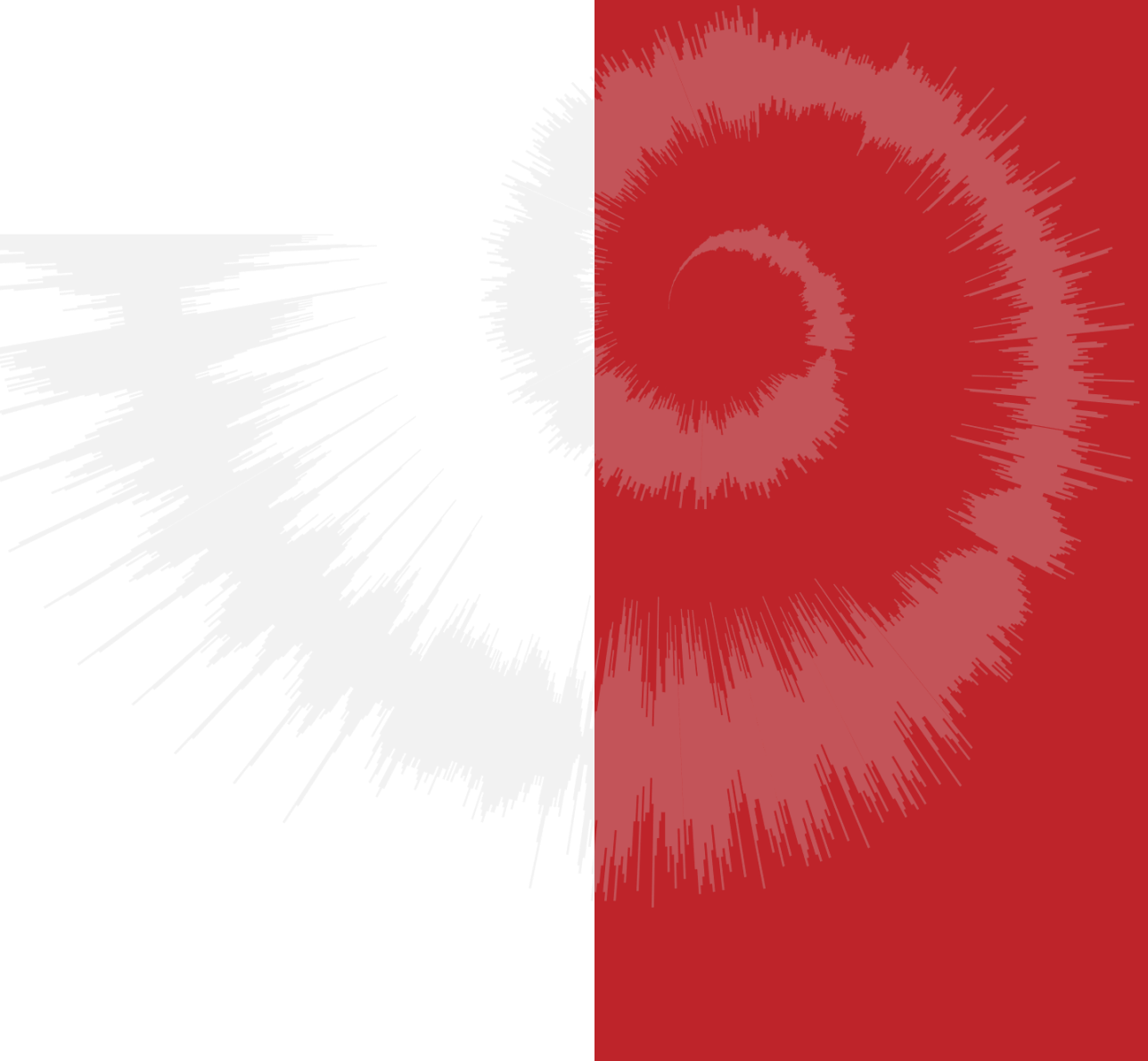
- Need for targeted education and intervention programs to promote safe listening habits among video gamers and esports viewers and players.
- Focus on increasing awareness of the risks associated with loud sound exposure and providing practical strategies for reducing exposure to potentially harmful sound levels.
- Healthcare professionals and governmental or international agencies should be utilized as trusted sources of information on this topic.
- The gaming and esports industries are urged to play a role in promoting safe listening habits by incorporating sound dosage information and warnings into their products.

Stakeholder conclusions

- Safe listening features are not widely included in video games or esports events
- Interviews have demonstrated we need to treat gaming and esports differently
- Existing safe listening standards (H.870 and live venues and events) provide a framework that could be used

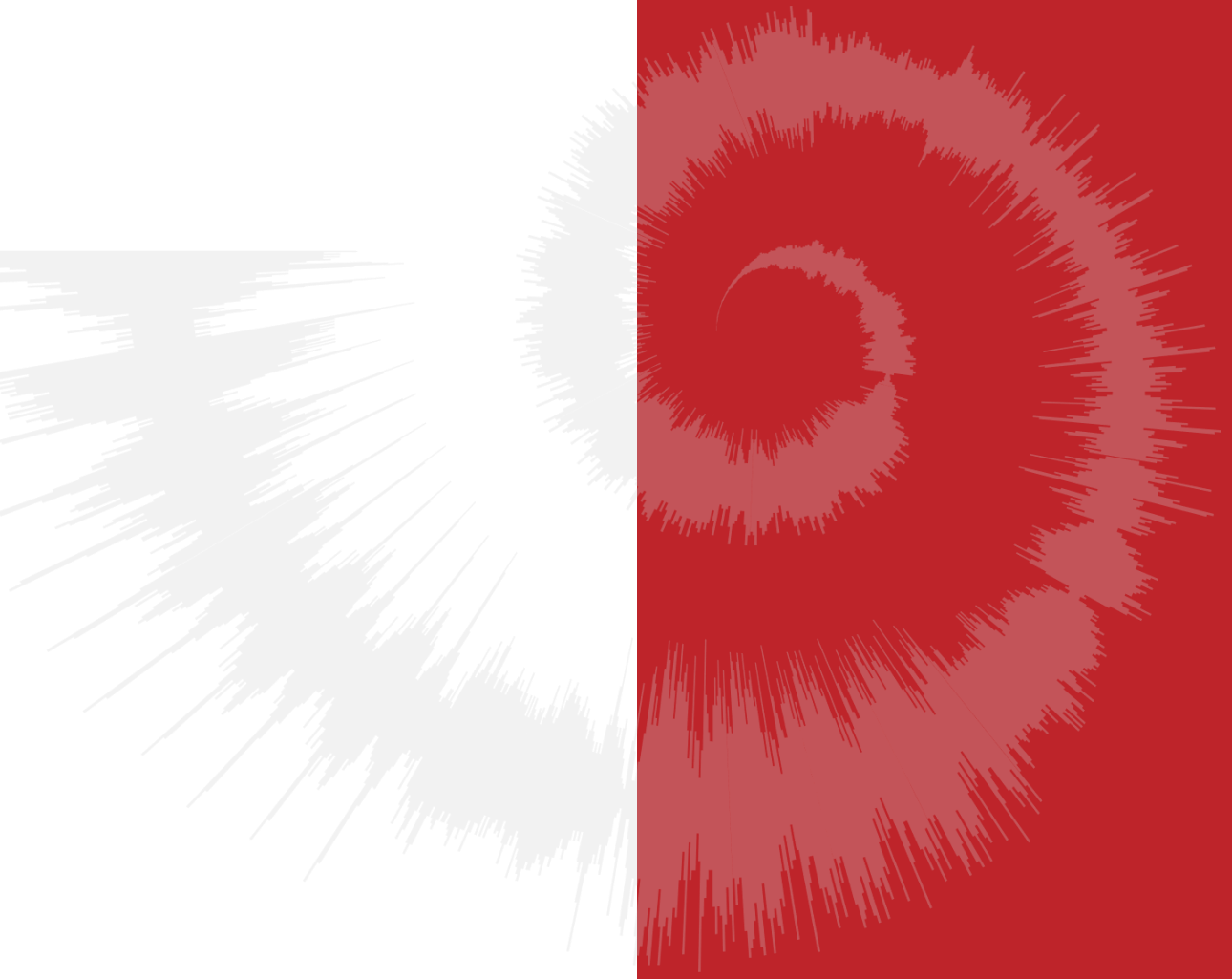
Stakeholder conclusions

- Hardware solutions seem preferable
- There is a willingness from industry to adopt safe listening, however several barries exist that need to be considered
- Education and promotion is an important apect; influencers and esports professionals are a key part of the message

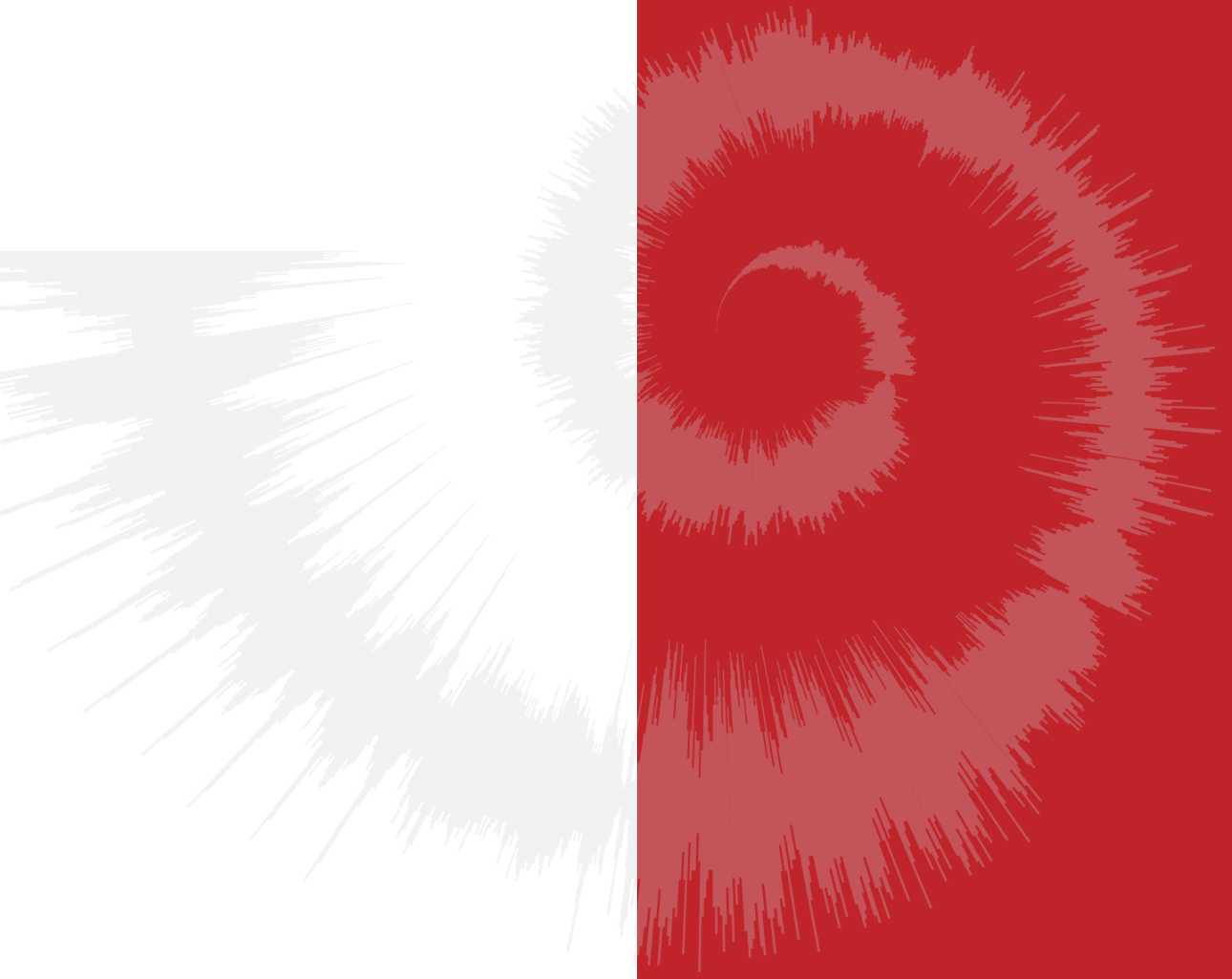


Peter??

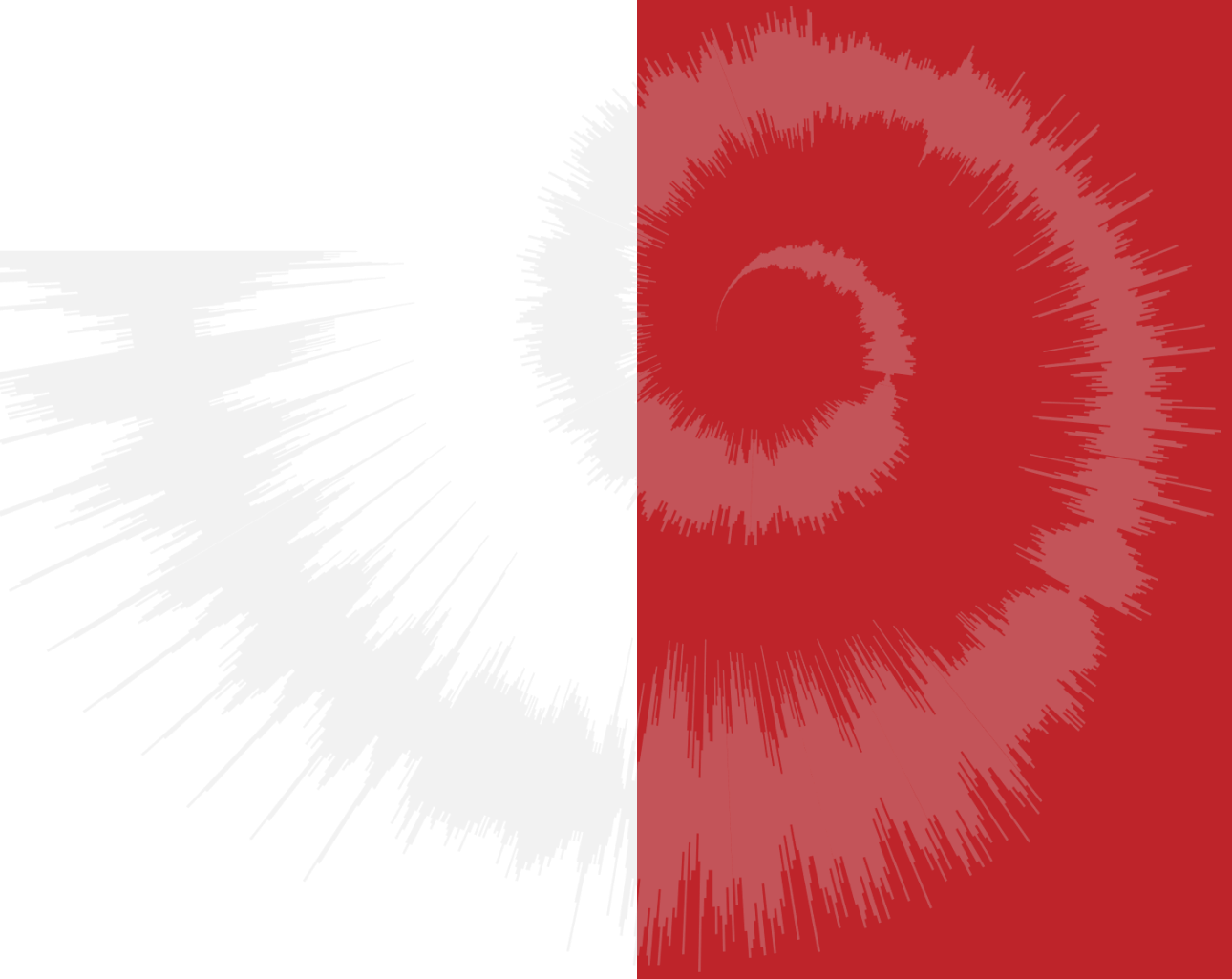
Video-gaming



What does successful safe listening in gaming and esports look like?

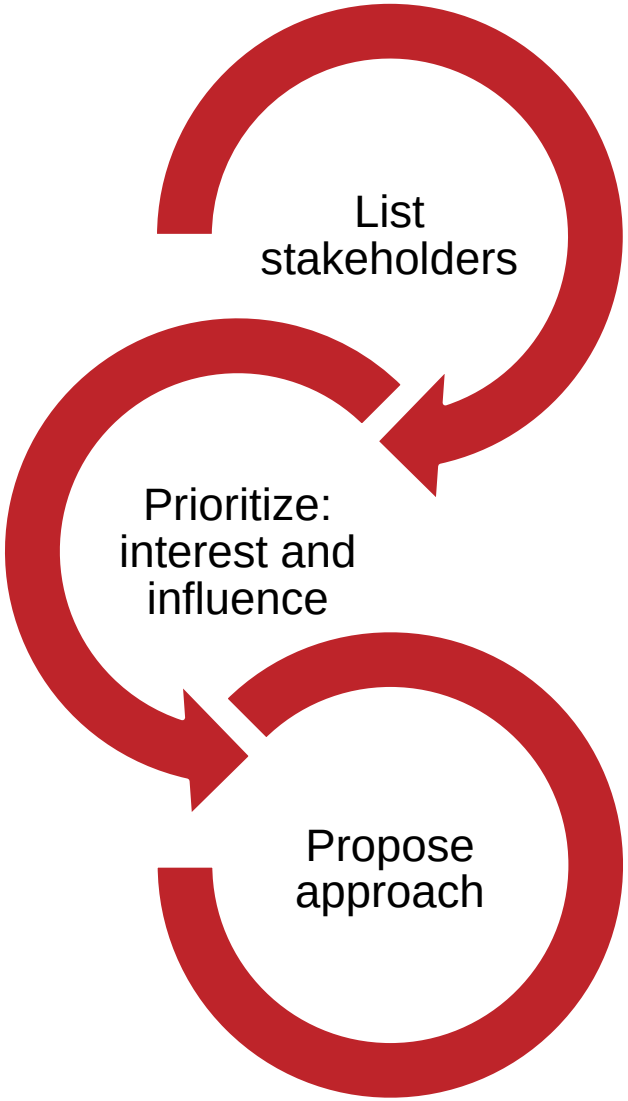


What kind of hardware or software features/modifications in gaming are feasible?



What can change listening behaviour in gamers?

Stakeholder analysis



List

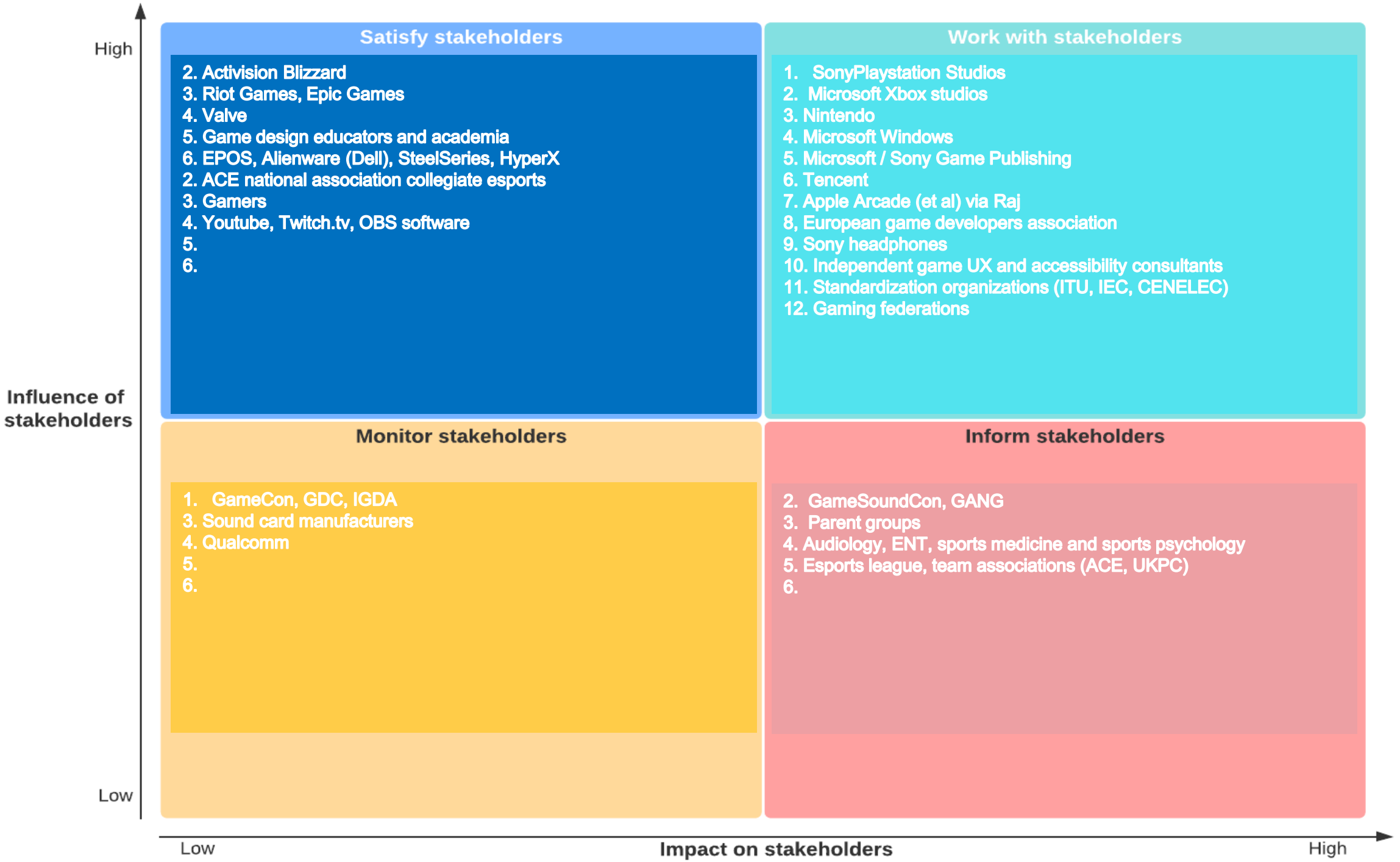
S.No.	Name
	Sony PlayStation division
	Microsoft Xbox division
	Windows division
	Nintendo hardware division
	Sony game publishing and development division
	Microsoft game publishing and development division
	Riot, Activision, Blizzard (Microsoft), Epic
	Bungee, Valve
	Tencent
	Google Android gaming teams
	Apple iOS gaming team
	European game developers association (and similar)
	GDC, IGDA, GamesCon, GameSoundCon, GANG,

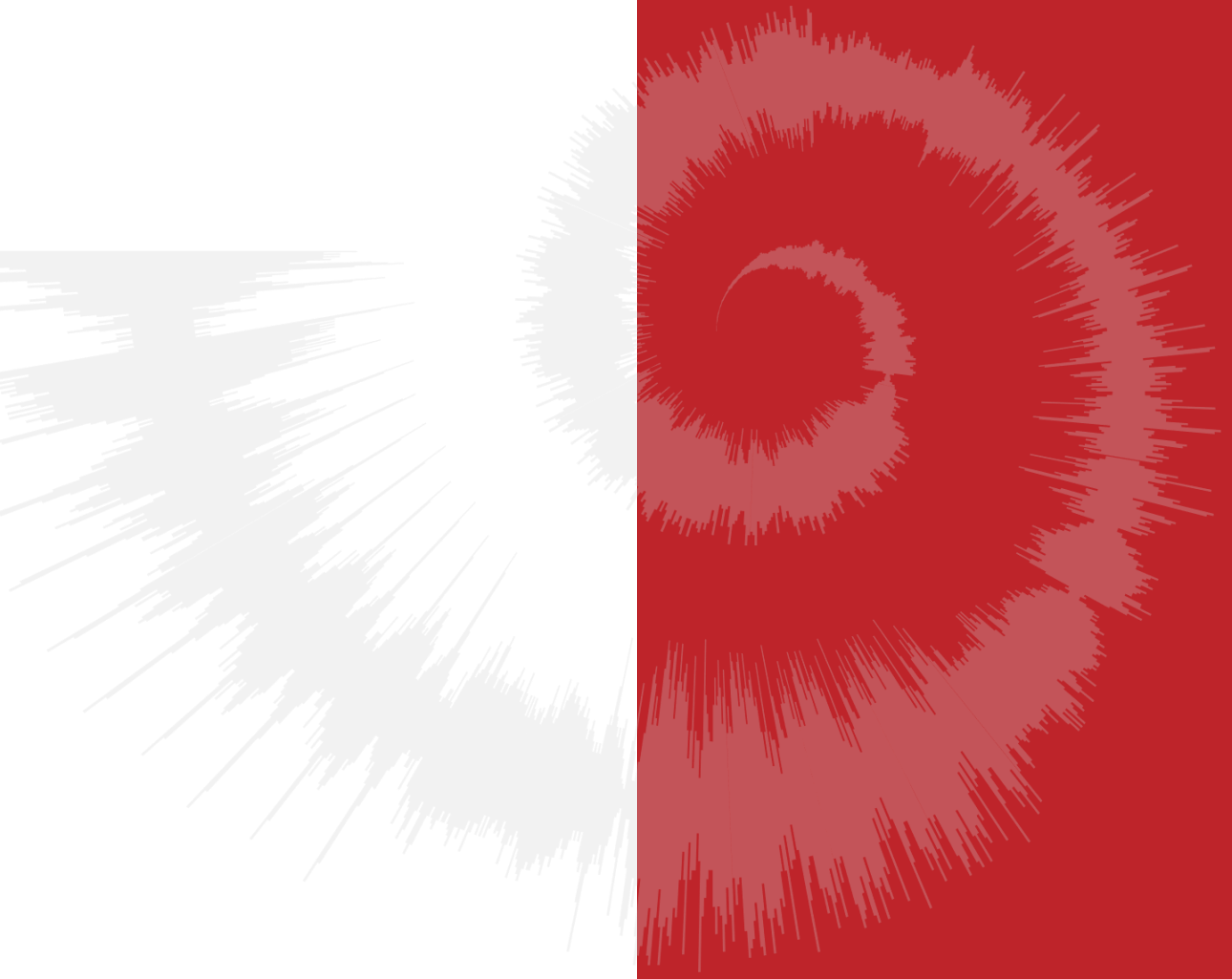
List

S.No.	Name
	Game design educators and academia
	University Southern California, Rochester, DigiPen
	Gaming headphone manufacturers (below)
	Razer, EPOS, Sony, SteelSeries, HyperX, Logitech, Alienware, AceZone
	Games UX designers
	Experts in communications
	WHO Behavioural science team
	Standardization Organizations (ITU, CENELEC, IEC)
	Soundcards: Creative, Focusrite, HyperX
	Gamers (of all levels)
	Parents associations: COPE
	Gaming federations & associations (e.g. GEF)
	NACE national association collegiate esports

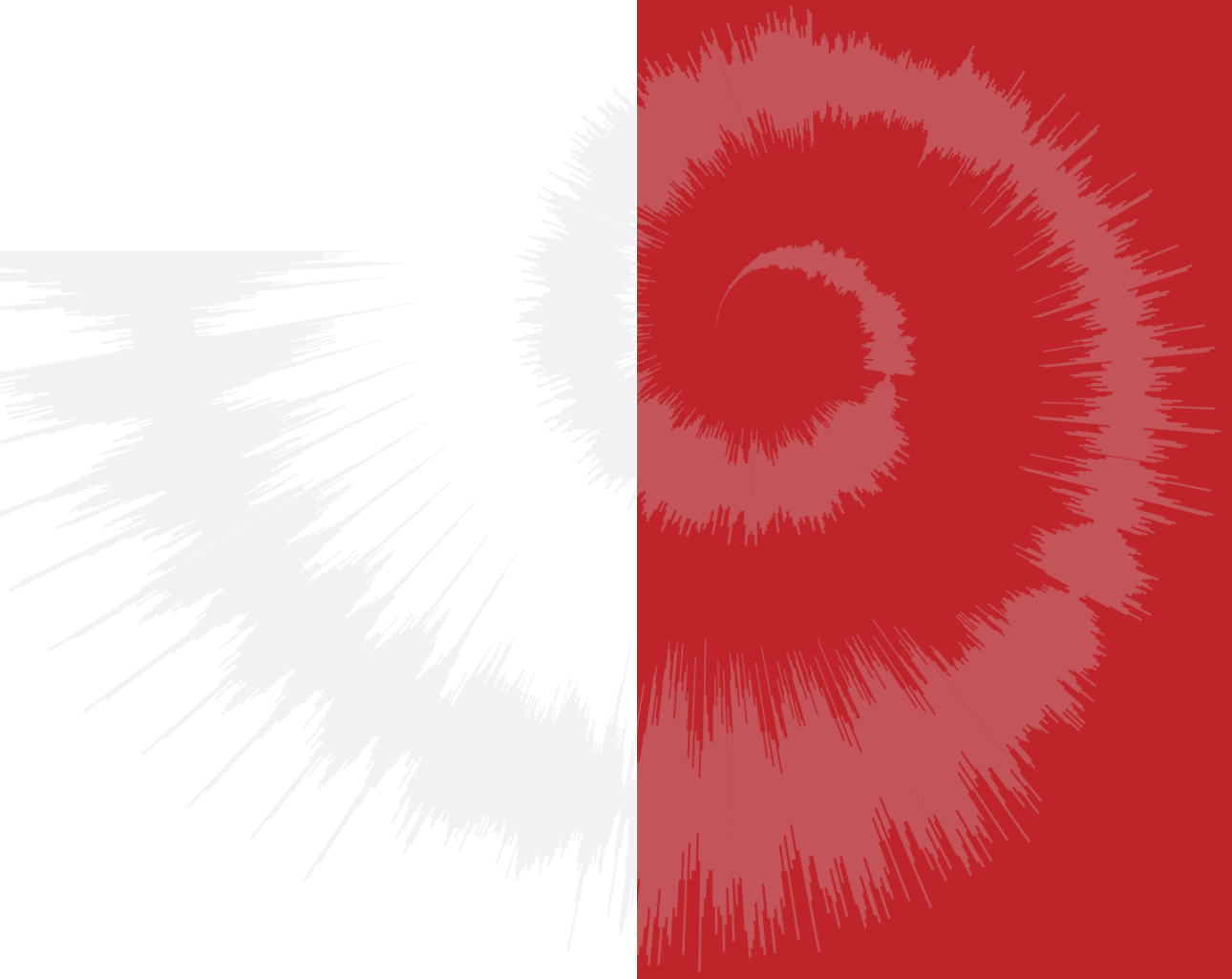
List

S.No.	Name
	Audiology, ENT, sports medicine and sports psychology
	Esports league, team associations (ACE, UKPC)
	Dolby Games, THX
	Qualcomm,
	Twitch.tv, YouTube (Google), OBS streaming software


High
Influence of stakeholders
Low
Satisfy stakeholders
2. Activision Blizzard
3. Riot Games, Epic Games
4. Valve
5. Game design educators and academia
6. EPOS, Alienware (Dell), SteelSeries, HyperX
2. ACE national association collegiate esports
3. Gamers
4. Youtube, Twitch.tv, OBS software
5.
6.
Work with stakeholders
1. SonyPlaystation Studios
2. Microsoft Xbox studios
3. Nintendo
4. Microsoft Windows
5. Microsoft / Sony Game Publishing
6. Tencent
7. Apple Arcade (et al) via Raj
8, European game developers association
9. Sony headphones
10. Independent game UX and accessibility consultants
11. Standardization organizations (ITU, IEC, CENELEC)
12. Gaming federations
Monitor stakeholders
1. GameCon, GDC, IGDA
3. Sound card manufacturers
4. Qualcomm
5.
6.
Inform stakeholders
2. GameSoundCon, GANG
3. Parent groups
4. Audiology, ENT, sports medicine and sports psychology
5. Esports league, team associations (ACE, UKPC)
6.
Low
Impact on stakeholders
High



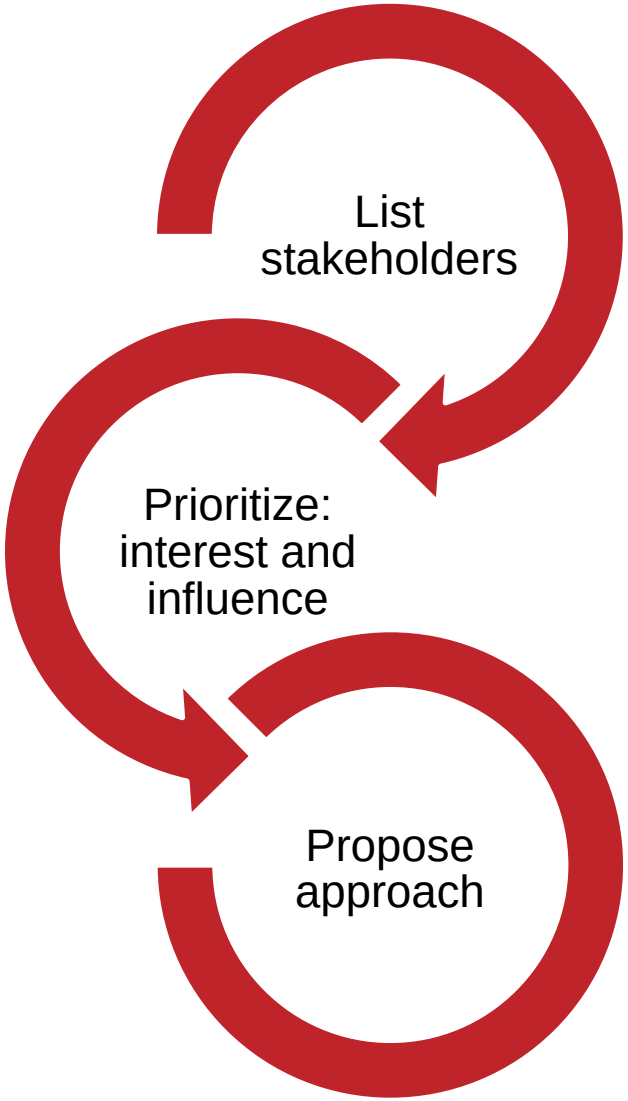
What kind of safe listening features/modifications are feasible?



What can change listening behaviour in esports?

If I meet a potential stakeholder, what are the questions we should ask?

Stakeholder analysis



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Group B: Adapting and implementing WHO global standard for safe listening venues and events

World Health Organization

WHO vision

Chair: Kris Chesky

Start time: 10:30 am

Room: V

Representatives
Jessica Borowski
Kris Chesky - AUDIO FOR MUSICIANS
Karissa Chesky
Rebecca Colbourne
Terez Lord
Brendan Morrissey
Adam Hill - HELA
Ian Bryan Hoffman
Ricky Kej
Marion Mariant
Amarilis Melendez - GOV'T
Jos Mulder
Jörn Nettingsmeier - ESSENCE
Aderinola Olopade
Nick Peverett
Moses Serwadda
Rob Shepheard
Meghan Taylor
Cyndi van den Hanenberg

Introduction
Discussion

Thematic group B

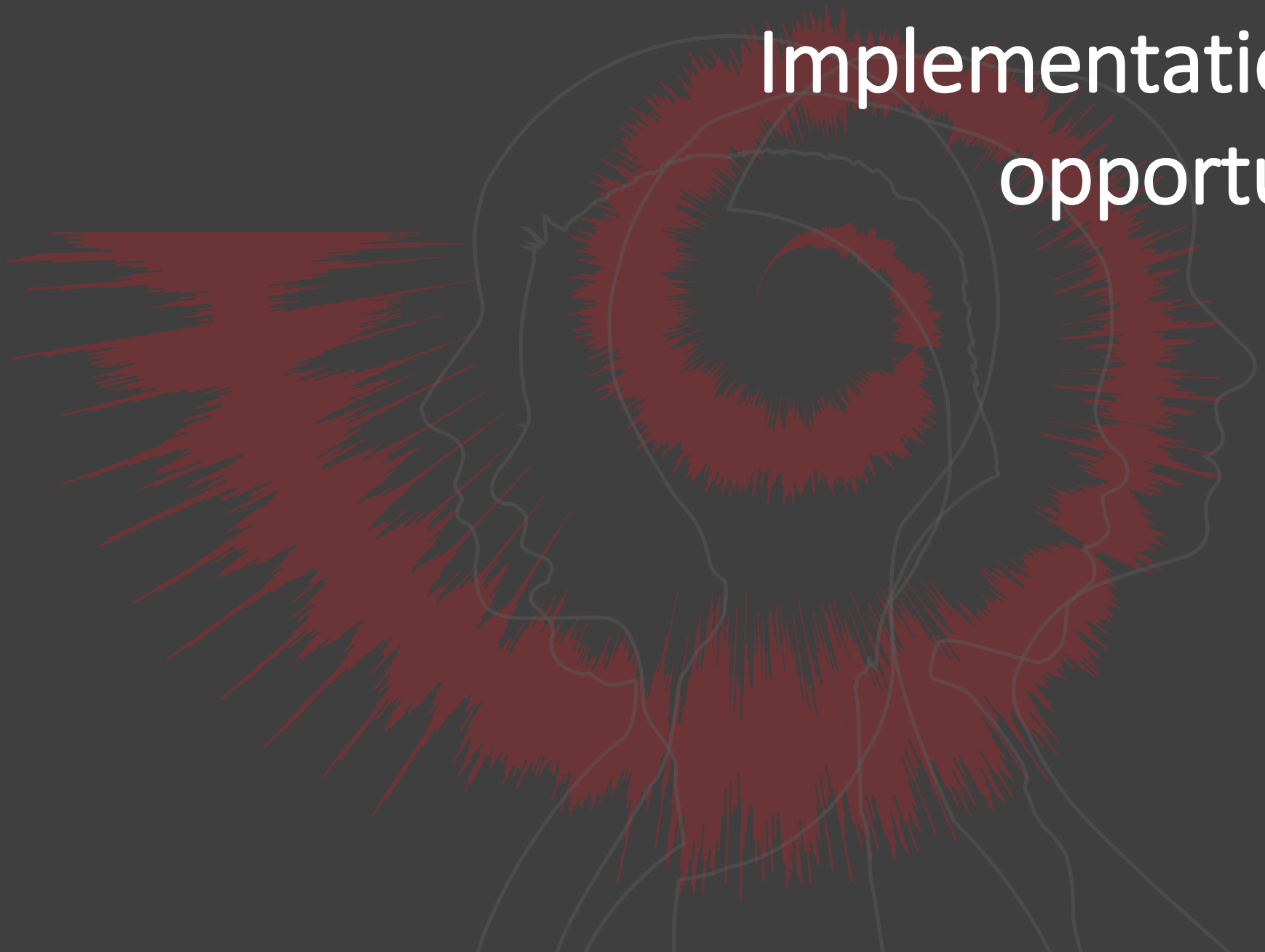
- Discuss and propose concrete steps for integrating safe listening concepts (aligned with the standard) within the curricula of music schools and audio-engineering schools.
- Increasing awareness of the standard through its inclusion in live venues, audio engineering schools, etc.

Safe listening standard for venues & events: implementation

- What are the opportunities for implementing safe listening in venues and events, in line with WHO's standard (e.g., through schools of music, audio-engineering and sound management courses, venues, govts, etc), in order of priority?
- Which stakeholders need to be engaged in each of the above?
- From these opportunities, what can be done, and what steps need to be taken?

Group B – Adapting and implementing WHO global standard for safe listening venues and events (Salle V) **Morning Session:**		**Chair: Kris Chesky**
10:30-11:00	Coffee break	
11:00-12:30	Workshop purpose and objectives Workshop member introductions WHO vision Implementing the standard: opportunities and stakeholders: guided discussion	
12:30-13:30	Lunch break	
Afternoon Session: (Salle V)		
13:30-15:00	Adapting the standard: Examples, comments and discussion • Implementation into an accreditation program for audio engineers (HELA) • Implementation into school for musicians programs (Audio health for musicians) • Implementation into ESSENCE core curriculum and teaching materials • Implementation of standard at a government level: Considerations Planning and discussion of other opportunities for amplification of the standard	Insights from: Johannes Mulder Adam Hill Kris Chesky Jörn Nettingsmeier
15:00-15:30	Coffee break	
Afternoon Session: (Salle V)		
15:30-16:30	Next steps: What does success look like? Close of workshop	

Implementation/adoption: opportunities



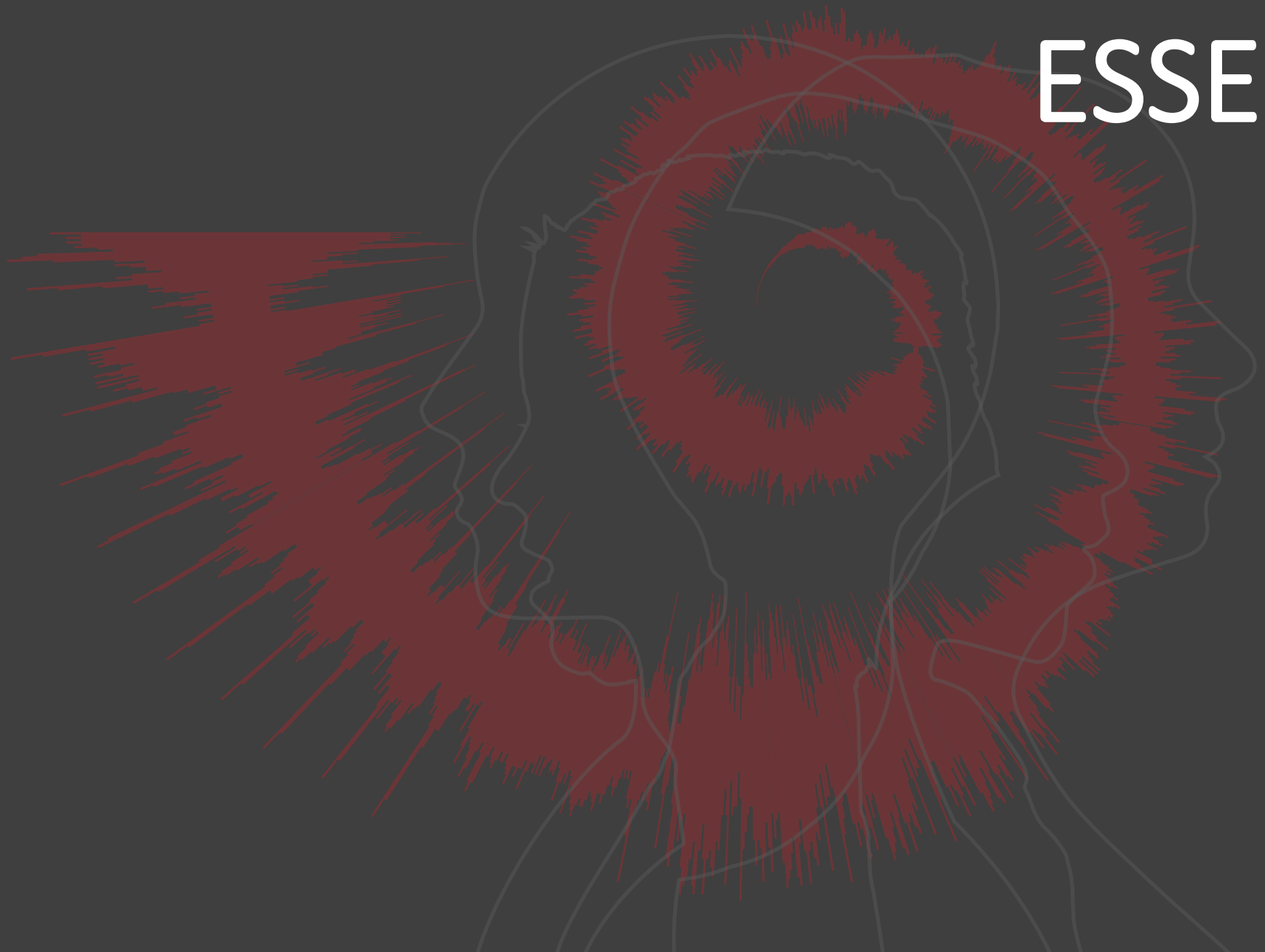

World Health Organization
HELA

World Health Organization

Audio health for musicians

World Health Organization

ESSENCE



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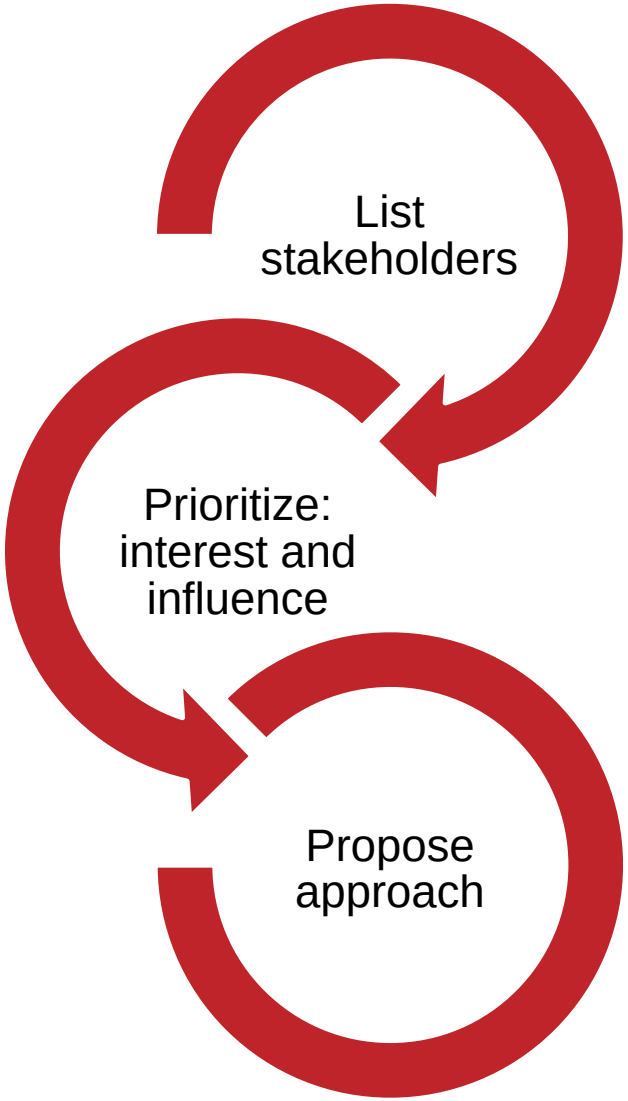
Government implementation

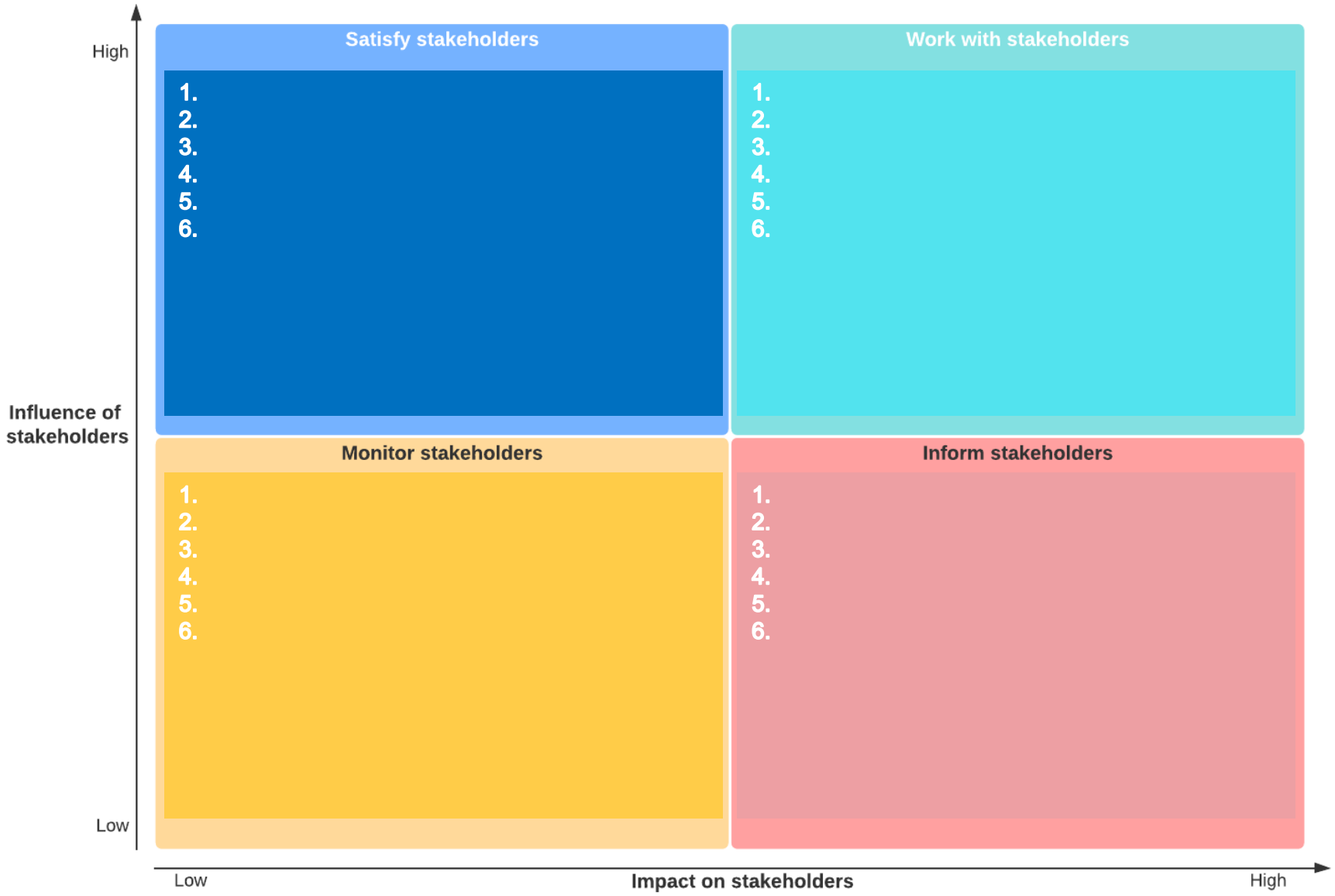
Stakeholder analysis



Prioritize

List of Stakeholders Groups not currently engaged in Make Listening Safe

- **Higher Education**
- **Music Educators**
- **General Educators**
- **Fitness Centers/Gyms**
- **Cinemas**
- **Olympic Park? Representatives**
- **Public Health (specifically to work with young folks out of school)**
- **Building Design**
- **Etc.**



Prioriti

1. UNICEF (Child and Maternal Development), Bill Gates Foundation, USAID)
2. Tertiary Music School Leadership
3. Healthy Universities
4. American College of Student Health
5. Music Educators' Associations (NAfME, ISME, etc.)
6. Youth Ambassador Program for Make Listening Safe (Caricom Youth, Commonwealth Youth Program)
7. Promoters (Live Nation)
8. Civil Society
9. Noise-sensitive community (autism, neurodiversity)
10. UK Noise Association (environmental noise)
11. Musician Community (International Musicians Union)
12. ISCOM
13. Trade Associations (NTIA)
14. Tinnitus BTA
15. Music Products Industry (NAMM)
16. AAS
17. Parent and Teacher Associations
18. Foundations (Music Cares; NAMM Foundation)
19. Hearing Protection/Hearing Aid Manufactures
20. Federal/National Health and Safety
21. Military Musician Community

Work with stakeholders

1. Medical Community (including professional medical organizations)
2. Public Health Officials
3. Audiology
4. ASHA
5. Audio Engineering Society
6. International Federation of the Hard of Hearing

1. Bluetooth Company
2. World Economic Forum
3. Cinema (SMPTE)
4.
5.
6.

Inform stakeholders

1. Journalists
2. IATSE
3. Labor Unions
4.
5.
6.

Low

Low

Impact on stakeholders

High

Approach

Whom	How
Ricky	UNICEF INDIA; Grammy's; Palm Export (Indian Version of NAMM); San Francisco Conservatory, Gothamburg University;
Amarilis	Healthy Universities; Pan-American
Rob	Tinnitus BTA; UK Audiology Organizations; UK Trade Associations; BAPAM
Kris	US Audiology Organizations; Music Educator Associations; ICSOM; individual schools of music; PAMA
Aderinola	African Trade Associations and Audiology Associations;
Karissa and Moses	Youth Ambassadors of Make Listening Safe
Terez	Caricom Youth Program; PAHO Youth For Health Group
Adam	Audio Engineering Society; IATSE
Jorn	VDT; IGVW (concert promoters); LiveKomm; LiveDMA in Europe

List

S.No.	Name

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What does success look like?

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WHO-ITU Consultation on Make Listening Safe 9 June

Thematic group C

- Half day workshop on standards for safe listening
- Half day ITU(T) SG16/Q28 rapporteur meeting

WHO-ITU Global standard for safe listening devices and systems

- Discuss harmonization evolution of technical standards for personal audio devices and systems that focus on safe listening and hearing loss prevention.
- Consider the deprecation of the ‘single number volume level limiting’ methods in favour of a standardized dosimetry approach.
- Increase an understanding of the development procedures and timelines across different standardization organisations ITU, IEC and CENELEC.
- Future inclusions to ITU H.870 Guidelines for safe audio devices/systems in the area of wireless headphones.
- How ITU can move forward in the area of conformance testing for applications.

The need for harmonization

H.870 update and overview

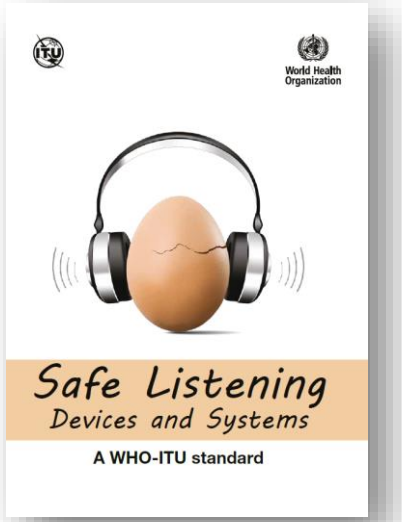
ITU

ITU-T Study Group 16

- ICT standardization sector of International Telecommunication Union
- Lead group for multimedia such as audio, video etc.
  - Well-known standards such as H.264 and H.265 (HEVC)
- E-health, digital health and telemedicine are important areas where multimedia and ICT can contribute (Question 28 is tasked with the work)
- Close collaboration with WHO
  - Focus Group on AI for Health
  - Joint work on “Make Listening Safe” Initiative
- As the oldest international organization, ITU provides a forum for discussion among private sectors, governments and UN agencies

A WHO-ITU standard

- ITU: "*Recommendation ITU-T H.870 (2018-08), Guidelines for safe listening devices/systems*"
- WHO publication: "*Safe listening devices and systems*"
  - **Free** publication
- It has the same level as ISO and IEC *de juris* standards



WHO/ITU H.870: Scope

- describes the requirements on safe listening devices and systems, especially those for playing music, to protect people from hearing loss.
- Version 2 has expanded its scope to include wireless head-sets
- For the purposes of this Recommendation, the following types of devices are excluded:
- – 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.
- NOTE – There has been discussion on the exposure to sound from e-gaming

Personal Audio System

Personal Audio Device

Listening Device

Personal Audio System (H.870v2)

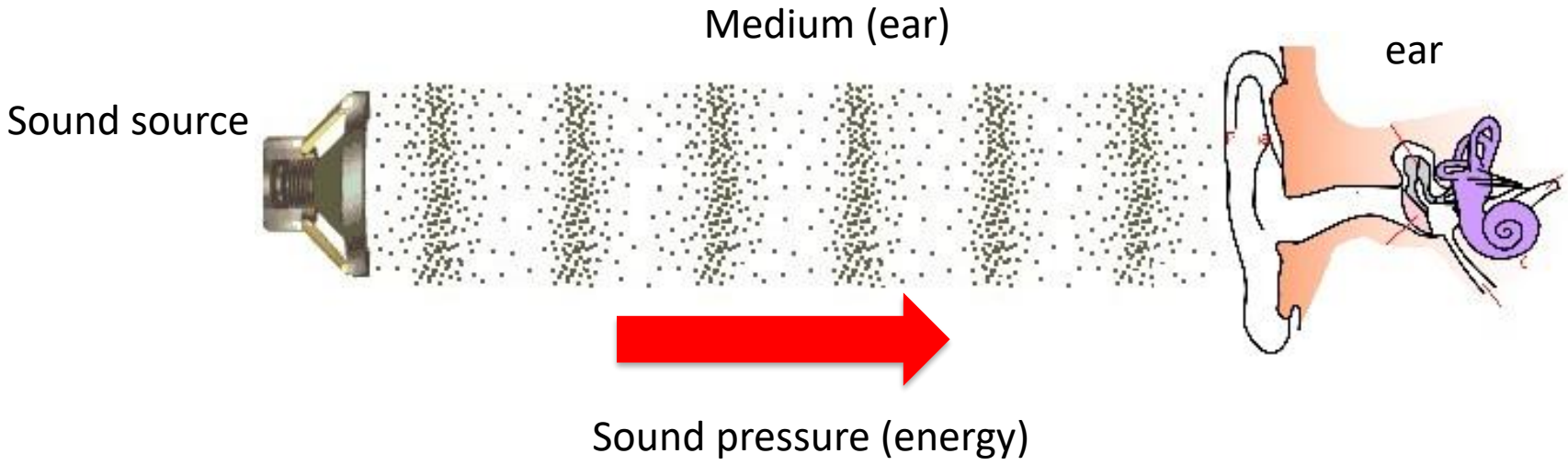
What's in WHO / ITU H.870?

- Introducing "**equal energy principle**" and **dosimetry**
- A new unit of sound exposure Pa²h (*pascal squared hour*)
- Recommending **2 modes of Safety levels**
- Guidance on **health communication** on personal audio devices
  - General information (how to listen safely, risk awareness, etc.)
  - General usage reporting (average levels, how much listening in a day & week)
  - Types of **warnings** when user reaches 100% of weekly allowance
- Gives **further guidance**: ambient noise control (e.g. noise cancelling) & parental control

Equal Energy Principle and Dosimetry

Basics: Sound

- Sound is propagation of energy (pressure) through medium (e.g., air), received by ear.
- Sound energy and pressure are usually associated with “loudness”
- Excessive energy (pressure), i.e., loud sound, received by ear can result in hearing damage
- Air pressure is commonly expressed in Pa (*Pascal*).
  - E.g., Hurricane Katrina in 2005 had 902 hPa (hectopascal) or 90,200 Pa
  - 2,600 Pa is the pressure to make water boil at room temperature



Definitions of decibel

- Conventionally, sound energy is expressed in terms of decibels
- There are many definitions of (different types of) “decibel” (dB), which makes things a bit confusing
  - **dB** - a relative logarithmic value used to express the ratio of one value of to another
  - **dB SPL** (Sound Pressure Level): the ratio of given sound pressure and a reference pressure, 20μPa (minimal pressure that a human ear can detect at 1kHz).

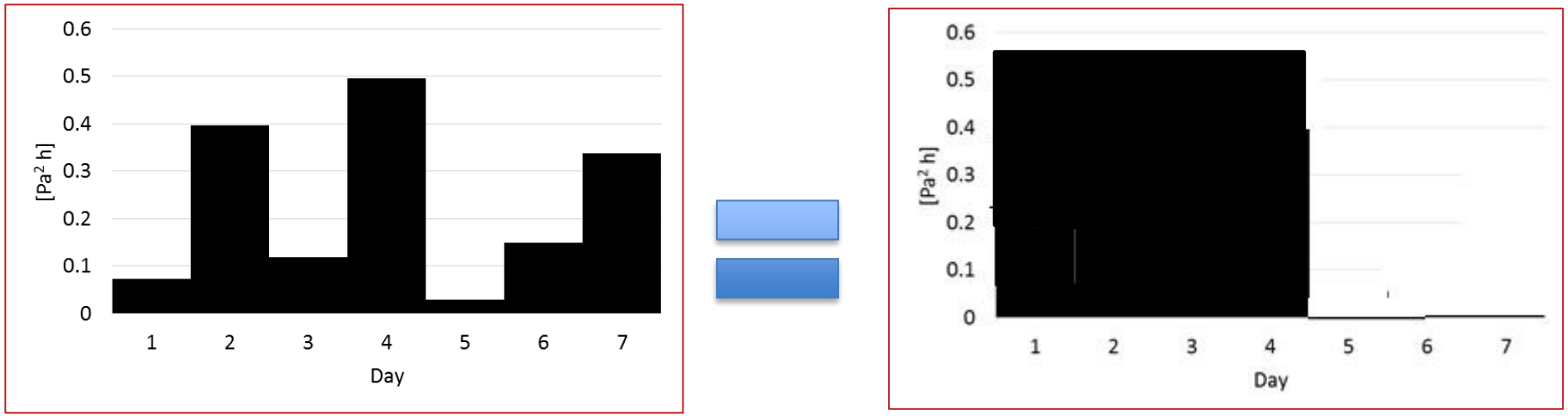
Important to note that it is not a simple linear absolute value

Decibels and Pressure

- Human ear is extremely sensitive
- Sound pressure expressed in Pa (*Pascal*) makes it easier to appreciate this fact
  - 0 dB (SPL) = 0.00002 (=20 x 10^{-6}) Pa
  - 20 dB (SPL) = 0.0002 Pa
  - 40 dB (SPL) = 0.002 Pa
  - 60 dB (SPL) = 0.02 Pa
  - 80 dB (SPL) = 0.2 Pa
  - 94 dB (SPL) ≒ 1 Pa
    - (Pressure exerted by a US dollar bill resting flat on a surface)
  - 100 dB (SPL) = 2 Pa
  - 140 dB (SPL) = 200 Pa = 10^7 (10 million) times the threshold of sound/hearing (10 thousand times more pressure than ordinary conversation)

Equal Energy Principle

- The premise that equal amounts of sound energy will cause equal amounts of sound induced hearing loss regardless of the distribution of the energy across time.
- I.e., 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
- “Less energy for longer period of time” “More energy for shorter period of time” Can have the same effect on ear



Dosimetry

- Based on the Equal Energy Principle, a 'dose' of sound energy is defined as the squared A-weighted sound pressure. pA. integrated over the exposure time $T=t2-t1$.
- $$dose = \int_{t1}^{t2} (p_A(t))^2 dt$$
- Simply put, “dose” is (the energy of) Sound Pressure Level integrated over the duration of the exposure:
- Unit is Pa²h (*pascal squared hour*)
  - Use L_{EQ} and dB (SPL)A for reference

- This is line with other sound dose management standards:

IEC 62368-1:2018 and EN 50332-3:2017

Relationship between dB(A) and Dosage

Mode1

dB(A)	Weekly (1.6 Pa^2h)
107	4.5 min
104	9.5 min
101	19 min
98	37.5 min
95	75 min
92	2.5 h
89	5 h
86	10 h
83	20 h
80	40 h

Mode2

dB(A)	Weekly (0.51 Pa^2h)
107	1.5 min
104	3 min
101	6 min
98	12 min
95	24 min
92	48 min
89	1 h 36 min
86	3 h 15 min
83	6 h 24 min
80	12 h 30 min
77	25 h
75	40 h

Acceptable levels of risk for Safe-listening

- It is recommended that PAS includes a system (dosimeter) that tracks the user's exposure time and estimates sound level and the percentage that has been used up of a reference exposure limit (sound allowance).
- References are as follows:
  - Mode 1: (WHO) standard level for adults: this will apply 1.6 Pa^2h per 7 days as the reference exposure.
    - Suited for general public
  - – Mode 2: (WHO) standard level for sensitive users (e.g., children): this will apply 0.51 Pa^2h per 7 days as the reference exposure.
    - Suited for children and other sensitive individuals

Other features of H.870

Guidance on **how to communicate** with users of personal audio devices

- Keep record of usage information and provide personalized recommendations & cues
- General information (how to listen safely, risk awareness, etc.)
- General usage reporting (average levels, how much listening in a day & week)
- Types of warnings when user reaches 100% of weekly allowance

Gives **further guidance**: ambient noise control (e.g. noise cancelling) & parental control

Importance of Health Communication

- How to convey the message to the user
- What message to be conveyed:
  - *Risk information,* i.e. information about behaviours (and sounds) that put users at risk of hearing loss
  - *Usage information,* i.e. a personal listening profile and risk information (for example, through a dosimeter to check their decibel levels and sound-dose details)
  - *Concrete recommendations*, i.e. instructions on how to practice safe listening (for example, in the form of cues for action)

Adoption of H.870

- Available in 5 languages
- Already implemented by some manufacturers worldwide
  - Dosimeters are implemented by several organizations
- Referenced by other standards and specifications globally
  - Other specifications for e.g., PSAPs (personal sound amplifying products) are referencing H.870 and adopt some of its recommendations
- Strongly promoted by World Hearing Forum (WHF)
  - Involving the music industry and device manufactures to promote the standard as well as “Make Listening Safe” initiative

Some topics for future study in H.870

- Gaming devices
- VR/AR/MR/XR
- Sensitivity range and frequency response of headphones
- Profiles for different categories of PAS
- Uncertainties in dose estimation
- …

Conformance Testing Specification for WHO-ITU Standard H.870

- HSTP.Conf-H870 “Conformance Specification for H.870” is drafted to provide a set of conformance testing requirements of H.870
- A “check-list” for implementation
- It accompanies H.870 to comprise a “Conformance Test Tool”
- **Call for “testing labs” is under way**

Further Related Work

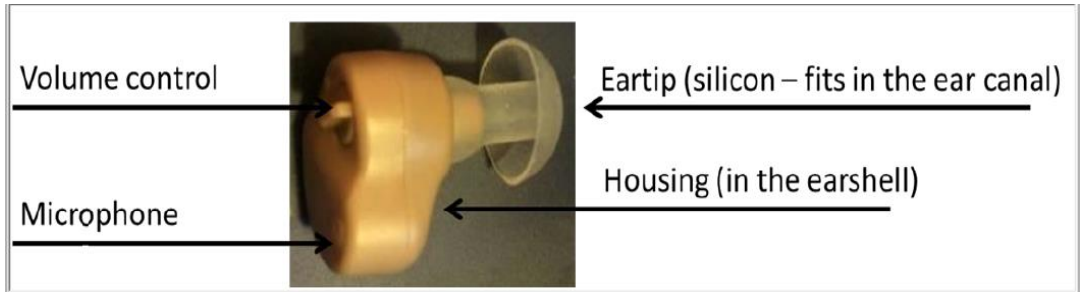
Personal sound amplification products

- Wearable electronic products or application on a wearable smart device (e.g. a mobile phone) that is **not** intended to compensate for impaired hearing, but rather is intended for non-hearing impaired consumers to amplify sounds in the environment for a number of reasons, e.g.
    - Recreational activities
    - Selective hearing in noisy environments
- PSAPs are off-the-shelf, non-regulated devices with a varying range of features
- Currently there are no international standards on the safety of PSAPs
    - Levels, exposure
- ITU-T's Recommendation F.781 "*Safety requirements for personal sound amplifiers*" is the first technical standard to address this issue, approved in July 2019
    - Project leaders: European Federation of the Hard of Hearing (EFHOH), European Association of Hearing Aid Professionals (AEA).
- Based on the same principle as ITU / WHO H.870
- Conformance testing specification under development

Standard on Personal Sound Amplifier

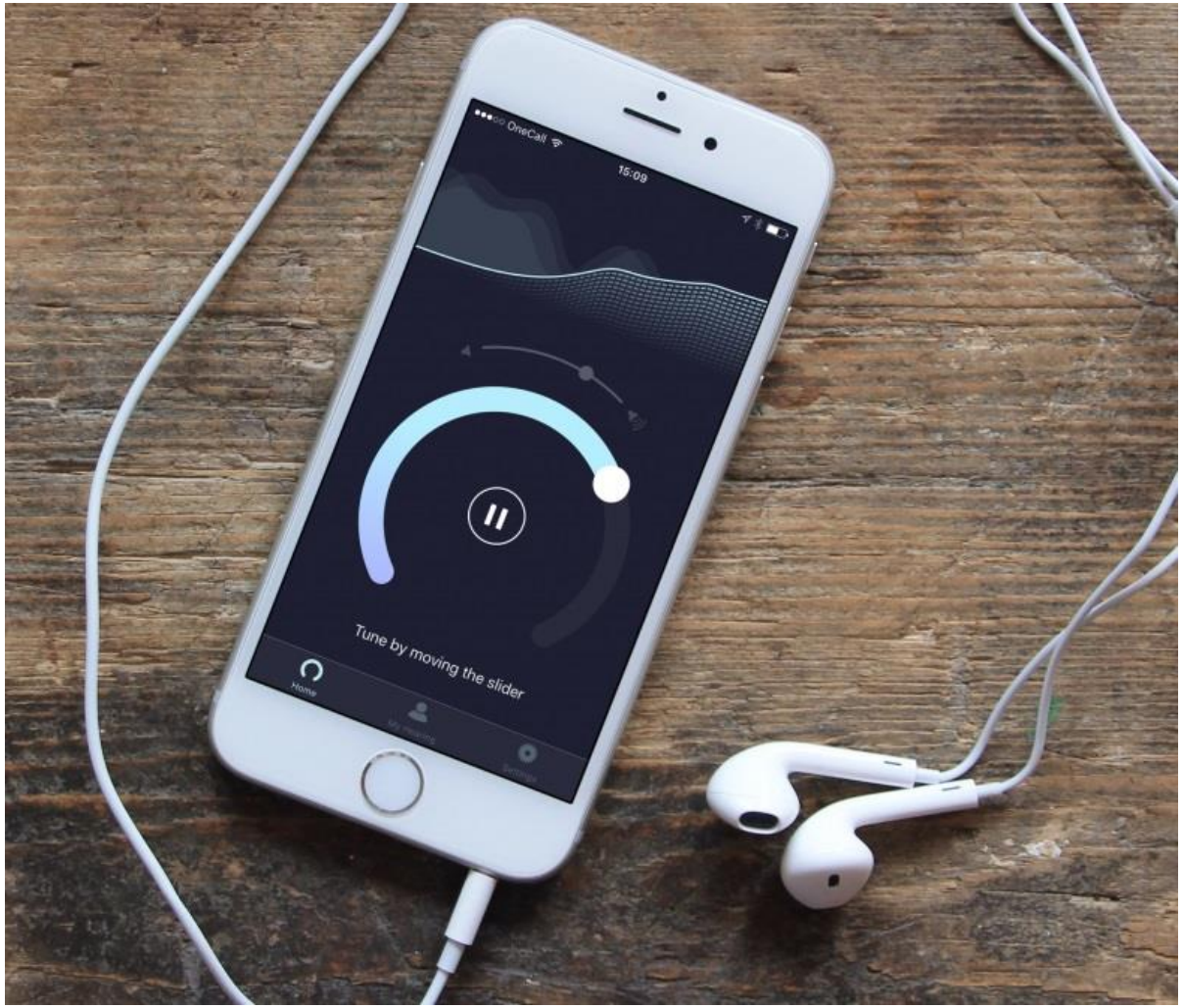
- Personal Sound Amplifier is a wearable electronic product (PSAP) or application on a wearable smart device (PSAA) that is not intended to compensate for impaired hearing, but rather is intended for non-hearing impaired consumers to amplify sounds in the environment for a number of reasons, such as for recreational activities.
- Currently there is no International standard on the safety (volume, etc.) of PSAs
- ITU-T's new draft Recommendation is to address this issue
- Proposed and drafted by European Federation of the Hard of Hearing (EFHOH) and the European Association of Hearing Aid Professionals (AEA).
- Based on the same principle as H.870

Personal Sound Amplifier



- PSA looks like a hearing aid, a <u>medical device</u>
- PSAs are not intended to be used for persons with hearing problems
- PSAs are readily available in the market, priced from around $10 USD up to $400 USD.
- Some people, indifferent to the difference, sometimes led to using PSAs in place of hearing aids to compensate their hearing
- This is a very dangerous situation

PSA on a smartphone



- Recently more and more audio enhancing apps are available in the market.
- This situation is becoming more like that PAS (though the user base is much smaller)

New work Item on Guidance for safe listening venues

Sound levels and acoustics

Rest zones

Earplugs

Information and announcements

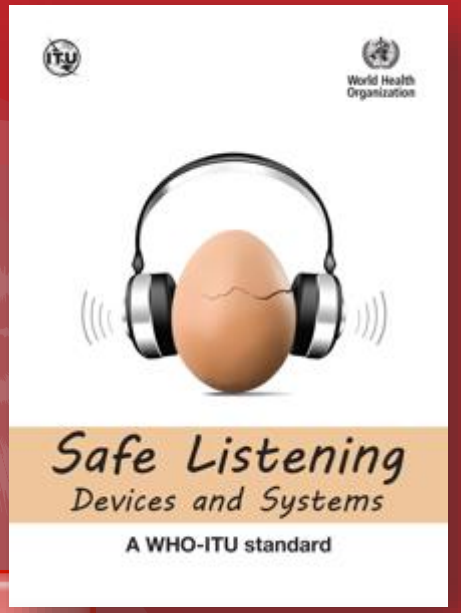
- WHO created a global standard for recreational sound in entertainment venues
  - Different components are identified (e.g. type of venues, sound limits, quiet spaces, hearing protection, warning messages and monitoring)
  - WHO will explore on identification of information needs, collection of existing evidence and collaboration with experts towards development of guidelines for sound exposure in recreational venues
- ITU has decided to create a Technical Paper based on the new WHO standard

Future Work

- Discussion on H.870-V3
- Conformance Testing Spec. H.870-V2
- Conformance Testing Spec. H.871
- Work Item on E-gaming
- Technical Paper on new devices
- Other environments for safe-listening.
- ...

- Thank you!!

WHO-ITU global standard for safe listening devices, 2019



Monitor and display	Offer volume limiting options	Inform
- Volume levels (in dB) - Time spent listening - Use of sound allowance	- Automatic volume reduction - Password-protected volume control	- Regarding personal sound use - Give personalized warnings, messages and cues for action

https://www.itu.int/rec/T-REC-H.870-201808-I/en
https://www.who.int/publications/i/item/safe-listening-devices-and-systems-a-who-itu-standard

World Health Organization

CENELEC and IEC perspectives

Jos Remy

Thomas Lund

Sound pressure requirements for PMP´s Short summary

Jos Remy
June 2023

Content

- Introduction
- Standards concerned
- Different phases
- Status in IEC and CENELEC
- Summary & conclusions

Introduction

- 2008: SCENIHR report

  Scientific Committee on Emerging and Newly Identified Health Risks

  Potential health risks of exposure to noise from personal music players and mobile phones including a music playing function

  SCENIHR report on PMPs

- EU workshop on the subject in January 2009

  At that time, CLC/TC 108X had already started working on the subject in a newly established WG 03

- Scope of TC 108

  Standardization in the field of safety for audio/video and similar technology, information technology and communication technology equipment

Standards concerned

- IEC/EN 60065

  Title: Audio, video and similar electronic apparatus - Safety requirements

- IEC/EN 60950-1

  Title: Information technology equipment - Safety -- Part 1: General requirements

- IEC/EN 62368-1

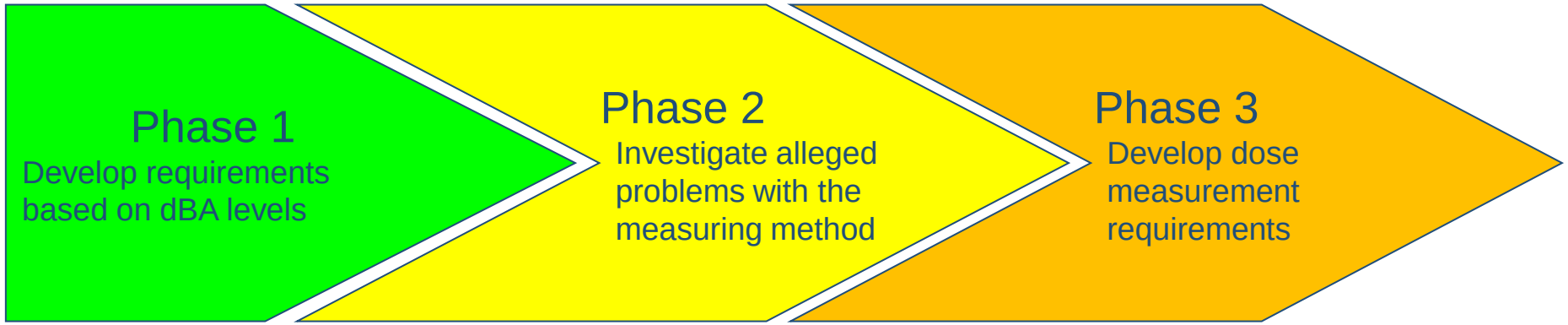
  Title: Audio/video, information and communication technology equipment – Part 1: Safety requirements

- EN 50332-1 and EN 50332-2

  Maximum sound pressure level measurement methodology

Phases

CLC/TC 108X/WG 03 decided to work in different phases:



All these phases have been finished.

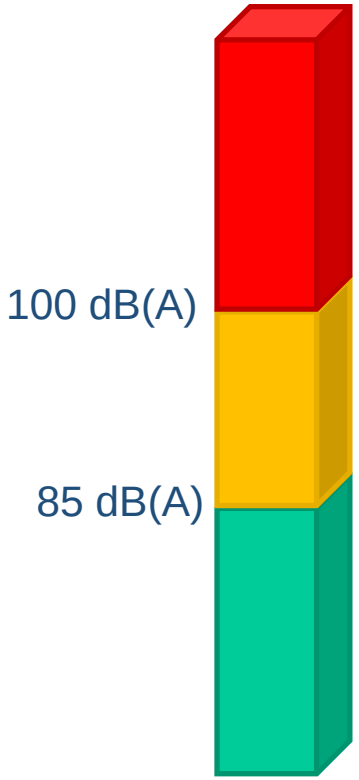
Phase 1 status

Updates to both EN 60065 and EN 60950-1

- Both updates were published in January 2011
- In both standards published as A12
- Short DOW 2 years => January 2013

Comparison of Phases 1 and 3

Maximum exposure

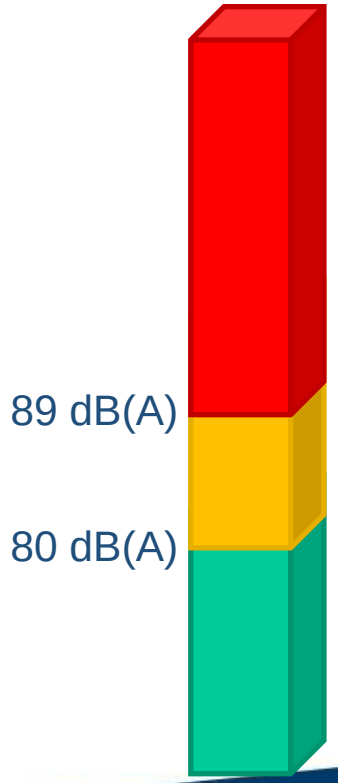


RS3 level
Hazardous level
Not allowed

RS2 level
Safe under conditions
Warnings are required
User must accept the risk

RS1 level
Safe level
No requirements

Dose measurement



Situation in IEC and CLC

- IEC had decided not to update IEC 60065 and IEC 60950-1 on this subject. IEC 62368-1 has replaced both standards in mean time.
- IEC 62368-1:2014 (edition 2) has the requirements of phase 1 and 2 implemented, see clause 10.6
- IEC 62368-1:2018 (edition 3) has the requirements of phase 3 (dose measurement) implemented as an alternative.
- No change in IEC 62368-1:2023 (edition 4). In respective EN 62368-1, dose based is preferred

Summary and conclusions

- Both IEC and CENELEC have mandatory requirements in place for PMPs
- No need for other competing standards for PMP´s
- Additional requirements outside TC 108 scope are welcomed.
- Further work is being done in CLC/TC 108/WG 03 (see presentation Thomas Lund, chair of WG 03)

EN 62368-1 Status

Safety requirements to be met by European standards for personal music players

Thomas Lund

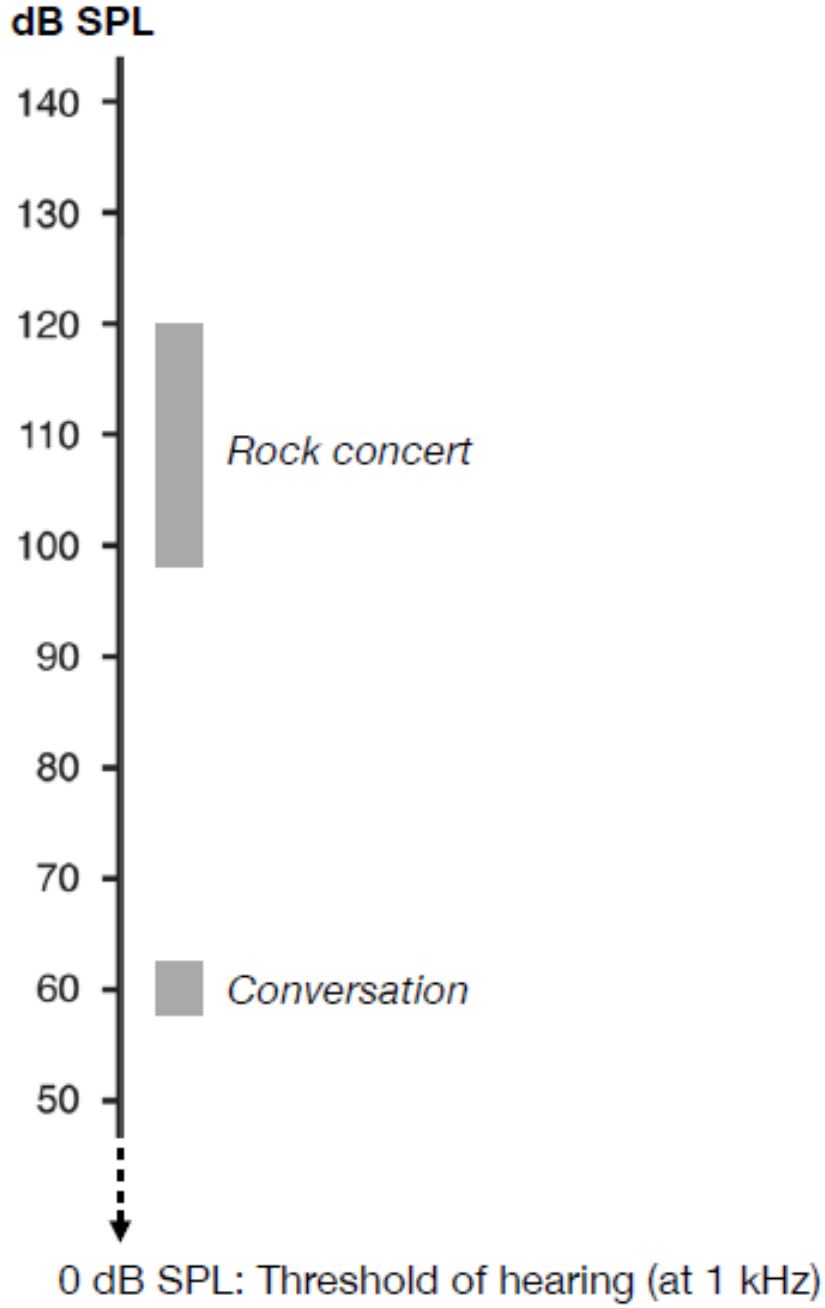
WHO/ITU-T Q28/16 Rapporteur Meeting • 9 June 2023

CEN and CENELEC

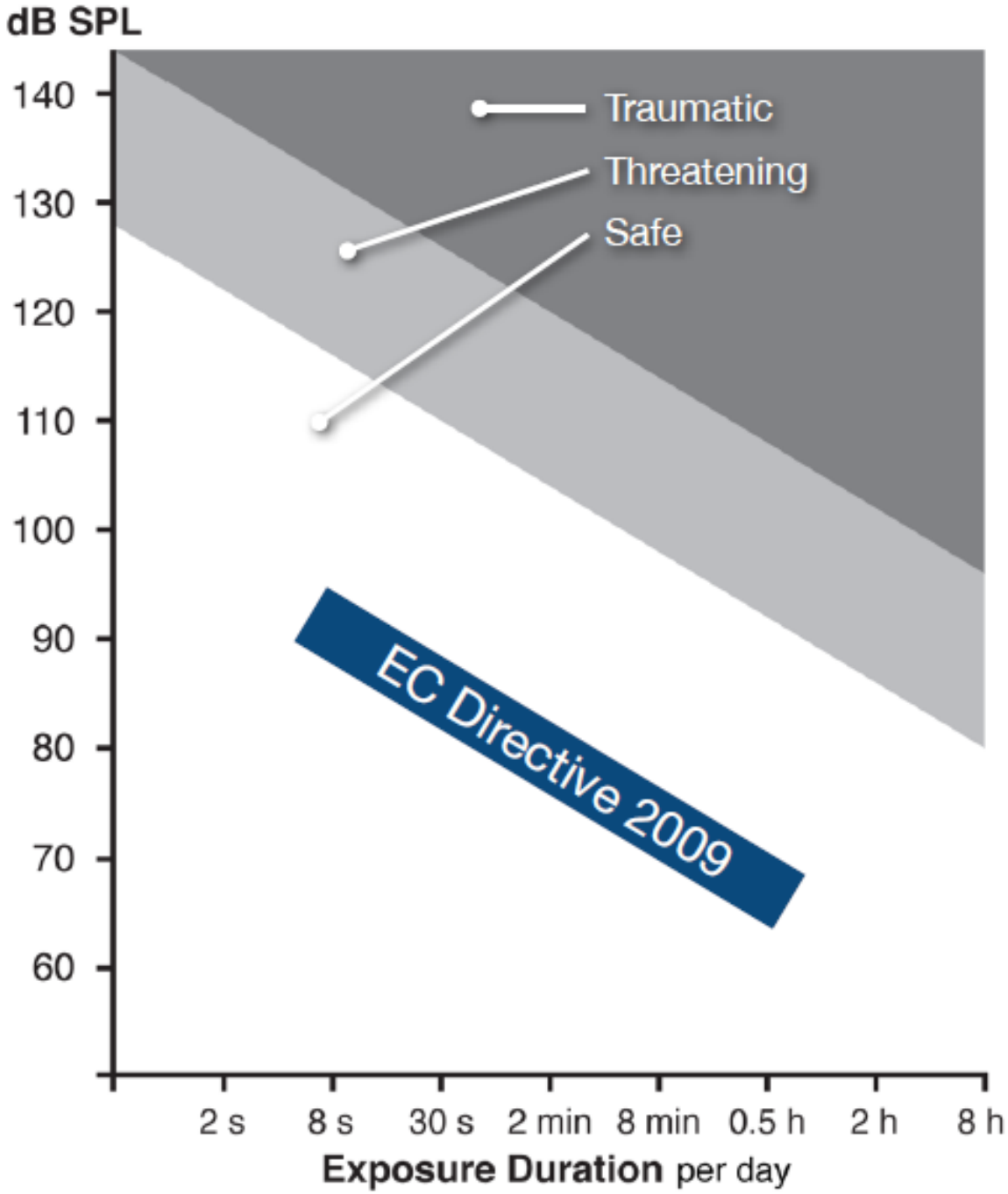
are international non-profit associations. They are officially recognized as European Standardization Organizations.

After the publication of a European Standard, each national standards body is obliged to withdraw any national standard which conflicts with the new European Standard. Hence, one European Standard becomes the national standard in all the 34 Member countries of CEN and/or CENELEC.

Sound pressure is a measure of sound **power**

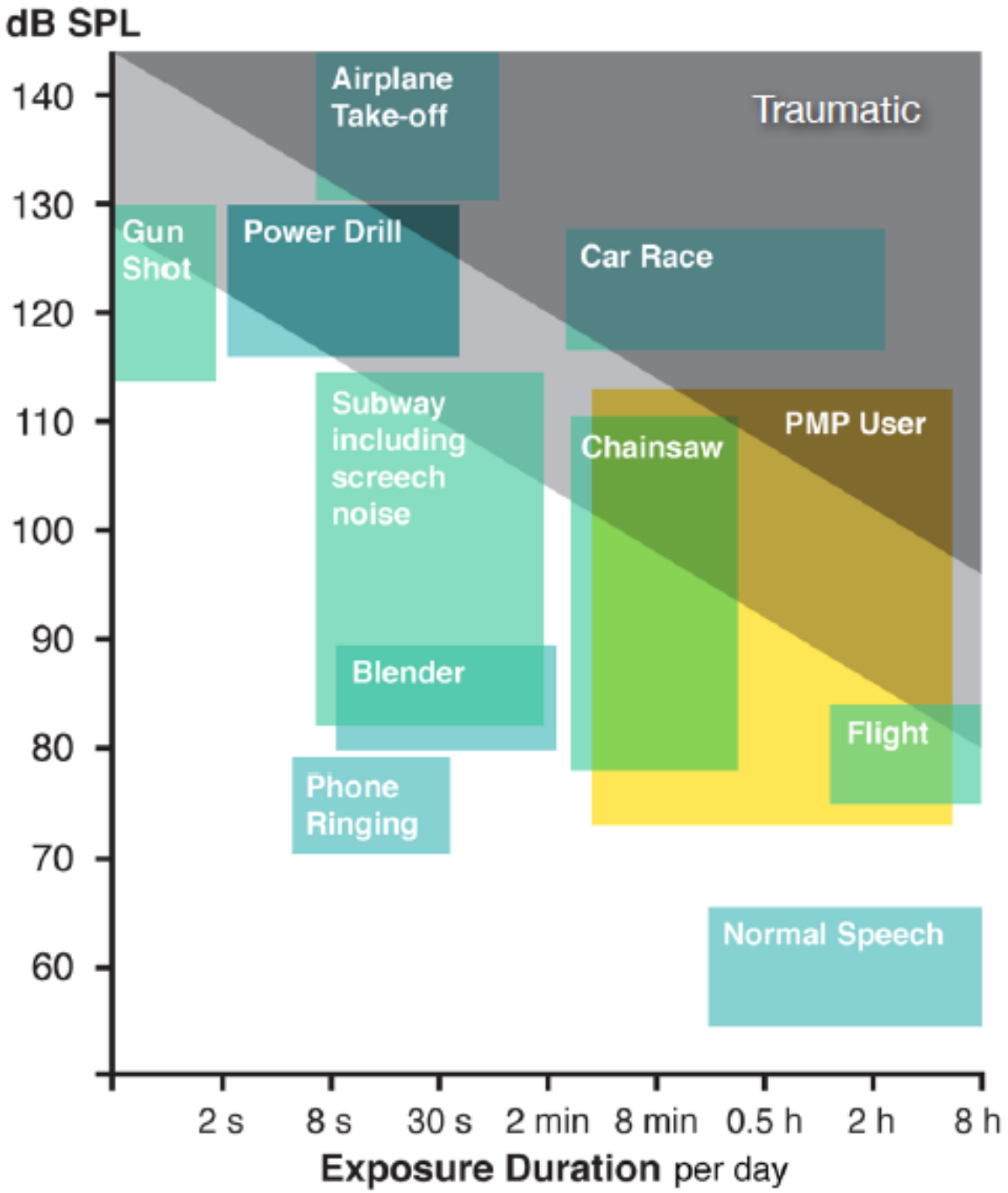


Sound **energy** needed to estimate risk of hearing damage



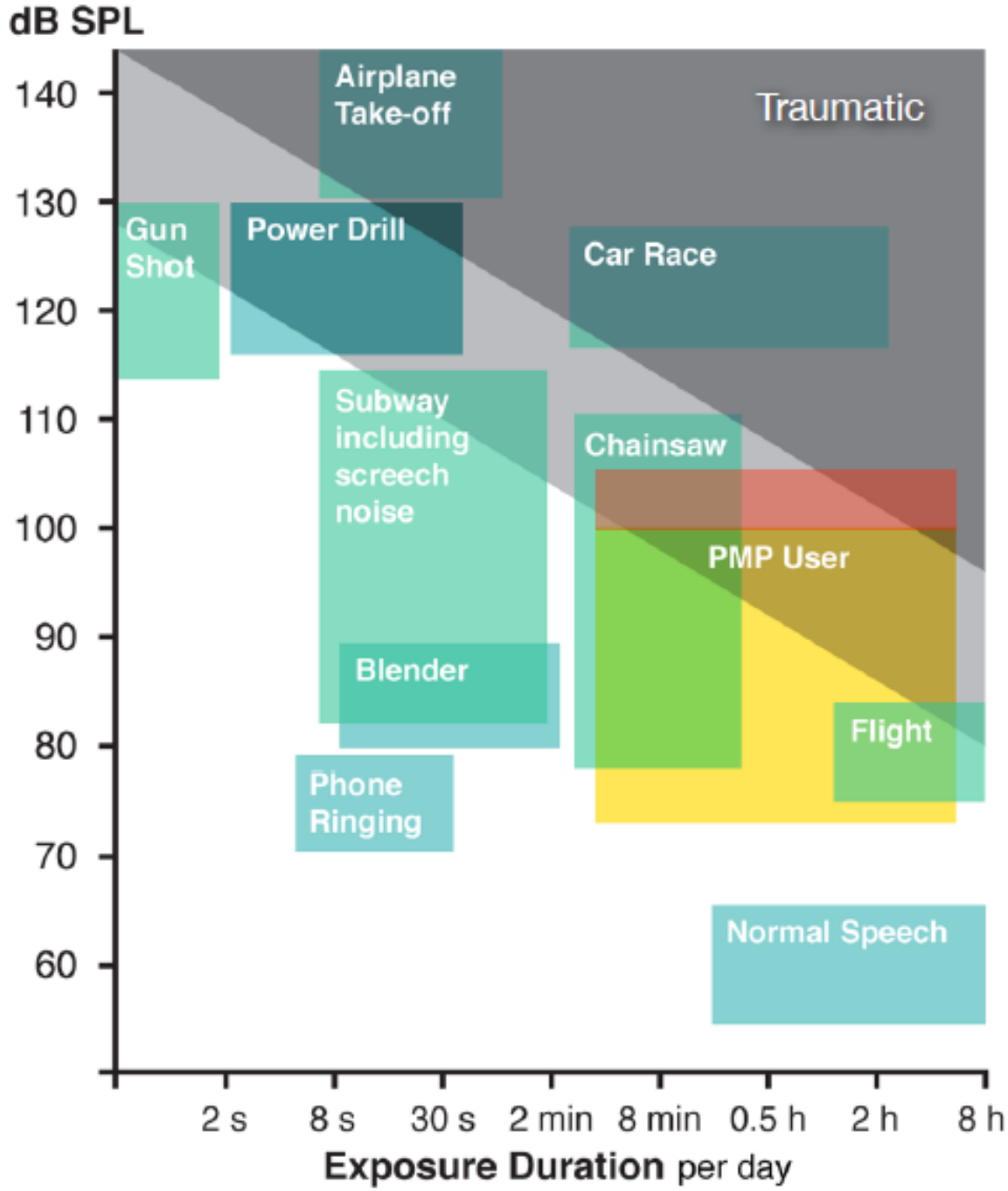
PMP listening by ordinary user

Before any EN requirements



PMP listening by ordinary user

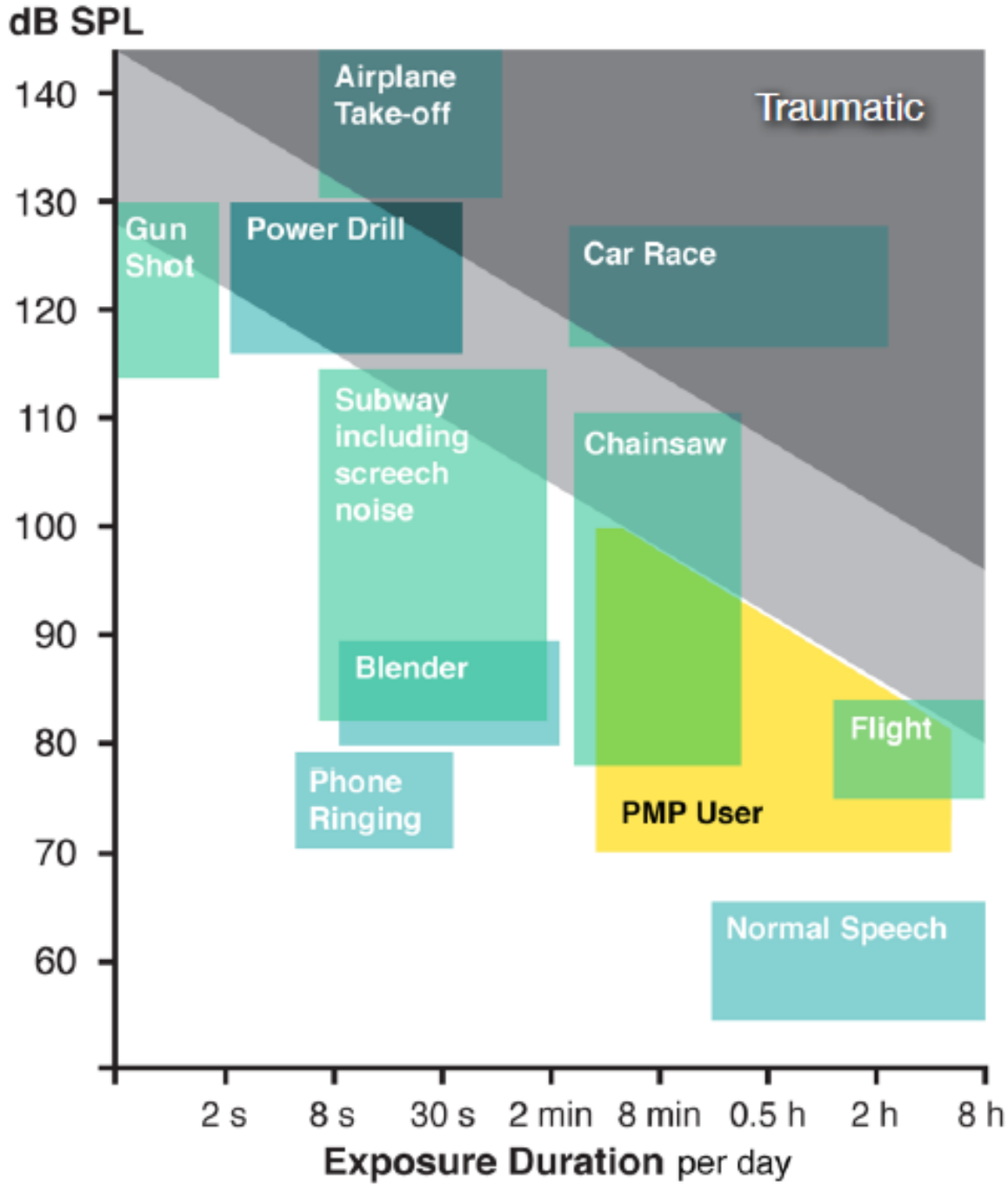
After the first EN requirements, i.e. gain capping, explained by Jos Remy



PMP listening by ordinary user

With current sound exposure requirements

Now an option, but sound exposure estimation will be the **only** way to comply, come the next revision



Requirements for dose-based Systems

System thinking has been pervasive in WG03 work for >10 years.

Handshaking between devices is a prerequisite for user friendly dose estimation requirements, instead of dumb gain capping.

Wireless in-ear, on-ear or around-ear devices are sophisticated, and naturally part of a *system*.

Work currently ongoing. Expected conclusion by this year.

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L. M. Viana et al. (2015). *Hearing Research.* **Cochlear neuropathy in human presbycusis: confocal analysis of hidden hearing loss in post-mortem tissue**

B. Gourévitch et al. (2014). *Nature Neuroscience.* **Is the din really harmless? Long-term effects of non-traumatic noise on the adult auditory system**

R. Neitzel & B. Fligor (2017). *Review conducted for WHO.* **The Determination of Risk of Noise-induced Hearing Loss Due to Recreational Sound: Review**

T. Lund (2015). *AES 58th Conference Paper.*
Prevention of Hearing Loss from the use of Personal Media Players

CENELEC EN50332, IEC/EN 62668-1

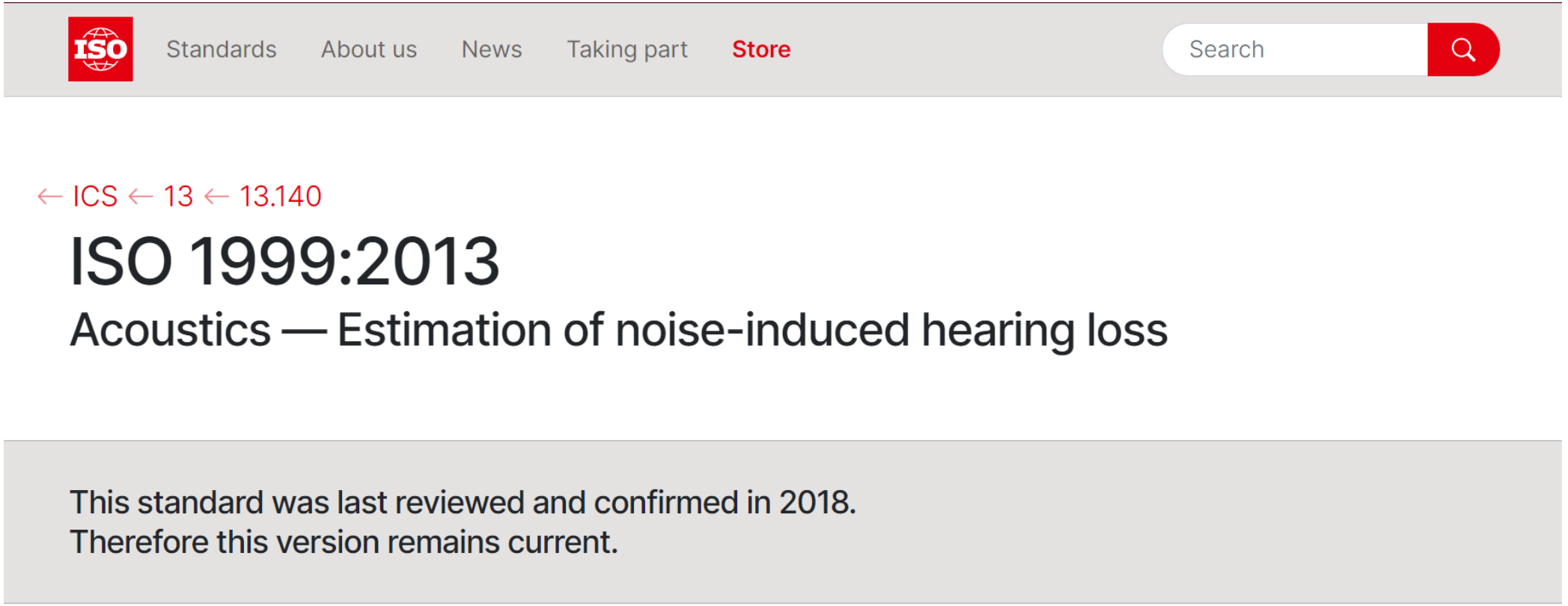
thomas@lund.one

CENELEC

Why move from Maximum Sound Pressure to Exposure?

Mark Laureyns

ISO 1999:2013 (confirmed in 2018)



ISO 1999:2013 (confirmed in 2018)

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- [2] ISO 389-1, *Acoustics — Reference zero for the calibration of audiometric equipment — Part 1: Reference equivalent threshold sound pressure levels for pure tones and supra-aural earphones*
- [3] ISO 389-2, *Acoustics — Reference zero for the calibration of audiometric equipment — Part 2: Reference equivalent threshold sound pressure levels for pure tones and insert earphones*
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ISO 1999:2013 (confirmed in 2018)

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ISO 1999:2013 (confirmed in 2018)

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- [15] Carter N.L., Waugh R.L., Murray N., Bultean V.G.Hearing levels of Australian youth aged 16-20, National Acoustics Laboratory Report No. 99. Canberra, Australian Government Publishing Service, 1983
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ISO 1999:2013 (confirmed in 2018)

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- [19] Hoffman H., Dobie R.A., Ko C.-W., Themann C.L., Murphy W.J. Americans hear as well or better today compared to 40 years ago: Hearing threshold levels in the unscreened adult population of the United States, 1959–62 and 1999–2004. *Ear Hear.* 2010, **31** pp. 725–734
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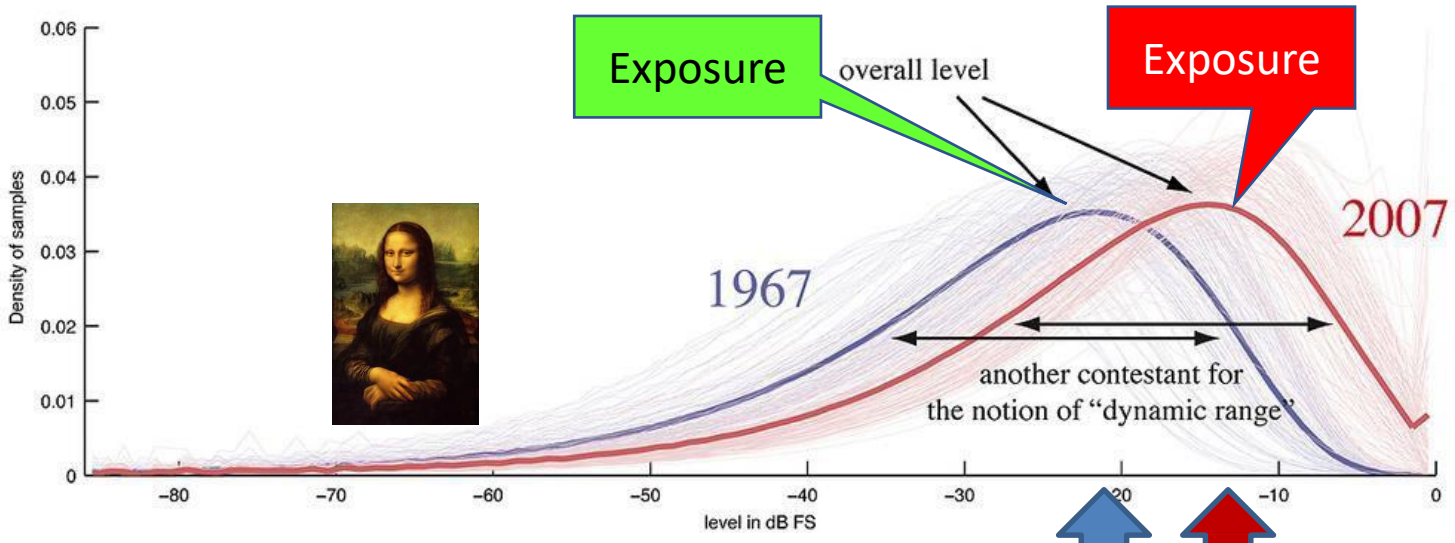
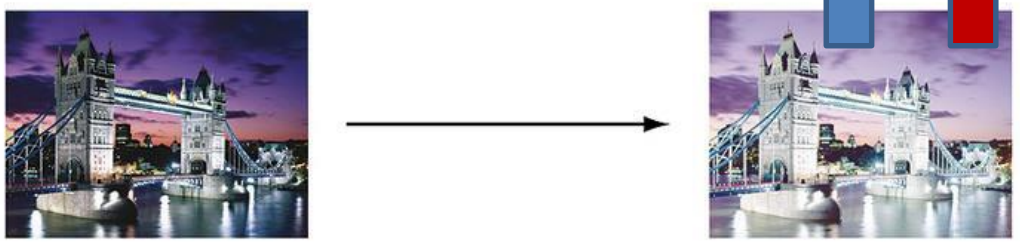
The dynamic range loudness war





Comparisons between signal levels and picture levels as defined in Photoshop result in another interpretation of the loudness war.

If the signal is compressed, you can stay under the unsafe output level … but you increase sound exposure to unsafe dosage

https://www.soundonsound.com/sound-advice/dynamic-range-loudness-war

European Commission

COMMISSION DECISION

of 23 June 2009

on the safety requirements to be met by European standards for personal music players pursuant to Directive 2001/95/EC of the European Parliament and of the Council

(Text with EEA relevance)

(2009/490/EC)

Requirements

1. For the purpose of Article 4(1)(a) of Directive 2001/95/EC, the safety requirement for personal music players shall be the following:

Personal music players shall be designed and manufactured in a manner that ensures that, under reasonably foreseeable conditions of use, they are inherently safe and do not cause hearing damage.

European Commission

COMMISSION DECISION

of 23 June 2009

on the safety requirements to be met by European standards for personal music players pursuant to Directive 2001/95/EC of the European Parliament and of the Council

(Text with EEA relevance)

(2009/490/EC)

Exposure / Dose

Requirements ….

2. The requirement set out in paragraph 1 shall include in particular the following:

1.Exposure to sound levels shall be time limited to avoid hearing damage. At **80 dB(A)** exposure time shall be **limited to 40 hours/week**, whereas at **89 dB(A)** exposure time shall be limited to **5 hours/week**. For other exposure levels a linear intra- and extrapolation applies. Account shall
be taken of the dynamic range of sound and the reasonably foreseeable use of the products.

2.Personal music players shall provide adequate warnings on the risks involved in using the device and to the ways of avoiding them and information to users in cases where exposure poses a risk of hearing damage.

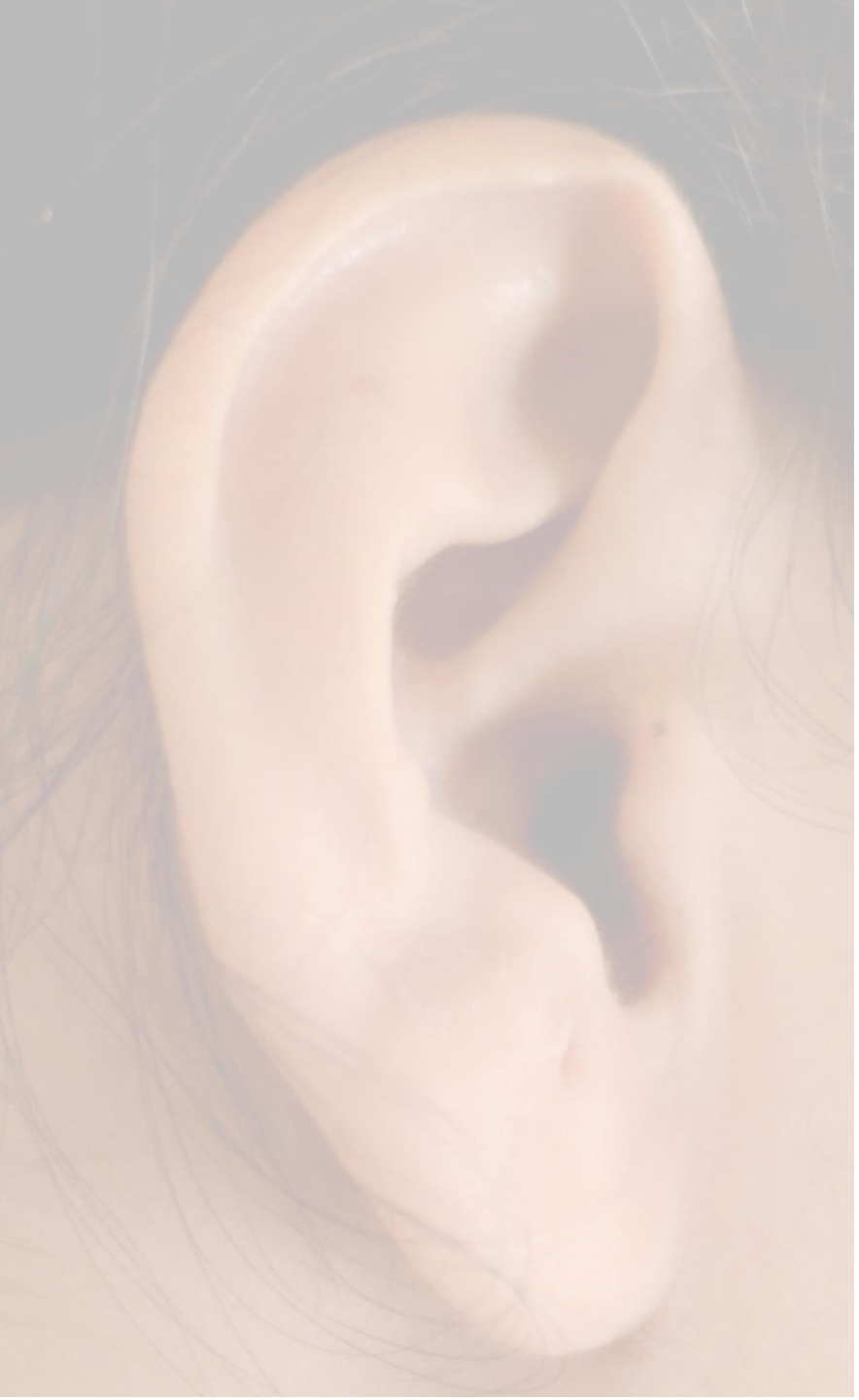
H.870 and future wireless headphone inclusions

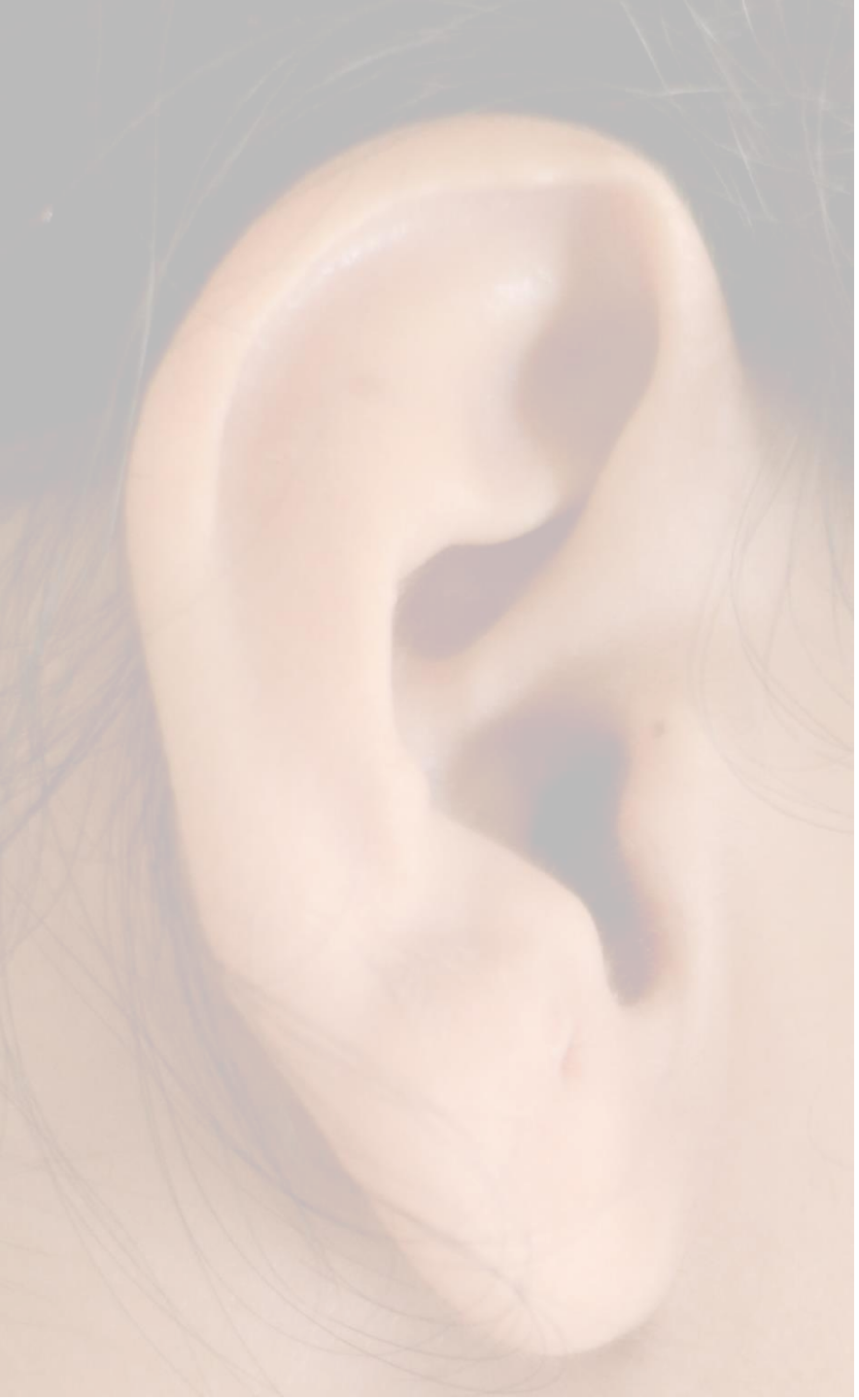
Richard Glover

https://commons.wikimedia.org/wiki/File:Human_Ear.jpg

Make Listening Safe

Richard Glover - Musings





Wireless Listening Devices

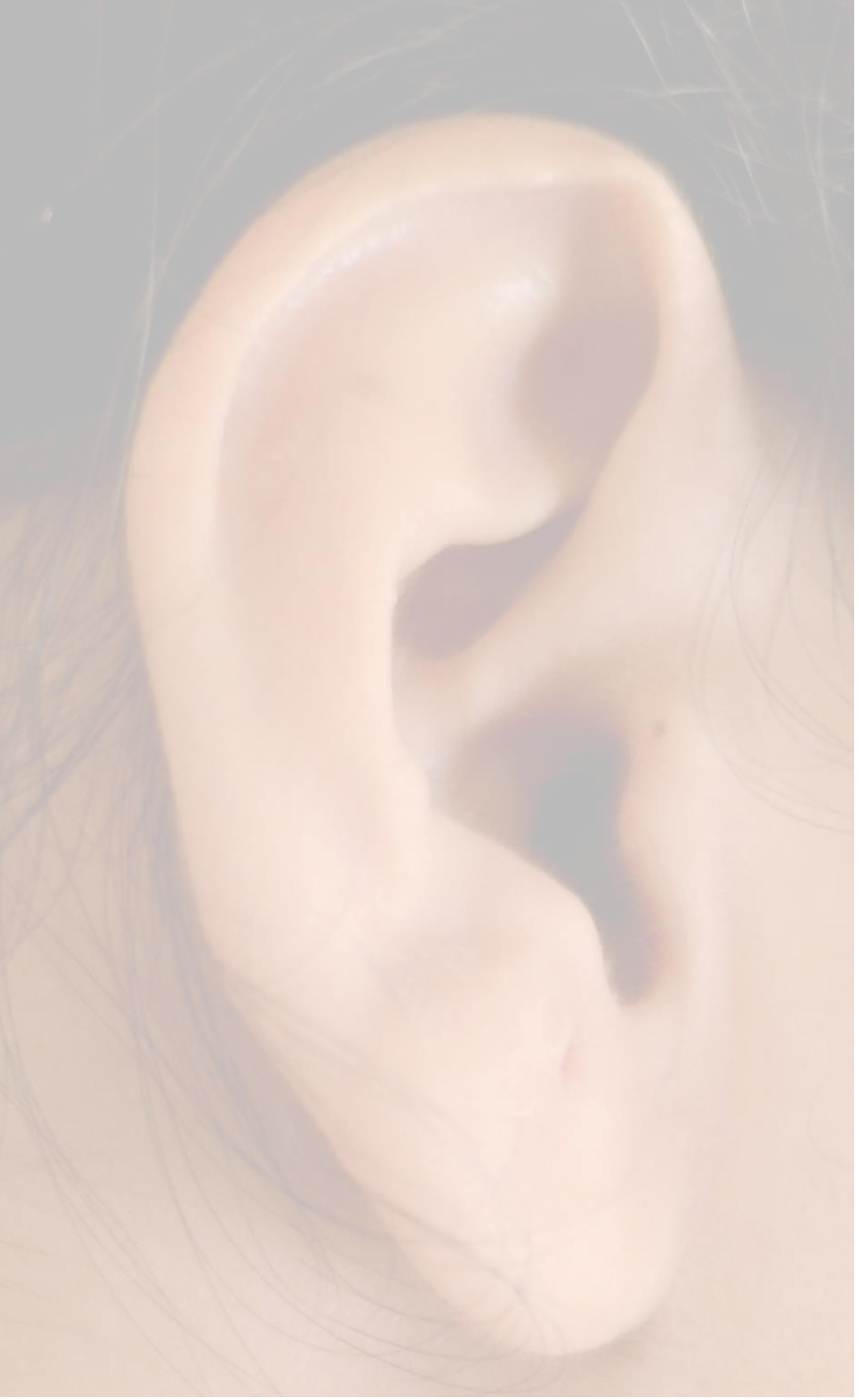
Still a mere listening device?

Sophisticated signal re-mapping

Autonomous operations

Multiple source / device options

Acoustic input - PSAP



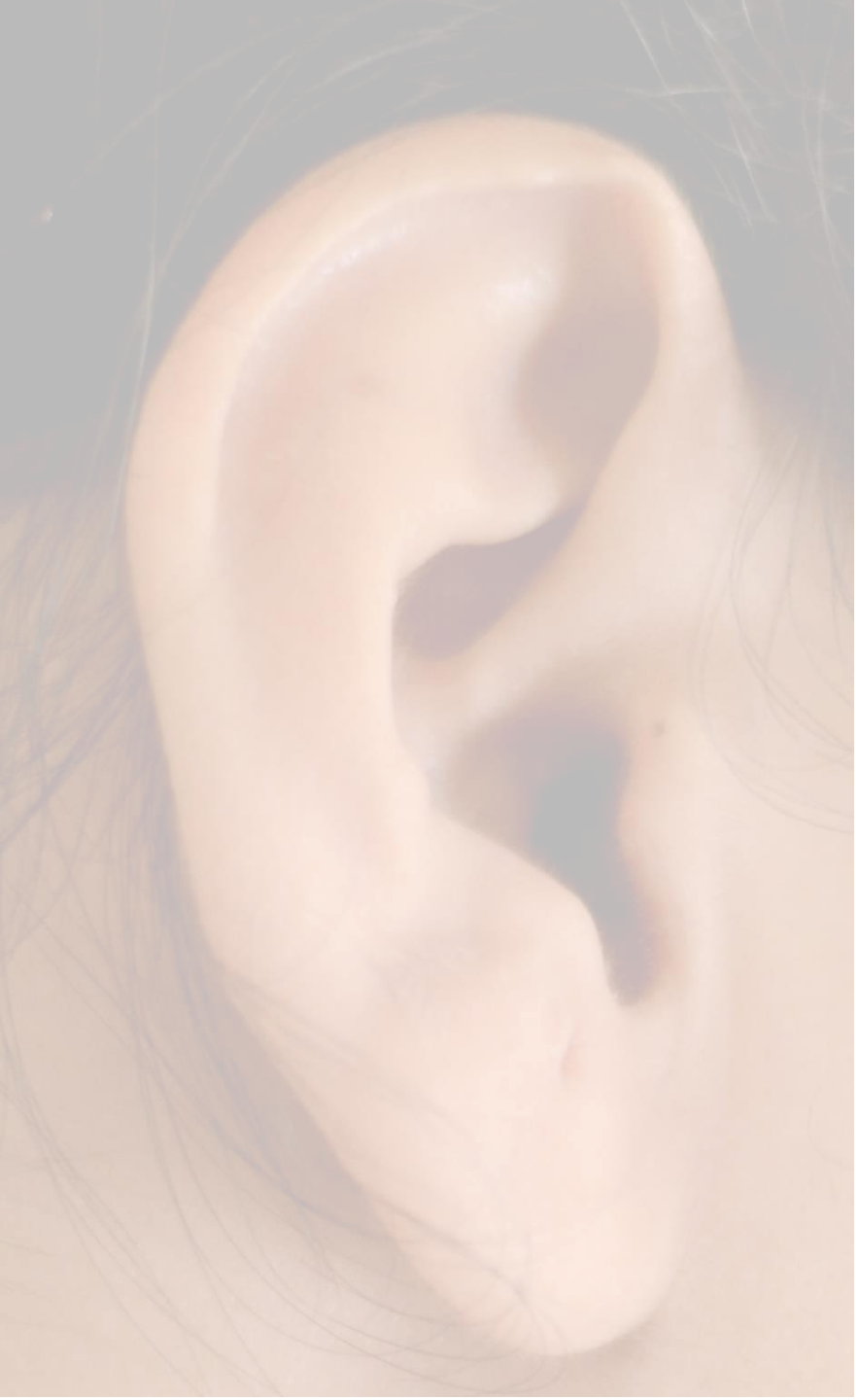
Dose Monitoring Options

Assume maximum sensitivity?

Communicate sensitivity?

Monitor post-processed dose?

Monitor acoustic dose?



Standards - Together

H.870 v2(3)

Compliance

Use Cases

(EN) IEC 62368-1 edn 4 (5)

Scope

https://commons.wikimedia.org/wiki/File:Human_Ear.jpg

What does conformance testing entail

Chuck Kardous

Conformance Testing of Personal Listening Devices and Systems

Chucri (Chuck) A Kardous
(Ret. CDC/NIOSH)

Conformance Testing

- Conformance testing is testing to see if an implementation meets the requirements of a standard or specification
- ISO/IEC DIS 10641 defined conformance testing as "test to evaluate the adherence or nonadherence of a candidate implementation to a standard."
- ISO/IEC TR 13233 defined conformance and conformity as "fulfillment by a product, process or service of all relevant specified conformance requirements."

Source: National Institute of Standards and Technology

Conformity Assessment Program

Conformity assessment program requires:

- Standard or specification
- Test method standard or conformance clause
- Test suite or test tools
- Procedures for testing
- Qualified body to do testing

Source: National Institute of Standards and Technology

Types of Conformance Testing

IEEE Standard 2003-1997 defines three types of testing:

- Exhaustive Testing

"Seeks to verify the behavior of every aspect of an element, including all permutations"

- Thorough Testing

"Seeks to verify the behavior of every aspect of an element, but does not include all permutations."

- Identification Testing

"Seeks to verify some distinguishing characteristic of the element in question. It consists of a cursory examination of the element."

Source: National Institute of Standards and Technology

Overview

- NIOSH research on sound listening devices
- Equipment
- Software
- Applicable Standards
- Findings

NIOSH Research

- Occupations where headphones/headsets are widely used (Call Center Ops, Audio Engs, Sports, Broadcasters, etc.)
- Use of personal listening devices in occupational settings
- Cumulative (occupational+recreational) exposure
- Effect of noise-cancelling technology and ambient background noise

NIOSH Research

- Collaboration between NIOSH and Hofstra University and Cardno on the effects of personal listening devices on hearing and tinnitus in young adults
- Examination of popular headsets and earphones w/ Apple and Android devices
- Sample files of several genres of music

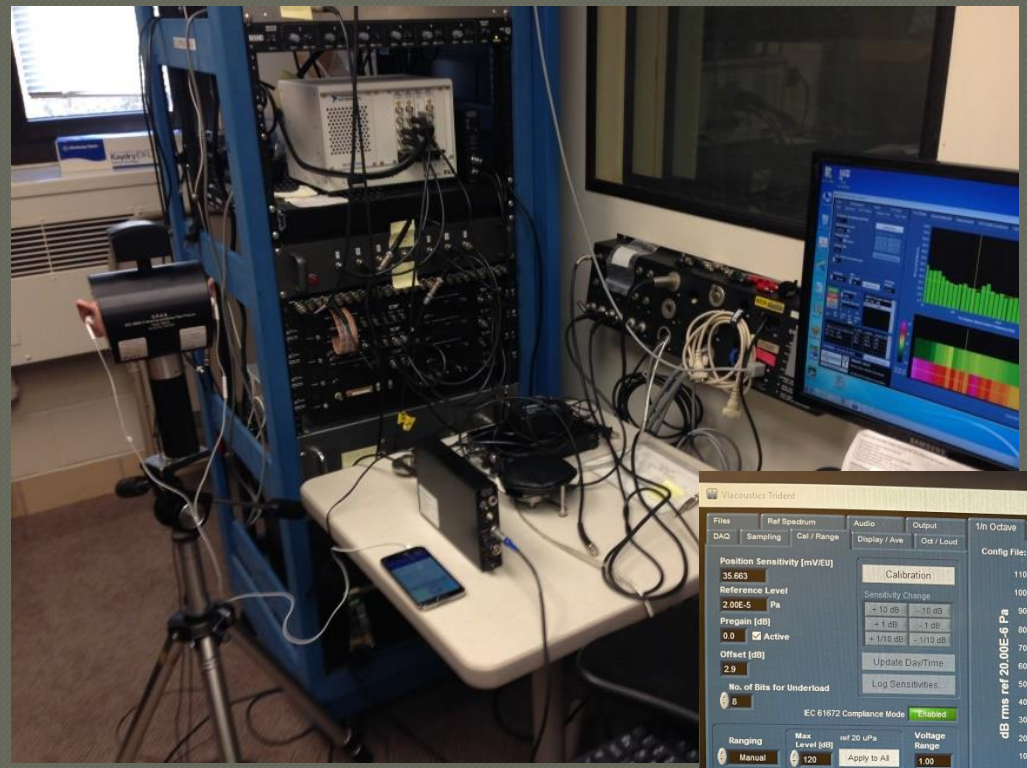
NIOSH Lab Setup

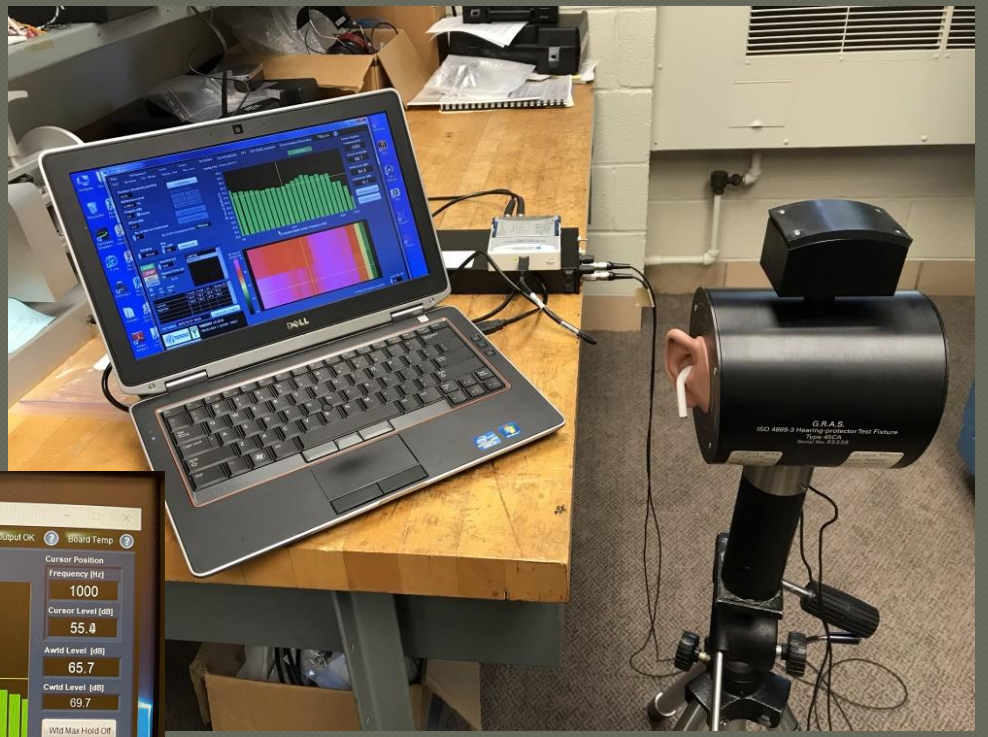
Hardware & Software

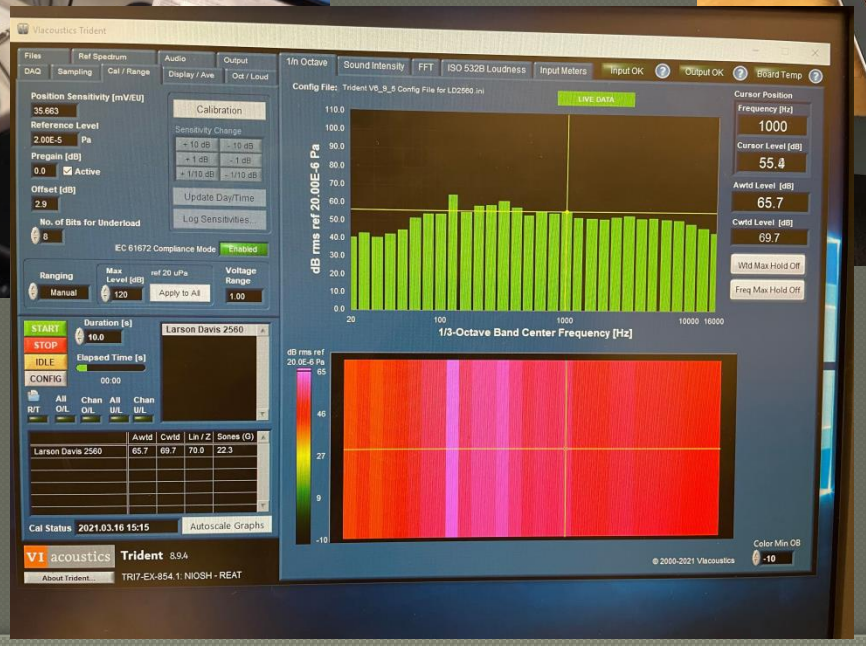
- GRAS 45 CA Acoustic Test Fixture (IEC 711) w/ GRAS 40 AG 1/2" microphone
- GRAS 12 AA Power Supply
- GRAS 42 AP Piston Phone (for calibration)
- National Instruments NI-OXI1037 Chassis (NI4461 data boards, 24-bit, 204.8 KS/s)
- ViaAcoustics Software: Trident v.8.9.4, SigPro v1.5.1, Wavefrom Analyzer v3.1

Headsets/Earphones

Hardware & Software







Test Signals

- Pink Noise used as test signal
- 9 Songs from billboard (3 from each genre: Pop, HipHop, Rock)
- 3 repetitions to ensure reliability of response
- Streamed vs. Downloaded music – No diff
- Pink noise and music downloaded to phone and switched to airplane mode to reduce interference
- Broadband noise used for ambient background

Applicable Standards

- ITU-T H.870 (03/2022) - Guidelines for safe listening devices/systems
- EN 50332: 1-3 (2013-2017) – Sound System Equipment…
- IEC 61672: 1-3 (2013) – Electroacoustics: Sound Level Meters…
- IEC 60318: 1-8 (2009-2022) – Electroacoustics: Simulators of human head and ear…
- ISO/IEC 17025 (2017) – General requirements for the competence and testing and calibration laboratories → in U.S., NVLAP
- ISO/IEC 17043 (2010) – Conformity assessment: General requirements for proficiency testing

Noise-cancelling headset

Bose Yoke	Level (dBA)	Left (dBA)	Right (dBA)	Level (dBC)	Left (dBC)	Right (dBC)	Noise Reduction (dBA)	Noise Reduction (dBC)
Pink Noise	73	60	61	77	59	61	12.5	17
125 Hz	57	37	37	74	45	51	20	26
250 Hz	67	38	38	74	45	51	29	26
500 Hz	74	54	54	77	57	57	20	20
1000 Hz	78	63	67	78	63	67	13	13
2000 Hz	78	65	68	77	64	67	11.5	11.5
4000 Hz	77	72	75	76	71	73	3.5	4
8000 Hz	75	66	60	73	64	59	12	11.5
Pink Noise	83	70	72	87	69	71	12	17
125 Hz	68	39	40	85	52	56	28.5	31
250 Hz	77	39	45	85	52	56	35	31
500 Hz	84	63	63	87	66	67	21	20.5
1000 Hz	88	73	77	88	73	77	13	13
2000 Hz	90	76	79	89	75	78	12.5	12.5
4000 Hz	89	84	87	87	82	85	3.5	3.5
8000 Hz	87	78	72	85	76	70	12	12

Noise reduction from noise cancellation ~10 dB(A) or 17 dB(C)

Measured Levels: iPhone 12/AirPod Pro

Sound_Type	Device	Ear Model	Volume_Level	Level dBA	Level dBC
Pink Noise	iPhone 12	Airpod Pro	1	44.9	49
Pink Noise	iPhone 12	Airpod Pro	2	48	50.9
Pink Noise	iPhone 12	Airpod Pro	3	52.6	54.8
Pink Noise	iPhone 12	Airpod Pro	4	57.7	58.5
Pink Noise	iPhone 12	Airpod Pro	5	62.6	63.2
Pink Noise	iPhone 12	Airpod Pro	6	67	67.7
Pink Noise	iPhone 12	Airpod Pro	7	71.5	72.2
Pink Noise	iPhone 12	Airpod Pro	8	75.5	76.1
Pink Noise	iPhone 12	Airpod Pro	9	79.5	80.1
Pink Noise	iPhone 12	Airpod Pro	10	83.5	84.1
Pink Noise	iPhone 12	Airpod Pro	11	87.5	88.1
Pink Noise	iPhone 12	Airpod Pro	12	91	91.6
Pink Noise	iPhone 12	Airpod Pro	13	94.5	95.1
Pink Noise	iPhone 12	Airpod Pro	14	98	98.6
Pink Noise	iPhone 12	Airpod Pro	15	101.5	102.2
Pink Noise	iPhone 12	Airpod Pro	16	104.5	105.2

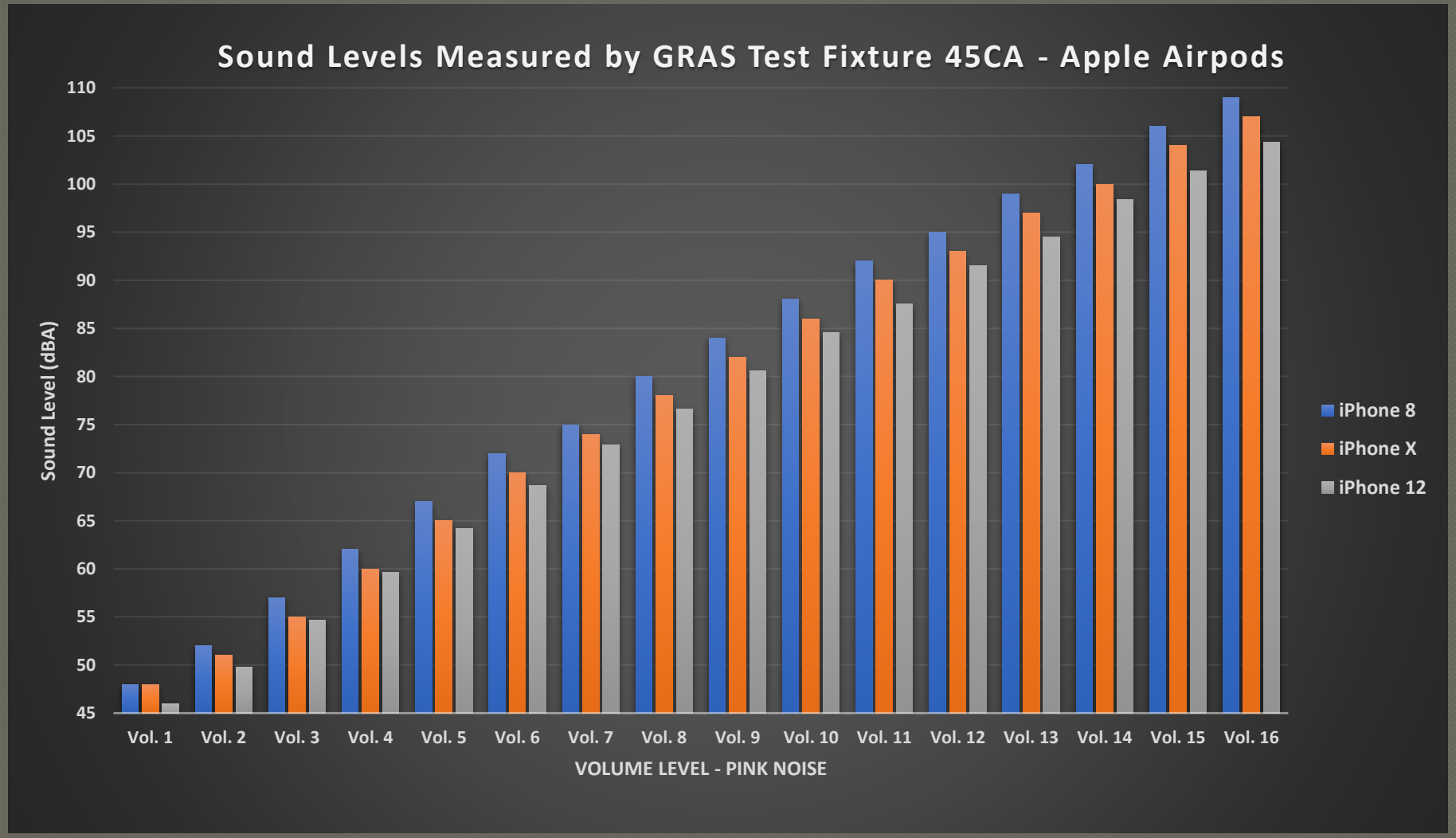
Measured Levels: Samsung S20/Galaxy Buds Pro

Sound_Type	Device	Ear Model	Volume_Level	Level dBA	Level dBC
Pink Noise	Samsung S20	Galaxy Buds Pro	1	49	52.7
Pink Noise	Samsung S20	Galaxy Buds Pro	2	53.8	56.1
Pink Noise	Samsung S20	Galaxy Buds Pro	3	59.5	59.3
Pink Noise	Samsung S20	Galaxy Buds Pro	4	65.5	64.3
Pink Noise	Samsung S20	Galaxy Buds Pro	5	71.4	69.9
Pink Noise	Samsung S20	Galaxy Buds Pro	6	76.4	74.9
Pink Noise	Samsung S20	Galaxy Buds Pro	7	79.3	77.7
Pink Noise	Samsung S20	Galaxy Buds Pro	8	82.3	80.7
Pink Noise	Samsung S20	Galaxy Buds Pro	9	85.3	83.7
Pink Noise	Samsung S20	Galaxy Buds Pro	10	88.3	86.7
Pink Noise	Samsung S20	Galaxy Buds Pro	11	91.2	89.6
Pink Noise	Samsung S20	Galaxy Buds Pro	12	94.2	92.6
Pink Noise	Samsung S20	Galaxy Buds Pro	13	97.2	95.6
Pink Noise	Samsung S20	Galaxy Buds Pro	14	100.3	98.7
Pink Noise	Samsung S20	Galaxy Buds Pro	15	103.5	101.8

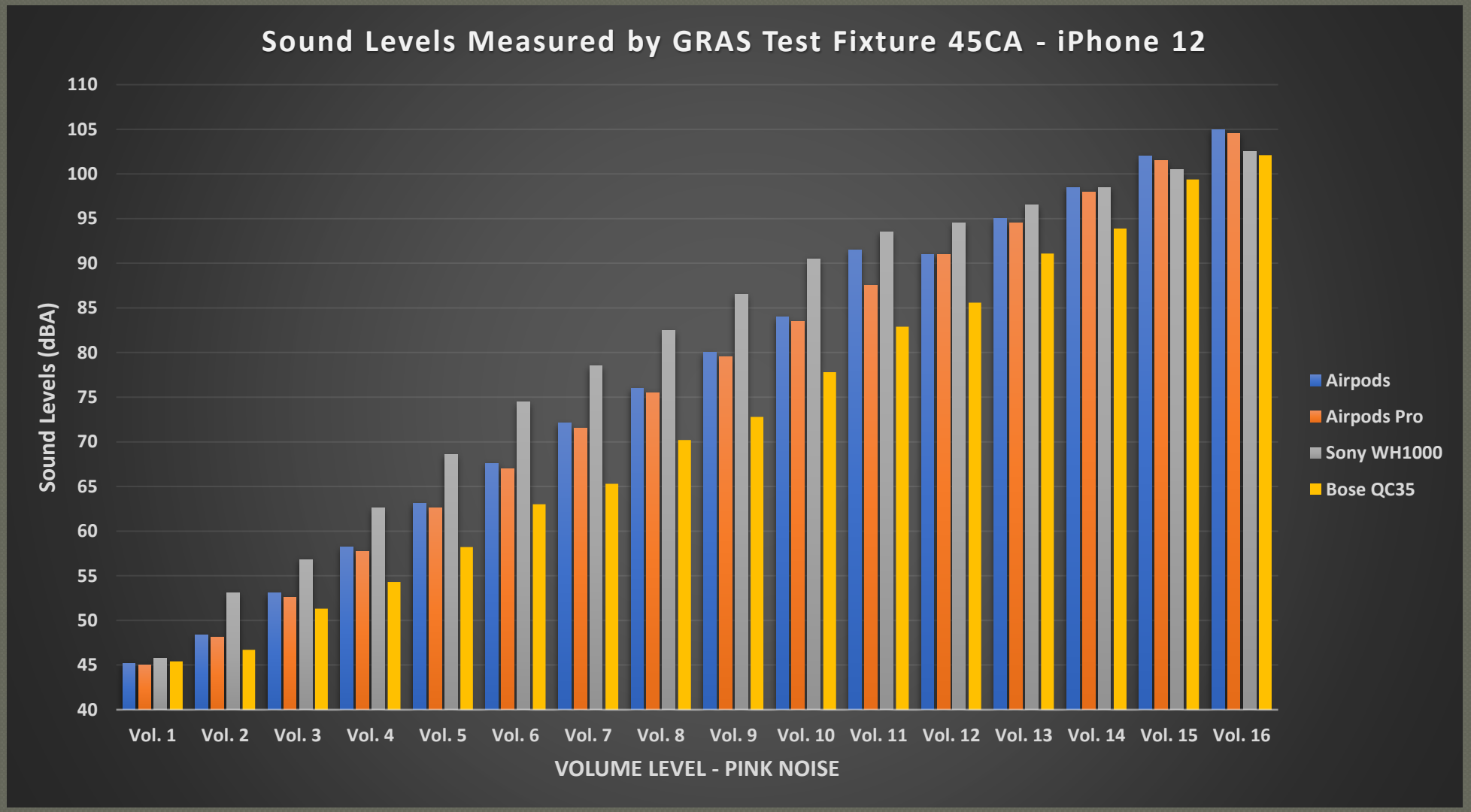
Measured Levels: Comparison on same model

Sound_Type	Ear Model	Volume_Level	iPhone 12		Samsung S20	
			Level dBA	Level dBC	Level dBA	Level dBC
Pink Noise	Sony WH1000XM4	1	45.8	52.4	45.3	53.8
Pink Noise	Sony WH1000XM4	2	53.1	55.5	52.4	55.5
Pink Noise	Sony WH1000XM4	3	56.8	58	58.9	60.2
Pink Noise	Sony WH1000XM4	4	62.6	62.9	64.8	65.2
Pink Noise	Sony WH1000XM4	5	68.6	68.7	70.8	70.9
Pink Noise	Sony WH1000XM4	6	74.5	74.7	75.8	75.8
Pink Noise	Sony WH1000XM4	7	78.5	78.6	79.8	79.7
Pink Noise	Sony WH1000XM4	8	82.5	82.6	83.8	83.8
Pink Noise	Sony WH1000XM4	9	86.5	86.7	87.8	87.7
Pink Noise	Sony WH1000XM4	10	90.5	90.6	91.8	91.8
Pink Noise	Sony WH1000XM4	11	93.5	93.6	93.8	93.8
Pink Noise	Sony WH1000XM4	12	94.5	94.6	95.8	95.8
Pink Noise	Sony WH1000XM4	13	96.5	96.6	97.8	97.7
Pink Noise	Sony WH1000XM4	14	98.5	98.6	98.8	99.7
Pink Noise	Sony WH1000XM4	15	100.5	100.6	101.8	101.7
Pink Noise	Sony WH1000XM4	16	102.5	103.3		

iPhone Models Comparison



Headphones Comparison



Conclusions

- To ensure success, conformity Assessment must be:
  - **Repeatable**: Different testers, following the same procedures and test methodology, should be able to get the same results on the same platform.
  - **Efficient**: Minimize costs burden on participants. Test tools must be optimized to maximize automation and minimize human intervention.
  - **Effective**: Must test the critical areas required by the specification or standard and provide the desired level of assurance for its customer base.

Thank you

Chuck Kardous
Kardous Acoustical, LLC
ckardous@gmail.com

NIOSHNoiseResearch@cdc.gov
https://www.cdc.gov/niosh/topics/noise/

Implementing a conformance testing programme

Dennis Andreev

ITU Product Conformity & Testing Laboratories Databases

June 2023

GENERAL OVERVIEW

The ITU C&I Programme was initiated at the request of ITU's membership to:

- **enhance the conformity and interoperability of ICT products implementing ITU Recommendations or part thereof**
- **improve the quality of ITU Recommendations**
- **reduce the digital divide and the Standardization Gap by assisting developing countries with human resource and infrastructure capacity building**

ITU-T C&I Portal – https://itu.int/go/citest

ITU Conformance and Interoperability programme (C&I), http://itu.int/go/citest

Key pillars:

Pillar 1: Conformity assessment
Pillar 2: Interoperability events
Pillar 3: Capacity building
Pillar 4: Establishment of test centres and a C&I programme in developing countries

Core ITU Resolutions:

- Resolution 177 (PP-22)
- Resolution 76 (WTSA-20)
- Resolution 47 (WTDC-22)
- Resolution 62-2 (RA-19)

Implementation of C&I programme:

- ITU-T SG11: lead group on testing (http://itu.int/go/tsg11)
- All other ITU-T SGs are developing test specifications in areas of their responsibilities
- ITU-D SG2 (Q4/2): assistance to developing countries on implementing C&I programme
- Conformity Assessment Steering Committee (CASC): Testing Laboratories Recognition procedure
- ITU test events
- ITU training events on C&I

Contact: conformity@itu.int

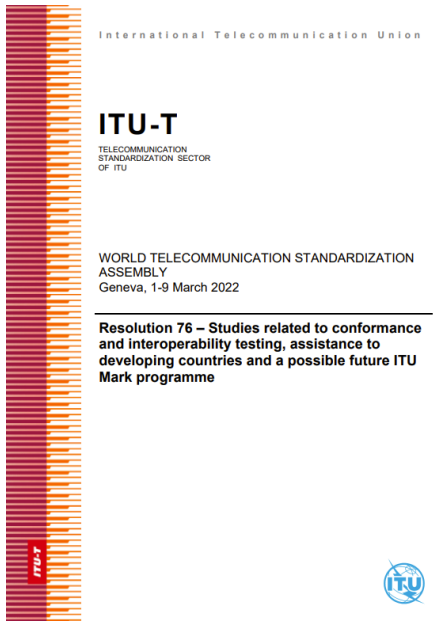
Overview

Conformity with international standards such as ITU Recommendations is one of the core principles underlying the global interoperability of ICT networks, devices and services.

The ITU Conformity and Interoperability (C&I) programme was initiated at the request of ITU's membership to enhance the conformity and interoperability of ICT products implementing ITU Recommendations or part thereof, solicit feedback to improve the quality of ITU Recommendations, and reduce the digital divide and the Standardization Gap by assisting developing countries with human resource and infrastructure capacity building.

Outcomes:

- **Product Conformity Database** (launched in 2014)
  Note: around 500 entries
- **Testing Laboratories database** (launched in 2022)
  Note: 11 TLs are registered
- **List of ITU-T Technical experts** (10 experts)
  Note: they might be involved in the TL assessment
- **Testing specifications for different ICT technologies**
- **Number of test events** (23 events)
- **Number of training events and Workshops**



Rev. Resolution 76 (WTSA-20)

"Studies related to conformance and interoperability testing, assistance to developing countries, and a possible future ITU Mark programme"

resolves

…

4 to **continue working with accreditation bodies to recognize testing laboratories** with competence to test in accordance with ITU-T Recommendations;

instructs the study groups

…

4 to submit to CASC a **list of ITU-T Recommendations** which could be candidates **for the certification scheme**, taking into account market needs,

Instructs the TSB Director

…

6 to **facilitate the development** and implementation of an ITU-T C&I **test laboratory recognition procedure**;

instructs the ITU-T CASC

…

to study and define an ITU procedure to recognize testing laboratories that are competent to test according to ITU-T Recommendations, in collaboration with existing accreditation bodies,

Rev. Resolution 177 (PP-22)

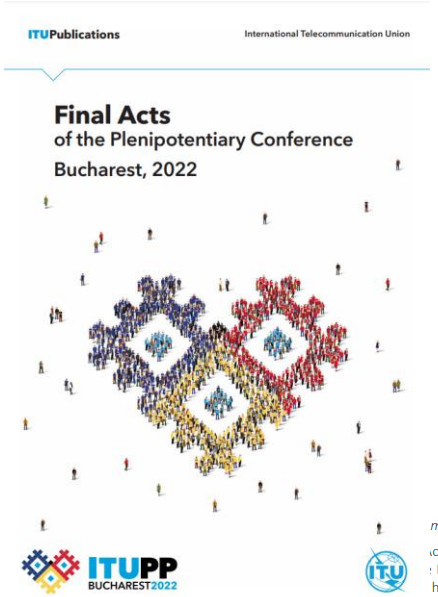
“Conformance and interoperability”

…

7 **to develop the criteria for assessing the maturity of Pillar 1** of the Action Plan for the C&I Programme mentioned in recognizing further j) above and report to the Council;

8 **to define the ITU Mark concept** and its implications for ITU and its membership,

…



munication Standardization Bureau

…ction Plan for the C&I Programme endorsed by the … Director of the Telecommunication Development … human capacity building and assistance in the … countries;

2 to continue to carry out pilot projects for conformity to ITU-T recommendations to increase the probability of interoperability in accordance with the Action Plan for the C&I Programme;

3 to enhance and improve standards-setting processes in order to improve interoperability through conformity;

4 to continuously update the Action Plan for the C&I Programme for the long-term implementation of this resolution;

5 to provide the Council with progress reports, including the results of studies, relating to the implementation of this resolution;

6 in cooperation with the Director of BDT, to implement the Action Plan for the C&I Programme agreed by the Council at its 2012 session and revised by the Council at its 2013 session;

7 to develop the criteria for assessing the maturity of Pillar 1 of the Action Plan for the C&I Programme mentioned in *recognizing further j)* above and report to the Council;

8 to define the ITU Mark concept and its implications for ITU and its membership,

instructs the Director of the Telecommunication Development Bureau, in close collaboration with the Director of the Telecommunication Standardization Bureau and the Director of the Radiocommunication Bureau

1 to advance the implementation of Resolution 47 (Rev. Kigali, 2022) and the relevant parts of the Action Plan for the C&I Programme, and to report to the Council;

2 to assist Member States in addressing their concerns with respect to non-compliant equipment;

3 to continue providing on-the-job capacity-building activities, in collaboration with recognized institutions and benefiting from the ITU Academy ecosystem, including activities related to preventing radiocommunication interference caused or received by ICT equipment;

4 under Pillars 3 and 4 of the Action Plan for the C&I Programme:

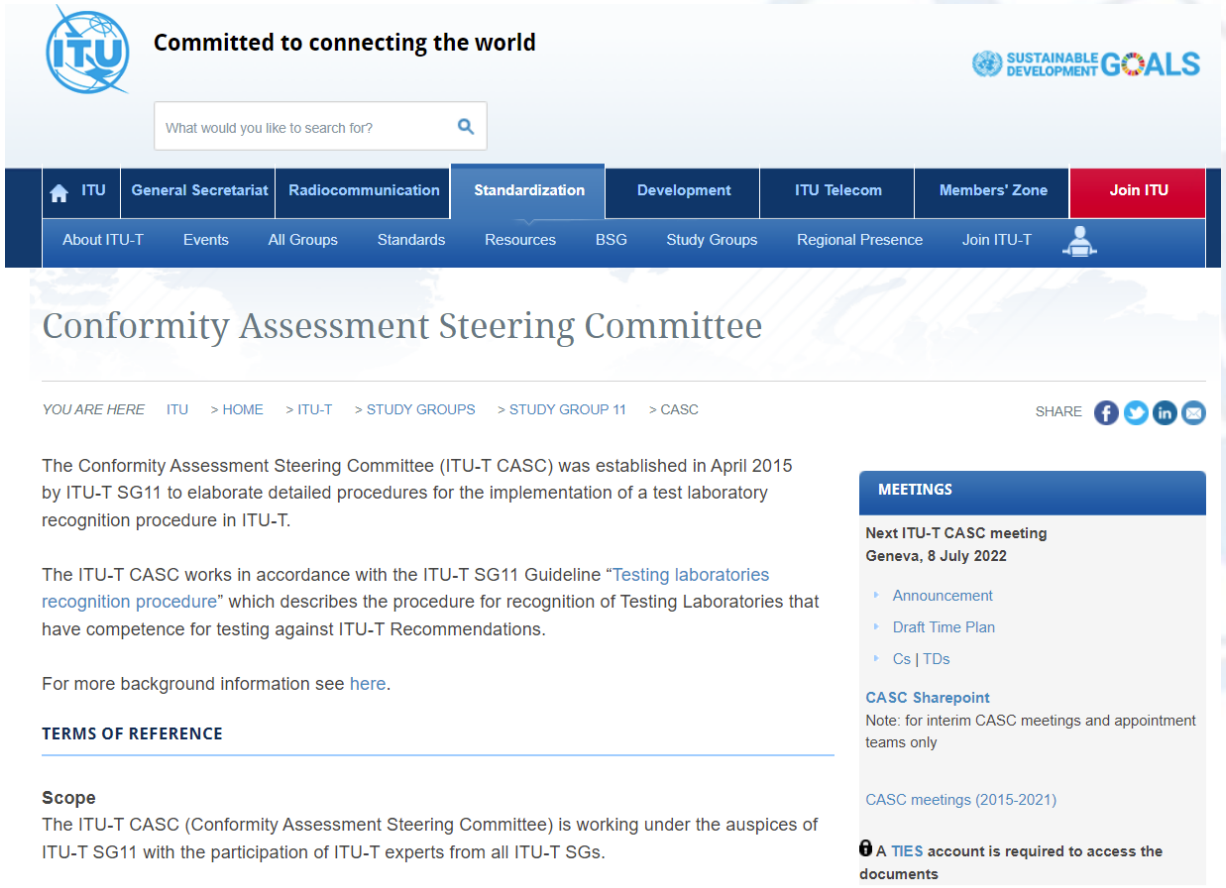
a) to raise awareness of the applicability of C&I programmes to certain IoT devices;

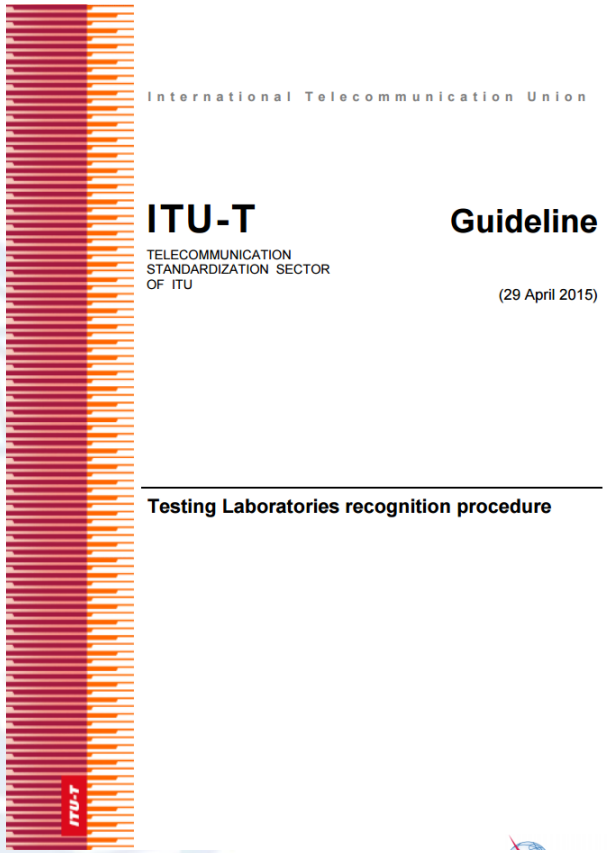
b) to provide capacity building on technical regulations and compliance testing to support developers, including SMEs and youth, as they design their telecommunication/ICT equipment, to enable them to access local, regional and global markets;

5 to use ITU seed money allocated for projects and encourage donor agencies to fund annual capacity-building and training programmes in testing centres adopted as ITU centres of excellence;

2015

SG11 established **ITU-T Conformity Assessment Steering Committee ITU-T CASC**, http://itu.int/go/casc
Main objective is elaborate the TL recognition procedure in close collaboration with existing accreditation entities (e.g., IEC, ILAC, IAF, etc.).



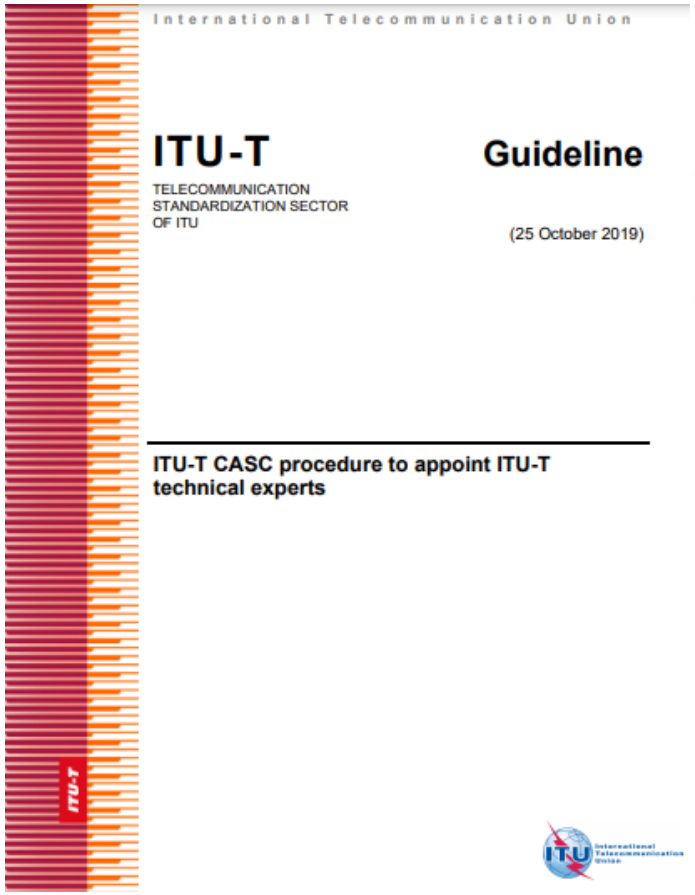


SG11 agreed a Guideline on "Testing Laboratories recognition procedure".
It describes the process on how ITU may recognize Testing Laboratories which competence covers ITU-T standards.

The Guideline was revised in July 2022.

2017-2019

SG11 agreed a Guideline "ITU-T CASC procedure to appoint ITU-T technical experts".
Those experts could be included in the assessment team of IEC or ILAC in order to evaluate TL which have competence on particular ITU-T Recommendations.


International Telecommunication Union

ITU-T

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU

Guideline

(25 October 2019)

ITU-T CASC procedure to appoint ITU-T technical experts

List of ITU-T technical experts appointed by ITU-T CASC

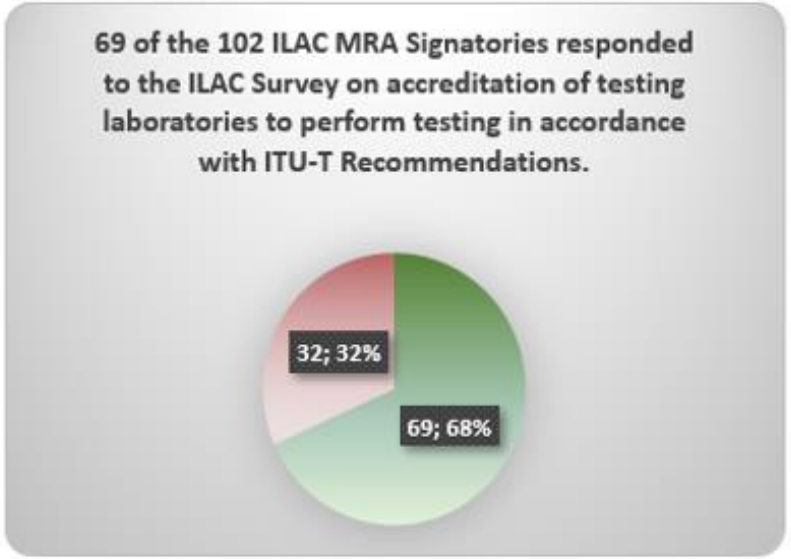
(Geneva, 18 October 2019, ref. Annex C of SG11-TD1020R1/GEN)

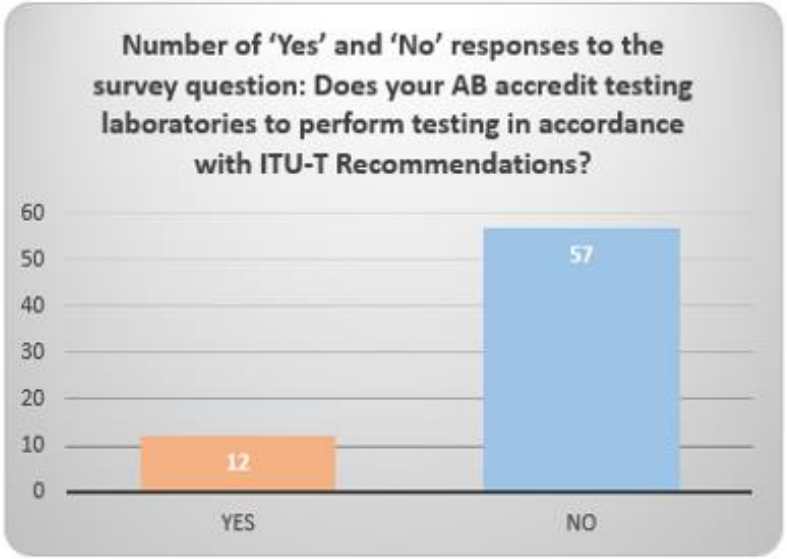
#	Name	ITU-T Recommendation	Country	Company	Email
1.	Feng Qi	ITU-T M.3101 (07/1995); ITU-T M.3170.4 (04/2015); ITU-T X.781 (08/2001); ITU-T X.783 (07/2014); ITU-T X.784 (03/2016)	China	BUPT, China	qifeng[at]bupt.edu.cn
2.	Awad Mulah	ITU-T K.48 (09/2006); ITU-T K.116 (11/2015)	Sudan	Telecommunication and Post Regulatory Authority (TPRA), Khartoum-Sudan	awadmulah[at]tpra.gov.sd
3.	Michael Maytum	ITU-T K.12 ITU-T K.77 ITU-T K.82 ITU-T K.95 ITU-T K.102 ITU-T K.129 ITU-T K.117 ITU-T K.20 ITU-T K.21 ITU-T K.45	UK	Bourns Ltd., United Kingdom	m.j.maytum[at]ieee.org
4.	Yuan Zhang	ITU-T H.626 (Rev.), ITU-T H.626.4, ITU-T H.626.5, ITU-T H.627, ITU-T H.627.1	China	China Telecom	zhangyuan1.sh[at]chinatelecom.cn
5.	Haitao Zhang	ITU-T H.626 (Rev.), ITU-T H.626.2, ITU-T H.626.3, ITU-T H.627	China	Beijing University of Posts and Telecomm	zht[at]bupt.edu.cn
6.	Yalan Zhang	ITU-T H.626 (Rev.), ITU-T H.626.2, ITU-T H.626.3, ITU-T H.627	China	Huawei Technologies Co., Ltd	zhangyalan[at]huawei.com
7.	Kai Liao	ITU-T H.626 (Rev.), ITU-T	China	ZTE	liao.kai[at]zte.com.cn

SG11 appointed several ITU technical experts on different ITU-T Recommendations.

2020

Collaboration with ILAC





ILAC presented outcomes of ILAC survey to identify Testing Laboratories accredited to perform testing in accordance with ITU-T Recommendations (see SG11-TD1370/GEN).

The results indicated that:

- 12 Accreditation Bodies (ABs) out of the 57 who replied to the survey, are accrediting laboratories for ITU Recommendations.
- Out of the 12 ABs 10 had fewer than 5 accredited labs while 2 members indicated they have accredited 23 and 37 laboratories respectively for ITU-T Recommendations.

2021

SG11 decided that ITU recognizes the Testing Laboratories (TLs) which are accredited by an AB that is a signatory to the ILAC MRA for testing, which scope of accreditation contains ITU-T Recommendation(s).

There are no financial implications for ITU for implementing such procedures. Financial implications for TLs are to be covered by the cost structures of the ABs.

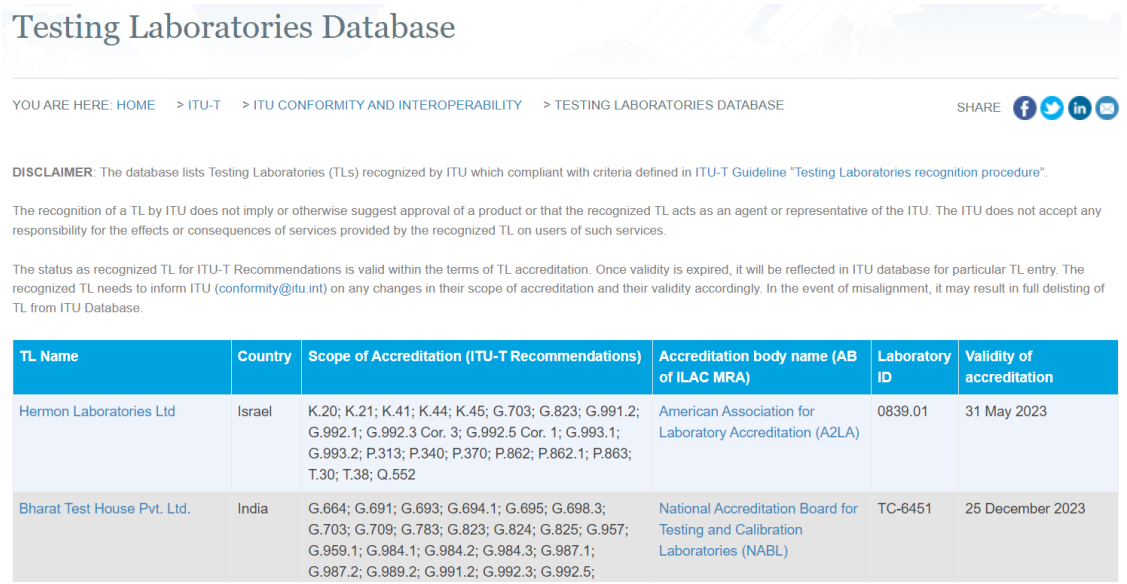
Ref.: SG11 Report, March 2021, SG11-R42

2022

Key achievements: CASC

- **Aligned its ToR with Resolutions of WTSA-20**
- **Established collaboration with International Laboratory Accreditation Cooperation (ILAC)** on Testing Laboratory recognition procedure
- **Approved the ITU Guidelines** on TL recognition procedure and appointment of ITU technical experts
- **Appointed 10 ITU-T Technical experts on ITU-T Recommendations** H., K., M. and X.series.
- **Recognized 11 TLs** which are accredited by an Accreditation Body (AB) that is a signatory to the ILAC Mutual Recognition Arrangement (MRA) for testing, which scope of accreditation contains ITU-T Recommendation(s).
  - ITU Operational Bulletins (OB.1253, OB.1256, OB.1263, OB.1266)
  - Newslog

TSB Circular 368



Testing Laboratories Database

YOU ARE HERE: HOME > ITU-T > ITU CONFORMITY AND INTEROPERABILITY > TESTING LABORATORIES DATABASE SHARE

DISCLAIMER: The database lists Testing Laboratories (TLs) recognized by ITU which compliant with criteria defined in ITU-T Guideline "Testing Laboratories recognition procedure".

The recognition of a TL by ITU does not imply or otherwise suggest approval of a product or that the recognized TL acts as an agent or representative of the ITU. The ITU does not accept any responsibility for the effects or consequences of services provided by the recognized TL on users of such services.

The status as recognized TL for ITU-T Recommendations is valid within the terms of TL accreditation. Once validity is expired, it will be reflected in ITU database for particular TL entry. The recognized TL needs to inform ITU (conformity@itu.int) on any changes in their scope of accreditation and their validity accordingly. In the event of misalignment, it may result in full delisting of TL from ITU Database.

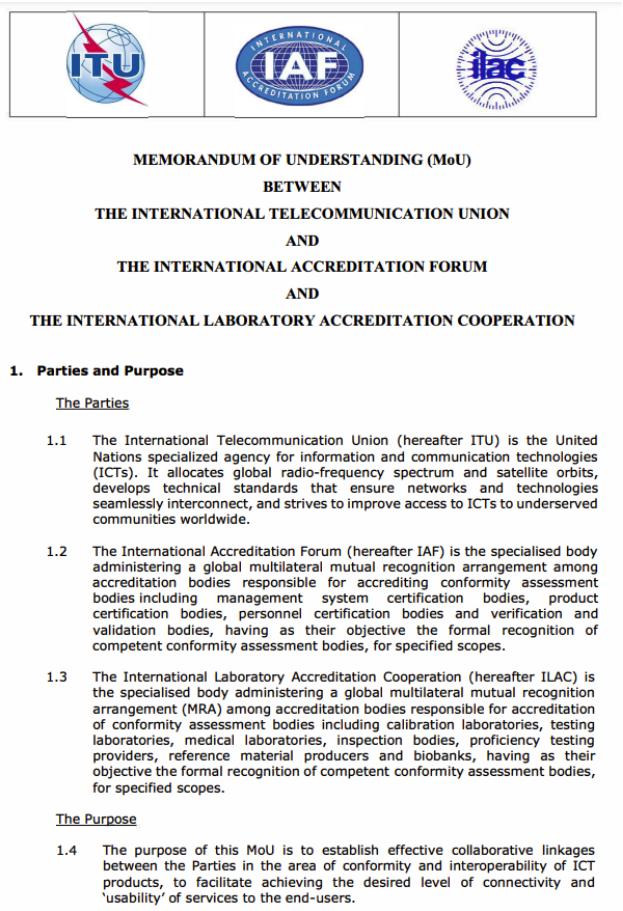
TL Name	Country	Scope of Accreditation (ITU-T Recommendations)	Accreditation body name (AB of ILAC MRA)	Laboratory ID	Validity of accreditation
Hermon Laboratories Ltd	Israel	K.20; K.21; K.41; K.44; K.45; G.703; G.823; G.991.2; G.992.1; G.992.3 Cor. 3; G.992.5 Cor. 1; G.993.1; G.993.2; P.313; P.340; P.370; P.862; P.862.1; P.863; T.30; T.38; Q.552	American Association for Laboratory Accreditation (A2LA)	0839.01	31 May 2023
Bharat Test House Pvt. Ltd.	India	G.664; G.691; G.693; G.694.1; G.695; G.698.3; G.703; G.709; G.783; G.823; G.824; G.825; G.957; G.959.1; G.984.1; G.984.2; G.984.3; G.987.1; G.987.2; G.989.2; G.991.2; G.992.3; G.992.5;	National Accreditation Board for Testing and Calibration Laboratories (NABL)	TC-6451	25 December 2023

MoU between ITU-T, International Accreditation Forum (IAF) and International Laboratory Accreditation Cooperation (ILAC)

24 August 2022: The MoU between ITU-T, IAF and ILAC provides critical support to ITU's Conformance and Interoperability (C&I) programme. Conformance with international standards is one of the core principles underlying the global interoperability of ICT networks and devices.

The ITU Conformity and Interoperability (C&I) programme was initiated at the request of ITU's membership to enhance the conformity and interoperability of ICT products implementing ITU Recommendations or part thereof.

The purpose of this MoU is to establish effective collaborative linkages between the ITU-T, IAF and ILAC in the area of conformity and interoperability of ICT products, to facilitate achieving the desired level of connectivity and 'usability' of services to the end-users.



MEMORANDUM OF UNDERSTANDING (MoU)

BETWEEN

THE INTERNATIONAL TELECOMMUNICATION UNION

AND

THE INTERNATIONAL ACCREDITATION FORUM

AND

THE INTERNATIONAL LABORATORY ACCREDITATION COOPERATION

1. Parties and Purpose

The Parties

1.1 The International Telecommunication Union (hereafter ITU) is the United Nations specialized agency for information and communication technologies (ICTs). It allocates global radio-frequency spectrum and satellite orbits, develops technical standards that ensure networks and technologies seamlessly interconnect, and strives to improve access to ICTs to underserved communities worldwide.

1.2 The International Accreditation Forum (hereafter IAF) is the specialised body administering a global multilateral mutual recognition arrangement among accreditation bodies responsible for accrediting conformity assessment bodies including management system certification bodies, product certification bodies, personnel certification bodies and verification and validation bodies, having as their objective the formal recognition of competent conformity assessment bodies, for specified scopes.

1.3 The International Laboratory Accreditation Cooperation (hereafter ILAC) is the specialised body administering a global multilateral mutual recognition arrangement (MRA) among accreditation bodies responsible for accreditation of conformity assessment bodies including calibration laboratories, testing laboratories, medical laboratories, inspection bodies, proficiency testing providers, reference material producers and biobanks, having as their objective the formal recognition of competent conformity assessment bodies, for specified scopes.

The Purpose

1.4 The purpose of this MoU is to establish effective collaborative linkages between the Parties in the area of conformity and interoperability of ICT products, to facilitate achieving the desired level of connectivity and 'usability' of services to the end-users.

https://www.itu.int/en/ITU-T/extcoop/Documents/mou/MoU-ITU-T-IAF-ILAC-20220824.pdf

ILAC-ITU Partnership

Welcome Guest

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- ILAC MRA and Signatories
- ILAC Membership
- Publications and Resources
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- Contact Us

» ILAC – ITU PARTNERSHIP

Memorandum of Understanding

The International Telecommunications Union (ITU), the International Accreditation Forum (IAF) and the International Laboratory Accreditation Cooperation (ILAC) have reviewed and re-signed the Memorandum of Understanding (MoU) from May 2012. The re-signing of the ITU-IAF-ILAC MoU continues to support and strengthen the three organizations' commitment to cooperation and collaboration and the ongoing development of ITU-T's Conformity and Interoperability (C&I) programme.

ITU Recognised Test laboratories.

The ITU maintains a register of test laboratories that are eligible to test ICT equipment against the ITU-T Recommendations in the ITU list of recognized test laboratories.

The ILAC Assessment Procedure in the field of Telecommunications has been produced to inform ILAC MRA signatory accreditation bodies about the requirements that must be met by testing laboratories seeking to be registered on the ITU list of recognized test laboratories.

https://ilac.org/about-ilac/partnerships/international-partners/itu/

ITU Testing Laboratories Database (TLDB)

TSB Circular 368

http://itu.int/go/tldb

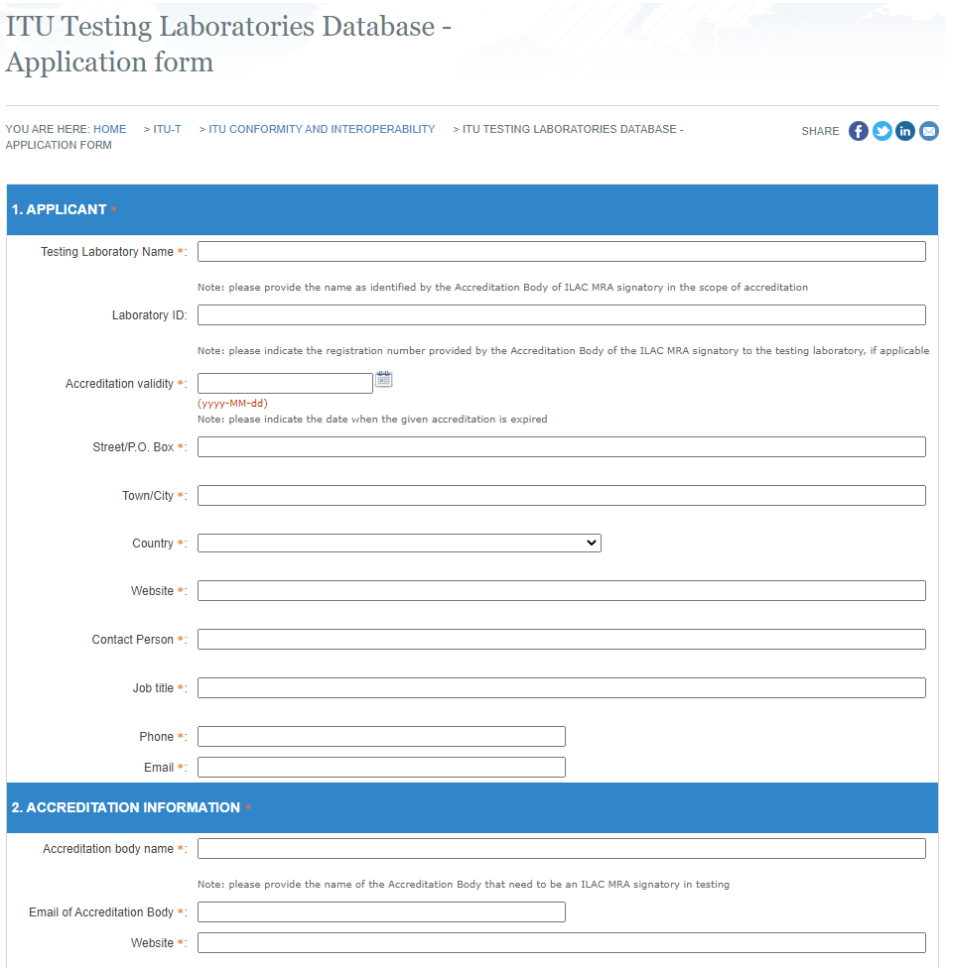
In order to be recognized by the ITU, Testing Laboratories (TL) shall be:

- accredited by an Accreditation Body that is a signatory to the ILAC MRA for Testing (using ISO/IEC 17025)
  Note: the list of ABs is available at: https://ilac.org/signatory-search/.
- have ITU-T Recommendations in the TL's scope of accreditation

Ref: revised ITU-T Guideline, July 2022

According to ITU Guideline: *"Based on received applications, if they are in line with the criteria defined in cl.9, TSB Director is asked to register the Testing Laboratory in the ITU Testing Laboratory Database accordingly."*

Any TL including non-ITU members are encouraged to apply



ITU Testing Laboratories Database - Application form

YOU ARE HERE: HOME > ITU-T > ITU CONFORMITY AND INTEROPERABILITY > ITU TESTING LABORATORIES DATABASE - APPLICATION FORM

SHARE

1. APPLICANT *

Testing Laboratory Name *:

Note: please provide the name as identified by the Accreditation Body of ILAC MRA signatory in the scope of accreditation

Laboratory ID:

Note: please indicate the registration number provided by the Accreditation Body of the ILAC MRA signatory to the testing laboratory, if applicable

Accreditation validity *:

(yyyy-MM-dd)

Note: please indicate the date when the given accreditation is expired

Street/P.O. Box *:

Town/City *:

Country *:

Website *:

Contact Person *:

Job title *:

Phone *:

Email *:

2. ACCREDITATION INFORMATION *

Accreditation body name *:

Note: please provide the name of the Accreditation Body that need to be an ILAC MRA signatory in testing

Email of Accreditation Body *:

Website *:

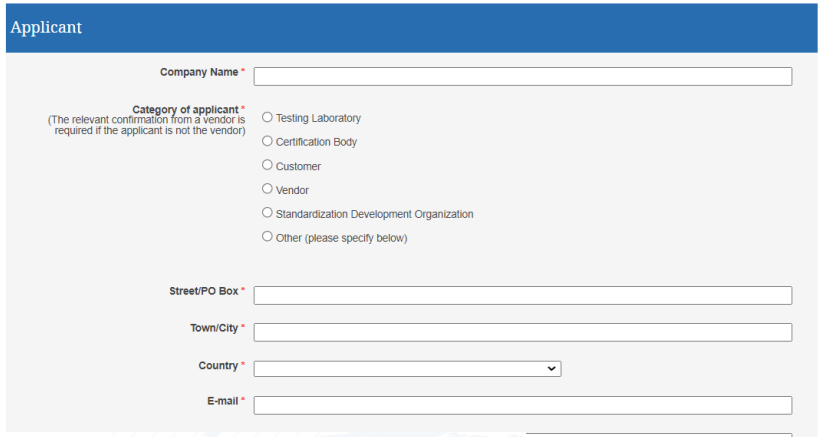
The request needs to be sent via online form.
It is available on ITU C&I Portal:
http://itu.int/go/citest

ITU Product Conformity Database (PCDB)

http://itu.int/go/tcdb

The PCDB can be populated by **testing laboratories,** Online application form **conformity assessment bodies (CABs), vendors** and others, **including non-members of ITU**, provided that the product is either (see here):

- **tested** by a testing laboratory which has an accreditation with ISO/IEC 17025 and at least one ITU-T Recommendation; or,
- **certified** to be in conformance with at least one ITU-T Recommendation by a CAB with ISO/IEC 17065 accreditation
- tested by testing laboratory recognized by ITU (accredited by ILAC MRA signatories AB which have ITU Recommendations in its scope of accreditation), see ITU-T Guideline.


Applicant

Company Name *

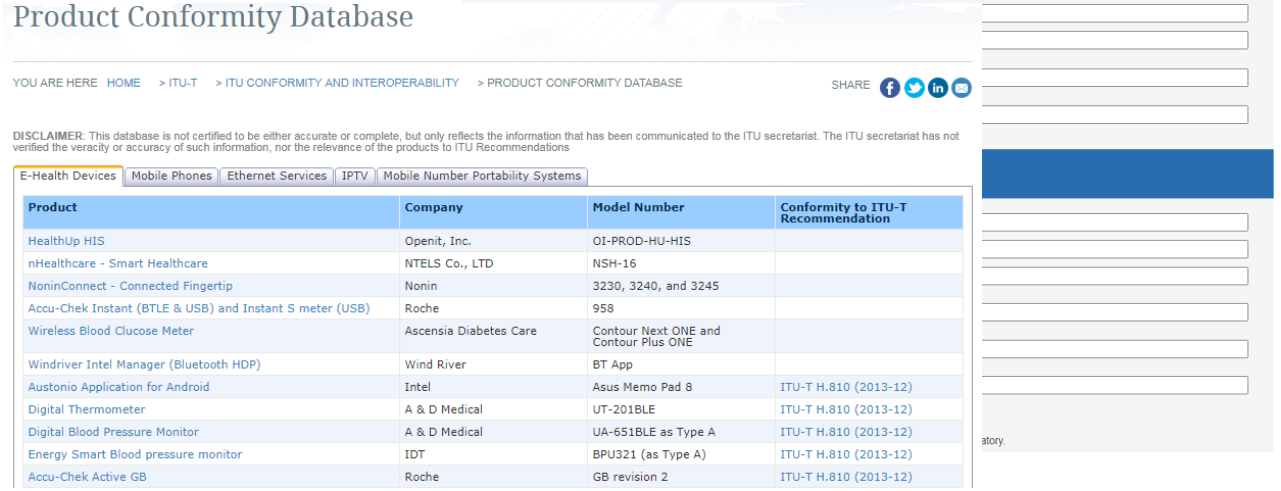
Category of applicant * (The relevant confirmation from a vendor is required if the applicant is not the vendor)
- Testing Laboratory
- Certification Body
- Customer
- Vendor
- Standardization Development Organization
- Other (please specify below)

Street/PO Box *

Town/City *

Country *

E-mail *


Product Conformity Database

YOU ARE HERE HOME > ITU-T > ITU CONFORMITY AND INTEROPERABILITY > PRODUCT CONFORMITY DATABASE SHARE

DISCLAIMER: This database is not certified to be either accurate or complete, but only reflects the information that has been communicated to the ITU secretariat. The ITU secretariat has not verified the veracity or accuracy of such information, nor the relevance of the products to ITU Recommendations

E-Health Devices | Mobile Phones | Ethernet Services | IPTV | Mobile Number Portability Systems

Product	Company	Model Number	Conformity to ITU-T Recommendation
HealthUp HIS	Openit, Inc.	OI-PROD-HU-HIS	
nHealthcare - Smart Healthcare	NTELS Co., LTD	NSH-16	
NoninConnect - Connected Fingertip	Nonin	3230, 3240, and 3245	
Accu-Chek Instant (BTLE & USB) and Instant S meter (USB)	Roche	958	
Wireless Blood Clucose Meter	Ascensia Diabetes Care	Contour Next ONE and Contour Plus ONE	
Windriver Intel Manager (Bluetooth HDP)	Wind River	BT App	
Austonio Application for Android	Intel	Asus Memo Pad 8	ITU-T H.810 (2013-12)
Digital Thermometer	A & D Medical	UT-201BLE	ITU-T H.810 (2013-12)
Digital Blood Pressure Monitor	A & D Medical	UA-651BLE as Type A	ITU-T H.810 (2013-12)
Energy Smart Blood pressure monitor	IDT	BPU321 (as Type A)	ITU-T H.810 (2013-12)
Accu-Chek Active GB	Roche	GB revision 2	ITU-T H.810 (2013-12)

Product is to be tested to applicable ITU-T Recommendations using ITU-T test specifications or procedures adopted by an SDO or forum qualified in accordance with Recommendation ITU-T A.5.

At this early stage of the database's implementation, the entry of products is possible through two other channels:

- if these products were tested in an **ITU test event**
- as part of an ITU conformity testing **pilot project**

Potential approach on safe listening project

- Appoint ITU-T technical experts on ITU-T H.870-series who might be involved by Accreditation Bodies of ILAC MRA to assess Testing Laboratories
- Register Testing Laboratories (TLs), which fulfill the criteria of ITU TL recognition procedure, in ITU TL Database
- Register ICT products tested by recognized TLs in ITU Product Conformity Database

Contacts

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Next steps

ITU

ITU Study Group 16, Question 28 Rapporteur’s meeting

Masahito Kawamori ITU

ITU Study Group 16, Question 28 Rapporteur's meeting

- Coordination with other SDOs, such as IEC, CENELEC, etc.
- H.870.V2 related documents
- F.780.2 (accessible telehealth) conformance testing specification
- Any other business
- New work items

World Health Organization 75 HEALTH FOR ALL

ITU

Group D: Research protocol

Chair: Adrian Fuente

Start time: 9:00 am

Room: W1

Adrian Fuente
Katya Feder
Adriana Lacerda
Colleen Le Prell
Richard Neitzel
Lauren Smith
Kelly Tremblay

Purpose

- Outline field testing methodology and propose sites for field testing of the research protocol, and discuss other areas of research interest

Objectives

- Discuss and finalize the draft research protocol
- Discuss and develop ideas of how the research protocol will be field tested
- Review the findings from the Apple Hearing Health study and discuss possible public health use of the data (TBC)
- Discuss other areas of potential research interest